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PHILOSOPHICAL AND HISTORICAL FOUNDATIONS
OF THE CONCEPT OF INNOVATION:
SOME IMPLICATIONS FOR CONTEMPORARY
HIGHER EDUCATION AS A SERVICE SECTOR

A thesis submitted in fulfilment of the requirement for the degree of
Doctor of Philosophy in the Australian Centre for Innovation,
Faculty of Engineering and Information Technologies at
The University of Sydney



Lawrence Stevenson
March 2013

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Abstract

The Australian higher education services sector has significantly increased its economic contribution to Gross Domestic Product in the twenty-first century. Innovation is highly prized in an increasingly competitive global knowledge economy. However, there is currently no theory of innovation in the higher education services sector. This factor is framed as the thesis research problem. The hypothesis of this thesis is that: based on an examination of the implications of the philosophical and historical foundations of the concept of innovation, contemporary higher education sector innovation can be meaningfully interpreted through a framework based on service sector innovation theory.

Based on the findings of an extended investigation of the philosophical and historical foundations of the concept of innovation, implications are explored by ‘field-testing’ a potential theoretical framework for its ability to identify innovative trends in the higher education sector. Case studies of the finance service sub-sector are constructed and are used as a template to compare current practices in the ‘lagging’ higher education services sector. The thesis concludes that the hypothesis is supported and confirmed. That is, based on an examination of the implications of the philosophical and historical foundations of the concept of innovation, contemporary higher education sector innovation can be meaningfully interpreted through a framework based on service sector innovation theory.

Foreword

This thesis reflects the outcome of around thirty years of reflection on the various issues related within this text. Studies in Science and Technology Studies, Economics, History and Philosophy of Science, Psychology, Philosophy, Science and Technology Policy and also a university career spanning twenty-five years in academic, research and management roles have all contributed to the issues considered within these pages. During the course of my life I have been fortunate to have met a number of key individuals who have inspired my thinking and whose understanding of issues has spurred my own endeavours. Particular thanks must go to my thesis supervisor, Professor Ron Johnston, an internationally acknowledged scholar and authority in the fields of science, technology and innovation policy. I have been fortunate to have had access to Ron's knowledge, patient wisdom and constructive advice throughout the writing of this thesis. Thanks must also be extended to the Australian Centre for Innovation and the Faculty of Engineering and Information Technology of the University of Sydney which granted the HECS scholarship that enabled this thesis to be written.

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Chapter 1. Introduction and Overview

1.1 Background to the research

The research contained within this thesis was initiated by the recognition of the lack of a theory of innovation in the higher education services sector that was useful for identifying trends and potential future directions in this sector. This finding appeared to deserve investigation due to the increasing contribution of the Australian Higher Education sector to the ‘global knowledge economy’. In addition, the Australian Higher Education system is undergoing a process of rapid and profound change embodying many technological and organisational innovations in processes, products and delivery methods.

Initial research revealed that theorising of innovation had only commenced relatively recently in the twentieth century. This seemed at odds with the history of practical innovations throughout millennia, for example in periods such as the Renaissance and the Industrial Revolution, to name but two. Further investigation revealed deeper philosophical and historical explanations for the relative late start in theorising innovation as an economic, technical and institutional process and the implications of this for the theorising of innovation in the higher education sector.

Numerous theories have been developed and case studies written by educationalists and managerial theorists which attempt to explain changes in the higher education sector. However, they are limited in that they only address the changes through the lens of educational and managerial theory thereby leaving a lacuna in relation to an innovation theory perspective. In short, the higher education sector lacks a cohesive, perspective based on a broader theoretical framework informed by a sustained historical and philosophical analysis of the foundations of the concept of innovation. The Higher Education sector has been theoretically viewed in isolation from other segments of the service sector. Whilst a variety of service sector innovation models have been developed, they do not specifically include the higher education sector within their interpretive frameworks, nor suggest a methodology for identifying potential innovation trends in the higher education sector.

Based on an investigation of the philosophical and historical foundations of the concept of innovation, this thesis will sketch some of the implications for a theory of contemporary higher education as a service sector. One of the implications will include a preliminary investigation of a potential framework for a theory of innovation in the higher education services sector. Expanding upon this, the thesis will also suggest potential practical research applications of its findings via case study examples.

1.2 Research problem and hypothesis

The research problem of this thesis is the current lack of a theory of innovation in the higher education sector. The hypothesis of this thesis is that: based on an examination of the implications of the philosophical and historical foundations of the concept of innovation, contemporary higher education sector innovation can be meaningfully interpreted through a framework based on service sector innovation theory.

The thesis will address the research problem by identifying factors contributing to the lack of a theory of innovation in the higher education sector. These factors will be identified by reviewing philosophical and historical foundations of the concept of innovation via textual analysis and also assessing their implications and influences on contemporary innovation theories. Based on the results of this review, the thesis will suggest a preliminary service sector innovation theoretical framework through which to interpret innovation in the higher education services sector. The thesis will also examine the potential implications of this theoretical framework for identifying innovation trends in the higher education sector by the construction and comparison of two service sector case studies.

The thesis will not examine higher education's contribution towards innovation in the development of emergent technologies; that issue lies beyond the purview of this thesis. However it is acknowledged that the types of institutional innovation examined within this thesis could, theoretically, assist by the development of emerging technologies by increasing efficiencies via collaborative research across

the trans-university network which is enabled by Information and Communication technology infrastructures.¹

1.3 Methodology

This section will discuss preliminary considerations of the methodology and establish the methodological traditions on which this thesis is based. It will then proceed to outline the methodological steps undertaken in the course of the thesis research.

This thesis has utilised a ‘qualitative’ research methodology based on historical textual research and case study research.² The research draws on the ‘interpretivist’ tradition which is based on the assumption that

...the social world is interpreted or constructed by people and is therefore different from the world of nature... [and is] dealing with multiple realities which are socially and individually constructed.³

It is therefore a ‘narrative’ in the sense that it does not

...claim to be in possession of the absolute truth.⁴

The methodology utilised in this thesis is also ‘iterative’ in that the ‘various elements of the research are interwoven’. For example, as the thesis research developed it influenced decisions about further areas of research.⁵

Initial research focussed on identifying and sourcing relevant literature for review. The initial literature review process revealed that there was a gap in the literature in relation to interpretations of innovation in the higher education sector. This finding initiated further research into the broader philosophical and historical literature field to establish explanations as to why this situation existed. This broader research revealed the absence of a sustained and cohesive treatment linking philosophical and historical influences on the relatively late development of

¹ Webster, A., Private communication, June 2013.

² Williamson, K., Research Methods for students, professionals and academics: information management and systems, (2nd edition), Centre for Information Studies, Charles Sturt University, Wagga Wagga, 2002, p.30.

³ Ibid.

⁴ Sim, S. (ed.), The Routledge Companion to Postmodernism, (2nd ed.), Routledge, London, 2005, p.255.

⁵ Williamson, K., op.cit., p.32.

conceptions of innovation and the implications for their application to interpret innovation in the higher education sector.

Due to the multidisciplinary nature of the research undertaken in this thesis, the literature review process was repeated for each chapter topic. The literature review process became more targeted and precise as a viable conceptual framework began to emerge from the prior literature reviews and research. This evolutionary and iterative research approach is recognised as appropriate and fruitful within qualitative research methodology.

The comparative case-study methodology utilised in the later chapters was inspired by remarks made by Barras (1990) regarding potential developmental similarities between ‘leading’ and ‘lagging’ services sub-sectors. Although Barras did not suggest, nor attempt, the construction of case studies to test his propositions, it was considered to be the next logical step that was required to extend the usefulness of Neo-Schumpeterian innovation theory into the higher education sector.

Comparative case-study methodology also contained the potential to demonstrate, or not, the practical utility of the proposed approach.

1.4 Outline of Thesis

Chapter 1 provides an introduction to the thesis and provides an overview of: the background to the research; the research problem and hypothesis; thesis methodology; and an outline of the thesis.

Chapter Two sets the keynote of the thesis by investigating the role of the higher education sector in the service sector and justifying the value of undertaking an examination of the philosophical and historical foundations of the concept of innovation and exploring their implications for theoretically framing contemporary higher education as a service sector. Definitions of the service sector will be examined and it will be established that precise definitions of the services sector are confounded by a number of factors including the dynamic nature of economic activity, and the transformative effects of information technology and communication.

The growth in the size and importance of the service sector in the global and Australian economies will be examined and it will be demonstrated that the higher education service sector is playing increasingly important roles in the service economy, the knowledge economy, and also as a significant contributor to earning Australian export income. The quantitative increase in economic activity in the services sector has also been accompanied by an increase in theoretical treatments of the sector. This is reflected in theories such as the 'New Service Economy', 'post-industrial society' and the 'knowledge economy'. These theories share the perspective that there has been a shift towards increased economic activity in the services sector and a decrease in manufacturing activities in western economies. They also highlight the growth in the importance of the production and use of knowledge in advanced economic activities. This development has been addressed by the theories of Gibbons (1994) in works such as 'The New Production of Knowledge'. Human resource implications of these changes have been conceptualised by Drucker (1993) and also Reich (1992) who theorise the increased demand for 'knowledge workers' or 'symbolic analysts' respectively.

The increase in the importance of the services sector and knowledge production activities has significant implications for the higher education sector. For example, the rapid growth of higher education's contribution to export income is of increasing economic importance. In addition, the role of higher education research activities in the production of knowledge and also the education of knowledge workers and symbolic analysts are another two obvious examples. However, there does not appear to be a theory of innovation in the higher education sector to assist in understanding the form and role of innovation, the identification of potential innovation trends and also provide some guidance as to interventions which may assist the growth of innovation in this increasingly important economic sector.

Chapter Two concludes that a theory of innovation of the higher education services sector would assist these processes. Therefore, the thesis proposes to undertake a preliminary investigation of a potential theoretical framework for such an undertaking based on the implications of the philosophical and historical foundations of the concept of innovation. The thesis will also suggest potential practical research applications of its findings via comparative case study examples.

Chapter Three commences the task of investigating the parent discipline of innovation theories and establishes that theorising about innovation did not commence until the late nineteenth and early twentieth centuries. For example, the first theoretical definition of ‘innovation’ was constructed by Joseph Schumpeter (1934) and is still used as the basis for the OECD’s Oslo Manual (2005) definition of innovation. It will also be established that theories of innovation do not fit neatly into the disciplinary home of economics. In fact, theories of innovation, as represented by the works of Joseph Schumpeter, are multidisciplinary. In the context of knowledge production, this element can be identified with what Gibbons (1994) refers to as ‘Mode 2’ knowledge production which is also multidisciplinary.

Chapters Three and Four provide an account of philosophical and historical foundations of cultural attitudes to innovation and identify the sustained influence of elements of Platonic attitudes towards innovation over nearly a two-thousand year period. Plato’s (2007, 2010) attitudes towards innovation, and the factors influencing the shaping of those attitudes, will be examined. Based on the textual evidence, it will be demonstrated that Plato’s attitudes towards innovation were undoubtedly negative – in the strongest possible terms. For example, he recommended the punishment of death to innovators in education.

Plato’s concerns will be linked to the historical construction of a stable and static model of society based on his philosophical principles. Evidence will be provided demonstrating that Plato interpreted technological, political and economic innovations as threats to his model society and therefore condemned these types of developments. Plato was particularly suspicious of merchants and foreign traders whom he believed were responsible for introducing subversive ideas and practices into society.

It will be argued that one of the key underlying beliefs structuring Plato’s logic was that of the ‘Forms’. Plato believed that ‘Forms’ were the underlying, static and perfect templates of any visible phenomena on earth. According to Plato, ‘Forms’ were ‘Reality’ and visible phenomena were but pale, imperfect reflections of the ‘Forms’. Plato believed knowledge of the ‘Forms’ could be accessed by ‘Reason’ and that the perfect society would be based on knowledge of the ‘Forms’. These

assumptions contributed to his belief that any innovations which diverted humans or society away from models of society based on the 'Forms' were at least ill-advised, if not sacrilegious.

Ironically, Plato's theory of 'Forms' provided the deep underlying philosophical template which structured philosophical reasoning and perspectives for millennia. The philosopher of science, Thomas Kuhn (1970), refers to these types of underlying templates as 'paradigms'. Therefore, it will be argued, the 'Platonic paradigm' effectively blocked theorising of 'innovation' until relatively recently.

The survival of elements of Plato's beliefs and attitudes towards innovation proved to be surprisingly long-lived and influential up until at least the nineteenth-century. It will also be argued that Platonic remnants can still be identified in some contemporary economic theories. For example, the Newtonian physics model was demonstrated to contain Platonic influences. In addition, the Newtonian physics model had been viewed as an exemplar for other 'sciences'. Adam Smith's (1776) classical economics, in common with other Enlightenment theories, were modelled in the image of the Newtonian physics model. Therefore, elements of the 'Platonic paradigm' contained in Newton's theories were also imported into Smith's classical economics. The widespread influence of the Newtonian physics model can be gauged by Gibbons (1994) reference to a 'Mode 1' knowledge production model based on Newtonian physics.

Chapter Four will continue the examination of the philosophical and historical foundations of the concept of innovation in the Age of Enlightenment. The continuing influence of the 'Platonic paradigm' will be identified and the inadequacy of static Enlightenment mechanistic metaphorical models as a basis for theories of innovation discussed. It will be argued that the gradual replacement of static, mechanistic metaphors by evolutionary, biological world views provided metaphorical models capable of dealing with the dynamics of change related to innovation. Chapter Four will also review Comte's new discipline of Sociology, in particular its static and dynamic models, based on biological metaphors, and its role in contributing towards the foundation of a theory of innovation.

Chapter 5 will examine contemporary economic philosophies and trace their origins to the Austrian School of Economics and its historical, cultural and philosophical context – ‘fin de siecle’ Vienna of the early 20th century Austro-Hungarian Empire. Vienna will be identified as the cradle of numerous philosophies which are still shaping thought and policy in the 21st century global economy.

Philosophers examined include Wittgenstein (1986), Popper (1972, 1974) and Hayek (1955). The common thread of thought uniting their investigations was their recognition and theoretical explication of the limits of rationality. The implications of the recognition of the limits of rationality, (and a signal for the end of the modernist project of rationality based on the principles of the Enlightenment) for areas as diverse as philosophy, psychology, physics, logic, epistemology, teleology, economics, politics, history and philosophy of science, opened the question of the validity of projects in the theory of knowledge such as teleology and deductive reasoning based on empirical or a priori justifications. These philosophies also provided the philosophical basis for questioning and eventually overturning the ‘Platonic philosophical paradigm’. Therefore, they also contained implications for theorising of ‘innovation’ in general and ‘innovation in the higher education sector’ in particular.

Chapter 5 then explores the philosophical outcomes of the testing of the limits of rationality in Vienna and the expanding influence of the diaspora of Viennese intellectuals prior to and post World War II. The genesis of postmodernism and economic rationalism and their influence on higher education canons and finances is investigated by tracing its development from Wittgenstein’s ‘language game’ paradigm philosophy and Hayek’s ‘Austrian economics’. Wittgenstein’s influence is traced through theorists such as Kuhn (1970) and his thesis of ‘scientific paradigms’, through to Dosi’s (1982) ‘technological paradigms’ and thence to Perez’s (2002) Neo-Schumpeterian ‘techno-economic paradigms’. It will be argued that these theories contain the conceptual elements necessary for the foundation of a theory of innovation in the higher education sector.

Chapter 6 will introduce the Neo-Schumpeterian theories of innovation and the influence of the theories of Joseph Schumpeter (1939, 1952, and 1961) on Neo-Schumpeterian theorists. It will be argued that the Schumpeterian and Neo-Schumpeterian theories of innovation would not have been theoretically possible prior to the discrediting of the ‘Platonic paradigm’ which theoretically prohibited ‘innovation’ and therefore ‘theories of innovation’. Consequently, the chapter will link Schumpeter’s theories to those discussed in the previous chapter and also identify Schumpeter’s Viennese origins and the influences of German and Austrian philosophy and economics on his theories. The Neo-Schumpeterian concepts of techno-economic paradigm and related socio-institutional changes will also be introduced and discussed and related to examples illustrating aspects of the Fourth Kondratiev and Fifth Kondratiev techno-economic paradigms.

Chapter 7 will argue that the political and economic philosophies that assist the introduction of new ‘techno-economic paradigms’ and socio-institutional arrangements are those which assist in what Schumpeter referred to as the ‘creative destruction’⁶ of the political and economic philosophies which were in place for the previous Fourth Kondratiev ‘techno-economic paradigm’, which, in this case, were social democracy, Keynesianism, regulation and centrally planned economies. The roles of postmodern philosophies, which reject the ‘Platonic paradigm’, in the creative destruction process of the previous political and economic paradigms will be discussed. The contemporary political and economic philosophies that will be identified as assisting in the process of ‘creative destruction’ are ‘neo-liberalism’ and ‘economic rationalism’ which both promote competition, deregulation, individualism and market-led economies. The implications for higher education of this ‘paradigm change’, in which the innovation prohibiting ‘Platonic paradigm’ is rejected, will be introduced in the following chapter.

Chapter 8 will introduce the Service Sector Innovation theories of Richard Barras. Barras’ Innovation model will be identified as a Neo-Schumpeterian cycle theory which in turn draws on the theories of Joseph Schumpeter and long wave economic

⁶ Schumpeter, J., Capitalism, Socialism and Democracy, George, Allen and Unwin, Ltd., London, 1961, pp. 81-86.

theory. It will be observed that Barras specifically applied his innovation model to the financial services sector, arguing that it was the leading innovator in the services sector. However, he alluded to the possibility that it may also be applicable to what he referred to as ‘lagging sectors’ such as the higher education and public health sectors, but this assertion was not developed or explicated in his paper, nor investigated and expanded upon by other theorists. Nonetheless, in 1990 Barras did argue that numerous economic, political, organisational and structural transformations would be necessary before the higher education and health ‘public sectors’ would be ready to transform themselves into innovative sub-sectors of the service sector.

The Neoliberal model has experienced some success in preparing these ‘public sectors’ for this transformation since Barras’ 1990 paper was written twenty years ago. Barras’ Service Sector Innovation Theory will be identified as a potentially suitable theoretical framework for interpreting innovation in the higher education sector. Based on this finding, it will be proposed that Barras’ suggestion that ‘leading’ service sectors may provide an innovation demonstration effect for ‘lagging’ service sectors could be tested by the construction of comparative case studies of the ‘leading’ and ‘lagging’ sector. The purpose of these case-studies will be to provide assessable evidence to establish whether it supports Barras’s Neo-Schumpeterian theory of innovation in the services sector and by extension provide a framework for interpreting innovation in the higher education sector. Chapter 8 will proceed to construct a case study of the ‘leading’ service sector, financial services.

Chapter 9 will construct a case-study examining one of the service sectors ‘lagging’ sub-sectors, the higher education services sub-sector. Chapter 9 will report on a comparison of the two case studies and establish similarities with trends and forces from the innovative ‘leader’ – the financial services sub-sector and the innovative ‘laggard’ – the higher education services sub-sector.

It will be argued that there are similarities to be observed between ‘leading’ and ‘lagging’ service sub-sectors when this technique is deployed. Therefore, it will be proposed that this extended Neo-Schumpeterian model could be useful in

conceptually framing innovation and also identifying potential innovation trends in the higher education sector. The additional insights provided by placing Barras' theory within the framework of Neo-Schumpeterian theory amplify the potential of the theory for identifying trends in the 'leading' and 'lagging' sectors of the services sector. It will also provide a powerful model for structuring and interpreting the diverse changes and trends within the higher education sector.

Based on this comparison, it will be argued that this technique also contains the potential to contribute to what Drucker (1993) has referred to as 'systematic innovation' by utilising it in qualitative 'scenario building' forecasting techniques⁷ such as 'horizon scanning' and 'trend impact' analysis.⁸

It will also be argued that this would assist the process of mapping and identifying innovation trends in the service sector and highlight areas which may benefit from a more comprehensive innovation implementation and therefore increase the contribution of the Australian higher education sector to participation in and contribution to a competitive global knowledge economy.

Chapter Ten will conclude that the research problem of the current lack of a theory of innovation in the higher education sector can in part be attributed to the relatively late commencement of the theorising of innovation which did not commence until the theories of Schumpeter in the twentieth century. Based on a textual analysis of the philosophical and historical foundations of the concept of innovation, it will be argued that one of the contributing factors to the delay in theorising innovation was due to what can be characterised as the 'Platonic paradigm' which strongly discouraged innovation and therefore discouraged attempts to theorise innovation. The influence of the 'Platonic paradigm' was particularly wide-reaching and long-lasting. It will be argued that one of the implications of this was not only delayed attempts to theorise innovation, but also delayed attempts to theorise innovation in the higher education sector.

⁷ Porter, M., Competitive Strategy: Techniques for Analysing Industries and Competitors, The Free Press, London, 1980, p.234.

⁸ OECD, Knowledge Bank: Futures Thinking, accessed at http://www.oecd.org/document/43/0,3746,en_36702145_36702245_37626859_1_1_1_1.00.html October 10, 2011.

The thesis performs an in-depth analysis of the philosophical and historical theoretical movements, changes and developments across a period of two thousand years and establishes that deep and sustained theoretical shifts were required to create a theoretical environment conducive to the production of theories of innovation. In short, theorising of innovation could not commence until the 'Platonic paradigm' was discredited and replaced with a theoretical paradigm supportive and conducive of innovation and theorising of innovation. These deep theoretical shifts also possessed far-reaching implications for the shape and bases of the theories of innovation themselves. The results of these influences are traced to the theories of Schumpeter and the Neo-Schumpeterians whose theories provide the basis for a preliminary investigation of a potential framework for a theory of innovation in the higher education sector. The potential implications of this preliminary theoretical framework for identifying innovation trends in the higher education sector will be extended by the construction and comparison of two service sector case studies.

Based on the results of the examination of the philosophical and historical foundations of the concept of innovation and the construction and comparison of two case studies, the thesis will argue that one of the implications of the findings of an analysis of the philosophical and historical foundations of the concept of innovation is that the contemporary higher education sector can be meaningfully interpreted through a framework of Neo-Schumpeterian service sector innovation theory.

Therefore, the thesis will conclude that its hypothesis is supported. That is, based on an examination of the implications of the philosophical and historical foundations of the concept of innovation, contemporary higher education sector innovation can be meaningfully interpreted through a framework based on service sector innovation theory.

Chapter 2. The Services Sector

2.1 Introduction

The goal of this chapter is to set the keynote of the thesis by investigating the economic importance of the services sector and also the importance and role of higher education in the services sector. This investigation will highlight the value of undertaking an examination of the philosophical and historical foundations of the concept of innovation and also exploring their theoretical implications for contemporary higher education as a services sub-sector. The importance of the services sector has increased rapidly in both economic and conceptual terms. The purpose of this chapter is to identify the increasing economic significance of the service sector in general, and the higher education sub-sector in particular. This will be achieved by examining quantitative and qualitative aspects of the services sector and also definitions and concepts used to describe the sector.

This will include a discussion of: various definitions of the service sector; various approaches used to conceptualise the service sector and its interaction and intersection with other economic sectors; service sector statistics and the difficulties encountered in measuring the service sector; the phenomenon of ‘servicization’; the service sector’s role in the larger national and international economy; the increasing role and economic significance of the education, and in particular, the higher education sector; the relationship between the services sector, the ‘service economy’ and what has been termed the ‘knowledge economy’; knowledge intensity, globalisation and the role of Information Technology and Communication in assisting these processes; and finally, the emergence of the new discipline of ‘service science’ will be examined.

The chapter will conclude by observing that although the statistical and economic literature recognises the importance of the role of higher education in earning export income, the implications of this for increasing the emphasis placed on the importance of the role of competitiveness and innovation within the sector are rarely explored. Furthermore, the higher education service sector lacks a

theoretical model in which to meaningfully frame and interpret these factors and also identify trends and base predictions which would assist in the process of promoting innovation in this increasingly important service sub-sector of the Australian economy.

In summary, the purposes of this chapter are twofold: Firstly, to set the stage for the recognition of the increasing significance in the ‘knowledge economy’ of the Australian services sector and, in particular, the Australian higher education sector; and secondly, to identify the absence of, and need for, a theory of innovation in the higher education sector based on an investigation of the philosophical and historical foundations of the concept of innovation.

2.2 Definitions of the ‘Service Sector’

Traditional economic theory has its roots in agriculture, mining and manufacturing. One of the consequences of this historical contingency is that there is no widely accepted definition of services, nor agreement on how they should be classified. It has been argued that this state of affairs has arisen due to the limitations of ‘legacy’ economic theories. For example, Sassen observes that,

...both neo-classical and Keynesian economics long ignored any distinction between the production of goods and that of services, let alone among the service industries.⁹

The economic category which is commonly referred to as the “service sector” is a diverse collection of residual economic sectors which do not fit into these traditional categories. Porter argues that ‘...there is no generally accepted taxonomy of services.’¹⁰ Some sources claim that the ‘Service Sector is often defined more in terms of what it is not rather than by what it is’.^{11 12} This definitional aspect of the service sector is dealt with in more detail below.

⁹ Sassen, S., The Global City: New York, London, Tokyo, Princeton University Press, Princeton, 1991, pp.92-93.

¹⁰ Porter, M., The Competitive Advantage of Nations, Macmillan, London, 1990, p.241.

¹¹ Department of Industry, Science and Resources, ‘Innovation - A Different Focus for Services: A Paper Prepared for the 2000 National Innovation Summit’, Service Industries Section, Services and Emerging Industries Division, , Department of Industry, Science and Resources, Commonwealth of Australia, November, 1999, p.9.

¹² Hauknes, J., ‘Innovation in the Service Economy’, STEP Report 7.96, STEP Group, Oslo, December, 1996, p.37.

However, in general, definitions of services use ‘the relation to materiality as the defining feature’.¹³

Examples of the various definitions of “service sector” which are to be found in the literature include:

- i) ‘services are anything that you can’t drop on your foot’;^{14 15}
- ii) ‘services are everything that is not agriculture, mining or manufacturing’;¹⁶
- iii) the service sector includes ‘all economic activity other than mining, manufacturing and agriculture, forestry and fishing’.¹⁷
- iv) ‘services are ...the activities that do not produce things’¹⁸
- v) ‘service/tertiary activities are those which do not produce or modify physical goods’¹⁹
- vi) ‘services deliver help, utility or care, and experience, information or other intellectual content - and the majority of the value is intangible rather than residing in any physical product’^{20 21}
- vii) the services sector is ‘composed of a wide variety of different activities ranging from fast food to brain surgery’²²
- viii) ‘...service sectors, such as health, education and finance and business services, are distinguished from the agricultural, mining and industrial sectors in that their outputs are predominately services rather than goods. Service activities of course lead to service outputs, but these may be neither final goods nor intermediate goods for use in another sector’.²³

¹³ Ibid.

¹⁴ Department of Industry, Science and Resources, op. cit., p.9.

¹⁵ Hauknes, J., op. cit., p.37.

¹⁶ Department of Industry, Science and Resources, op. cit., p.9.

¹⁷ The Allen Consulting Group, ‘The Australian Service Sector Review 2000 - Statistics and Industry Profiles: Volume 1’, Prepared for The Australian Services Network, p.1.

¹⁸ Ibid.

¹⁹ Illeris, S. in Hauknes, J., ‘Innovation in the Service Economy’, STEP Report 7.96, STEP Group, Oslo, December, 1996, p.37.

²⁰ The Allen Consulting Group, op. cit., p.1.

²¹ Pilat, D., ‘Innovation and Productivity in Services: State of the Art’, Paper prepared for the OECD/Government of Australia workshop on Innovation and Productivity in Services, Sydney, November, 2000, p.4.

²² Wolf, A., ‘The Service Economy in OECD Countries’, Chapter 2 in Enhancing the Performance of the Service Sector, OECD, Paris, 2005, p.30.

²³ Sheehan, P., Pappas, N., Tikhomirova, G., and Sinclair, P., Australia and the Knowledge Economy: An Assessment of Enhanced Economic Growth Through Science and Technology, Centre for Strategic Economic Studies, Victoria University of Technology, 1995, p.127.

- ix) ‘Services have often been defined as non-tangible, non-storable, non-tradable commodities which require the presence of producers and consumers in the same place at the same point in time.... In the age of ICT this definition has to be revised ...because storability and tradability have increased considerably with the use of modern technologies’.²⁴
- x) ‘The service sector has been defined as the sector which “transforms the state of material goods, people themselves, or symbolic material (information)”’.²⁵

2.3 Definitional problems of the ‘Service Sector’

As the above examples of definitions of the “service sector” demonstrate, there is no generally agreed definition as to what actually constitutes the service sector. However, service sector theorists are in general agreement that what is termed as the ‘service sector’ is heterogeneous. This factor may partially explain the multiplicity of definitions of the service sector.

Two different approaches can be adopted to address the heterogeneous nature of the service sector - quantitative or qualitative i.e. statistical or analytical theoretical models. Of course this distinction is not clear-cut, as both models interact with and shape each other. However, for heuristic purposes this distinction is useful. The residual and heterogeneous nature of the service economic sector creates numerous difficulties in any statistical measurement exercise.

One theorist has typified ‘services as a rather fuzzy set’.²⁶ That is, its component members do not fit neatly into one economic set as would be expected in classic mathematical set theory. Fuzzy set theory challenges the classic set theory paradigm by suggesting that there are cases in which a phenomenon cannot be neatly classified into one set or another, but instead possess characteristics which defy classification in this way. The ‘service sector’ provides an illustrative example of this.

²⁴ Preissl, B., ‘Services in Europe - Patterns of Growth and Development’, SI4S Working Paper WP.97, SI4S Working Package 2: Statistical Overview, STEP Group, Berlin, February, 1997, p.7.

²⁵ Miles, I., ‘Innovation in Services’, Chapter 18 in Dodgson, M. and Rothwell, R. (Eds.), The Handbook of Industrial Innovation, Edward Elgar, Aldershot, England, 1994, p.243.

²⁶ Hauknes, J., op. cit., p.37.

2.4 Instrumental Definitions of the ‘Service Sector’

One strategy for “cutting through the Gordian knot” of the multiplicity of definitions for the “service sector” is to take a more pragmatic approach by adopting an operational definition or ‘functional classification’²⁷. That is, to assume ‘services are what statistics tell us they are’.²⁸ This is of course to some extent a circular definition and is similar to the example of the psychological ploy of defining “intelligence” as “that which is measured by I.Q. tests”. However, even this semantic manoeuvre is not completely satisfactory as there is no standardised agreement between national and international statistical agencies as to what activities actually constitute services, thereby confounding attempts to compare data across national boundaries.

Furthermore, even if the definition of “services” is restricted to that of one national statistical agency in an attempt to simplify the exercise, a further difficulty arises in that the statistical measurement instruments and data are aggregated and therefore do not accurately represent the activities of the various sub-sectors and groupings. This state of affairs had led one researcher to argue that it might be ‘unavoidable to live with unsatisfactory definitions and classifications in order to say anything about the quantitative dimensions of service sectors at all’.²⁹

The economic sectoral definitions of the service sector used by statistical agencies enable sectoral statistical data sets to be compiled. However, in combination with factors discussed above, they may not provide a comprehensive and accurate picture of economic service activity. For example they may not distinguish between service activities and service outputs.

2.4.1 Distinction between service activities and service outputs

A further distinction relevant to the statistical representation of services concerns the difference between service activities and service outputs. Statistical instruments measure service outputs from the industries classified as belonging to

²⁷ Hauknes, J., *op. cit.*, p.37.

²⁸ Preissl, B., *op. cit.*, p.7.

²⁹ *Ibid.*

the ‘service sector’ by instruments such as the International Standard Industrial Classification (ISIC) and industrial classification templates developed by national statistical agencies.³⁰

However, significant support service activities also take place in other economic sectors, such as manufacturing and mining. Service activities such as ‘accounting, management, marketing, planning and research and development, and transport are central to the goods producing sectors’,^{31 32} and on ‘some estimates provide 60 to 75 per cent of the input costs of modern manufacturing firms.’³³ However these service activities may not be reflected in the service sector statistics. A further confounding factor for statistical analysis of the service sector is the growth of the business model known alternatively as ‘servicization’ or ‘servitization’.

2.4.2 The ‘servicization’ of products

The terms ‘servicization’ or ‘servitization’ are used interchangeably within the research literature. Therefore, for the purposes of this thesis, the term ‘servicization’ will be considered as referring to both terms. The ‘servicization’ of products is a relatively recent business model which reverses the traditional business practise of ‘productizing’ services.

For example, the traditional business practice model would have focussed on converting consumers from using laundry services to purchasing a product to achieve this task in the home – a washing machine. In contrast to this, ‘Servicizing’ has been referred to as the practice by suppliers of providing ‘the services their products provide, in lieu of the products themselves’.³⁴ Servicization

³⁰ Howells, J., ‘The Nature of Innovation in Services’, Paper prepared for the OECD/Government of Australia workshop on Innovation and Productivity in Services, Sydney, November, 2000, p.6.

³¹ Crum, R. and Gudgin, G. (1977) ‘Non-production activities in UK manufacturing industry’ Collection Studies, Regional Policy Series No.3, Commission of the European Communities, Brussels - referred to in Howells, J., ‘The Nature of Innovation in Services’, Paper prepared for the OECD/Government of Australia workshop on Innovation and Productivity in Services, Sydney, November, 2000, p.7.

³² Sheehan, P., Pappas, N., Tikhomirova, G., and Sinclair, P., op. cit., pp.127-128.

³³ National Research Council 1994, Quinn 1992a in Sheehan, P., Pappas, N., Tikhomirova, G., and Sinclair, P., op. cit., pp.127-128.

³⁴ Rothenberg, S., ‘Sustainability through servicizing’, MIT Sloan Management Review, Winter, 2007, p.84.

of business practices is based on an understanding of what consumers desire from products:

Not ownership per se, but the service the products provide; transportation from our car, cold beer from the refrigerator, news or entertainment from our television³⁵

Servicizing has also been characterised as assisting the shift from a ‘transactional economy’ to a ‘functional’ or ‘service’ economy. For example, in a transactional economy consumers would purchase photocopiers, whereas in a ‘functional’ or ‘service’ economy’ consumers would purchase ‘document reproduction services’. Another example is provided by comparing the purchase of a car to the purchase of ‘mobility’ services.³⁶

Servicization of products, although very appropriate in a ‘functional economy’ which is transforming into a ‘service economy’, can also be viewed as creating difficulties for statistical measurement and therefore gaining an accurate understanding of the size and scope of the ‘service sector’. The next section of this chapter will examine some of these issues.

2.4.3 Difficulties in measuring a moving, morphing target – the service sector

It has been demonstrated above that there are not only numerous definitions of the service sector, but also that these definitions, when used to guide statistical data collection, provide an incomplete representation of service activities as they focus only on service outputs in industries defined by statistical agencies as belonging to the service sector, not on comprehensively measuring service activities taking place in other economic sectors. It was also argued above that definitions of the service sector themselves are subject to change as various forces transform the service sector.

³⁵ Hawken, P. (1993), quoted in White, A., Stoughton, M. and Fend, L., Serviceizing: the Quiet Transition to Extended Product Responsibility, submitted to the U.S. Environmental Protection Agency Office of Solid Waste, May, 1999, p.13 accessed at <http://www.p2pays.org/ref/17/16433.pdf>, November 20, 2009.

³⁶ Examples provided in White, A., Stoughton, M. and Fend, L., Serviceizing: the Quiet Transition to Extended Product Responsibility, submitted to the U.S. Environmental Protection Agency Office of Solid Waste, May, 1999, p.13 accessed at <http://www.p2pays.org/ref/17/16433.pdf>, November 20, 2009.

The changing nature of these definitions points toward the dynamic forces at work in not only the service sector, but also in the wider economy. Although there are definitional and statistical difficulties involved in accurately portraying the ‘service sector, there is general agreement as to the increasingly important role that the service sector is playing in the global economy. The increasing economic importance of the service sector will now be examined.

2.5 The Service Sector: Size and Growth

The service sector is playing an increasingly important and dominant role in the global economy. The size of the service sector, as a proportion of GDP, has grown significantly in OECD nations over the last thirty years. The OECD argues that the service sector has become ‘the quantitatively most important sector’ accounting for approximately seventy per cent of ‘aggregate production and employment in OECD economies and continues to grow’.³⁷

2.5.1 The role of services in the Australian economy

Traditionally, Australia has been an exporter of agricultural and mineral produce. However, more recently, Australia’s exports have broadened to include the services sector to the point that now it also runs a trade surplus in knowledge-based services.³⁸ In the Australian context, the Service Sector is defined by the Australian Bureau of Statistics as consisting of the following fourteen industries listed in Table 2.1:

³⁷ Wolf, A., *op. cit.*, p.280.

³⁸ Mandeville, T., ‘Measuring up in the New Economy’, *Australian Financial Review*, 17/11/00, Internet version of article.

Table2.1: The Service Sector: the Australian Context

- Electricity, Gas and Water;
- Construction;
- Wholesale Trade;
- Retail Trade;
- Accommodation, Cafes and Restaurants;
- Transport and Storage;
- Communication Services;
- Finance and Insurance;
- Property and Business Services;
- Government Administration and Defence;
- Education;
- Health and Community Services;
- Cultural and Recreational Services; and
- Personal and Other Services.

Source: Australian Bureau of Statistics

The Australian services sector has accounted for most of the growth in Australia's Gross Domestic Product (GDP) and employment over the last two decades.³⁹

In 2000-01 the services sector provided:

- approximately seventy-five per cent (\$419 billion) of Australia's GDP;⁴⁰
- eighty per cent (7.4 million) of employment;⁴¹
- twenty per cent of total exports of goods and services;⁴²
- fifty per cent of Australia's largest economic sectors (finance and investment; insurance; cultural and recreational services, property and business services; and transport and storage), as measured by revenue, belong to the service sector industry classification.⁴³

³⁹ OECD, 'Background Paper on Australia's Service Industries', paper for the OECD Business and Policy Forum on "Realising the Potential of the Service Economy: Facilitating Growth, Innovation and Competition", Paris, 28 September, 1999, submitted by the Commonwealth Department of Industry, Science and Resources, Canberra, Australia, p.4.

⁴⁰ McLachlan, R., Clark, C. and Monday, I. 2002, *Australia's Service Sector: A Study in Diversity*, Productivity Commission Staff Research Paper, AusInfo, Canberra, p.13.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ibisworld data quoted in Business Review Weekly, 'The Top Ten Revenue Review', November 17, 2000, p.135.

This level of growth prompted the Commonwealth of Australia Department of Foreign Affairs and Trade to state that

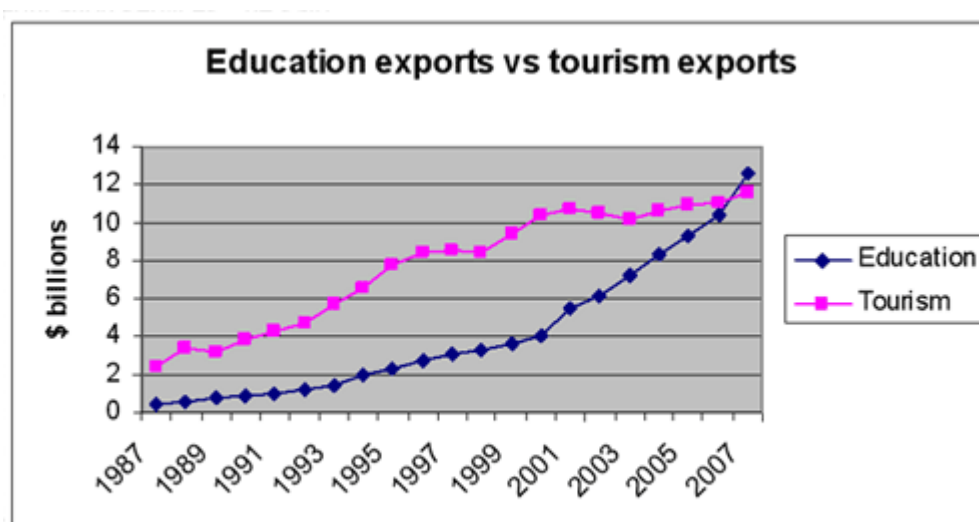
Australia's economy is now a service-based economy, with service industries accounting for around 70 per cent of total gross value added.⁴⁴

In addition to the service industries directly contributing to the economy, they are also a 'crucial component of most Australian industry processes' through providing service infrastructures such as telecommunications, financial and business services, transport systems, and electricity and gas.⁴⁵

2.5.2 The contribution of education services to the Australian economy

Education services comprise an increasing share of Australia's knowledge-based services exports. The value of Australia's education exports grew 21 per cent in 2007 to replace tourism as the top services export and become Australia's third largest export overall. Australian Bureau of Statistics figures released on February 4, 2008 by the Australian Bureau of Statistics valued education exports in 2007 at \$12.5 billion compared to \$11.5 billion for tourism (refer Table 2.2).

Table 2.2: Australian Education Exports versus Tourism Exports 1987–2007



Source: Australian Bureau of Statistics, International Trade in Goods and Services, 5368.0, December 2007

⁴⁴ Department of Foreign Affairs and Trade, *Investing in Australia*, August 2008.

⁴⁵ OECD, *op.cit.*, p.5.

Another illustrative example of the growth of Australia's education exports is that they are currently of a similar magnitude to its wheat exports.⁴⁶ Or, as another source states:

National income from the export of education, of which higher education provides the largest part, now exceeds national income from wool, beef and veal, alumina and aluminium.⁴⁷

This phenomenon of growth in education export earnings has gradually increased over time. Aggregated education exports more than tripled from \$906 million in 1990 to \$3,018 million in 1998.⁴⁸ In 2000, education earned \$3.7 billion in export earnings making it Australia's eighth-largest export earner.⁴⁹ By 2009, education services exports had increased to \$15.5 billion to make it Australia's third largest export earner.⁵⁰ Education exports were worth more than all other Australian export industries in 2007 and 2008 with the exception of the coal and iron ore industries (refer Table 2.3).

The ongoing liberalisation of international trade in services via the General Agreement of Trade in Services (GATS) discussions under the World Trade Organisation may also be conducive to further growth in Australia's education exports and influx of foreign students studying at Australian campuses.

⁴⁶ Mandeville, T., *op.cit.*

⁴⁷ Group of Eight, 'Imperatives and Principles for Policy Reform in Australian Higher Education', Group of Eight - Australia's Leading Universities, P.O. Box 4008, Manuka, A.C.T., 2603, Australia, August, 2000, p.8.

⁴⁸ The Allen Consulting Group, *op.cit.*, p.41.

⁴⁹ Australian Vice-Chancellors' Committee (AVCC), 'AVCC Discussion Paper on International Education', September, 2001, p.3.

⁵⁰ ABS trade data on DFAT STARS database and ABS catalogue 5368.

Table 2.3: Australia's Top 10 Exports of Goods and Services (a) (A\$ million)

Rank	Commodity/service activity	2007	2008
1	Coal	20,760	46,620
2	Iron ore & concentrates	16,258	30,144
3	Education services (b)	12,567	15,507
4	Gold (c)	11,570	14,710
5	Personal travel (excluding education) services	11,845	11,661
6	Crude petroleum	7,984	10,355
7	Natural gas	5,079	9,244
8	Aluminium ores & concentrates (including alumina)	6,074	6,479
9	Professional, technical & other business services	5,618	6,474
10	Aluminium	5,883	5,777

(a) Rank based on 2008.

(b) Includes *Education-related travel* and *Other education services*.

(c) Balance of payments basis.

Sources: ABS trade data on DFAT STARS database & ABS catalogue 5368.

In addition to the direct export contribution to GDP made by the education sector, national education and training systems also play a central role in the National Innovation System of what has been variously termed as the knowledge, information or learning economy.⁵¹

2.5.3 Higher Education's contribution to Australia's service sector exports

Disaggregation of the service sector export statistics reveals that the Higher Education sub-sector is the highest service sector export earner; contributing 59.4 per cent of Australian service sector education earnings (refer to Table 2.4).

⁵¹ Lundvall, B.A., ('Introduction' in Lundvall, B.A., (ed.) *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*, Pinter, London, 1992, 14-15), referred to in Howells, J., 'The Nature of Innovation in Services', report presented to the OECD "Innovation and Productivity in Services Workshop", October 31 - November 3, 2000, November, 2000, p.6.

Table 2.4: Education Sub-Sectors Share of Service Exports, 2008

- Higher Education - \$8.9 billion (59.4%)
- VET (Vocational Education and Training) - \$3.4 billion (22.7%)
- Schools - \$942 million (6.3%)
- ELICOS (English Language Intensive Courses for Overseas Students)- \$908 million (6.1%)
- Non – award - \$604 million (4.0%)

(Source: Reserve Bank of Australia Bulletin – June 2008)

The economic value of the higher education sector to the Australian economy highlights the strategic importance of this sector. It also signals the urgency of the requirement for a theoretical model in which to frame this development and assist further innovation within this crucial services sub-sector. For example, Richard Larson, from the Massachusetts Institute of Technology, recently stated that ‘Education as a service industry is crying out for serious research’.⁵²

In addition to the higher education sub-sector’s large contribution to the Australian service sector export earnings, the higher education sector also plays a major role in the creation and distribution of innovation throughout the Australian economy through both its products in the form of human resources and intellectual property. As the graduates of Higher Education disperse throughout the broader economy they inject innovative knowledge and practices. This observation is supported by Gibbons who argued that

The higher education system also underpinned the widespread distribution of initiative and innovation in the economy...⁵³

In summary, the past few decades have witnessed a significant shift in economic activity from the manufacturing sector and into what has been referred to as the service sector (with all its attendant classificatory and measurement problems).

⁵² Larson, R.C., ‘Education: Our Most Important Services Sector’, *Service Science*, Vol.1 (4), 2009, p.i.

⁵³ Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M., *The New Production of Knowledge: the Dynamics of Science and Research in Contemporary Societies*, Sage, London, 1994, p.74.

The quantitative expansion of the role of the service sector as a proportion of GDP has amplified the lack of, and need for, theoretical models which recognise and conceptualise this transformation. Conceptual lacunae in relation to the services sector had been identified in Neo-Classical and Keynesian economic theories. These developments have also been identified by theorists who have proposed new conceptual models for capturing these changes. Examples of this are provided by theorists who have coined the phrases ‘the post-industrial society’ and ‘the service economy’.

2.6 The Service Economy

Theorists such as Alain Touraine⁵⁴ and Daniel Bell⁵⁵ anticipated this economic transition and labelled it as the ‘post-industrial society’. Although Touraine and Bell’s characterisations and projected outcomes for the ‘Post-Industrial’ society differed, they were in agreement as to the increasing economic importance of the services sector as a proportion of GDP to the overall economy. Bell’s theoretical characterisation of ‘post-industrial society’ shifts the emphasis of economics to a ‘knowledge theory of value’. In this economic model, ‘knowledge is the source of invention and innovation’.⁵⁶

The potential impacts and magnitude of these changes was also foreseen by Gershuny and Miles in 1983 when they labelled it as the ‘New Service Economy’.⁵⁷ Put simply, the ‘service economy’ refers to a situation where the service sector is the dominant economic sector, surpassing other economic sectors such as agriculture and manufacturing. As discussed above, this phenomenon was identified by statistical agencies that recognised the effect this had on the accuracy of service sector statistical measurements.

The service sector and the service economy are also changing qualitatively in part due to the introduction of new information and communication technologies, and

⁵⁴ Touraine, A., The Post-Industrial Society, Wildwood House, London, 1974.

⁵⁵ Bell, D., The Coming of Post-Industrial Society: A Venture in Social Forecasting, Basic Books, New York, 1999 (originally published 1973).

⁵⁶ Bell, D., op.cit., p. xvii.

⁵⁷ Gershuny, J., and Miles, I., The New Service Economy: The Transformation of Employment in Industrial Societies, Frances Pinter, London, 1983.

also globalisation which is in turn assisted by these new technologies and the organisational forms they make possible.

2.6.1 The Service Economy and Information and Communication Technology

The service economy is distinguished from the service sector through the recognition of the important role played by services in sectors external to what has traditionally been defined as the service sector. An example of this is the provision of financial services in the mining industry.

This is particularly evident in the increasing use of Information and Communication Technology (ICT) in the Service Economy. Technological advances such as ICT are also blurring the boundaries between the services sector and other economic sectors. In particular definition iv on page 3 considered the increasing importance of Information Communication Technology (ICT) to the services sector. Pilat argues that ICT is transforming the services sector as it not only

...enables innovation and productivity growth, but greater international reach. Some of the most successful services firms in recent years were pioneers in introducing new technology and developing innovative applications, such as airline reservations without physical sales points, interactive TV or digital tracking of postal packages. But they have also been able to profit from effective underlying infrastructure, which has allowed faster, often cheaper, access to better network services and applications, including broadband.⁵⁸

2.6.2 Knowledge Intensive Service Sub-sectors

The issue of knowledge-intensity will be discussed in detail later in this chapter, but for our present purposes it is necessary to highlight the changing nature and role of the service sector and the importance of ICT in the knowledge-intensive and, increasingly in the information components of the broader services sector.

The most significant change to the 'knowledge-intensive' sub-sectors of the service sector is that although the commodities provided by this sector may still be 'non-tangible, non-storable and non-tradable', information about these commodities is undergoing a process of codification which is converting

⁵⁸ Pilat, D., 'Services: a sleeping giant', *OECD Observer*, No. 249, May, 2005 accessed at <http://www.oecdobserver.org/news/printpage.php/aid/1576/Services.html> August 31, 2009.

information about these service commodities into tangible, storable and tradable goods.

This transformation dispenses with the necessity of producers and consumers being in the same place at the same point in time. Increasingly, knowledge intensive services can be delivered online anywhere and anytime the networked consumer requires. In this respect, knowledge has become a tradeable commodity which has been enhanced by the increased mobility and velocity of transmission and communication made possible by Information and Communication Technology. The commodification of knowledge and its increasing economic importance has been identified by theorists who refer to this phenomenon as the 'knowledge economy'.

2.6.3 Knowledge economy

The term 'knowledge economy' was first used in 1969 by Peter Drucker as the title of Chapter 12 in his book 'The Age of Discontinuity.'⁵⁹ In this work Drucker argues that 'knowledge' rather than 'science' has become the foundation of the modern economy'⁶⁰. The knowledge-based economy is also referred to in the literature as the 'new economy' or the 'information economy'.⁶¹ The OECD defines knowledge-based economies as 'those which are directly based on the production, distribution and use of knowledge and information'.⁶² A knowledge-based economy has also been defined as

...one in which the production, distribution, and use of knowledge is the main driver of growth, wealth creation and employment across all industries. ... [and] encompasses the exploitation and use of knowledge in *all* production and service activities; not just those sometimes classified as 'high-tech' or 'knowledge-intensive'.⁶³

Drivers of the emergence and growth of the knowledge economy include the increased knowledge intensity of economic activities, the information and

⁵⁹ Drucker, P., The Age of Discontinuity: Guidelines to our Changing Society, Heinemann, London, 1969, p.247.

⁶⁰ Drucker, P., op.cit. p.249.

⁶¹ McKeon, R. and Weir, T., (Knowledge-based Economy Branch, Department of Industry, Science and Resources, Commonwealth of Australia), 'Towards KBEs: Preconditions and Assessments', Paper for APEC symposium on knowledge-based economies, Seoul, 29-30 June, 2000, Endnote 1, p.17.

⁶² OECD, The Knowledge Based Economy, OECD, Paris, 1996, p.7.

⁶³ McKeon, R. and Weir, T., op.cit.

communication technology revolution and also the expansion of the globalisation of economic affairs. Theorists have also argued that the methods of the production of knowledge are related to this phenomenon.

2.6.4 New production of knowledge

In addition to the growth in importance of knowledge to economic activity, it has also been argued that the method of the production of knowledge in the knowledge economy has also been transformed. Gibbons *et al* argue that knowledge production has shifted from what they refer to as a Mode 1 method in which knowledge is produced within disciplinary contexts within universities to a Mode 2 method which is problem-centred and cross-disciplinary. The Mode 2 method also focuses more on forming partnerships with industry and seeks to apply knowledge to real world contexts.⁶⁴ The Mode 2 method of knowledge production also contributes to increasing the knowledge intensity of products and services. Lyotard also addressed the changing nature of knowledge production in his 1984 work, 'The Postmodern Condition: A Report on Knowledge'.

2.6.5 Knowledge intensity

The use of knowledge in economic activities is not new, but what has changed is the level of knowledge, or knowledge intensity, being brought to bear in economic activities. Johnston has argued that it is also reflected in '... the shift from the opportunistic to the systematic engagement with knowledge'.⁶⁵ The increase in knowledge intensity is being driven, in turn, by the explosive growth of the information technology and communication revolution and also the increasing velocity of technological change. The increasing knowledge intensification of all economic activity also interacts with the emergence of trade in knowledge as a commodity in its own right in a global knowledge economy.

⁶⁴ Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M., *op.cit.*

⁶⁵ Johnston, R., personal communication 27/3/11. Johnston also expresses this view in Johnston, R., *The Changing Nature and Forms of Knowledge: A Review*, Evaluations and Investigations Programme, Higher Education Division, Department of Employment, Education, Training and Youth Affairs, Commonwealth of Australia, 1998.

2.7 The relationship between the knowledge economy and the service sector

It is a common misconception that the terms ‘knowledge economy’ and the ‘service sector’ can be equated one with the other and that they are therefore interchangeable.

Drucker argues that ‘economists still tend to classify the ‘knowledge industries’ as ‘services.’⁶⁶ For example, Houghton and Sheehan claim that this identification of a knowledge economy as a services economy is ‘dangerously misleading’. They argue that ‘manufacturing and services are becoming increasingly integrated into complex chains of *creation, production and distribution*’.⁶⁷ They further argue that ‘complex product systems’ have emerged as a consequence of ‘the increasingly complex inter-relation between goods producing and related service activities in the economy’ and that this process is misrepresented by accounts that present ‘simplistic interpretations of a structural shift from manufacturing to services.’⁶⁸

It has been argued above that the demarcation lines between what are commonly referred to as the ‘manufacturing sector’ and the ‘services sector’ are increasingly becoming blurred. This phenomenon also contributes to the statistical difficulty of measuring these discrete sectors as they are in effect ‘moving targets’.

2.7.1 Internationalisation of Services

The importance of ICT’s role in transforming the Service Sector also extends to it technically enabling the delivery of services across national boundaries. This ability significantly multiplies the number of potential accessible marketplaces and consumers. This ability amplifies the reach of knowledge-based service production, distribution and delivery. Numerous corporations which were formerly restricted to operating within national boundaries are now successfully operating branches or subsidiaries in multiple international locations.

⁶⁶ Drucker, P., *op.cit.*, p.248.

⁶⁷ Houghton, J. and Sheehan, P., *A Primer on the Knowledge Economy*, Centre for Strategic Economic Studies, Victoria University, 2000, p.14.

⁶⁸ Houghton, J. and Sheehan, P., *op.cit.*, p.14.

2.7.2 Globalisation

The concept of ‘globalisation’ has been defined as the ‘recognition that markets, industries and enterprises transcend national boundaries’.⁶⁹ ‘Globalisation’ is also a contested concept and can therefore have a variety of meanings depending on which perspective is adopted. This thesis will leave the political dimension of globalisation to one side and focus on the economic and technological aspects of the concept and phenomenon, although even these categories are not without political dimensions. The European Commission has provided a typical definition of globalization as the following:

Globalization can be defined as the process by which markets and production in different countries are becoming increasingly interdependent due to the dynamics of trade in goods and services and flows of capital and technology. It is not a new phenomenon but the continuation of developments that have been in train for some considerable time.⁷⁰

Houghton and Sheehan neatly capture the dynamics of globalisation by stating that it is ‘being driven by national and international regulation, and by the IT related communications revolution’.⁷¹

2.7.3 Globalization and information and communication technologies: a co-evolving process

The inter-related nature of regulations, treaties, trade agreements and new technologies, in this case, information and communication technology is a co-evolving process. Information and communication technologies (ICTs) enable organisations to trade in new ways - both domestically and globally. However, domestic and international trading agreements and regulations which were constructed for pre-ICT trading environments often fall behind and require renegotiation to cope with the new trading environments. International organisations such as the World Trade Organisation (WTO) and the General Agreement in Trades in Services negotiations (GATS) play a key role in the process of renegotiation of trade agreements amongst signatory economies.

⁶⁹ Globalisation: Implications for the Australian Information Technology Industry, Bureau of Industry Economics Research Report 30, Australian Government Publishing Service, Canberra, 1989, p.93.

⁷⁰ European Commission, ‘Annual Report for 1997’, *European Economy No.63*, Luxembourg, Official Publication of the European Communities, 1997, p.45.

⁷¹ Houghton, J. and Sheehan, P., op.cit., p.2.

New economic conditions, business models, technologies and trade agreements are assisting the transition to a period of rapid change. However without appropriately educated and skilled human resources, these innovations would stall. In short, the rise of the ‘knowledge economy’ has created the demand for human resources with new skill sets and also presented a transformational challenge for educational institutions responsible for providing the educational resources for this purpose.

2.7.4 Knowledge economy and human resources

The advent of the knowledge economy has also had workforce implications. For example, Drucker argues that a knowledge economy requires increased numbers of what he terms ‘knowledge workers’ and less ‘manual workers’.⁷² According to Drucker, manual workers produce with their hands, whereas knowledge workers produce with their heads. These types of workers have also been identified by Reich who refers to them as ‘symbolic analysts’.⁷³ Knowledge workers and symbolic analysts ‘possess the skills of problem identification, problem solving, and brokerage.’⁷⁴

The timely provision of knowledge workers and symbolic analysts presuppose higher education organisations and curricula are evolving to meet the challenges presented by these innovative economic times and conditions. As a sub-sector of the services sector, the higher education sector shares a number of similar concerns with other knowledge intensive sub-sectors of the services sector, not least of which is the pressing need for the capability to interpret and anticipate changes and challenges to their operating environment. One response to this has been the creation of the new academic discipline of ‘Services science’.

⁷² Drucker, P., *Post-Capitalist Society*, Harper Business, New York, 1994.

⁷³ Reich, R., *The Work of Nations: Preparing ourselves for 21st Century Capitalism*, Vintage Books, New York, 1992.

⁷⁴ Blumentritt, R., *Knowledge Management: Strategies, Models and Practices*, Ph.D. Thesis, Australian Centre for Innovation and International Competitiveness, Faculty of Engineering, University of Sydney, 2000, pp.13-15.

2.7.5 Services science - a new academic discipline for the service economy

In response to the growth of the economic importance of the service sector, academia and industry have established the discipline of ‘Service science’, which has been described as ‘an emerging discipline concerned with the evolution, interaction, and reciprocal cocreation of value among service systems.’⁷⁵ The basic units of analysis in service science are service systems.⁷⁶ Service science recently established an academic journal in 2009, ‘Service Science’, and released its fourth issue in Winter 2009.

Services Science is defined as a cross-disciplinary science which brings

... together established fields of computer science, operations research, industrial engineering, management sciences, and social and legal sciences, in order to develop the skills required in a services-led economy.⁷⁷

Due to its cross-disciplinary nature, Service science can be characterised in Gibbons’ terminology as a ‘Mode 2’ science. The discipline of service science is also complementary to the ‘servicization’ thesis, previously discussed above, in that it also recognises that firms are making a ‘transition from a manufacturing orientation to a service orientation’.⁷⁸ Service science also reinforces this thesis’ assertion that there is ‘a lack of integrated, foundational knowledge to ... [assist] organisations in the process of service innovation and provision in order to realize more predictable outcomes’.⁷⁹

The establishment of the new discipline of Service Science which recognises the ‘... lack of integrated, foundational knowledge to [assist] organisations in the process of service innovation...’ highlights the timeliness of an examination of the philosophical and historical foundations of the concept of innovation and its implications for a theoretical framework through which to view and interpret innovation in the higher education services sector.

⁷⁵ Vargo, S. and Akaka, M., ‘Service Dominant Logic as a Foundation for Service Science: Clarifications’, *Service Science*, Vol.1 (1), 2009, p.32.

⁷⁶ Vargo, S. and Akaka, M., *op.cit.*, p.33.

⁷⁷ Horn, P., ‘The New Discipline of Services Science’, *Business Week*, 21/1/05 accessed at http://www.businessweek.com/technology/content/jan2005/tc20050121_8020.htm July 14, 2009.

⁷⁸ Vargo, S. and Akaka, M., *op.cit.*, p.32.

⁷⁹ *Ibid.*

2.8 Conclusion

The goal of this chapter was to set the keynote of the thesis by investigating the economic importance of the services sector and also the importance and role of higher education in the services sector. The chapter highlighted the value of undertaking an examination of the philosophical and historical foundations of the concept of innovation and also exploring their theoretical implications for contemporary higher education as a services sub-sector.

The material presented in this chapter provided definitions of the service sector and examined the difficulties of statistically measuring a heterogeneous sector. The service sector is not only undergoing transformation, but it is also transforming elements of other economic sectors, for example the manufacturing sector, through the process of servicization.

The chapter has illustrated the international and domestic growth of the role and importance of the service sector to GDP and also the increasing significance of education exports, and in particular, higher education service exports to the Australian economy. These trends have been linked to the expansion of the roles of Information and Communication technologies, and in turn, its influence on globalisation, internationalisation and the 'knowledge economy'. Human resource developments and their implications for the higher education sector have also been discussed.

Theories of the 'service economy' and 'post-industrial' society have contributed towards conceptually framing these economic transformations. The establishment of the academic discipline of services science has recognised the multidisciplinary nature of the service sector by addressing some of the systemic theoretical deficiencies that have been created with the significant growth of the service sector and its major economic contribution.

Although these developments and trends have been, and are, widely discussed in the literature, a lacuna exists in relation to the construction of a theoretical framework in which to place developments within the higher education sector. The role of higher education in these developments is of increasing significance –

not only as a major contributor to Australia's export earnings, but also in relation to its role in providing the appropriate educational requirements for the human resources, be they termed 'knowledge workers' or 'symbolic analysts', to adapt to these new socio-economic conditions and meaningfully contribute to the growth of Australia's knowledge economy exports. Innovation in the higher education sector is therefore of increasing strategic importance to the Australian economy.

The growth of service sector export income highlights the importance of service sector innovation. The higher education services sub-sector is Australia's third highest export earner, therefore innovation in this sector is of crucial economic significance. However, there is currently no innovation theory which models higher education service sector innovation. This state of affairs has highlighted the urgent need for a theory of innovation for the higher education service sector. Such a theory may be useful to interpret these developments in a meaningful manner and also potentially identify further trends on which useful predictions may be based.

This situation has been succinctly captured by Gallouj who argues that

...modern economies are both service economies and economies of innovation. Paradoxically, they are not regarded as economies of innovation in services.... It is as if services and innovation were two parallel universes that co-exist in blissful ignorance of each other.⁸⁰

The new discipline of Services science also recognises the '... lack of integrated, foundational knowledge to [assist] organisations in the process of service innovation...' These considerations highlight the timeliness of an examination of the philosophical and historical foundations of the concept of innovation and its implications for a theoretical framework through which to view and interpret innovation in the higher education services sector.

Chapter Three will commence the task of identifying a basis for an innovation theory for the higher education sector through an examination of the philosophical and historical foundations of the concept of innovation.

⁸⁰ Gallouj, F., Innovation in the Service Economy: the New Wealth of Nations, Edward Elgar, Cheltenham, 2002, p.xii

Chapter 3. A Conceptual History of Innovation

...innovation is ...a historically contingent process which will vary in time and space.⁸¹

3.1 Introduction

Chapter Two examined the increasing economic significance of the service sector in general, and the higher education sub-sector in particular by examining quantitative and qualitative aspects of the services sector. The services sector was identified as a heterogeneous, dynamic sector undergoing rapid and far-reaching change and innovation – both practically and theoretically. The importance of the Australian higher education sub-sector was identified through its generation of the third highest export earnings in the Australian economy. The chapter concluded with the observation that although the higher education sector was a significant contributor to Australia's export earnings, there is currently no innovation theory which models higher education sector innovation and identifies potential innovation trends for higher education. It also highlighted the recognition by Services science of '... lack of integrated, foundational knowledge to [assist] organisations in the process of service innovation...'

The aim of Chapter Three is to begin the task of addressing this theoretical deficiency through the examination of the philosophical and historical foundations of the concept of innovation and their potential implications for interpreting the higher education sector through the lens of service sector innovation theory. Chapter Three will commence the task of examining the philosophical and historical foundations of the concept of innovation by focussing on the textual history of the concept of innovation and cultural attitudes towards it. The historical texts discussing innovation referred to in this chapter cover a broad range of subject matters including politics, economics, society, organisations, technology and education. It will be revealed that over a period of around fifteen hundred years, the earlier texts are almost unanimous in their negative attitudes towards the concept of 'innovation'.

⁸¹ Scott-Kemmis, D., Darling, T. and Johnston, R., Innovation for the 1990s: New Challenges for Technology Policy and Strategy, Department of Industry, Technology and Commerce, Commonwealth of Australia, November, 1988, p. 1.

The chapter will not claim that innovation and invention were not taking place throughout history, rather it will explore the textual record for potential explanations as to why the concept of ‘innovation’ was not being theorised until the early twentieth century. As a consequence, the crucial point to be addressed is the recorded textual attitudes towards the idea of innovation and the implications of these for the intellectual environments in which concepts of innovation would have been constructed.

Somewhat ironically, it appears that the conceptualising of ‘innovation’ could not commence until a range of intellectual innovations had taken place. Therefore this chapter deliberately avoids providing a definition of the concept of ‘innovation’ as the historical texts discussed in this chapter do not provide a clear, precise or definitive account of the concept of ‘innovation’. This is demonstrative of the lack of attempts to theorise innovation until the early twentieth century. Up until this point, it is only possible to identify historical attitudes to innovation via textual analysis. Retrospectively projecting contemporary concepts and definitions of ‘innovation’ onto historical textual accounts of innovation would commit the fallacy of ‘Whig History.’⁸²

Chapter Three will also undertake an exploration of the underlying philosophies which have influenced and shaped cultural attitudes towards innovation and which also act as axioms for economic theories. The exploration of the philosophical and historical concepts and belief systems associated with attitudes towards innovation is highly appropriate as a demonstration of its historical and cultural situatedness and therefore its socially constructed nature. It also illuminates the role of earlier beliefs and concepts in shaping contemporary attitudes towards innovation. This is consistent with the work of the author Mokyr who argues that

Prevalent beliefs are the outcome of a past flow of [theoretical] innovations that were ‘proposed’ to the accessible population (meaning here mostly a literate and intellectually engaged elite).⁸³

⁸² Butterfield, H., *The Whig Interpretation of History*, Bell, London, 1963.

⁸³ Mokyr, J., *The Enlightened Economy: an economic history of Britain 1700 –1850*, Yale University Press, New Haven, 2009, p.488.

This process will assist in the larger goal of later chapters in identifying an appropriate theoretical basis from which to focus on the services sector and more particularly, the higher education services sector.

3.2 Parent discipline/fields and classification models

One of the curious things that must strike any researcher investigating theories of innovation is the relatively late arrival of these types of theories in the field of human enquiry. Innovation theory could generally be said not to have existed at all until the first glimmerings of it appear in the late nineteenth century.

3.2.1 Genesis of theories of innovation

It is only in the second quarter of the twentieth century that the theorist Joseph Schumpeter actually started to deliberately conceptualise the phenomenon of innovation. The irony of theories of ‘innovation’ lies in the fact that the first theorists to recognise the central place of innovation to capitalist economies were perhaps capitalism’s greatest critics. Freeman argues that ‘...only Marx in the 19th century and Schumpeter in the 20th could be said to place innovation at the very centre of their growth theory’.⁸⁴ However, Schumpeter’s attitudinal perspective on innovation differed totally to that of Marx. McCraw observes that

Hateful gangs of parasitic capitalists become, in Schumpeter’s hands, innovative and beneficent entrepreneurs.⁸⁵

3.2.2 The multidisciplinary innovation theories of Schumpeter

Although Schumpeter was an economist by training, he introduced innovation theory via a peripheral discipline, Economic Sociology, which he seemingly resurrected for the purpose. ‘Sociology’ had been established as a discipline in the early nineteenth century by the French philosopher August Comte. ‘Economic Sociology’ had originally been proposed in the late nineteenth century by the

⁸⁴ Freeman, C., ‘Innovation and Growth’, Chapter 7 in Dodgson, M. and Rothwell, R., The Handbook of Industrial Innovation, Edward Elgar Publishing, Aldershot, 1994, p.78.

⁸⁵ McCraw, T., Prophet of Innovation: Joseph Schumpeter and Creative Destruction, The Belknap Press of Harvard University Press, Cambridge, Massachusetts, 2007, p.69.

British economist, W. Stanley Jevons, who first used the term in 1879.⁸⁶ The conventional discipline of economics was not equipped theoretically, philosophically, politically or attitudinally to accept not only a theory of innovation, but, also the idea that there was a need for one.

The study of innovation is difficult to place neatly within any one particular discipline. If one agrees with the assertion that innovation theories can be traced to the theories of Joseph Schumpeter, then the multidisciplinary nature of it is confirmed. McCaw argues that it

... is confined to no single discipline. Many economists, sociologists, historians, political scientists, professors of business administration, and other academics are self-conscious Schumpeterians. And all capitalist innovators are Schumpeterians, whether they realize it or not.⁸⁷

The majority of theoretical perspectives on innovation acknowledge the importance of the work of Schumpeter. Many of the key themes analysed in contemporary innovation theories can be identified particularly in Schumpeter's work 'Capitalism, Socialism and Democracy'⁸⁸ So, the first surprising aspect of innovation theory is that its disciplinary home was not originally squarely placed in economics. Although some aspects of innovation theory can now be located in the economics discipline, it is an uneasy accommodation that has only occurred relatively recently in the late twentieth century.

However even this belated recognition of innovation theory by the economics discipline is theoretically awkward as the underpinning static theoretical structure that it has been grafted onto was never designed to be capable of being the progenitor of a dynamic theory of innovation. Additionally, if the genealogy of conventional neo-classical economics is traced back to its theoretical forebears, it appears that this incapacity to spawn innovation theories is due to the

⁸⁶ Smelser, N.J. and Swedberg, R., 'Introducing Economic Sociology', Chapter 1 in Smelser, N.J. and Swedberg, R. (eds.), *The Handbook of Economic Sociology*, (Second edition), Princeton University Press, Princeton, 2005, p.7.

⁸⁷ McCraw, T., *Prophet of Innovation: Joseph Schumpeter and Creative Destruction*, The Belknap Press of Harvard University Press, Cambridge, Massachusetts, 2007, p.503.

⁸⁸ Chapter Five 'The Rate of Increase of Total Output' and Chapter Seven 'The Process of Creative Destruction' are particularly relevant as the starting points and inspiration of many contemporary theories and approaches.

philosophical precursors of these theories being more at home with actually suppressing innovation.

Innovation, it seems, has a very short history of being accepted not only by the person on the street, but also particularly by conventional forms of authority and the theorists who generated theories supporting the status quo. Evidence of these attitudes is scattered throughout the literature that are today referred to, and regarded, as the 'Classics'. The thread which guides us through this labyrinth has many theoretical strands woven by many philosophers and later, *natural* philosophers, who constructed, adapted and negotiated their theoretical legacy into existence.

So although, the analysis of 'Innovation' can be broadly placed within the Economics discipline, it is a late arrival and actually sits more easily within the disciplines of philosophy, sociology, history, politics and other transdisciplinary areas such as Science and Technology Studies. The differentiating factor between these disciplines is that Economics, which generally refers to orthodox or Neo-Classical economics, is based on a static, equilibrium model which cannot theoretically deal with the dynamic, disequilibrating phenomena required in an innovation theory. In contrast to this, the disciplines of sociology, history, politics and other transdisciplinary areas such as Science and Technology Studies are theoretically better equipped to deal with dynamic change and innovation due to their differing theoretical and metaphorical bases and origins.

This situation of transdisciplinarity is not problematic; in fact it correlates with what Gibbons refers to as Mode 2 knowledge production, in contrast to what he terms Mode 1 knowledge production. This categorical binary will be referred to in detail in later chapters; however it suffices at this point to define Mode 1 knowledge production as knowledge produced within an academic disciplinary structure. Gibbons identifies the Mode 1 ideal as 'Newtonian empirical and mathematical physics' produced within a disciplinary context. In contrast to Mode 1 disciplinary knowledge, Mode 2 knowledge is transdisciplinary.⁸⁹

⁸⁹ Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., et.al., op.cit., pp.2-3.

3.2.3 *The economics paradigm*

The discipline of economics is similar to any other discipline in that it has an underlying set of theoretical axioms from which its formulations proceed. However, these collective, underlying axioms form what Kuhn labelled a ‘paradigm’ or model – which, while informing and giving the discipline direction and context, also limits its purview and potential theoretical conclusions.⁹⁰

The disciplinary label of ‘Economics’ conveys a misleading impression of a unity of theoretical thought when in fact there are numerous competing theoretical schools of thought within the discipline. Of course the economics discipline is not unique in this respect, for example Kuhn remarks that

Philosophers of science have repeatedly demonstrated that more than one theoretical construction can always be placed upon a given collection of data.⁹¹

Economics is a contested discipline in which the various schools of thought continually evolve, compete and cross-fertilise. It has been observed that the discipline of

Economics is an agglomeration and a mix. It is also a never to be completed structure on which the concrete never sets.⁹²

This continual process can be traced to the earliest beginnings of what can today be regarded as economic analysis. The next section in this chapter will begin an examination, via textual analysis, of the early philosophical and historical foundations of the concept of innovation and its relationship to social attitudes and beliefs towards innovation.

3.3 ‘Innovation’ - a conceptual history

The nature of the states of stability and change in human and cosmic affairs and the relationship between them has been the subject matter of human inquiry for millennia. These themes can be identified in the literatures of numerous ancient cultures, both eastern and western. These enquiries have often been accompanied by concepts and principles of order and disorder, equilibrium and disequilibrium.

⁹⁰ Kuhn, T.S., *The Structure of Scientific Revolutions*, Second edition, The University of Chicago Press, Chicago, 1970.

⁹¹ *Ibid.*, p.76.

⁹² Reisman, D., *Schumpeter's Market: Enterprise and Evolution*, Edward Elgar, Cheltenham, UK, 2004, p.29.

According to the particular place and time, varying value judgements have been attached to these concepts and each contested in turn. Broadly speaking these values have also been a vehicle for political concerns, be they conservative or progressive in nature. 'Innovation' has been a constant, if not consistent, companion of the human race and is often placed in relation to the above concerns.

In contemporary times, innovation is generally considered to be a positive contributor to economic competitiveness and well-being. However, this was not always the case. Apart from a general understanding of the term 'innovation', economic meanings of the term 'innovation' cannot really be understood unless it is placed within its theoretical context. The term 'innovation' is not only given meaning by its theoretical economic context, it is also always situated within a social, historical and political context.

It is possible to view the value placed on 'innovation' within various societies as a dichotomy. Conservative societies tended to view innovation with suspicion due to its potential to disrupt social order and established procedures. Conservative societies' tendency for aversion to innovation is apparent from the earliest recorded times, reflected, for example, in the writings of societies such as the Ancient Greece of Plato. In contrast to this, progressive societies embraced and encouraged innovation as an ally in their attempts to 're-engineer' society and alter established customs.

Ordering the scale of 'Innovation' in early societies, the most highly valued state consisted of continuity of the society's status quo. Social innovation was viewed as undesirable and technical innovation was viewed with suspicion due to its potential to disrupt existing social arrangements.

3.3.1 Origins of the term ‘innovation’

One of the earliest textual references to ‘innovation’ was by the Ancient Greeks who used the word ‘kainotomia’ to refer to innovation around 422BC.⁹³ The origins of the term ‘innovation’ can be traced to the Latin terms ‘innovare’ and ‘innovatio’ which signified ‘renewal, rejuvenation from inside, rather than novelty, which is its modern meaning in both English and French’.⁹⁴ Although commonly used today, the word ‘innovation’ did not come into widespread use in the English language until the sixteenth century.⁹⁵

3.3.2 The Social Construction of ‘Innovation’

The value placed on innovation, whether it is of a positive or negative nature, is socially constructed and certainly not a necessary quality of innovation either as a process or a product. Attitudes to innovation have often been shaped by a particular society’s underlying philosophical or religious beliefs. It is therefore necessary to place ‘innovation’ within social and historical contexts to assess the value judgements placed on it within particular social and historical situations.

The fact that the meaning of the term ‘innovation’ is not clear, precise or definitive at this historical juncture is demonstrative of the lack of attempts to theorise innovation until the early twentieth century. Up until this point, it is only possible to identify historical attitudes to innovation via textual analysis. The meaning and intent of the term ‘innovation’ in these earlier texts can only be assessed by judging it within its particular textual context. Retrospectively projecting contemporary concepts and definitions of innovation onto historical accounts of innovation would commit the fallacy of ‘Whig History’.⁹⁶

⁹³ D’Angour, A., ‘What’s new? Some answers from Ancient Greece’, *OECD Observer*, No.221-222, Summer 2000.

⁹⁴ Girard, R., ‘Innovation and Repetition’, *SubStance*, Vol.19, No. 2/3, Issue 62/63: Special Issue: Thought and Novation (1990), p.7.

⁹⁵ Johnston, R., ‘The Many Facets of Innovation’, paper prepared for the *Open Universities Fast Thinking Innovation Awards*, October, 2008, Australian Centre for Innovation Limited, 2008, p.2.

⁹⁶ Butterfield, H., *The Whig Interpretation of History*, London, Bell, 1931 (reprinted 1963).

3.3.3 Value placed on innovation determined by its social context

Contemporary western market economies place a high value on innovation – particularly in regard to technologically-based innovations, which are seen as a key to competitive advantage. It is a fair observation that contemporary narratives supportive of innovation argue that industries and companies which fail to innovate are likely to fail in a competitive, capitalist marketplace which is dependent upon economic growth for its survival. Taking this one step further, it can be stated that innovation and the changes induced by it play a key role in the dynamic evolution of competitive, capitalist economies.

However, the socially constructed nature of innovation also infers that it is logically possible for societies to possess a negative view of innovation and in fact take active steps to suppress it. Ancient Greek thought, typified by Socrates, Plato and Aristotle, provides an excellent example of this scenario. The influence of the Ancient Greeks on contemporary thought should not be underestimated. For example, Coleridge observed ‘that each of us is from birth a Platonist or an Aristotelian’.⁹⁷ A variety of theorists have argued that a number of Ancient Greek themes and attitudes can be identified as still shaping some contemporary issues, including those related to innovation. For example, the great twentieth-century philosopher, Alfred North Whitehead asserted that

The safest general characterization of the European philosophical tradition is that it consists of a series of footnotes to Plato⁹⁸

Another theorist argued that the ancient Greeks ‘as charioteers, hold in their hands the reins of our own and every other culture’.⁹⁹ George Steiner addresses this aspect when he argues that ‘... it is the repertoire of Greek legends which has provided the principle codes of recognition ... in modernism’¹⁰⁰. Expanding on this statement Burrell observes that Steiner ‘... maintains that the twentieth century has as its major texts of modernity many forms of plays upon the Greek

⁹⁷ Knowles, D., *The Evolution of Medieval Thought*, Longman, London, 1978, p.4.

⁹⁸ Whitehead, A.N., (Griffin, D. and Sherburne, D. (eds.)), *Process and Reality*, Free Press, U.S.A., 1979, p.39.

⁹⁹ Nietzsche, F., quoted in Wolin, S., *Politics and Vision: Continuity and Innovation in Western Political Thought*, Princeton University Press, Princeton, 2004, p.481.

¹⁰⁰ Burrell, G., *Pandemonium: Towards a Retro-Organization Theory*, Sage Publications, London, 1997, pp.40-41.

myths'¹⁰¹. Having established the significance of the influence of ancient Greek thought on contemporary thought, we will begin our exploration of forces shaping attitudes to innovation through an examination of ancient Greek myths.

3.3.4 Societies placing a negative value on innovation – Ancient Greece

Ancient Greek mythology abounds with exemplary tales of the fate of innovators. Examples of this include the story of Prometheus (Greek for forethought)¹⁰² who stole fire from the gods. Prometheus was punished by being chained to a rock for eternity. Another Ancient Greek example of the fate awaiting innovators is provided by the myth of Daedalus and Icarus who harnessed the power of flight by constructing wax wings. Icarus fell to his death when he flew too close to the sun and melted his wings of wax. Ancient Greek philosophy also provides a cautionary tale in the fate of Socrates whose philosophical innovations were punished with death by a cup of hemlock.

Extant textual evidence supports the view that the Ancient Greece of Socrates, Plato and Aristotle did not value innovation. In fact the textual evidence indicates that these Ancient Greek philosophers were highly critical of innovation which was viewed as a potential threat to social stability. Plato's vision of an ideal state was recorded in his work 'The Republic'.¹⁰³ According to Russell, in Plato's ideal state, '...all the rulers are to be philosophers, there are to be no innovations...'¹⁰⁴ Innovation was viewed with suspicion and actively discouraged by these Ancient Greek philosophers. Preservation of the existing social order was viewed as the highest good and any innovation was viewed as potentially socially disruptive.

Contemporary theorists also support this interpretation. For example, Popper claims that these Ancient Greeks demonstrated a 'fear of innovation'.¹⁰⁵ Gordon observes that the 'intellectual elitism' of Socrates, Plato and Aristotle '... foreshadows that of a proportion of modern writers who view growth as a

¹⁰¹ *Ibid*, p.40.

¹⁰² Aeschylus, *Prometheus Bound*, Hayes Barton Press, North Carolina, 2007, p.6.

¹⁰³ Plato, *The Republic*, (Second Edition), Penguin Books, Middlesex, 1983.

¹⁰⁴ Russell, B., *History of Western Philosophy*, George Allen and Unwin, London, 1957, p. 136.

¹⁰⁵ Popper, K., *The Open Society and its Enemies: The Spell of Plato*, Routledge Classics, Oxfordshire, 2003, p.235.

threat'.¹⁰⁶ The texts of these Ancient Greek thinkers will now be examined to identify their relevance and influence on innovation-related issues.

The Ancient Greek philosopher Socrates, the mentor of Plato, did not leave any written texts to posterity. What is known of Socrates has been transmitted through two sources: the writings of his student Plato, and also through the Greek playwright Aristophanes. Aristophanes was a contemporary of Socrates and portrayed Socrates as one of the characters in his play 'The Clouds'. Writing in 422 B.C., Aristophanes satirized innovators for '...plucking their novelties from the blue'.¹⁰⁷

Gordon asserts that both 'Plato and Aristotle shared this negative attitude to innovation and development...'¹⁰⁸ For example, Plato's view of innovation is quite clear when he argued that 'there is no greater evil in a state than the spirit of innovation'.¹⁰⁹ Aristotle's attitude is supportive of Plato's position when he recommends '...persons ought not seek after innovations'.¹¹⁰ Innovation was only considered necessary in response to external pressures which threatened to destroy a community. If a community was considered strong enough to repel any potential external threat, individuals were encouraged to contribute their energies to the maintenance of the social status quo.

Plato was particularly wary of educational innovation. He cautioned Ancient Greeks to 'avoid at all costs any innovation in the physical or academic curriculum'.¹¹¹ The strength of Plato's caution and the lengths he was prepared to go to avoid innovations can be assessed when Plato recommended that if anyone was '...convicted of attempting to make innovations in education and the laws, let him die'.¹¹²

¹⁰⁶ Gordon, B., Economic analysis before Adam Smith: Hesiod to Lessius, Macmillan, London, 1975, p.29.

¹⁰⁷ D'Angour, A., op.cit.

¹⁰⁸ Gordon, B., op.cit., p.32.

¹⁰⁹ Plato (translated by Jowett, B.), The Laws, Timeless Classic Books, 2010, p.55.

¹¹⁰ Aristotle, The Politics, George Routledge and Sons Limited, London, 1895, p.32.

¹¹¹ Plato (translated by Lee, D.), The Republic, Penguin Classics, 2007, p.125.

¹¹² Plato (translated by Jowett, B.), op.cit., p.94.

The Platonic philosophers' attitude to innovation was shaped by their perspectives on the role and function of knowledge for the individual and society. Ancient Greek philosophers such as Socrates, Plato and Aristotle, believed 'the sole function of knowledge is self-knowledge: the intellectual, moral and spiritual growth of the person.'¹¹³ The Greeks contrasted this view of knowledge with that of practical skills, which they termed as 'techne'. The modern English equivalent of the Greek word 'techne' is 'artificial'.¹¹⁴

Techne 'was confined to one specific application and had no general principles ... [and] could not be applied to anything else.'¹¹⁵ Techne or technological knowledge was viewed as a lower order knowledge with which the learned elite did not engage. According to Drucker,

...the only way to learn a techne was through apprenticeship and experience. A techne could not be explained in words, whether spoken or written; it could only be demonstrated.¹¹⁶

For the Ancient Greeks, techne is what would today be referred to by theorists such as Polanyi as 'tacit knowledge'.¹¹⁷ The disapproval of innovation in the political and social spheres, which was not a reaction to an external threat, also extended to the discouragement of technological innovations. For example, it was feared that

... translating the mechanical inventions made in Greece into new technologies of production ... might result in [the] alteration of existing social frameworks.¹¹⁸

For the Ancient Greeks, innovations and promoters of innovation were not only suspect, but were believed to originate from sources external to Greek society. Accordingly they believed that innovation or

The promotion of change is a matter for alien merchants, foreign bankers, and slave-managers and their activities need to be watched closely as potential sources of subversion of the existing order.¹¹⁹

¹¹³ Drucker, P., Post Capitalist Society, Harper Collins, New York, 1993, p.26.

¹¹⁴ Barnes, J., Early Greek Philosophy, Penguin Classics, London, 1987, p.19.

¹¹⁵ Drucker, P., op.cit., p.27.

¹¹⁶ Ibid.

¹¹⁷ For example in Polanyi, M., The Tacit Dimension, Routledge and Kegan Paul, London, 1966.

¹¹⁸ Gordon, B., op.cit., p.33.

¹¹⁹ Ibid, p.32.

Plato's and Aristotle's attitudes towards change and innovation also had economic consequences which are the polar opposite of those valued in dynamic capitalist economies. Gordon argues that

Plato's and Aristotle's economics is not the economics of growth. Their approach is guided by a belief in the desirability of establishing a relatively stationary state of economic activity...¹²⁰

This negative attitude to innovation and economic growth in the Ancient Greece of Socrates, Plato and Aristotle has been interpreted as a response to the collapse of the formerly expansionist economic policies of pre-Socratic Greece. By the middle of the fifth century B.C., Athens had become '... the richest and most powerful state of Europe...'¹²¹ This period of economic growth '... gave rise to a cluster of innovations unparalleled until the Europe of the late middle ages'.¹²²

Gordon observes that

The Socratic philosophers were witnesses of the disintegration of the political, military and economic strength of Periclean Athens. ... It is not surprising then, to find that the economics of the Socratics is not a technology of an age of growth and development. Rather it is the product of an age of anxiety ... [in] a political environment threatening chaos.¹²³

The widely known philosophical dispute between Plato and the Sophists was not only based on Plato's criticism of Sophist rhetoric. The Sophists of Ancient Greece argued for expansionist and mercantilist policies which were opposed to the stationary, non-expansionist philosophies of Plato. Gordon argues that, 'The direction in which the Sophists led economics was not to be pursued again with vigour until the latter part of the sixteenth century A.D'.¹²⁴ Gordon further argues that

The manner in which economics was taught by the Sophists had a strong affinity with the approach which has come to be dominant in the twentieth century. In fact, their approach is much closer to that of the majority of modern professional economists than are those adopted by Plato, Aristotle and the scholastics. For the Sophists, economics is a technology. Its techniques can be taught and mastered without reference to the desirability or lack of desirability attached to the ends or purposes which the technique can be made to serve.¹²⁵

It is of particular significance that the Sophist economic philosophy and teaching methods are comparable to those of the sixteenth and twentieth centuries. This important aspect will be referred to again later.

¹²⁰ Ibid, p.27.

¹²¹ Ibid, p.2.

¹²² Ibid, p.2.

¹²³ Ibid, p.22.

¹²⁴ Ibid, p.21.

¹²⁵ Ibid, p.16.

3.3.5 Ancient Greek perspective of society excluded innovation as subversive

Gordon argues that the attitudes of Plato and Aristotle towards innovation were also shaped by their perspectives on society and the state. They possessed the belief that the ‘state’ was the highest natural form of society. Aristotle illustrated this view when he argued that

... every state exists by nature ... for whatever is the end-product of the coming into existence of any object, that is what we call its nature...¹²⁶

This perspective infers a linear view of development towards an object’s predetermined end ‘nature’. One of the consequences of this view is that it precludes any intervention which may alter or interfere with an object’s course towards its predetermined end. According to this view it would be considered at least ill advised, if not entirely foolhardy for human intervention to disturb the development of natural processes towards their natural end state. Gordon reinforces this point when he observes

Aristotle’s emphasis is on sound management of what is given man by nature, rather than entrepreneurship and innovations which transform it.¹²⁷

For Plato and Aristotle, once the ‘state’ had achieved a ‘given level of material well-being’, emphasis should be placed on maintaining it in its ‘natural’, static state.¹²⁸ Supporting this view, Gordon argues that Aristotle’s economics were the ‘economics of the stationary state...’ which placed ‘little attention to the ‘variable features ... which may alter in the course of economic and social evolution’.¹²⁹

The Ancient Greek attitude to innovation can be more clearly understood if it is placed within its philosophical context. Underlying philosophical beliefs shaped the Greek’s world view and their negative attitude towards innovation and change. For example, Plato and Aristotle both reasoned ‘in terms of a system of natural law ... independent of temporal change and of location’.¹³⁰ Both philosophers based their systems on a belief system structured upon an underlying static template of reality.

¹²⁶ Aristotle, *The Politics*, (Revised Edition), Penguin Classics, Middlesex, England, 1981, p.59.

¹²⁷ Gordon, B., *op.cit.*, p.30.

¹²⁸ *Ibid*, p.33.

¹²⁹ *Ibid*, pp.33-34.

¹³⁰ *Ibid*, p.33.

3.3.6 The static 'Forms' and 'Paradigm' of Plato

...gennaion pseudos? ¹³¹

One of the key philosophical beliefs underlying this world view of Plato and Aristotle was their belief in the existence of 'eidos', a Greek term which has been translated as 'Forms'. In Plato's philosophy, the terms 'Forms', 'Patterns' and 'Ideas' were interchangeable and they were believed to be the underlying template of 'reality'. ¹³² In Plato's work 'The Timaeus', he also uses the Greek term 'paradeigma' to refer to 'an eternally changeless' ... 'example, original or model'. ¹³³ The significance of Plato's use of the term 'paradeigma' will be referred to in later chapters. However at this point it will be noted that Plato stated that the Demiurge (god) '...fashions the cosmic likeness after an intelligible paradigm or paradeigma...' ¹³⁴

Regarding the Forms, Popper observes that,

The Forms or Ideas are not only unchanging, indestructible, and incorruptible, but also perfect, true, real and good. ¹³⁵

Plato explains in 'The Republic' that 'good' is 'everything that preserves' and 'evil' is 'everything that destroys or corrupts'. ¹³⁶ Plato and Aristotle both believed that 'Forms' determined the nature of things; however, they differed in their understanding of the nature of 'Forms'. Plato believed that 'Forms' had a separate, independent non-tangible existence which could be grasped by the intellect. Aristotle also believed forms could be grasped by the intellect; but he did not believe that they had an independent existence apart from matter. ¹³⁷ Wolin

¹³¹ Translation – 'noble lie'. In his work 'The Republic', Plato introduces the instrumental device of 'gennaion pseudos' or the 'noble lie', through the mouthpiece of Socrates, as necessary 'for the ultimately beneficial aim of justifying the organisation of the city', Emlyn-Jones, C. and Preddy, W., (editors and translators), 'General Introduction', in Plato, Republic, Loeb Classical Library, Harvard, 2013, p.lxiv.

¹³² Popper, K., op.cit., p.23.

¹³³ Kalkavage, P., Plato: Timaeus, Focus Publishing, Newburyport, 2001, pp.16 and 139.

¹³⁴ Ibid, p.139.

¹³⁵ Ibid, p.36.

¹³⁶ Ibid.

¹³⁷ Flew, A., A Dictionary of Philosophy, Pan Books, London, 1979, pp.122-123.

observes that these Ancient Greek philosophers believed intellectual theorizing to be ‘an act of “unveiling” that revealed the principles underlying all existence’.¹³⁸

Thinkers of the Platonic School regarded ‘the Creator ... as a mathematician’.¹³⁹ For both Plato and Aristotle, the philosophical uses of the word for ‘Form’ ‘are closely connected with its mathematical sense, “regular figure”’.¹⁴⁰ Ancient Greeks believed that by apprehending and expressing the static ‘Forms’ in mathematical terms, it was possible to understand and emulate the perfect state of nature which could not, and should not, be improved upon. According to Popper,

Plato, a pessimist, believed that all change – or almost all change – is decay; this was his law of historical development. Accordingly, his utopian blueprint aims at arresting all changes; it is what would nowadays be called ‘static’.¹⁴¹

For Aristotle, ‘the human world of state and society and mind appears’ to be ‘founded fast in the unalterable permanence of forms that, while they change within certain limits, remain identical in essence and purpose’.¹⁴² Innovation in this context was viewed not only as evil and an offence against nature and society, but also as unnatural and contrary to the mathematical perfection of the ‘Creator’.

This static philosophy which formed the basis of Ancient Greek beliefs on society and the economy also provided the gestalt through which later societies constructed their religious, social and economic beliefs and theories. This is supported by Gordon who argues that the influence of Plato’s and Aristotle’s ‘exclusion of analysis of future possibilities for economic growth from the realm of serious scholarship was to be the accepted practice for social thinkers in Europe for many centuries’.¹⁴³ A negative view of innovation can be identified through medieval times and continued in this vein until the late Renaissance Period when pockets of thought supportive of innovation began to develop.

¹³⁸ Wolin, S., Politics and Vision: Continuity and Innovation in Western Political Thought, Princeton University Press, Princeton, N.J., 2004, p.481.

¹³⁹ Dijksterhuis, E.J., The Mechanization of the World Picture: Pythagoras to Newton, Princeton University Press, New Jersey, 1986, p.501.

¹⁴⁰ Taylor, A.E., Aristotle, Dover Publications, New York, 1955, p.45.

¹⁴¹ Popper, K., The Poverty of Historicism (2nd ed.), Routledge, London, 1974, p.73.

¹⁴² Gordon, B., op.cit., p.33.

¹⁴³ Ibid, p.32.

3.3.7 Societies placing a negative value on innovation – Medieval religion

In Medieval Latin the term ‘innovation’ was mainly used in relation to theological concerns where it was also viewed through a negative perspective. In this context, ‘innovation’ referred to

... a departure from what by definition should not change – religious dogma. In many instances, innovation is practically synonymous with heresy.¹⁴⁴

Girard observes that in relation to medieval politics and religion

... good things are stable by definition, and therefore untainted by innovation, which is always presented as dangerous or suspicious.¹⁴⁵

The importance and far-reaching influence of Christianity in the medieval period is widely accepted. However it is lesser known that theological thinkers of this period placed

...the forms of Plato ... in the Mind of God.¹⁴⁶

As ‘Platonism is the conceptual basis of Christianity’,¹⁴⁷ it is not surprising that Medieval religion continued the ancient Greek tradition of a negative attitude towards innovation. Platonists and Neo-Platonists alike ‘despised innovation (kainotomia)’.¹⁴⁸ Although the textual record indicates a continuing negative attitude towards innovation, technical innovations were nevertheless taking place.

An example of an important innovation in this period was the construction of a printing press by Gutenberg in 1450. This innovation was disruptive in that it presented a threat to the religious literary cultures based on the traditional monastic scriptoriums of this time. An indication of the initial reception to the innovation of printing can be judged by the fact that Printer’s apprentices were referred to as ‘Printer’s devils’.

¹⁴⁴ Girard, R., ‘Innovation and Repetition’, *SubStance*, Vol.19, No. 2/3, Issue 62/63: Special Issue: Thought and Novation (1990), p.7.

¹⁴⁵ *Ibid.*

¹⁴⁶ Knowles, D., *op.cit.*, p.39.

¹⁴⁷ Hollingdale, R.J., in *Schopenhauer: Essays and Aphorisms*, Penguin Classics, London, 2004, p.15.

¹⁴⁸ Helming, C. and Steel, C., “Proclus”, *The Stanford Encyclopedia of Philosophy*, (Spring 2011 Edition), Zalta, E. (ed.), accessed at <http://plato.stanford.edu/archives/spr2011/entries/proclus/> March 22, 2011.

3.3.8 Societies placing a negative value on innovation – the Renaissance

The continuation of the negative value placed on innovation could in part be attributed to the underlying philosophical beliefs which supported a static view of society and creation. Gough observes that ‘a static concept of society [is] characteristic of antiquity and the renaissance.’¹⁴⁹ Therefore it is not surprising that the recorded textual connotations of the term ‘innovation’ ‘were almost uniformly unfavourable’ from when it came into widespread use in the 16th century.

This situation is not unusual in the context of innovation, as noted in earlier chapters; the literate, educated classes were generally aligned with the status quo. This may also represent a continuation of the Ancient Greek legacy of the educated classes despising practical matters such as technology. Therefore their recorded responses to innovations, which held the potential to disrupt social equilibrium, were generally negative. Political considerations were also closely allied to all things innovative. In 1514 the scholar Machiavelli addressed the topic in his best known work ‘The Prince’. Machiavelli advised that

The innovator makes enemies of all those who prospered under the old order, and only lukewarm support is forthcoming from those who would prosper under the new.¹⁵⁰

Machiavelli’s advice did not reach the English speaking world until 1640 when the first English translation of ‘The Prince’ was released.¹⁵¹ It must be acknowledged that the Renaissance was a period of unparalleled innovation. However, in general, these innovations were being created by practical inventors and innovators who may not have recorded their attitudes towards innovation in the literature of the time. So, although practical invention and innovation was occurring, it was not being theorised within a broader conceptual framework. Another example of the Renaissance attitude to innovation in the 16th century is provided by the great Humanist Montaigne, who reputedly inspired the Scepticism of Rene Descartes, when he wrote

¹⁴⁹ Gough quoted in Bacon, F. (edited by Vickers, B.), *Francis Bacon: The Major Works*, Oxford University Press, Oxford, 2008, p.794.

¹⁵⁰ Machiavelli, N. (translated by Bull, G.), *The Prince*, Penguin Books, Middlesex, 1961, p.51.

¹⁵¹ *Ibid*, p.9.

I am disgusted with innovation, in whatever guise, and with reason, for I have seen very harmful effects of it.¹⁵²

A further example of a late 16th century Renaissance attitude towards innovation is provided by Shakespeare who, through the mouthpiece of Henry IV, practically equates innovation with discontent and rebellion

To face the garment of rebellion
With some fine color that may please the eye
Of fickle changelings and poor discontents.
Which gape and rub the elbow at the news
Of hurly-burly innovation.¹⁵³

3.4 Conclusion

Chapter Three began the task of examining the philosophical and historical foundations of the concept of innovation and their potential implications for interpreting the higher education sector through the lens of service sector innovation theory. This chapter addressed the philosophical and historical foundations of the concept of innovation by undertaking a textual examination of the concept of innovation and cultural attitudes towards it. It also explored the underlying philosophies which have influenced and shaped cultural attitudes towards innovation and which also act as axioms for economic theories.

Chapter 3 established that, perhaps surprisingly, attempts to theorise innovation did not commence until the late nineteenth and early twentieth centuries. It was also established that contemporary theoretical framings of innovation are multidisciplinary, and therefore do not sit squarely within economic models seeking to explain economic phenomena via static, equilibrium-based frameworks. In this sense, they constitute what Gibbons et al refer to as Mode 2 knowledge.

The chapter also identified innovation theory as a relatively late newcomer to the theoretical scene and addressed the issues responsible for this. Historically, theories based on the ancient Greek philosophies of Socrates, Plato and Aristotle were static in nature and therefore not capable of hosting a dynamic theory of

¹⁵² Montaigne, M., *The Complete Essays of Montaigne*, (originally published 1580), Stanford University Press, Stanford, 1976, p.86.

¹⁵³ Shakespeare, W., 'King Henry', in *Henry IV*, Part 1, Act 5, Sc.1, l. 74–6.

innovation. Ancient Greek Socratic attitudes towards innovation were also identified and discussed. It was concluded, through textual analysis, that these Ancient Greeks had a negative attitude towards innovation. This attitude was very influential and, by tracing the literary trail, it was established that the overwhelming historical attitude to innovation, until the sixteenth-century, was one of negativity and caution. It was observed that although invention and innovation were taking place, it was not being theorised. That is there were no attempts made to rationally understand and theorise the innovation process.

The attitudes of the ancient Greek Sophists, or Pre-Socratics, were also examined and it was established that they supported innovative expansionist, mercantilist policies which were comparable to economic policies and teaching methods in the sixteenth and twentieth centuries. These Pre-Socratic attitudes were opposed by the static, stationary, anti-innovation theories of the Socratics, Plato and Aristotle.

Chapter Four will build on the framework constructed in Chapter Three and examine the beginnings of positive attitudes towards innovation located in sixteenth century texts, and evidence of increasingly positive attitudes identified in the Age of Reason and also the Enlightenment. Rousseau is identified as arguing against Socratic (Platonic) beliefs and is located at the beginning the Counter-Enlightenment philosophy movement.

These attitudes were supported by philosophical developments which altered world views or gestalts, and by commencing the questioning of the 'Platonic paradigm' created the potential for further changes. For example, the gradual shift from a static world-view based on ancient Greek Socratic philosophy and also mechanistic metaphors, to a more dynamic philosophy utilising biological metaphors resulting in the synthesis of these in Comte's new academic discipline of Sociology. These shifting world-views were the predecessors of more contemporary philosophical influences which have shaped economic theories and determined their capability, or not, for hosting a theory of innovation.

Chapter 4. A Conceptual History of Innovation: Part 2

...innovateth greatly, but quietly, by degrees scarce to be perceived.¹⁵⁴

4.1 Introduction

Chapter Three initiated the task of addressing the philosophical and historical foundations of the concept of innovation. This was commenced by examining the textual history of cultural attitudes towards innovation from Ancient Greece through to the Renaissance. The underlying philosophies which have influenced and shaped those attitudes towards innovation were also examined. This examination revealed that, according to the textual record, the dominant cultural attitude towards innovation throughout that period was a negative one. The enduring influence of philosophy based on the 'Platonic paradigm' on later philosophical and religious thought was also identified – and as a consequence, its legacy of a negative attitude towards innovation.

The goal of Chapter Four is to complete a review of the philosophical and historical foundations of the concept of 'innovation' before proceeding to examine the role that the concept of 'innovation' plays in various economic theories.

4.2 The dawn of positive attitudes to innovation

Prior to the sixteenth century, apart from the Pre-Socratic period, textual attitudes towards innovation appear to have been consistently negative. However, sixteenth century attitudes towards innovation were not uniformly unfavourable.

Nevertheless, innovative thinkers were circumspect enough to exercise caution. For example, Francis Bacon, considered by many to have contributed to the initiation of the scientific revolution through his establishment of an inductive scientific method, titled one of his 1597 essays 'Of Innovation'.

Zagorin argues that 'the major purpose of Baconian natural philosophy is to produce innovations of which nature unaided is not capable.'¹⁵⁵ Reflecting the times in which he wrote, Bacon advised caution in all things innovative and

¹⁵⁴ Bacon, F., *Essays*, Cosimo Classics, New York, 2009, p.65.

¹⁵⁵ Zagorin, P., *Francis Bacon*, Princeton University Press, Princeton, 1998, p.97.

recognized that innovations may not be welcomed by those with a conservative attitude. In Bacon's words,

...retention of custom is as turbulent a thing as an innovation; and they that reverence too much old times are but a scorn to the new. It were good, therefore, that men in their innovations would follow the example of time itself; which indeed innovateth greatly, but quietly, by degrees scarce to be perceived.¹⁵⁶

Galileo, widely attributed as the inventor of the telescope, would have done well to follow Bacon's advice. Galileo experienced the displeasure of the Renaissance Church establishment towards innovation in 1633 when, faced with the threat of excommunication, he was forced to recant the innovative Copernican heliocentric theory which was challenging the traditional (Ancient Greek) geocentric view.¹⁵⁷ Negative attitudes to innovation were maintained throughout the 17th century and continued on until at least the late Renaissance period.

4.3 Societies placing a negative value on innovation – seventeenth century

Negative attitudes towards innovation were still in evidence in texts of the seventeenth century. These attitudes could be identified in both Britain and the Continent. As discussed earlier in Chapter Three, it should be clarified that these negative religious and philosophical textual attitudes to innovation were quite separate from the practical technological innovations that were taking place in areas such as transport, weapons, architecture, art and exploration.

4.3.1 Innovation – seventeenth century Britain

In seventeenth century British politics, innovation was 'almost tantamount to rebellion and revolution'.¹⁵⁸ An example of this attitude is provided by the political author Thomas Hobbes who 'loathed innovation' and associated it with political unrest.¹⁵⁹ In 1651 Hobbes wrote that

... there are many who supposing themselves wiser than others, endeavour to innovate, and divers innovators innovate in various ways which is a mere distraction and civil war¹⁶⁰

¹⁵⁶ Bacon, F., *op.cit.*, p.65.

¹⁵⁷ Koestler, A., *The Sleepwalkers*, Penguin Books, Middlesex, 1986, p.499.

¹⁵⁸ Girard, R., 'Innovation and Repetition', *SubStance*, Vol.19, No. 2/3, Issue 62/63: Special Issue: Thought and Novation (1990), p.7.

¹⁵⁹ *Ibid.*

¹⁶⁰ Hobbes, T., 'Philosophical Rudiments' (1651), in Wootton, D. (ed.), *Divine Right and Democracy: An Anthology of Political Writing in Stuart England*, Hackett Publishing, Indianapolis, 2003, p.461.

The British attitude to innovation was not an isolated case. Evidence of this attitude was also to be found in France.

4.3.2 Innovation – seventeenth century France

Girard observes that the negative attitude towards innovation was also shared in seventeenth century classical France by ‘French grammarians and literary theoreticians’ who viewed innovation as a threat to French language and literature.¹⁶¹ However, early seventeenth century France also witnessed philosophical innovation in the theories of Descartes. Descartes has been credited as one of the founders of Rationalism and also one of the initiators of what has been termed the ‘Age of Reason’.

4.3.3 Shifting foundations of knowledge – from revelation to rationalism

Descartes has been identified as the ‘first to point out the necessity of the mechanistic explanation of natural phenomena’.¹⁶² The mechanistic explanation has been described as using ‘mathematical formulation as the descriptive medium, mathematical deduction as the guiding principle.’¹⁶³ Dijksterhuis argues that

... the science called mechanics had emancipated itself in the seventeenth century from its origin in the study of machines, and had developed into an independent branch of mathematical physics dealing with the motion of material objects and finding in the theory of machines only one of its numerous practical applications.¹⁶⁴

Rationalism continued the Greek belief in mathematics providing knowledge of the natural world. However, Krieger argues that the philosophies of Bacon, Descartes, Hobbes and Spinoza which developed during this time removed the necessity of the dependence on theological revelation as the basis for ascertaining ‘facts’.¹⁶⁵ Kaufman supports this when he argues that ‘... the history of philosophy from Descartes is ... the story of an emancipation from religion’.¹⁶⁶

Best and Kellner also support this view when they observe that thinkers like

¹⁶¹ Girard, R., *op.cit.*, p.7.

¹⁶² Dijksterhuis, E.J., *The Mechanization of the World Picture: Pythagoras to Newton*, Princeton University Press, New Jersey, 1986, p.458.

¹⁶³ *Ibid.*, p.3.

¹⁶⁴ *Ibid.*, p.498.

¹⁶⁵ Krieger, L., *Kings and Philosophers 1689–1789*, Weidenfeld and Nicolson, London, 1971, p.139.

¹⁶⁶ Kaufman, W., (ed.), *The Portable Nietzsche*, Penguin Books, Middlesex, 1976, p.17.

...Descartes ...replaced qualitative, religious and mystical definitions of reality with quantitative, mathematical and secular models.¹⁶⁷

Given the previous discussion on the role of Platonism in Christian theological issues, it can be argued the history of philosophy was also a story of the gradual emancipation from a foundation based on the concepts of Platonic forms or what has been referred to previously as the 'Platonic paradigm'. However due to the subtlety of the Platonic philosophy in Christianity, Platonic metaphysics containing a negative attitude towards innovation continued their influence in secular philosophies.

4.3.4 The Age of Enlightenment

These philosophical developments were aspects of the rise of the 'Enlightenment' period. The 'Enlightenment' has '... often been called the 'Age of Reason' or the 'Age of Criticism' not only by historians but also by contemporaries themselves'.¹⁶⁸ The 'Enlightenment' was a dynamic period and the range of issues and subjects examined by the Enlightenment attitude towards reason and criticism evolved over time. Beiser argues that at this point of its development, the Enlightenment

...made reason its highest form of authority, its final court of appeal, in all intellectual questions. Its central and characteristic principle is what we might call the *sovereignty of reason*. This principle means that there is no source of intellectual authority higher than reason. Neither scripture, nor divine inspiration, nor ecclesiastical and civil tradition have the authority of reason. While reason judges the legitimacy of all these sources of authority, none of them stands in judgement of it.¹⁶⁹

4.3.5 Innovation in the Age of Enlightenment

Newton's *Principia Mathematica* was also published in the late seventeenth century and provided the innovative mechanistic and mathematical model which was to be adopted as the legitimating template for scientific activities from that point forward. Newton's model was structured on a static, equilibrium basis and in this sense is comparable to the earlier Greek philosophies. However Krieger argues that

Newton's achievement consisted in his miraculous synthesis of physics and mathematics

¹⁶⁷ Best, S. and Kellner, D., *The Postmodern Adventure: Science, Technology and Cultural Studies at the Third Millennium*, Guilford Press, New York, 2001, p.109.

¹⁶⁸ Beiser, F., *Hegel*, Routledge, New York, 2005, p.22.

¹⁶⁹ *Ibid*, pp.22-23.

... which undermined the belief in the absolute sovereignty of mathematical law and initiated the commitment to its necessary immanence in the facts of the actual world.¹⁷⁰

Dijksterhuis argues that the prejudice of linking the concepts of nature and mathematics evident in the physical sciences and mechanistic explanatory models can be traced back to thinkers of the Platonic School who regarded ‘the Creator ... as a mathematician’.¹⁷¹ The publication of Newton’s work has been identified by some authors as the beginning of the Enlightenment period. Enlightenment thought sought to use reason in two ways: firstly to understand nature; and secondly to question all traditional forms of authority which Enlightenment philosophers believed were obscuring the truth of nature. How these truths of nature were to be ascertained and understood had been previously addressed by the philosophy of Descartes and his method of rationalism and doubt. Descartes’ rationalism was highly compatible with the notion of Platonic forms in that both philosophical systems believed in separately existing, or *a priori*, ideas or forms in Platonic terminology. So, even at the commencement of the Enlightenment, elements of the ‘Platonic paradigm’ still wielded influence in the underlying assumptions of the Enlightenment philosophers.

4.3.6 Epistemology – rationalism, empiricism and the foundations of knowledge

However, another Enlightenment philosopher, John Locke, questioned Descartes’ rationalism and the belief that knowledge could be only accessed by use of the mind. Locke argued that the basis of knowledge of the world should commence with the experiences of the senses.¹⁷² Locke’s view came to be known as empiricism, or *a posteriori* knowledge, whilst Descartes’ view was referred to as rationalism, or *a priori* knowledge.

These two views of how knowledge should be accessed are referred to in philosophy by the Greek word ‘epistemology’, which translates as ‘theories of knowledge’, and provided the basis of knowledge and reason in Enlightenment thought. The belief in the existence of an underlying basis for knowledge is

¹⁷⁰ Krieger, L., *op.cit.*, p.141.

¹⁷¹ Dijksterhuis, E.J., *op.cit.*, p.501.

¹⁷² Grimsley, R., (ed.), *The Age of Enlightenment: 1715–1789*, Penguin Books, Harmondsworth, 1979, p.36.

termed ‘Foundationalism’. Beiser highlighted the importance of this belief for Enlightenment philosophers when he observed that

The Enlightenment faith in the authority of reason rested first and foremost on the possibility of providing a firm foundation for knowledge. ... The search for a foundation appears in both the empiricist and rationalist traditions of the Enlightenment. ... Despite their opposing ideas about where to place it, both shared a belief in the possibility, and indeed necessity of some foundation. ... The alternative to a firm foundation seemed to be the abyss of scepticism.¹⁷³

4.3.7 Sceptical philosophy – challenges to epistemology and Platonism

The sceptical philosophy of David Hume, based on the ‘Problem of Induction’, appeared to result in the conclusion that there was no firm foundation for knowledge based on reason. Russell argues that Hume’s sceptical philosophy ended ‘...with the conviction that belief is never rational, since we know nothing’.¹⁷⁴

The conclusions of Hume’s sceptical philosophy therefore contained the potential to topple one of the pillars of the ‘Platonic paradigm’, that of foundationalism and the role of the intellect in ascertaining the ‘Forms’ and ‘true knowledge’. At the time of its publication, Hume’s philosophy was not influential and other philosophers either ignored or ‘rejected his scepticism without refuting it’.¹⁷⁵

The philosophy of Kant retrieved philosophy briefly from the ‘abyss of scepticism’ and also introduced the perspective that the mind is not passive, but instead actively involved in creating the ‘...organising principles which *impose order on experience*’.¹⁷⁶ However, intellectuals like Kant sought ‘...after profound truths at a chiefly theoretical level, without regards to the relevance of their work to modern society’.¹⁷⁷

Both the rationalist and empiricist epistemologies assumed reason could access the underlying ‘truth’ in Nature. The Enlightenment philosophers’ emphasis on the truth of nature also carried ancient Greek intellectual baggage. For both the

¹⁷³ Beiser, F., *op.cit.*, 2005, pp.22-23.

¹⁷⁴ Russell, B., *History of Western Philosophy*, George Allen and Unwin, London, 1957, p.699.

¹⁷⁵ *Ibid.*, p.698.

¹⁷⁶ Stromberg, R., *European Intellectual History Since 1789*, Appleton-Century-Crofts, New York, 1968, p.22.

¹⁷⁷ Benda, J., quoted in Cockett, R., *Thinking the Unthinkable: Think-Tanks and the Economic Counter-Revolution, 1931- 1983*, Fontana Press, London, 1995, p.48.

ancient Greeks and also the Enlightenment philosophers held the belief in common that the ‘truth’ of nature could be ascertained by using reason to remove the veils obscuring it. Nisbet supports this view in his observation that

Nature, then, in eighteenth-century as in Ancient Greek thought carries with it the clear idea of an ideal-type, a character of an entity, physical or social, that is its true essence and *that will manifest itself* provided only that corrupting, deflecting or interfering circumstances of one kind or another do not obtrude. Whether for purposes of analysis or action, what is necessary is to cut away all that now hides nature in order to know it and then to achieve it. This is the central theme of the philosophy of nature in the eighteenth century, as seen in writings as distinct from one another as those of the physiocrats, Rousseau, Adam Smith, Diderot, Adam Ferguson and others.¹⁷⁸

4.3.8 Newtonian physics, mechanistic philosophies and Platonic forms

The acceptance of Newton’s work into the intellectual milieu of the period meant that other intellectual systems were affected in one way or another. For example the Scholastic philosophers of this time had adopted the concept of Aristotle’s ‘substantial Forms’ which were believed to exist in matter or substance. However, ‘the theory of substantial Forms was sharply criticized by many philosophers and scientists of the 17th century, who saw the Forms as inconsistent with the mechanistic concepts of the new [Newtonian] physics’.¹⁷⁹ One of the key axioms of Newtonian physics was the ability for gravity to have physical effects at a distance without physical connection. This required an underlying supporting philosophy for which Scholasticism, with its Aristotelian belief structures, was inadequate.

The theories of Forms of Plato and Aristotle were previously compared above where it was explained that both Plato and Aristotle believed that ‘Forms’ could be grasped by the intellect. However Plato believed they had a separate, independent non-tangible existence in contrast to Aristotle who did not believe that they had an independent existence apart from matter. Therefore a consequence of the rejection of Aristotle’s ‘substantial’ (that is, existing in matter) Forms by the mechanistic concepts of the new physics of Newton was the reinstatement of the belief in Platonic ‘Forms’ which had a separate, independent non-tangible existence apart from matter.

¹⁷⁸ Nisbet, R.A., *Social Change and History: Aspects of the Western Theory of Development*, Oxford University Press, Oxford, 1969, p.142.

¹⁷⁹ Flew, A., *A Dictionary of Philosophy*, Pan Books, London, 1979, p.123.

The return to the earlier Platonic understanding of Forms was to have consequences for other ‘sciences’ which adopted the Newtonian scientific model. One example of this is Classical economics, which based on this premise, introduced ‘the invisible hand’ as an explanatory mechanism. This aspect is explored further below.

It is easy today to underestimate the revolutionary world-view that was ushered in by the arrival of Newtonian physics. It was a gestalt game-changer and significantly altered ways of understanding the universe and the world of philosophers of the time. It provided the basis of a new way of approaching and producing knowledge and its echoes are still apparent in many contemporary knowledge producing institutions. In the words of Krishan Kumar

The triumphant success of Newtonian physics dazzled the eighteenth-century philosophers. They hoped to discover in human society a principle of order, of equilibrium, equivalent to the operations of gravity in Newton’s mechanical universe.¹⁸⁰

Best and Kellner observe that these models which ‘...constructed a mechanistic universe that was unchanging, uniform, deterministic, simple and predictable ...prompted dramatic advances in the state of knowledge and led to important technological innovations’.¹⁸¹ However, they also argue that ‘... this clock-like universe was an ideal model’ and that the theoretical trade-off for this idealised, predictable clock-like model was the suppression of ‘...change and indeterminacy in favour of geometrical, law-governed explanations’.¹⁸² They further argue that

Despite the discontinuities, however, nature was still seen in static terms because Platonist metaphysics continued to rule Western thought.¹⁸³

4.3.9 Newtonian Physics, Platonic Forms, Adam Smith and Classical Economics

So, in the case of one of the founders of Classical Economics, Adam Smith, the conceptual model of Newtonian physics with its underlying mechanistic metaphors carried other theoretical consequences. For example, human intervention in a clockwork universe constructed by the omnipotent Creator would

¹⁸⁰ Kumar, K., *Prophecy and Progress: The Sociology of Industrial and Post-Industrial Society*, Penguin Books, London, 1991, p.16.

¹⁸¹ Best, S. and Kellner, D., *op.cit.*, 2001, p.109.

¹⁸² Ibid.

¹⁸³ Ibid.

not only be heretical, it would also be foolish to disturb the workings of a perfect, well-balanced and divinely ordered mechanism.

Kumar reinforces this interpretation when he argues that

...Adam Smith's model of the 'natural' economy, in the *Wealth of Nations*, was conceived in the image of a self-balancing machine: man's propensity to truck, barter, and exchange gave rise to actions obeying impersonal laws – such as the law of supply and demand – which, if not disported by 'unnatural interventions on the part of the political authority, maintain the system in a state of mechanical equilibrium.¹⁸⁴

Smith's metaphor of the 'invisible hand' of the market takes on new metaphorical meanings when placed in the context of a clockwork universe. It is a doubly powerful metaphor as the 'invisible hand' can also represent the invisible hand of the Creator making slight adjustments to the mechanism of the market.

Illustrations of the time represented the 'invisible hand' (and arm) appearing from a cloud to fine tune the market mechanism. In fact, Smith had used the 'invisible hand' metaphor previously in the context of physics, not in

... an economic context: "heavy bodies descend, and light substances fly upwards by the necessity of their own nature; now was the invisible hand of Jupiter ever apprehended to be employed in these matters?"¹⁸⁵

Reinert also supports this view when he argues that 'Adam Smith's invisible hand metaphor [views] the role of man as a passive being in the hands of 'Providence' ...'¹⁸⁶ Smith's theoretical endeavours were shaped by the belief system of the Enlightenment and were shared by other theoreticians in other fields of theoretical endeavour who were

... striving to find a total philosophy whose principles were so fundamental and so general that they were applicable to the whole of creation ... Some form of social Newtonianism was an easy, and popular, resolution of this endeavour¹⁸⁷

However, although Enlightenment thought strongly encouraged attempts to understand Nature through the faculty of Reason, the mechanistic world-view did

¹⁸⁴ Kumar, K., *op.cit.*, p.17.

¹⁸⁵ Smith, A., 'Essay on the History of Ancient Physics', in *The Early Writings of Adam Smith*, Kelly, New York, 1967, p.49 quoted in Mirowski, P., *More Heat than Light, Economics as Social Physics: Physics as Nature's Economics*, Cambridge University Press, Cambridge, 1989, p.408.

¹⁸⁶ Reinert, E., 'Production-Based Economic Theory and The Stages of Economic Development: From Tacitus to Carlota Perez', Chapter 18 in Dreschler, W., Kattel, R. and Reinert, E. (eds.), *Techno-Economic Paradigms: Essays in Honour of Carlota Perez*, Anthem Press, London, 2009, p.341.

¹⁸⁷ Kumar, K., *op.cit.*, p.18.

not accommodate human intervention. This situation contained obvious consequences for the activity of formulating policy interventions designed to assist innovation in national economies.

4.3.10 Societies placing a negative value on innovation – British politics of the eighteenth century

In the eighteenth century, the political writer Edmund Burke continued the negative political view of innovation when he observed,

A spirit of innovation is generally the result of a selfish temper and confined views. People will not look forward to posterity, who never look backward to their ancestors.¹⁸⁸

Robertson argues that Burke represented the emergence of conservatism as a political and philosophical reaction to the

...rationalist thinkers of the European Enlightenment, the utopianism they hoped to create, and the radical forces unleashed by the French Revolution.¹⁸⁹

Stromberg argues that the writings of Edmund Burke were associated with ‘... a kind of intellectual counter-revolution against the Enlightenment’.¹⁹⁰ This has been characterised as a reaction against the ‘...dictatorship of reason...’¹⁹¹ The social disincentive for innovating began to be altered in Europe where new understandings of reason, society, the state and commerce began developing. Although the new positive attitude towards innovation was not universally shared, differing segments of society held differing views. This is illustrated by Mokyr who argues that

Existing knowledge and ideas tend to develop into orthodoxy, and incumbents are defensive and jealous. Many entrenched elites found ingenious ways to perpetuate the status quo, so that intellectual innovation would only be admissible if it did not contradict the existing orthodoxy.¹⁹²

¹⁸⁸ Burke, E., Reflections on the Revolution in France, Penguin Books, London, 2004, p.119.

¹⁸⁹ Robertson, D., The Penguin Dictionary of Politics, (Second Edition), Penguin Books, London, 1993, p.107.

¹⁹⁰ Stromberg, R., European Intellectual History Since 1789, Appleton-Century-Crofts, New York, 1968, p.5.

¹⁹¹ Ibid, p.11.

¹⁹² Mokyr, J., The European Enlightenment, the Industrial Revolution, and Modern Economic Growth, Max Weber Lecture, European University, March 27, 2007, p.14.

4.3.11 The survival of ancient Greek attitudes towards innovation in the Eighteenth and Nineteenth centuries

Part of the existing orthodoxy was still based on Ancient Greek attitudes and influence. This situation may have been connected to educational backgrounds of the elites. Kumar argues that Greek and Latin classics

... persisted as a central point of reference and a central element in the upbringing of all the educated classes of Europe throughout the eighteenth and nineteenth centuries. Indeed in the nineteenth century, the century of European industrialization, classical humanism even seems to have strengthened its hold on European culture.¹⁹³

Nauert observes that ‘Humanistic education from its very origin was designed to meet the needs of an elite who...thought of themselves as the proper holders of political power’.¹⁹⁴ Beiser also supports this view when he argues that Romantic philosophers such as Hegel, Rousseau and Schiller were ‘... enthusiastic students of the Greek classics ...’¹⁹⁵ and had ‘... a very idealistic concept of ancient Greek life’ based on the ‘...paradigm of fifth century Athens’.¹⁹⁶ Beiser further observes that the Romantic philosophers believed in the myth that the ancient Greeks ‘... lived in harmony with himself, with others and with nature’.¹⁹⁷

Bullock argues that the ‘...Graeco-Roman tradition exercised an extraordinary influence on Western education until the end of the nineteenth century’.¹⁹⁸ Trevor-Roper supports this assessment through his observation that

Never were the Greek and Roman classics so widely read as in that century of boundless materialism and revolutionary science.¹⁹⁹

Supporting this, Haines argues that in the nineteenth century the ‘...traditional Platonic strain in English thought had become too firmly embedded in English minds to be easily eradicated’.²⁰⁰ At this time, and remaining so until the end of the First World War when its ideology was challenged by Bertrand Russell and G.E. Moore, ‘British Idealism’ was the dominant philosophy in British

¹⁹³ Kumar, K., *op.cit.*, p.140.

¹⁹⁴ Nauert, C.G., *Humanism and the Culture of Renaissance Europe*, Cambridge University Press, Cambridge, 1995, p.44.

¹⁹⁵ Beiser, F., *op.cit.*, 2005, p.37.

¹⁹⁶ *Ibid.*, p.38.

¹⁹⁷ *Ibid.*

¹⁹⁸ Bullock, A., *The Humanist Tradition in the West*, W.W. Norton, New York, 1985, p.12.

¹⁹⁹ Trevor-Roper, H., quoted in Kumar, K., *op.cit.*, p.140.

²⁰⁰ Haines, G., *German Influence Upon English Education and Science, 1800–1866*, Stonington Publishing Company, Connecticut, 1957, p.58.

universities such as Oxford.²⁰¹ British Idealism drew ‘...inspiration from common roots in Greek and German thought – above all in Plato...’²⁰² Whether or not it was a direct consequence of this, ancient Greek attitudes towards innovation were still apparent in the attitudes of the British educated classes. Haines further argues that, as a consequence of this, they were

Devoted to their own traditions [and that] most Englishmen distrusted innovations and were suspicious of the alien.²⁰³

Veblen also supported this interpretation in the nineteenth century when he observed that

It is generally held true that the accredited learning class and the seminaries of the higher learning have looked askance at all innovation.²⁰⁴

This observation is placed in its historical context by Hill who argues that

...British education [of the nineteenth century] emphasised the classics and was disconnected from industrial application.²⁰⁵

This emphasis on the classics in British universities such as Oxford and Cambridge resulted in these universities producing

...excellent civil servants and administrators; they did not, however, produce the men and women able to lead in doing the work of an industrialised society.²⁰⁶

Roper notes the irony in this aspect by observing that the British

...industrial revolution, having triumphed at home, was carried over the whole world by the elite of a society bred up on the literature of a city state and an empire whose slave-owning ruling class regarded industry and commerce as essentially vulgar.²⁰⁷

The English attitudes towards innovation also affected the attitudes of British colonies such as Australia. Hill argues that Australia

...imported ... the *ideologies* of nineteenth century Britain on technical education, and did not develop an effective skills base that could capitalise on local invention.²⁰⁸

²⁰¹ Boucher, D. (ed.), The British Idealists, Cambridge University Press, Cambridge, 1997, p.viii.

²⁰² Nicholson, P., The Political Philosophy of the British Idealists: Selected Studies, Cambridge University Press, Cambridge, 1990, p.2.

²⁰³ Ibid, p.57.

²⁰⁴ Veblen, T., ‘The Theory of the Leisure Class’, quoted in Galbraith, J.K., The New Industrial Estate, (2nd ed.), Mentor Books, New York, 1967, p.384.

²⁰⁵ Hill, S., ‘The Social and Cultural Power of Technology’, in Jagtenberg, T., and D’Alton, S. (eds.), Four Dimensional Social Space, (Second edition), Harper Educational Publishers, Artarmon, 1992, p.58.

²⁰⁶ Haines, G., op.cit., p.xii.

²⁰⁷ Trevor-Roper, H., quoted in Kumar, K., op.cit., p.141.

4.3.12 *Changing attitudes towards technology and innovation*

Drucker argues that after 1700, the word ‘technology’ was invented. The word ‘technology’ combines the Greek words ‘techne’ and ‘logy’ which in combination referred to ‘organized, systematic, purposeful knowledge’ of a ‘craft skill’.²⁰⁹ ‘Techne’ was referred to earlier where it will be recalled that it was considered beneath the interest of Ancient Greek philosophers who believed ‘the sole function of knowledge is self-knowledge: the intellectual, moral and spiritual growth of the person.’²¹⁰ It will also be recalled that these beliefs shaped the Ancient Greeks’ negative attitudes towards innovation. Given this context it is understandable that the *intellectual* environment of this time was not supportive of innovation and therefore saw no need for the development of a theory of innovation.

The combination of the terms ‘techne’ and ‘logy’ represented a major shift in attitudes towards technology and innovation and signal the increasing acceptance of the potential benefits of the knowledge of technology and therefore also the consequent innovations which it would initiate. This shift in attitudes was also evident in the publication of the ‘Encyclopedie’ between 1751 and 1772. Drucker states that the purpose of this work was to ‘... bring together in organized and systematic form the knowledge of all crafts, in such a way that the non-apprentice could learn to be a “technologist”’.²¹¹

Another indication of the shift in Continental attitudes towards ‘techne’ by the educated classes was the contribution of articles to the Encyclopedie by such learned men as Rousseau and Voltaire who are both regarded as key figures in the Enlightenment. However, Rousseau had also begun questioning not only the Platonic influences on models of understanding, but also the privileged role that ‘Reason’ had been allocated by the Enlightenment. Russell argues that

²⁰⁸ Hill, S., ‘The Social and Cultural Power of Technology’, in Jagtenberg, T., and D’Alton, S. (eds.), *op.cit.*, p.58.

²⁰⁹ Drucker, P., *op.cit.*, pp.27-28.

²¹⁰ *Ibid*, p.26.

²¹¹ *Ibid*, p.28.

philosophers, such as Rousseau, who began questioning the privileged role of ‘Reason’ owed an intellectual debt to Hume’s philosophical scepticism.²¹² The implications of Rousseau’s change of perspective will be considered in later chapters. These Enlightenment intellectual developments also had practical outcomes. One of these was the changing of attitudes ‘... toward technology and the role it should play in human affairs.’²¹³

Mokyr argues that the

...best definition of the Industrial Revolution is the set of events that placed technology in the position of the main engine of economic change.²¹⁴

However, as discussed previously, the potential of technological innovation initiating social change had been recognised at least as far back as the Ancient Greeks. It will be recalled that the Platonic philosophy particularly warned of the dangers to society and the state presented by innovations. Explanatory models incorporating a static, clockwork universe, which were based in part on the static Forms of Plato, were not conducive to supporting positive cultural attitudes towards innovation, nor policies promoting innovation. Clearly new explanatory models were required which were capable of providing a philosophical narrative that not only supported technological innovations, but also the related social innovations.

4.4 The Genesis of Evolutionary World Views

The eighteenth century witnessed the introduction of theories which were just as revolutionary and game changing as those of Newton had been previously in the seventeenth century. For example Grimsley observes that

The rigidly mechanistic outlook associated with Descartes and Newton gradually yielded to a conception that interpreted the universe in more dynamic terms.²¹⁵

Grimsley argues that the philosophical groundwork for this change had been prepared by philosophers such as Leibniz and Spinoza who ‘stressed the idea of

²¹² Russell, B., *History of Western Philosophy*, George Allen and Unwin, London, 1957, p.699.

²¹³ Mokyr, J., *op.cit.*, March 27, 2007, p.1.

²¹⁴ Mokyr, J., *op.cit.*, 2009, p.5.

²¹⁵ Grimsley, R., (ed.), *op.cit.*, p.13.

energy and striving rather than the Cartesian notion of ‘extension’²¹⁶ This process was also assisted when

Later eighteenth-century thinkers began to replace the image of the clock by that of the animal or organism.²¹⁷

The gradual replacement of clockwork metaphors by biological metaphors ushered in a variety of other implications for conceptual understandings of the world. Grimsley observes that

When biology began to replace physics as the developing science, the universe was seen as a centre of energy rather than of order: it was the constant creation and destruction of its various elements – and not the orderly workings of its complex mechanism – which began to command attention. Imagination – as well as reason – now began to play a large part in the interpretation of the world.²¹⁸

The role of metaphor had long been recognised as playing a role in human understanding. For example, Classical philosophers such as Aristotle and Cicero had examined the role of metaphor in language. The word ‘metaphor’ itself is a Greek word which translates as ‘to carry over’.²¹⁹ However, the Classical philosophers’ view of the role of metaphor differed significantly from that of the Romantic philosophers.

Classical philosophers believed that the role of metaphors was to assist language to reveal ‘...the reality of a world that lies unchanging beneath it’, or in Platonic terms ‘the Forms’. In contrast to this, the Romantic philosophers believed that the role of metaphor involved ‘...quite literally, the creation of ‘new’ reality’.²²⁰ The Romantic view of the role of the creative aspect of metaphor signalled a key transition point in understanding leading towards an intellectual climate supportive of the conceptualisation of ‘innovation’. These shifts in conceptual world-views, informed by more dynamic metaphors, enabled the derigidifying of static views of the universe and provided the basis for the construction of more dynamic theoretical explanations supportive of innovation. The static, mechanistic model of Newtonian physics had acted as a brake on the development of more dynamic concepts. Grimsley supports this view when he argues that

²¹⁶ Ibid.

²¹⁷ Ibid., p.14.

²¹⁸ Ibid.

²¹⁹ Hawkes, T., Metaphor, Methuen and Co., London, 1977, p.1.

²²⁰ Ibid., p.92.

...so long as the reigning scientific 'world-view' was the mechanistic universe of Newtonian physics' it '...did not allow for the change, the temporality, the novelty, in a word, the progressiveness, of the human world. But by the mid-nineteenth century the scientific influence was of a different kind. Not physics now, but geology and especially biology were at the centre of attention'.²²¹

The introduction of a dynamic philosophy was a necessary component of any theory attempting to explain innovation. Static mechanistic theories were not capable or suitable for this task so the development of dynamic philosophies represented an important step for the potential development of dynamic theories of innovation. Another theoretical step in this direction was provided by August Comte.

4.4.1 Comte and sociology

A notable theorist of the early nineteenth century was the Frenchman, August Comte. Comte's achievement was to synthesize static and dynamic philosophies into a new discipline he named 'Sociology'. The goal of the new discipline of Sociology was to analyse society through the categories of social statics and social dynamics. Social statics consisted of the examination of principles of social order whereas social dynamics consisted of the examination of 'the general laws of social development'.²²² It is significant that Comte's division of Sociology into statics and dynamics is adopted from biology, not mechanics.²²³

4.4.2 John Stuart Mill and Comte's sociology

The influential nineteenth century English philosopher, John Stuart Mill, who made written contributions to philosophy, economics, social science and politics explained Comte's Sociology in the following terms,

The Empirical Laws of Society are of two kinds; some are uniformities of co-existence, some of succession. ...the former sort ...Comte gives the title of Social Statics [and the latter] Social Dynamics, conformably to the distinction in mechanics between the conditions of equilibrium and those of movement, or in biology between the laws of organization and those of life. The first branch of the science ascertains the conditions of stability in the social union; the second, the laws of progress.²²⁴

²²¹ Kumar, K., *op.cit.*, p.18.

²²² Abercrombie, N., Hill, S. and Turner, B., *The Penguin Dictionary of Sociology*, (second edition), Penguin Books, Middlesex, 1988, p.47.

²²³ Hayek, F.A., *The Counter-Revolution of Science: Studies on the Abuse of Reason*, The Free Press, New York, 1955, p.178.

²²⁴ Mill, J.S., *A System of Logic Ratiocinative and Inductive Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation*, Longmans, Green and Co., London, 1952 (first published in 1843), pp.598-599.

Mill's connection to Comte is significant. Mill was a leading nineteenth century theorist and author of the philosophical work, 'On Liberty'. This work of political philosophy was one of the seminal texts of the political philosophy now known as Liberalism. English liberalism argued against government intervention in economic matters. Although Mill was an early supporter of Comte's sociology, Mill's views altered over time and he began to believe that Comte's plan for a rational society was not conducive to political and economic liberty.

Mill's introduction of Comte's thought to Britain in the mid-1800s had borne fruit twenty years later and had become part of the university history curriculum where it contributed towards the development of evolutionary theories of history. Kadish records that

During the early 1870s Comte's works appear to have been fairly standard reading at Oxford'... which influenced the adoption of Positivism as the philosophy of history. ... Traditionalist historians '... assumed the existence of static laws resembling in their applicability the laws of physics, [whereas] the Positivists sought laws of human social evolution more akin to Darwinian biology.'²²⁵

Later chapters will identify the significance of these developments and theoretically locate contemporary economic theories within them. Philosophically and historically, these developments contained important implications toward the foundations of conditions capable of supporting the conceptualisation of 'innovation'.

4.5 Conclusion

This chapter continued an examination of the philosophical and historical foundations of the concept of innovation and also an exploration of the underlying philosophies which have influenced and shaped cultural attitudes towards innovation. The beginnings of positive attitudes towards innovation were located in sixteenth century texts, and evidence of increasingly positive attitudes were identified in the Age of Reason and also the Enlightenment. This also marked the shift away from theological explanations based on revelation towards explanations increasingly based on rationalism.

²²⁵ Kadish, A., Historians, Economists, and Economic History, Routledge, London, 1989, pp.7-8.

However the deep theoretical legacy of Platonic Forms, or ‘Platonic paradigm’, survived even this transition and continued its subtle influence in shaping philosophical thought and cultural attitudes. For example the Newtonian physics model drew on Platonic philosophy which in turn influenced the economic model of Adam Smith. The Enlightenment also witnessed new attitudes towards what the Greeks had referred to as ‘*techne*’ – the coining of the word ‘technology’ signified this new attitude and challenged the Ancient Greek’s perspective which viewed technical or craft skills beneath the interest of the educated elite. This development also signalled a shift in attitudes toward ‘innovation’.

These attitudes were supported by philosophical developments which altered world views or *gestalts* and created the potential for further changes. For example, the gradual shift from a static world-view based on ancient Greek Platonic Form philosophy and also Newtonian mechanistic metaphors, to a more dynamic philosophy utilising biological metaphors resulting in the synthesis of these in Comte’s new academic discipline of Sociology. Biological metaphors also enabled the utilisation of evolutionary models of explanation, not only in biology, but also in economics. Dynamic biological metaphors could also more readily accommodate the concepts of change and development necessary for a theory of innovation.

However, even in the nineteenth century, the influence of Platonic philosophy was still strong, particularly in Britain. Textual evidence from this period also indicates that the Platonic negative attitude towards innovation had also survived unscathed even in the midst of increasing industrialisation.

The goal of the chapter was to set the stage for Chapter Five which will build on the framework constructed in Chapter Four and examine the philosophical and historical influences on contemporary economic theories and their implications for a theory of innovation of the higher education services sector.

Chapter 5. Theoretical Genealogy of Contemporary Political, Economic and Epistemological Models

The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist²²⁶

5.1 Introduction

Previous chapters have established the lack of a theory of innovation for the higher education service sector and also the socially constructed nature of attitudes and ideas of innovation. It was noted that one theorist argued that Neo-Classical economic theory was not conceptually equipped to deal with innovation in the service sector.

It was demonstrated through a textual analysis of classic texts that a positive attitude towards innovation cannot always be assumed and that in fact, longitudinally, a positive attitude towards innovation is actually an anomaly. It was established that this situation may have contributed to the relatively late arrival of theories of innovation in the late nineteenth and early twentieth century.

It was suggested that this could be attributed to the underlying philosophical and, in turn, religious beliefs held in the past by various societies and cultures. The powerful influence of Ancient Greek thought was illustrated and the observation made that the genesis of the Ancient Greek negative attitude towards innovation was a reaction to the aftermath of an expansionary period in sixth century BC Greece. In this sense, the Ancient Greek negative attitude to innovation could be understood as a conservative response to the decline of their civilisation.

It was demonstrated that the Ancient Greek theoretical influence, or the 'Platonic paradigm', extended well beyond the geographical and conceptual

²²⁶ Keynes, J.M., *The General Theory of Employment, Interest and Money*, Macmillan, London, 1936, p.383.

boundaries of Greece. Its theoretical constructs and attitudes are subtly influencing economic beliefs and theories even today. The gradual development of more dynamic philosophies and metaphors used to express them was also discussed. It was argued that the rise of dynamic, biological models was a precondition for theories of change and, more particularly, theories of innovation to be constructed.

These aspects of the development of thought also play a role in contemporary thinking. However the results of these theoretical developments have spread unevenly through various academic disciplines – whilst some have recognised, adapted and absorbed these developments, others have seemingly turned a ‘blind eye’ and continued to base their theoretical constructs on older discredited philosophical models.

This chapter will explore the genesis of theories and theoreticians which have had a major impact on the shaping of thought, knowledge, policy and innovation theory in the Western industrialised world. The main focus will dwell on theorists of the ‘Austrian School of Economics’; however, similarities and differences between the German Historical School and Neo Classical economics will also be examined. Differences between theorists within the ‘Austrian School of Economics’ will be highlighted and the work of Schumpeter and Hayek discussed in further detail.

Earlier influences in their theories will be identified and discussed. This will include their relationship to the intellectual movements and philosophers of the Enlightenment and Counter-Enlightenment. It will be argued that many of these theorists embodied the intellectual heritage of an elite education in the *Gymnasiums* of Central Europe – in the majority of cases, post World War One Vienna, the capital of the then vast Austro-Hungarian Empire, the seat of power of the centuries old Hapsburg dynasty.

An examination of the origins, curriculum and goals of a Viennese *Gymnasium* education will highlight the similarities between the *Gymnasium*’s educational outcomes and the intellectual products of its graduates. In

particular it will identify common, underlying Counter-Enlightenment theoretical themes expressed by some of its well known graduates and their theoretical and historical threads which are woven into concepts such as neoliberalism, postmodernism, falsifiability, paradigms and evolutionary economics.

All of these concepts represent non-teleological theories, which is consistent with the educational principles of the *Gymnasium*. Teleological theories are theories which attempt to explain processes ‘... by reference to an end state to which they are alleged to be working, or to an ultimate function which they are said to serve.’²²⁷ The use of teleological theories as explanatory devices can be traced at least as far back as Aristotle. Non-teleological theories consist of explanations which do not make knowledge claims regarding end states or ultimate functions.

Historical and political circumstances contributed to the graduates of the Viennese Gymnasium’s educational curriculum becoming a powerful influence in shaping contemporary thought. The spread of the influence Viennese theorists on contemporary theories can, in part, be traced to the sudden departure of some significant theorists from Europe in the 1930s. Prior to their departure however, their intellectual outlooks and approaches were shaped by their Viennese education.

5.2 The Viennese Intellectual Diaspora

Numerous well-known and highly influential theorists from such fields as economics, philosophy, the history and philosophy of science and also management, can be identified as tracing their physical and intellectual origins to Vienna. Examples of these theorists include Schumpeter, Hayek, Popper, Wittgenstein and Drucker to name but a few. Austrian-born Paul Feyerabend, whose philosophy was influenced by Wittgenstein and Popper, can also be included in this group however he remained in Germany during World War

²²⁷ Abercrombie, N., Hill, S. and Turner, B., *The Penguin Dictionary of Sociology*, (second edition), Penguin Books, Middlesex, 1988, p.252.

Two.²²⁸ If we broaden this list to include émigrés from wider central Europe, Strauss and Polanyi can also be included in this number.

Many of these theorists, including Hayek, Popper, Wittgenstein and Schumpeter, were amongst a group who participated in the flight of intellectuals from Europe to the United States and Britain in the wake of Adolf Hitler's rise to power in Germany in the 1930s. This 'intellectual migration' has had profound consequences for contemporary economic, political and philosophical thought. This has led one writer to comment that

These days it seems the writings of long dead Viennese intellectuals rule the day.²²⁹

Although differing in subject matter and theoretical detail, these theorists all shared a similar underlying set of philosophical axioms on which they constructed their various theories. In general, they all undertook an exploration of the limits of rational thought and the recognition of the role of the non-rational, and cast their philosophical, sociological, political and economic theories into the larger epistemological recognition of the role of the non-rational in all human affairs.

In many respects they continued the philosophical tradition of what has been termed the 'Counter-Enlightenment'.

It has been argued that

Any general examination of recent political theory in the English-speaking world must consider the impact of the émigrés who left Vienna a few years after the dissolution of the Austro-Hungarian Empire. Taking their inspiration from pre-war Austria, these theorists...²³⁰ are Friedrich von Hayek, Hans Kelsen, Ludwig von Mises, Karl Popper and Joseph A. Schumpeter. They were all distinguished products of the University of Vienna, and they left Austria during the late 1920s and early 1930s. Though of different generations – Hayek and Popper were younger than the others – collectively they represent the flowering of the Viennese enlightenment at the turn of the [20th] century, an enlightenment which bore its fruit outside Austria-Hungary.²³¹

²²⁸ Oberheim, E., *Feyerabend's Philosophy*, Walter de Gruyter, Berlin, 2006, p.116.

²²⁹ de Janosi, P., 'A Paeon to Vienna', *Austrian Information*, Vol. 51, No. 6, 1997, p.1.

²³⁰ Francis, M., 'The Austrian Mind in Exile: Kelsen, Schumpeter and Hayek', in Francis, M. (ed.), *The Viennese Enlightenment*, Croom Helm, London and Sydney, 1985, p.63.

²³¹ *Ibid*, p.64.

Supporting this claim, Schumpeter's work 'Capitalism, Socialism and Democracy' has been described as:

...a significant piece of general political theory containing the wisdom which the Hapsburg empire bequeathed to the new empire on the other side of the Atlantic.²³²

The interwar years of 1919–1934 witnessed the rise of Social Democracy in Austria during which time many Viennese intellectuals experienced the practical realisation of a political and social environment conducive to the exploration of the limits of rationalism and modernism and the cultivation of the seeds of post structuralism and postmodernism. This period, which is referred to as the 'Red Vienna' period, abruptly ended with the successful rise of Fascism in Germany, and shortly thereafter the rise of Fascism in Austria.

Many of the influential intellectuals of this interwar period of Austrian Social Democracy emigrated to escape the rise of Fascism. Many fled to Britain, the United States and the USSR – taking their political experiences and philosophies with them to their adopted countries. Schumpeter, who had been Treasurer of the Socialist Democratic Austria, emigrated to the United States in 1932 and continued as an active academic outside his homeland.

5.3 Austrian and German Economics

The flight of Viennese émigrés from Europe to their adoptive homelands introduced seemingly new theoretical ideas to Britain, the United States and New Zealand. However, although the ideas seemed new, they were actually the continuation of lines of theorising that had been developing in Austria and Germany for centuries. The next section will begin an exploration of the sources of these theories.

5.3.1 The origins of the Austrian School of Economics

The *laissez-faire* model of classical economics, based on the theories of Adam Smith, David Ricardo and John Stuart Mill, had been the dominant economic school from 1817 to 1870. As discussed in Chapter 3, Classical economics drew on a static, mechanistic analogy inspired by Newton's physics model.

²³² Ibid, p.72.

The classical economic model was based on a labour theory of value, however Karl Marx used the labour theory of value to criticise the *laissez – faire* model of classical economics which ultimately led to its collapse in the 1870s. The breakdown of the *laissez – faire* model of classical economics led to a restructuring of the discipline of economics.²³³

It is in this context that the ‘Austrian School of Economics’ of Carl Menger, Friederich von Wieser and Eugen von Bohm-Bawerk was born and formed its ideas, and of which Hayek, von Mises and Schumpeter later became influential ‘second -generation’ members. The ‘neoclassical school’ of Alfred Marshall, William Stanley Jevons and Leon Walras also traces its origins to this time.²³⁴ The Austrian school defined itself as an alternative to the ‘old classical economics and to the German Historical School’.²³⁵ One of the Austrian School economists, Hayek, was opposed to the Neoclassical economic school’s ‘importation of physics metaphors into economic theory.’²³⁶ However, it is interesting to note that the founder of the Neoclassical school of economics, Alfred Marshall recognised the superiority of the biological metaphor in economics over the mechanistic metaphor. For example, he stated that

The Mecca of the economist lies in economic biology, but biological conceptions are more complex than those of mechanics; a volume on Foundations must therefore give a relatively large place to mechanical analogies.²³⁷

5.3.2 The ‘German Historical School’

The ‘German Historical School’ ‘has been described as a criticism of British classical economics’ of Adam Smith, David Ricardo and John Stuart Mill. The ‘German Historical School’ opposed ‘universally valid economic theory’ and

²³³ Dolan, E. (ed.), The Foundations of Modern Austrian Economics, Sheed and Ward Inc., Kansas City, 1976, pp. vii.

²³⁴ Ibid, pp. viii.

²³⁵ Chaloupek, G., ‘The Second Cleavage of the Austrian School: Schumpeter’s German Writings on Economic Systems and Economic Policy in Comparison with Mises/Hayek’, in Backhaus, J. (ed.), Joseph Alois Schumpeter: Entrepreneurship, Style and Vision, Kluwer Academic Publishers, Boston, 2003, p.246.

²³⁶ Mirowski, P., More Heat Than Light: Economics as Social Physics: Physics as Nature’s Economics, Cambridge University Press, Cambridge, 1989p.355.

²³⁷ Marshall, A., quoted in Mirowski, P., Ibid, p.263.

proposed instead that ‘economic principles should be inductively derived through the study of historical facts of different countries’.²³⁸ Shionoya argues that the theoretical roots of the ‘German Historical School’ can be traced to ‘a reaction to rationalism and enlightenment, of which [British] classical economics was one of the products’.²³⁹ So, in this respect, its theoretical lineage can be traced to a branch of the Counter-Enlightenment.

Dow argues that the German Historical School

... attempted to develop an empirical tradition in economic analysis, retaining an organic, society-centred conception of economic activity and human motivation while policy would limit competition, defend national peculiarities and redress the influence of misinformed liberal ideas.²⁴⁰

Mirowski indicates the German Historicist School was one of the few economics schools to avoid ‘the siren song of a social physics.’²⁴¹ Mirowski further observes that ‘...the German Historicist School ... were the only group to identify neoclassicism with the slavish imitation of physics’²⁴² based on the Newtonian model.

The German thinkers Johann Gottfried Herder, Adam Muller, and Friedrich List have been identified as ‘forerunners of the Historical School’.²⁴³ Friedrich List had ‘advocated ‘infant industry’ protection for nations wanting to catch up with more productive or more powerful ones.’²⁴⁴ The expression ‘more powerful ones’ in this instance can be read as Britain, which had been experiencing the Industrial Revolution. Germany had reformed its education system at this time to enhance its technological and industrial capabilities and as a result, in contrast to the British educational system,

²³⁸ Shionoya, Y., The Soul of the German Historical School: Methodological Essays on Schmoller, Weber and Schumpeter, Springer, New York, 2005, p.1.

²³⁹ Ibid.

²⁴⁰ Dow, G., ‘Policy Matters in Political Economy’, in Argyrous, G. and Stilwell, F. (eds.), Economics as Social Science, (Second edition), Pluto Press, Annandale, 2003, p.80.

²⁴¹ Mirowski, P., More Heat than Light, Economics as Social Physics: Physics as Nature’s Economics, Cambridge University Press, Cambridge, 1989, p.396.

²⁴² Ibid., p.356.

²⁴³ Shionoya, Y., op.cit., p.1.

²⁴⁴ Dow, G., ‘Policy Matters in Political Economy’, in Argyrous, G. and Stilwell, F. (eds.), Economics as Social Science, (Second edition), Pluto Press, Annandale, 2003, p.81.

... the German educational system of the nineteenth century could and did produce ... technologists and technicians... in abundance.²⁴⁵

In his work 'The National System of Political Economy' published in 1841, Dow records that List had argued

...against English Liberalism and the doctrines of free trade which List considered to be for export (from England). The British Navy, rather than the doctrine of free trade, had actually been responsible for English economic development. Nations following the *laissez faire* doctrine were destined to lose their creative manufacturing capacities. Protection was therefore justified in all the countries pursuing 'late industrialisation', particularly when increasing returns to scale could be observed.²⁴⁶

List's comments can be placed in the context of the beginnings of Germany's industrialisation in the mid-nineteenth century. List's observations may also sound familiar to an ear tuned to contemporary free trade policy discussions.

5.3.3 The Methodenstreit between the 'Austrian School' and the 'German Historical School'

Although the 'Austrian School' and the 'German Historical School' were united in their opposition to the use of physics metaphors in economic theory, there were other areas of disagreement. The 'Austrian School' and the 'German Historical School' had significant methodological differences which created theoretical conflict and heated debate amongst the proponents of the two schools of thought. 'The resulting bitter and inconclusive dispute between the two factions became known to economists as the *Methodenstreit* (Conflict of Methods)'.²⁴⁷ Bostaph argues that the conflict between the two schools of thought could be traced to 'a fundamental opposition between two basic methodological tendencies' - the abstract-theoretical methodology of the 'Austrian School' and the historical-empirical methodology of the 'German Historical School'.²⁴⁸

Hutchison identifies the Methodenstreit as a false dilemma, arguing that the methodology of the Austrian School of Economics 'is suited to the study of microeconomics' whilst the methodology of the German Historical School 'is

²⁴⁵ Haines, G., *op.cit.*, p.xi.

²⁴⁶ Dow, G., *op.cit.*, p.81.

²⁴⁷ Bostaph, S., 'The Methodological Debate Between Carl Menger and the German Historicists', *Atlantic Economic Journal*, September, 1978, p.3.

²⁴⁸ *Ibid*, p.4.

suitable to the study of macroeconomics.²⁴⁹ Schumpeter also believed that the Methodenstreit was a false dichotomy.

5.3.4 Theoretical differences amongst the Austrian School of Economics theorists

Although Schumpeter, Hayek and von Mises were all considered to be members of the ‘Austrian School of Economics’, there were a number of theoretical tensions between members of this ‘School’. For example, while another member, von Mises, was ‘a rationalist and utilitarian, which identifies him as subscribing to Enlightenment ideals, Hayek focused on the limits to reason, basing his defence of capitalism on its ability to use limited knowledge and learning by trial and error’.²⁵⁰ Therefore Hayek’s position is consistent with Counter-Enlightenment thought.

The defining event for the Austrian School of Economics was, ‘post-World War One inflation – with its devastating consequences’.²⁵¹ Witnessing the economic destruction wrought by inflation at this time left long-lasting impressions on these theorists; however they drew differing theoretical conclusions on the cause of these types of events and the appropriate role of governments in addressing them. Although Hayek and von Mises differed on some theoretical points, they agreed on others. For example, they agreed that ‘economic problems were caused by state interventions ... [and that] the Great Depression was a crisis of interventionism’.²⁵² Chaloupek argues that Mises ‘recommends only one solution for any kind of problem: to follow strictly the principles of [English] liberalism and absolute non-intervention.’ The significance of identifying Mises as following English liberalism will be clarified later in this chapter.

Chaloupek further argues that ‘behind this [non-interventionist] approach is a Platonic image of market capitalism as a system which constitutes a final ideal

²⁴⁹ Hutchison, T. cited in Bostaph, S., *op.cit.*, p.4.

²⁵⁰ Klein, P.G., ‘Biography of F.A.Hayek (1899-1992), Ludwig von Mises Institute, accessed at <http://www.mises.org/hayekbio.asp>, Tuesday, November 05, 2002, p.3.

²⁵¹ Yergin, D. and Stanislaw, J., *The Commanding Heights: The Battle Between Government and the Marketplace that is Remaking the Modern World*, Touchstone, New York, 1998, p.339.

²⁵² Chaloupek, G., *op.cit.*, p.245.

state'.²⁵³ Chaloupek's statement is also significant as it conceptually links the non-interventionist English Liberal approach, the Platonic belief system and market capitalism. So, according to this interpretation, Platonic thought was still wielding its theoretical influence in some twentieth-century Austrian economic models. However, Schumpeter's economic theories differed from those of those of Mises and Hayek in that he believed that 'economic policy in a capitalist system was interventionist by its very nature'.²⁵⁴

Hayek has been described as a 'product of the Austro-Hungarian Empire and its collapse

... he was shaped by the vibrant, vital culture of Vienna both before World War One and, in its more tortured form, after the war. [Hayek was] a second cousin to the philosopher Ludwig Wittgenstein.²⁵⁵

Hayek, in common with other Viennese intellectual refugees, were well versed in the history and philosophy of science and problems of knowledge. For example, Francis observes that

The Viennese who made an impact upon the English-speaking world were all strongly influenced by the philosophy of science. But, at the same time, they wished to restrict science in order to avoid the faults associated with crude versions of nineteenth-century positivism and Darwinism.²⁵⁶

It has been argued that Hayek's later work 'shows more influence of his friend [and renowned philosopher of science] Sir Karl Popper [who had] ... a significant impact on Hayek's mature thought'.²⁵⁷ Popper's influence is clearly apparent in Hayek's 'defence of capitalism' and its ability to use limited knowledge and learning by trial and error.

Popper's defence of the Scientific Method also used this rationalisation. Popper attempted to accommodate non-rational elements of theory selection by shifting the emphasis to the theory-testing aspect of scientific hypotheses. That is, Popper argued that the problem of induction prevented the construction of objective, valid generalisations about the propositions of

²⁵³ Ibid.

²⁵⁴ Ibid.

²⁵⁵ Yergin, D. and Stanislaw, J., op.cit., p.141.

²⁵⁶ Francis, M., op.cit., p.81.

²⁵⁷ Klein, P.G., op.cit., p.5.

science, however he argued that ‘good science’ ‘progressed’ by attempting to falsify hypotheses and proceeding by a process of trial and error.

In Popper’s model, it is irrelevant where hypotheses come from, that is, they do not have to be the result of a rational chain of reasoning, the main criteria for their acceptability is their ability to be subjected to the process of ‘falsificationism’. That is, hypotheses must be constructed in a way that it is possible for empirical evidence to falsify a theory.²⁵⁸ According to Popper, empirical evidence cannot be used to inductively verify a theory.

Popper’s work in the role of epistemology in the philosophy of science is generally conceded to have been discredited and overtaken by Kuhn’s theory of scientific paradigms (which itself drew its inspiration from another Viennese intellectual and émigré, Ludwig Wittgenstein and his theory of ‘language games’ which will be referred to later). Kuhn’s theories recognise an even greater role for non-rational elements in the process of paradigm changes in the sciences.

Clearly inspired by his familiarity with Counter-Enlightenment thought, Hayek constructs the axioms for his economic theory on a binary system which draws on the Greek terms *cosmos* and *taxis*. *Cosmos* denotes ‘a spontaneous order’ while *taxis* denotes ‘a consciously planned’ order.²⁵⁹ According to Hayek,

Examples of a *cosmos* include the market system as a whole, money, the common law, and even language. A *taxis*, by contrast, is a designed or constructed organization, like a firm or bureau; these are the “islands of conscious power in [the] ocean of unconscious cooperation like lumps of butter coagulating in a pail of buttermilk”²⁶⁰.

Hayek argues that *taxis* or planned orders can only ‘handle problems of strictly limited complexity’. Whereas, in contrast, *cosmos* or spontaneous orders ‘tend

²⁵⁸ Popper, K., *The Logic of Scientific Discovery*, Hutchinson, London, 1974, p.92.

²⁵⁹ Klein, P.G., *op.cit.*, p.5.

²⁶⁰ *Ibid.*, p.35.

to evolve through a process of natural selection, and therefore do not need to be designed or even understood by a single mind'.²⁶¹ Hayek argues that the

... belief that processes which are consciously directed are necessarily superior to any spontaneous process is an unfounded superstition.²⁶²

Hayek further argues of the importance of the task for '... human reason rationally to comprehend its own limitations'.²⁶³ Hayek labels rationalism which fails to recognise 'the limits of what individual conscious reason can accomplish' as 'intellectualism'.²⁶⁴ Hayek's attitude reveals more evidence of his adherence to the principles of Counter-Enlightenment thought. A more recent observer argues that

Evolution in non-predetermined ways is the model that underlies the Austrian worldview, as well as most of the liberal reforms of the past 20 years.²⁶⁵

5.3.5 The evolution of theories of evolution - teleological considerations

This particular model of evolutionary development, that is, 'evolution in non-predetermined ways,' can be traced back to Charles Darwin. Prior to Darwin's version of the theory of evolution, evolutionary theories had 'taken evolution to be a goal-directed process' following an idea or plan that had been 'present from the first creation of life, perhaps in the mind of God'.²⁶⁶ In other words, pre-Darwinian theories of evolution were what are referred to in philosophy as, 'teleological'.

Teleology can be further subdivided into two categories: external teleology and internal teleology. External teleology 'presupposes an agent outside of nature that arranges material within nature for its own purposes'.²⁶⁷ Plato's 'Demiurge', the Stoics 'Nature' and British theologian's 'God' have been identified as examples of 'extra natural agents' performing this external

²⁶¹ *Ibid.*, p.5.

²⁶² Hayek, F.A., *The Counter-Revolution of Science: Studies on the Abuse of Reason*, The Free Press, New York, 1955, p.87.

²⁶³ *Ibid.*, p.92.

²⁶⁴ *Ibid.*, p.203.

²⁶⁵ Kasper, W., 'Review of Baumol, W., "The Free Market Innovation Machine: Analysing the Growth Miracle of Capitalism"', Princeton University Press, 2002, in *Policy*, Vol.19, No.2, Winter, 2003, p.55.

²⁶⁶ Kuhn, T.S., *op.cit.*, p. 171.

²⁶⁷ England, R., 'Natural Selection, Teleology, and the Logos: From Darwin to the Oxford Neo-Darwinists, 1859-1909', *Osiris*, 2nd Series, Vol.16, pp.276.

teleological function in their various meta–narratives.²⁶⁸ The German philosopher Hegel can also be identified as using an external teleology in his philosophy.

Internal teleology ‘describes an inherent tendency to achieve a certain goal, without reference to the intentions of an external agent’.²⁶⁹ Aristotle’s work ‘Metaphysics’ and also the theories of ‘...nineteenth-century German *Naturphilosophen*’ have been cited as example of ‘internal teleological’ accounts.²⁷⁰ Hegel, who was identified above as an external teleologist, contributed to philosophical thought by introducing the dynamics of

process and organism ... as opposed to the static formulations of enlightenment thought ... he has everything in motion, to be grasped only when its growth and development is understood; no one better reveals the nineteenth century’s genetic, evolutionary outlook, or contributed more to implanting it.²⁷¹

Stromberg argues that, ‘...Hegel’s vision of an organic rather than a mechanistic universe was prophetic, and his stress on process, evolution, development, has been basic to the development of the modern mind.’²⁷² As mentioned previously, Hegel incorporated an externalist teleological account to drive the dynamic processes of his theories.

Kuhn argues that Darwin’s theory of evolution affectively abolished ‘that teleological kind of evolution’.²⁷³ That is, it discredited external teleological accounts of evolution. However, this conceptual development also carried other theoretical implications. Kuhn argues that without a specified goal of the type that had previously been supplied by a teleological, theoretical framework, the concepts of ‘evolution’, ‘development’ and ‘progress’ lost much of their meaning.²⁷⁴

²⁶⁸ *Ibid.*

²⁶⁹ *Ibid.*

²⁷⁰ *Ibid.*

²⁷¹ Stromberg, R., *European Intellectual History Since 1789*, Appleton-Century-Crofts, New York, 1968, p.67.

²⁷² *Ibid.*, p.70.

²⁷³ Kuhn, T.S., *op.cit.*, p. 172.

²⁷⁴ *Ibid.*

Kuhn's perspective is supported by Strauss who argues that 'The teleological view of the universe, of which the teleological view of man forms a part, would seem to have been destroyed by modern natural science'.²⁷⁵ Strauss further argues that a non-teleological explanation of humanity conceives 'of them merely as posited by desires or impulses'.²⁷⁶

Kuhn argues that the 'analogy that relates the evolution of organisms to the evolution of scientific ideas ... is very nearly perfect. The entire process may have occurred, as we now suppose biological evolution did, without the benefit of a set goal, a permanent, fixed scientific truth...'²⁷⁷ Darwin's thought was also interpreted as carrying political and economic policy implications. For example, Haines observes that

Perhaps the most unfortunate aspect of Darwin's theory was that ... it confirmed the conviction among Englishmen that no one, and least of all the State, needed to direct or guide the nation's development. Individual competition would ultimately perform the work of the world; England's advanced commercial and political position was enough evidence of that [in the nineteenth century].²⁷⁸

5.3.6 Implications of Darwin's evolutionary theory – intervention or non-intervention?

The above quote clearly argues for non-interventionist economic policies based on its interpretation of Darwinian Evolutionary Theory. However an alternative reading of Darwin is also possible which not only recognises the possibility of human intervention in evolutionary (and therefore economic) processes, but also recommends it as a method to accelerate the accumulation of characteristics that are 'valued'. For example, the first chapter of Darwin's work 'The Origin of Species' is titled 'Variation under Domestication'. In this chapter, Darwin examines examples of human intervention in the breeding of domestic varieties of plants and animals which lead to changes or variations in the various breeds.

²⁷⁵ Strauss, L., Natural Right and History, The University of Chicago Press, Chicago, 1953, pp.7-8.

²⁷⁶ Ibid, p.8.

²⁷⁷ Kuhn, T.S., op.cit., p.172.

²⁷⁸ Haines, G., op.cit., p.42.

Relating to this point, Darwin argues ‘...man can do much by artificial selection...’²⁷⁹ He further argues that ‘...great is the power of man in accumulating by his selection successive slight variations’.²⁸⁰ For example, he states that without human intervention the various breeds of cattle, horses and pigeons ‘...could never have been effected by the mere chance accumulation of similar variations during many successive generations.’²⁸¹ Darwin argues that there are ‘...circumstances favourable to man’s power of selection’.²⁸² According to Darwin,

...probably the most important element is that the animal or plant should be so highly valued by man, that the closest attention is paid to even the slightest deviations in its qualities or structure. Unless such attention be paid nothing can be effected.²⁸³

In Chapter Two ‘Variations under Nature’, he argues that a similar process of variation, minus conscious human intervention, takes place in nature but he also states that ‘...I do believe that natural selection will generally act very slowly, only at long intervals of time...’²⁸⁴

The importance of this alternative reading of Darwin is that he can be interpreted as arguing that conscious human intervention can be beneficial in the selection of *valued* characteristics in the breeding of variations in plants and animals. Therefore, extending this argument by analogy (and in contrast to the quote above which argued that Darwin’s work supported non-intervention in economic matters), conscious human direction can not only promote valued characteristics, but also accelerate their implementation – in both the biological and economic worlds. These are important considerations in relation to concerns of the efficacy of ‘theories of innovation’ and by extension policies designed to promote innovation.

A final quote of Darwin’s also supports the intervention of human intellect in the social construction of desired characteristics in an economic or technological artefact. Darwin observes that ‘We know that this instrument

²⁷⁹ Darwin, C., The Origin of Species, Cricket House Books, London, 2010, p.70.

²⁸⁰ Ibid, p.vi.

²⁸¹ Ibid, p.72.

²⁸² Ibid, p.20.

²⁸³ Ibid, p.21.

²⁸⁴ Ibid, p.70.

[the telescope] has been perfected by the long-continued efforts of the highest human intellects...'²⁸⁵ So although 'evolution in non-predetermined ways' underlies the Austrian worldview and also Darwin's theory of natural selection, it is important to bracket this perspective as being applicable to the realm of 'Nature'. Confusion often arises when this theory is applied beyond its intended theoretical target, that is, 'Nature'.

It has been demonstrated above that Darwin's theory does not preclude human intervention in activities such as the selection and breeding of desired characteristics in domestic animals. In fact, Darwin explicitly supports this activity as accelerating the implementation of desired, or valued, characteristics. Similarly, he explicitly supports the intervention of the human intellect in the development of technologies such as the telescope. By analogy, it can be argued that Darwin also supports economic intervention to accelerate the incorporation of desired values into economies.

As noted above, Kuhn correctly argues that 'organisms and scientific ideas' evolved 'without the benefit of a set goal, a permanent, fixed scientific truth'. However, similar to Darwin's theory, this amplifies the role of the possibility of human intervention to selectively enhance and pursue desired characteristics or outcomes in not only particular animal breeds, but also scientific and economic paradigms. For example, Kuhn himself argues that progress can only be said to be made within the confines of a paradigm where practitioners set problems for themselves.²⁸⁶

Similar to livestock breeding, a set of desired characteristics are established and pursued within that particular breed or paradigm. It is meaningless, or incommensurable, to compare one paradigm to another as it is meaningless to compare one breed to another as they are both established and pursue goals determined by their scientific paradigm or breed paradigm.

²⁸⁵ *Ibid*, p.124.

²⁸⁶ Kuhn, T.S., *The Structure of Scientific Revolutions*, Second edition, The University of Chicago Press, Chicago, 1970, p.166.

The liberating of the biological metaphor from non-interventionist, Platonic perspectives increased its potential for assisting intervention in economic matters. This provided the basis for a parting of the ways between static Platonic, mechanistic metaphors used in Neoclassical economic theory and the dynamic biological metaphors used in evolutionary economics such as Schumpeterian economic theory. More significantly, it also provided a dynamic theoretical metaphor useful as a foundation for the construction of a concept of innovation; a quality that static mechanistic metaphors could not provide.

5.3.7 The influence of British liberalism in Austrian economic thought

Haines observes that ‘Darwin was a political Liberal’.²⁸⁷ ‘Hayek frequently refers to two types of liberalism: the continental rationalist or utilitarian tradition, which emphasises reason and man’s ability to shape his surroundings, and the English common-law tradition, which stresses the limits to reason and the “spontaneous” nature of evolution’.²⁸⁸ Grassl and Smith argue that,

Hayek is often regarded as the latter-day spokesman of a largely British liberal tradition. This tradition – ranging through Mandeville, Hume, the Scottish Enlightenment, Burke and bits of J.S. Mill – is, however, in some ways Hayek’s own creation. For it was he who grouped these people together and attributed to them a common position, which he then developed in his own writings (Hayek, 1967, 1978). This he contrasted with another more rationalistic strand in liberalism, which he denounced as ‘false individualism’.²⁸⁹

Therefore, according to this view it is entirely possible for a liberal perspective to embrace both interventionist and non-interventionist policies depending on which particular political strand of liberalism one subscribes to.

5.3.8 The Influence of the Austrian Gymnasium’s Curriculum on Viennese Intellectuals

Viennese modernism can be interpreted as an anticipation of certain important post modern themes²⁹⁰

²⁸⁷ Haines, G., *op.cit.*, p.42.

²⁸⁸ Klein, P.G., *op.cit.* p.6.

²⁸⁹ Grassl, W. and Smith, B. (eds.), *Austrian Economics: Historical and Philosophical Background*, Croom Helm, London and Sydney, 1986, p.210.

²⁹⁰ Le Rider, J. quoted in Peters, M. and Marshall, J., *Wittgenstein: Philosophy, Postmodernism and Pedagogy*, Bergin and Garvey, Westport, Connecticut, 1999, p.38.

The underlying philosophical commonalities amongst Viennese intellectuals can, in part, be traced to their exposure to these ideas during their formative educational experiences whilst attending Austrian ‘gymnasiums’.

‘Gymnasiums’ were (and are) elite secondary schools in Austria (and other parts of Europe) which prepared students for entry to university level studies. Entry to the ‘gymnasium’ was very selective – in 1850-51 only 0.2 percent of the population were enrolled.²⁹¹ The majority of students who did not qualify for entry to the gymnasium attended ‘Realschulen’.

The word ‘gymnasium’ originated in Ancient Greece where it represented the sites for the physical and intellectual training of youth. In Europe, the focus tended to be more on the intellectual training rather than the physical.

The establishment of the Austrian ‘Gymnasiums’ in 1849 represented a revolution in the Austrian education system. Prior to this time, in the 1840’s, ‘Vienna was the capital of the largest Roman Catholic power in the world’ and Austrian education ‘was still strictly constrained by Roman Catholic dogma.’²⁹² The curriculum of Austrian secondary schools during this time has been characterised as ‘Catholic in its principles and absolute in its presentation’.²⁹³

Europe had experienced a period of industrial expansion in the 1840s. However, the years 1846 to 1849 witnessed a European economic depression. The depression, in combination with liberal and nationalist ideologies, contributed to the outbreak of revolutions in Vienna, Berlin, Milan, Venice and the Rhineland. The revolutions were short-lived, however the

...reorganisation of Austria’s education system on a primarily secular basis was one of the few lasting victories that Europe’s liberals won in the revolutions of 1848.²⁹⁴

The restructuring of Austrian education to reflect secular and liberal values faced a number of challenges. Firstly, it sought to instil a sceptical attitude in

²⁹¹ Coen, D., *Vienna in the Age of Uncertainty: Science, Liberalism, and Private Life*, The University of Chicago Press, Chicago, 2007, p.6.

²⁹² *Ibid*, pp.4-5.

²⁹³ *Ibid*, p.5.

²⁹⁴ *Ibid*, p.6.

its students to replace ‘Catholic dogma as the foundation of moral education’, but also avoid the dangers of ‘radical relativism’.²⁹⁵

Coen argues that by the 1860s,

... a sixteen year-old student at an Austrian Gymnasium ... would have learned that the precondition for knowledge was neither faith, nor trust, nor impartiality, but rather “doubt”.²⁹⁶

To achieve this end, the student experienced ‘the overthrow of all his convictions’ and ‘a head-first plunge into uncertainty’.²⁹⁷ Students were told that ‘somewhere along a man’s path to intellectual maturity’ ... “the foundations of his knowledge sway beneath his feet and he grasps for an anchor to steady himself.”²⁹⁸

This introduction to ‘doubt’ is consistent with other varieties of philosophical scepticism of which Descartes and Hume are two early representatives. The philosopher Nietzsche can also be located within the sceptical approach. This sceptical approach is also an antecedent of ‘postmodern’ approaches to knowledge which will be discussed in later chapters.

5.3.9 The Influence of German Philosophy on Viennese Intellectual Thought

What was tolerably accurate description of German thought twenty-seven years ago [1934] would now appear to be true of Western thought in general. It would not be the first time that a nation, defeated on the battlefield and, as it were, annihilated as a political being, has deprived its conquerors of the most sublime fruit of victory by imposing on them the yoke of its own thought.²⁹⁹

German philosophy played a very influential role in the shaping of Viennese intellectual thought and the dilution of the influence of the Ancient Greek thought of Socrates, Plato and Aristotle. Peters and Marshall record that ‘Le Rider (1991) sees the German philosopher Nietzsche as the common starting point for most Viennese modernists.’³⁰⁰ This is an important observation in

²⁹⁵ *Ibid*, p.7.

²⁹⁶ *Ibid*, p.7.

²⁹⁷ *Ibid*, p.7.

²⁹⁸ *Ibid*, p.7.

²⁹⁹ Strauss, L., *op.cit.*, p.2.

³⁰⁰ Le Rider, J. quoted in Peters, M. and Marshall, J., *op.cit.*, p.38.

relation to the philosophy's break with Platonic thought and its shift to philosophies supportive of innovation. For example, Nietzsche

... emphatically rejected Plato's ... theory of ideas, which taught that all earthly occurrences are merely pale copies of disembodied, celestial "forms".³⁰¹

Nietzsche was theoretically opposed to the Platonic idea that theorising was 'an act of unveiling that revealed the principles underlying all existence'.³⁰²

Nietzsche argued

... that claim ... was empty because there was no ultimate reality for thinking to contact other than the one it had constructed. The world and thinking were not such that the structure of one corresponded to the constructs of the other. ... all truths were relative.³⁰³

Nietzsche drew on pre-Socratic Greek thought to inform his theories and questioned reason's ability to access 'the truth'. Le Rider places great importance upon the influence of 'Nietzsche as part of the cultural fabric of Viennese modernism' on Viennese fin-de-siecle scholars such as Wittgenstein.³⁰⁴ Viennese modernism was 'marked by Nietzsche's contempt for such 'modern' ideas as democracy, historicism, scientism or progress.'³⁰⁵

Janaway argues that both Wittgenstein and Nietzsche were 'strongly influenced by Schopenhauer'.³⁰⁶ Janaway further argues that Wittgenstein read Schopenhauer 'as part of the stock of ideas with which Viennese high society was furnished'.³⁰⁷ Schopenhauer also stressed the limits of reason and argued that

... human beings are not essentially rational, but are desiring, emotional animals, whose rationality was developed to serve and maximise the will to life³⁰⁸

³⁰¹ Wolin, S., The Seduction of Unreason: The Intellectual Romance with Fascism from Nietzsche to Postmodernism, Princeton University Press, Princeton, N.J., 2006, p.48.

³⁰² Wolin, S., Politics and Vision: Continuity and Innovation in Western Political Thought, Princeton University Press, Princeton, N.J., 2004, p.481.

³⁰³ Ibid, 2004, pp.481-482.

³⁰⁴ Le Rider, J., quoted in Peters, M. and Marshall, J., op.cit., p.39.

³⁰⁵ Le Rider, J., 'Between Modernism and Postmodernism: The Viennese Identity Crisis' in Timms, E. and Robertson, R., Vienna 1900: From Altenberg to Wittgenstein, Edinburgh University Press, Edinburgh, 1990, p.2.

³⁰⁶ Janaway, C., quoted in Peters, M. and Marshall, J., op.cit., p.37.

³⁰⁷ Ibid, p.37.

³⁰⁸ Berman, D., in Schopenhauer, A., The World as Will and Idea, J.M. Dent, London, 1995, p.xxv.

Berman observes that Schopenhauer also ‘... anticipated many of Freud’s leading ideas’.³⁰⁹ Freud, of course, was another Viennese émigré who questioned the limits of the rational mind.

5.3.10 The Austrian Counter-Enlightenment

Wittgenstein has been identified with ‘the spirit of the Austrian counter-enlightenment characterised by a focus upon the limits of reason, in the tradition of Lichtenberg, Kraus, Schopenhauer, Kierkegaard, Weininger and Nietzsche’.³¹⁰ Cavell has argued that Wittgenstein called ‘...into question philosophy’s claim to a privileged perspective on culture that could be called the perspective of reason’.³¹¹ Monk records that ‘...Wittgenstein once said that his method could be summed up by saying that it was the exact opposite of Socrates’.³¹² This is not surprising, as Wittgenstein had studied at Cambridge under Bertrand Russell,³¹³ the philosopher who contributed to overturning Platonic inspired British Idealism.³¹⁴ Von Wright argues that Wittgenstein believed he was living in ‘“an age without culture,” an age where modern philosophy was no longer able to provide the metalanguage...’³¹⁵ It will be recalled that Hayek also focussed on the limits of reason and can therefore be located as a member of the Austrian counter-enlightenment.

Ludwig Wittgenstein was also a product of pre and post World War One Vienna and is distinguished as the philosopher who coined the epistemological concept of ‘language game’ paradigms. In fact this use of the term ‘paradigm’ can be traced back to the 18th Century German philosopher Lichtenberg³¹⁶ and then of course to Plato. However Lichtenberg’s and Plato’s opinions of the relationship of a ‘paradigm’ to ‘truth’ differ. For example, Plato’s definition of a ‘paradigm’ was that it was a ‘model’ or ‘template’ used by the creator god

³⁰⁹ *Ibid*, p.xvii.

³¹⁰ Janik, A. quoted in Peters, M. and Marshall, J., *op.cit.*, p.36.

³¹¹ Cavell, S., A. quoted in Peters, M. and Marshall, J., *op.cit.*, p.36.

³¹² Monk, R., *Ludwig Wittgenstein: The Duty of Genius*, Vintage, London, 1991, pp.337-338.

³¹³ Ayer, A.J., *Ludwig Wittgenstein*, Penguin Books, England, 1985, p.2.

³¹⁴ Boucher, D. (ed.), *The British Idealists*, Cambridge University Press, Cambridge, 1997, p.viii.

³¹⁵ von Wright, G., A. quoted in Peters, M. and Marshall, J., *op.cit.*, p.36.

³¹⁶ Stern, J.P., *Lichtenberg: A Doctrine of Scattered Occasions*, Indiana University Press, Bloomington, 1959, 103.

and that it was related to the forms which were unchanging and eternal. Lichtenberg's use of the term 'paradigm' still referred to a 'model' or 'template', however it was used by humans to interpret phenomena.³¹⁷ This is significant because Plato's, Lichtenberg's and Wittgenstein's use of the term 'paradigm' were the conceptual antecedents of Kuhn's 'scientific paradigm' theories, which inspired later Neo-Schumpeterian theorists such as Dosi and Perez.

In combination with the theories of Hegel and Nietzsche, Wittgenstein's theories can also be traced as one of the theoretical influences of postmodernist theories. For example, in relation to Wittgenstein's concept of 'language games', Thompson and McHugh argue that many postmodernists '...embrace the view that 'truth' is a product of language games.'³¹⁸ Wittgenstein was also the inspiration behind the highly influential 'Vienna Circle' of philosophers, who developed the philosophy of Logical Positivism, amongst whom Karl Popper was a member. Karl Popper's later theory of Falsificationism was a direct (Counter-Enlightenment) theoretical response to the perceived conceptual problems of Logical Positivism. The defining commonality amongst this collection of philosophers was their recognition of the problem of knowledge – in particular the recognition of the limits of knowledge and its application to epistemology.

5.3.11 The Influence of Greek Philosophy on German Philosophy

Greece has profoundly modified the whole trend of modern civilisation. ... the extent of Greek influence is incalculable throughout Europe; its intensity is at its highest in Germany.³¹⁹

Chapter 3 discussed the influence of Ancient Greek thought on philosophies and economic theories leading up to the nineteenth century. This influence also continued into the late nineteenth and early twentieth centuries. When

³¹⁷ Stern, J.P., *Lichtenberg: A Doctrine of Scattered Occasions*, Indiana University Press, Bloomington, 1959, p.103.

³¹⁸ Thompson, P. and McHugh, D., *Work Organisations: A Critical Introduction*, (Second Edition), Macmillan Press, London, 1995, p.379.

³¹⁹ Butler, E. M., *The Tyranny of Greece over Germany: A Study of the Influence Exercised by Greek Art and Poetry over the Great German Writers of the Eighteenth, Nineteenth and Twentieth Centuries*, Beacon Press, Boston, 1958, p.4.

examining the texts of the German and Austrian philosophers such as Hegel, Nietzsche, Schumpeter, Popper and Hayek, one cannot fail to notice the large role played by their examination of the Greek philosophers, such as the pre-Socratics, Socrates, Plato and Aristotle, on the development of their conceptual theories. It is as if, in the absence of a Monistic, Christian God to provide a framework and contrast for their speculations, they have reached further back to the pre-Christian thought of the Ancient Greeks as a frame or foil for their conceptualisations.

This mode of thinking is illustrative of a 'Humanist' philosophy. Humanism 'looks back to Classical Greece' and based its theories on 'the ontological primacy of 'man' over the Christian God.'³²⁰ Nauert claims that instead of theological explanations,

...the humanists turned...to an idealized and largely mythical Antiquity...as the source of knowledge and wisdom.³²¹

Humanistic thought can be traced at least as far back as the Renaissance and was accompanied by the search for ancient Greek and Roman texts to inform their world view. This interpretation is supported by Lash who interprets this as an aspect of

...the Renaissance and the eighteenth century search for Classical and humanist values in Greek Antiquity.³²²

Nauert argues that for Renaissance humanists, '...Platonism became and remained the most widespread of the revived ancient philosophies'.³²³ The humanists had believed that the uncovering of ancient texts would '...lead to harmony, concord, and unity on philosophy, a goal especially dear to fifteenth-century Platonists'.³²⁴ However, as more ancient texts were rediscovered, the

³²⁰ Turner, B., (ed.), *Theories of Modernity and Postmodernity*, Sage Publications, London, 1990, p.62.

³²¹ Nauert, C.G., *Humanism and the Culture of Renaissance Europe*, Cambridge University Press, Cambridge, 1995, p.197.

³²² Turner, B., (ed.), *op.cit.*, p.63.

³²³ Nauert, C.G., *op.cit.*, p.197.

³²⁴ *Ibid*, p.198.

humanists realised that the ancient authors had been ‘...unable to reach agreement on philosophical truth’.³²⁵

This finding created division amongst later humanist philosophers who either subscribed to versions of Platonic humanistic philosophy or alternatively Pre-Socratic philosophy to inform their theorising. One of the earliest philosophers to turn to Pre-Socratic philosophy was the French philosopher Jean Jacques Rousseau. For example, Hicks records that Rousseau ‘...was an admirer of all things Spartan ... and a despiser of all things Athenian’.³²⁶ Rousseau has been identified by Hicks as ‘... the most significant figure in the political Counter-Enlightenment’.³²⁷ As previously mentioned in the previous chapter, Rousseau was also inspired by Hume’s sceptical philosophy. The significance of the linking of Counter-Enlightenment philosophy to philosophical scepticism will become clearer in Chapter 7.

5.3.12 Counter–Enlightenment thought as a representation of paradigm change

Counter-Enlightenment thought arose from within the Enlightenment movement in the late eighteenth century. Beiser argues that

... philosophers of this time broke with the twin pillars of the modern Cartesian tradition: the authority of reason and the primacy of epistemology.³²⁸

As discussed previously, the Enlightenment made reason the ultimate judge and critic of all sources of authority and belief. However as the Enlightenment unfolded, philosophers began to question the authority and source of legitimacy of reason itself and also the foundationalism upon which epistemology depended. Mere acceptance of the belief in the authority of reason without criticism ‘... would be nothing less than dogmatism, accepting beliefs on authority, which is the very opposite of reason’.³²⁹

³²⁵ *Ibid*, p.198.

³²⁶ Hicks, S., *Explaining Postmodernism: Skepticism and Socialism from Rousseau to Foucault*, Scholarly Publishing, Tempe, 2004, p.91.

³²⁷ *Ibid*.

³²⁸ Beiser, F., *The Fate of Reason: German Philosophy from Kant to Fichte*, Harvard University Press, 1993, p.vii.

³²⁹ Beiser, F., *op.cit.*, 2005, p.23.

The German philosopher Hamann stressed ‘... the cultural and social dimension of rationality’. Hamann believed ‘... reason exists only in embodied form in particular activities’. He argued that ‘the great fallacy’ of the Enlightenment thinkers such as Kant was the Platonic belief that reason is ‘... a self-sufficient faculty that exists in some special noumenal or intelligible realm of being’.³³⁰

Hamann further argued that ‘... language is the very criterion of thought and that the philosophy of language should replace epistemology’.³³¹ Hamann’s argument that the philosophy of language should replace epistemology places Wittgenstein’s (1986 – originally published 1953) ‘language game’ paradigm theories in context and demonstrates his continuation of the development of a German theoretical problem. It also illuminates the theoretical heritage of Kuhn (1970), Dosi (1982) and Perez (2002) in that: Kuhn’s ‘scientific paradigm’ theories are based on Wittgenstein’s ‘language game’ paradigm theories; Dosi’s ‘technological paradigm’ theories are based on Kuhn’s theories; and Perez’s ‘techno-economic paradigm’ theories are based on Dosi’s theories.

Garrard argues that ‘...there were – and are – many counter-enlightenments ... in Germany and beyond, and from the mid-eighteenth century to the present’.³³² Wittgenstein has previously been identified above as having been influenced by Counter-Enlightenment thought. Kuhn could also be interpreted as similarly being influenced. Previous discussions above of the philosophical positions of Hayek and Popper also identified elements of Counter-Enlightenment thought in their work.

Seidman interprets the role of one of these Counter-Enlightenment phases as a ‘transitional phase between a traditional social order that was in retreat in the eighteenth century and an emergent new form of industrial civilisation that typified the nineteenth century. Seidman further observes that the Counter-

³³⁰ Beiser, F., *op.cit.*, 1993, p.18.

³³¹ Beiser, F., *Ibid.*, 1993, p.17.

³³² Garrard, G., *Counter-Enlightenments: From the Eighteenth Century to the Present*, Routledge, London, 2006, p.4.

Enlightenment was a ‘transmitter of innovations in social theory originally made by the Enlightenment, refining and adapting them in the process.’³³³

The correlation of industrial change and social theory innovation supports the contentions of Neo-Schumpeterian theorists such as Freeman and Perez; although they would frame it as a ‘techno-economic’ paradigm being accompanied by ‘socio-institutional change’. ‘Transitional phases’ accompanying ‘emergent new forms of industrial civilisation’ can be also meaningfully interpreted within the context of what Kuhn would refer to as a ‘paradigm transition’.

Kuhn refers to the ‘incommensurability’ of paradigms, meaning that they cannot meaningfully be compared to one another and a decision made as to the ‘best’ one, as they are fundamentally different world views. Burrell identifies Wittgenstein’s influence on Kuhn when he equates Kuhn’s ‘...paradigms as ‘language games’’.³³⁴ Kuhn refers to Wittgenstein who also argued that different ‘language games’ are similarly incommensurable.³³⁵ Garrard citing Macintyre argues that

The tragedy for the Enlightenment and for Western civilisation ever since is that it was unable actually to agree on the principles on which all rational persons were supposed to concur, a fact that has been disguised by a ‘rhetoric of consensus’. The Enlightenment left the West with a monistic ideal of universal rational justification ‘which it has proved impossible to attain’.³³⁶

In addition it is argued that ‘reason is plural rather than monistic – that there are rationalities rather than rationality’.³³⁷ This pluralism is also recognisable in the work of Thomas Kuhn when he speaks of there being many sciences, not one Science. It has been claimed that each rational tradition,

...has its own particular standards of reasoning in terms of which its beliefs, texts and authorities find their justification. This is necessarily so because we are all inextricably embedded in a particular tradition, and there is no universal perspective or ‘God’s eye view’ beyond all traditions from which to judge them.³³⁸

³³³ Seidman S., in Garrard, G., *Ibid.*, p.3.

³³⁴ Burrell, G., *op.cit.*, p.21.

³³⁵ Kuhn, T.S., *op.cit.*, pp. 44-45.

³³⁶ Macintyre, A., in Garrard, G., *op.cit.*, p.116.

³³⁷ *Ibid.*, p.116.

³³⁸ *Ibid.*, p.116.

The previous quote is illustrative of the philosophical transition: from a ‘Platonic paradigm’ in which objective truth of the eternal and unchanging ‘Forms’ could be grasped by the intellect; to a sceptical, counter-enlightenment stance in which the intellect accesses the ‘intelligible world’, ‘...that is, the world that our intellects impose upon Nature, in accordance with our beliefs and our whole way of life’.³³⁹

5.4 Conclusion

The last three chapters have closely examined philosophical and historical theoretical influences which have shaped attitudes towards innovation. This chapter has explored the genesis of theories and theoreticians which have had a major impact on the shaping of thought, knowledge and policy in the Western industrialised world. Theorists of the ‘Austrian School of Economics’, the ‘German Historical School’ and ‘Neo Classical Economics’ were discussed and similarities and differences between them were examined. It was revealed that although Neo Classical economics utilises mechanistic metaphors based on the static Newtonian model, the founder of Neo Classical economics, Alfred Marshall, recognised the superiority of economic thought based upon dynamic biological metaphors. However he believed that it was too complicated for foundational economics textbooks. The adherence of Neo Classical economic theory to static mechanistic metaphors based on Platonic foundations instead of dynamic biological metaphors based on Counter-Enlightenment philosophy therefore makes Neo Classical economic theory unsuitable as the basis for a dynamic theory of innovation.

Differences between theorists within the ‘Austrian School of Economics’ were highlighted and the work of Schumpeter and Hayek was discussed. Earlier theoretical influences in their theories were also identified and discussed. The significance of these theorists as precursors to theories of innovation, theories of innovation in the services sector and, consequently, their implications for a theory of innovation in the higher education services sector will be examined in the following chapters.

³³⁹ Hawkes, T., Metaphor, Methuen and Co., London, 1977, p.21.

It was argued that many of these theorists embodied the intellectual heritage of an elite, education in the *Gymnasiums* of Central Europe – in the majority of cases, post World War One Vienna, the capital of the then vast Austro-Hungarian Empire. The common thread of thought uniting these thinkers was their questioning of the authority and legitimacy of the role of reason in human affairs and their exploration of the limits of rational thought.

An examination of the origins, curriculum and goals of a Viennese *Gymnasium* education highlighted the similarities between the *Gymnasium's* educational outcomes and the intellectual products of its graduates. In particular it identified common, underlying, theoretical themes expressed by some of its well known graduates and their theoretical and historical threads which are woven into concepts such as neoliberalism, postmodernism, falsifiability, paradigms and evolutionary economics. It was argued that all of these concepts represent non-teleological theories, which is consistent with the educational principles of the *Gymnasium*.

The influence of German philosophical thought on Viennese intellectuals was also examined, and the underlying Greek influences on German philosophy were identified. The theoretical lineage of contemporary theories was traced to German philosophy, particularly that of Nietzsche and Schopenhauer. Nietzsche's and Schopenhauer's role in contributing to Counter-Enlightenment thought was established in their questioning of the Ancient Greek Socratic belief in the pre-eminence of reason and the ability of reason to reveal 'Platonic Forms' underlying 'reality'. Wittgenstein, also argued against Plato's theory of Forms, and can therefore be also located amongst Counter-Enlightenment philosophers.

The thought of Nietzsche and Schopenhauer also contributed towards the acceptance of the 'social construction of knowledge' and its relative, rather than objective, status. Wittgenstein assisted this transition through his conceptualisation of 'truth' as a product of 'language games'. Wittgenstein also introduced the use of the term 'paradigm', which was later adopted by Kuhn, Dosi and Perez, into the English-speaking world. Therefore, these

theorists have assisted in the transition to dynamic philosophical and economic theories, originating in Austria and Germany, which contain the conceptual elements necessary for the foundations of a theory of innovation in the higher education sector.

The next chapter will examine the theories drawing on these conceptual foundations, namely those of Joseph Schumpeter and the Neo-Schumpeterians. It will identify innovation theories as drawing on the theoretical sources of the Austrian Counter-Enlightenment movement which rejected Enlightenment theories based on Socratic and Platonic philosophies.

Chapter 6. Joseph Schumpeter and Neo-Schumpeterian Theories of Innovation

...innovation [lies] ... at the heart of economic development [and requires] ... heroic efforts to break out of static economic routines'.³⁴⁰

6.1 Introduction

Previous chapters established the economic importance of the services sector and in particular, the higher education services sector. The lack of, and need for, a theory of innovation for the higher education sector was also highlighted. Earlier chapters also examined the role of philosophical, religious and cultural beliefs and attitudes in shaping literary representations of value judgements placed on innovation by various societies. Philosophical and historical literary representations of innovation were found to be essentially negative and the implications of this highlighted, and partially explained, the lack of attempts to construct theories of innovation until the late nineteenth and early twentieth centuries.

The pervasive influence of the Ancient Greek Platonic thought, or 'Platonic paradigm', was identified as providing a subtle underlying influence which shaped the boundaries of, and approaches to, what was considered to be valid theoretical knowledge. Textual evidence demonstrated that the influence of the Ancient Greek negative attitude towards innovation also continued until at least the seventeenth century and still survives in some theoretical fields today.

It was established that Classical and Neo-Classical economic models were also influenced by Ancient Greek thought. In addition, they also adopted a metaphor based on Newton's static physics model to construct economic models. For example, Mjoset argues that '... neoclassical models are thought experiments ... [based on] the 'original' of the thought experiment analogy – the physics experiment.'³⁴¹

³⁴⁰ Scherer, F.M., New Perspectives on Economic Growth and Technological Innovation, British-North American Committee, Brookings Institution Press, Washington D.C., 1999, p.27.

³⁴¹ Mjoset, L., 'The Art of Macro-Qualitative Modelling: An Exploration of Perez' Sequence Model of Great Surges', Chapter 14 in Dreschler, W., Kattel, R. and Reinert, E. (eds.), Techno-Economic Paradigms: Essays in Honour of Carlota Perez, Anthem Press, London, 2009, pp.246-247.

In contrast to Classical and Neoclassical economic models, German and Austrian economic models opposed the use of static physics metaphors in economics and instead utilised dynamic biological metaphors which held the potential to accommodate theories of economic growth, change and innovation. These economic models also symbolised the theoretical dichotomy between Enlightenment and Counter-Enlightenment representations of knowledge and their respective perspectives on the foundations, boundaries and validity of rationality in the construction of knowledge. Importantly, Counter-Enlightenment theorists such as Nietzsche and Wittgenstein explicitly reject Socratic and Platonic philosophical accounts. This is significant, as it will be recalled that Platonic philosophy discouraged innovation, particularly in education, in the strongest possible terms – recommending death to innovators.

Enlightenment and Counter-Enlightenment economic models differ in their perspectives on the role and extent of rational economic planning. Classical and Neo-Classical Enlightenment economic models utilising a static physics metaphor argue that all aspects of an economy are capable of being rationally understood and planned. Alternatively, German and Austrian Counter-Enlightenment economic models, utilising a dynamic biological metaphor, argue that it is not possible to rationally understand and plan all aspects of an economy and that some economic elements are best left to evolve, change and adapt to their particular economic environment.

However, as tempting as it is to present this clear-cut theoretical cleavage, there are also variations amongst these two positions according to whether they subscribe to an English or Continental version of Liberalism. So, for example, variations of these theories which draw on English Liberalism argue for non-intervention in economics whereas those based on Continental Liberalism endorse economic intervention. Previous chapters aligned free-trade non-interventionist policies with dominant industrial and economic empires or nations. Interventionist policies were promoted by newly industrialising nations attempting to ‘catch-up’ with leading industrial nations. Historical examples of these two scenarios were provided from nineteenth-century Britain and Germany.

Contemporary events have demonstrated that the polarisation of these two theoretical examples may be readily sacrificed when confronting 'real world' economic situations. Recent economic events surrounding the 2008 Global Financial Crisis have provided sobering examples of the adaptability and flexibility of these two theoretical positions. Therefore it can be argued that policy implementations of these theoretical positions are not a question of absolutes, but rather a question of degree and appropriateness to circumstance.

The influence of German and Austrian Counter-Enlightenment thought spread prior to the outbreak of World War Two due to the Viennese intellectual diaspora which relocated many Viennese philosophers and economists, such as Joseph Schumpeter, to the universities of Allied nations. This chapter deconstructs Neo-Schumpeterian cycle theory and identifies it as an endogenous economic model based on the theories of Joseph Schumpeter. Schumpeter's theories draw on Kondratiev long wave economic theory and elements of Marxian theory. Kondratiev and Marxian theory are based on the theories of the German Historical School which were explored in the previous chapter. Schumpeter's theories also reflect an intellectual debt to the Counter-Enlightenment philosophers Schopenhauer and Nietzsche and therefore also to philosophers such as Rousseau and Hume.

Schumpeter's theories are also identified as being grounded in the economic theorising that had been underway for some time in Vienna, of the Austro-Hungarian Empire of the late 19th and early 20th centuries. Therefore they can be located within the Counter-Enlightenment tradition which arose during this period. Although Schumpeter's theories appeared to be novel and innovative when introduced to the Anglo-Saxon economic tradition, they were actually a continuation of a much older continental economic and philosophical discourse.

Schumpeter's theories and their implications for innovation in the higher education sector are explored and expanded to include the techno-economic paradigm theory of Carlotta Perez. The results of this analysis are then located within the context of techno-economic, techno-organisational paradigms and socio-institutional theory. The utilisation of these theories as meta-theories enables the interpretation of changes within the services sector, and more specifically the higher education

sector, as the result of a complex set of interacting and overlapping forces associated with the diffusion of a new techno-economic paradigm and its associated socio-institutional changes in capitalist economies.

It will be argued that the political and economic philosophies that assist the introduction of new techno-economic paradigms and socio-institutional arrangements are those which assist in the ‘creative destruction’ of those which were in place for the previous techno-economic paradigm. It will be further argued that the changes currently taking place in the Australian Higher Education Sector can be interpreted via an analysis based on Neo-Schumpeterian economic theory – more specifically through a conceptual framework based on the theory of ‘techno-economic paradigms’ as developed by Freeman, Perez, Barras and other Neo-Schumpeterian theorists.

6.2 Neo-Schumpeterian theorists: a definition

For the purposes of this thesis, Neo-Schumpeterian theorists are referred to as theorists whose conceptual models are based in whole or in part on the theories of Joseph Schumpeter. In defining Neo-Schumpeterian theorists in this way, the term is used very broadly – some theorists may use Schumpeterian theories in a partial manner, whilst others base a significant proportion of their theoretical foundations on Schumpeter’s work.

However, what all these theorists have in common is their general reference to, or use of Schumpeterian theoretical components, in their theoretical constructions. In saying this, it is not implied that there is complete agreement between Neo-Schumpeterian theorists in their interpretation of Schumpeter’s theories, or their use of, and conclusions based upon his theories. This is a contested area of theoretical knowledge. Neo-Schumpeterians acknowledge this and readily admit that the Neo-Schumpeterian paradigm is still under construction. In common with any group of theorists who are in broad agreement as to general foundational concepts, there is a vigorous debate, and in some cases, disagreements as to theoretical particulars, findings and conclusions. In short, it is a dynamic theoretical discourse. In this sense, this thesis is based upon and also contributes to this ongoing discursive negotiation.

Underlying this interpretation of Neo-Schumpeterian theorists is the premise that knowledge is socially constructed. That is communities of theorists construct and contest theoretical frameworks with the goal of interpreting and predicting the relationships between phenomena. These theoretical discussions form the basis of discourses by constructing series of logically constructed and coherent arguments.

Identifying Neo-Schumpeterian theorists as subscribing to the social construction of knowledge philosophy also confirms their status as rejecting the ‘Platonic paradigm’. This position is supported by the philosopher Stephen Toulmin who has been credited with providing a

...philosophical bridge between ancient sophistic rhetoric and the constructivist philosophy that informs contemporary sociology of science [and] ...privileging the Sophists over Plato...³⁴²

The social construction of knowledge premise is also consistent with the theories of the Viennese Modernist theorists discussed in the previous chapter. Viennese Modernist theorists were identified as subscribing to the views of the Austrian Counter-Enlightenment movement which also drew on the pre-Socratic philosophies of the Greek Sophists in their examination of the limitations of reason. Neo-Schumpeterians have been defined as sharing ‘a common interest in Schumpeter’s writings, deriving ‘their inspiration from Schumpeter’s evolutionary approach and also their theoretic challenge to neo-classical economics’.³⁴³

6.3 Joseph Schumpeter’s influence on Neo-Schumpeterian theories

Neo-Schumpeterian theory is based on the economic theories of Joseph Schumpeter (1883–1950). Schumpeter’s economic theories can be distinguished from Neo-classical and Keynesian economic theories by his theories postulating the endogenous nature of technological change - that is technological change is interpreted as an integral component of economic theory. In comparison, Keynesian and Neoclassical theories argue that technological change is external, or exogenous, to their economic models. For example, Keynesian macro-economics assumed that

³⁴² Fuller, S., Thomas Kuhn: A Philosophical History for Our Times, University of Chicago Press, 2000, p. 312.

³⁴³ Heertje, A., ‘Neo-Schumpeterians and Economic Theory’, Chapter 10 in Magnusson, L. Evolutionary and Neo-Schumpeterian Approaches to Economics, Kluwer Academic Publishers, London, 1994, p.265.

...if economic policy could maintain a high level of effective demand, technical change was a black box that need not be opened.³⁴⁴

Keynesian theory also neglected ‘...innovation’s important role in capitalist evolution’³⁴⁵.

An indication of Schumpeter’s influence on economic thought and policy can be gauged by some of the notable economists who were students of Schumpeter; these include Alan Greenspan, Robert Solow and Robert Heilbroner. The former United States Federal Reserve Chairman, Alan Greenspan, referred to Schumpeter in speeches of April 4 and October 24, 2001 as the ‘theoretician and prophet of the Events.’³⁴⁶ Greenspan also referred to Schumpeterian theory in May 2002 when he stated that

Capitalism expands wealth primarily through creative destruction – the process by which the cash flow from obsolescent, low-return capital is invested in high-return, cutting-edge technologies.³⁴⁷

6.4 Theoretical sources of Schumpeter’s theories

Schumpeter’s economic theories were influenced and shaped from a number of sources. In common with a number of other influential twentieth century theorists, he was a product of the declining early twentieth century Austro-Hungarian Empire and was therefore influenced by the Austrian Counter-Enlightenment. Schumpeter’s Doctorate was completed in Vienna under the influence of the Austrian School of Economics (of whom Friedrich von Hayek was an influential member). In common with many Austrian theorists educated by the Austrian Gymnasium system, Schumpeter was also influenced by the philosophy of science which informed his economic methodology. Shionoya argues that

Schumpeter ingeniously adapted the philosophy of science of Ernst Mach to economics and developed the economic methodology of instrumentalism, the view that theories are not descriptions but instruments for deriving useful results and are neither true nor false.³⁴⁸

³⁴⁴ Freeman, C. ‘Technological Change and the New Economic Context’, Chapter 3 in Hill, S. and Johnston, R. (eds.), Future Tense? Technology in Australia, University of Queensland Press, St Lucia, 1984, p. 49.

³⁴⁵ McCraw, T., Prophet of Innovation: Joseph Schumpeter and Creative Destruction, Belknap Press, Cambridge, 2007, p.492.

³⁴⁶ Reinert, H. and Reinert, E.S., ‘Creative Destruction in Economics: Nietzsche, Sombart, Schumpeter’, p.3, Accessed 20/1/06 from <http://www.othercanon.org/papers/more.asp?id=30>

³⁴⁷ Greenspan, A., ‘Remarks by Chairman Alan Greenspan’, at the 2002 Financial Markets Conference of the Federal Reserve Bank of Atlanta, Sea Island, Georgia, U.S.A., May 3, 2002.

However, his theories although conservative in part, also draw on Marxian elements – the prime example of this being his theoretical concern for the role of technological change in economics. Another influence on Schumpeter’s theories was that of the Russian Marxian economist Nikolai Kondratiev who proposed to interpret long-term growth in capitalist societies through long-wave economic theory. Schumpeter’s theories also drew on the theories of August Comte who established the new discipline of sociology to analyse society through the categories of social statics and social dynamics. Comte’s theories provided the theoretical basis for Schumpeter to establish his studies of economic sociology. This provided the theoretical foundation for Schumpeter to study the dynamic economic disequilibrium associated with innovation. Schumpeter has the distinction as the first theorist to define the concept of ‘innovation’. As noted in Chapter 3, Schumpeter also contributed towards creating more positive perceptions of innovation in contrast to Marx.

In his work titled, ‘The Theory of Economic Development’ (published in German (1911) and in English (1934)), Schumpeter defined his concept of ‘innovation’ as:

The introduction of a new good — that is one with which consumers are not yet familiar - or of a new quality of a good;

The introduction of a new method of production, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially;

The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before;

The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created; and

The carrying out of the new organization of any industry, like the creation of a monopoly position.³⁴⁹

The strength of Schumpeter’s pioneering concept of ‘innovation’ is evidenced by the similarity of Schumpeter’s 1934 typology of Innovation to the OECD’s 2005 Oslo Manual innovation typology which is elaborated below.

³⁴⁸ Shionoya, Y., op.cit., p.52.

³⁴⁹ Schumpeter, J., The Theory of Economic Development, Harvard University Press, Cambridge, Massachusetts, 1934, p.66.

1. Product—a good or service that has new or significantly improved characteristics, including technical specifications, components, materials and intended uses.
2. Process—a new or significantly improved production or delivery method that includes changes in techniques, equipment and/or software.
3. Marketing—a new marketing method involving significant changes in product design or packaging, product placement, promotion or pricing.
4. Organisational—a new organisational method in a firm’s business practices, workplace organisation or external relations.³⁵⁰

Schumpeter proposed two main arguments:

First, innovation – including the introduction of new products and production methods, the opening of new markets, the development of new supply sources, and the creation of new industrial forms – lay at the heart of economic development, facilitating the growth of material prosperity; Second, innovations did not just happen, but required acts of entrepreneurship – heroic efforts to break out of static economic routines’.³⁵¹

Schumpeter’s intellectual debt to the theorists, Schopenhauer and Nietzsche, is suggested by Freeman when he argues that Schumpeter describes

...innovation as an act of will rather than an act of intellect ...³⁵²

This statement also places Schumpeter firmly within the sphere of influence of the Austrian Counter-Enlightenment.

6.4.1 German and Austrian economic influences on Schumpeter

In common with other Austro-Hungarian theorists and theories (such as Wittgenstein, Popper, Hayek and Drucker), many of Schumpeter’s economic theories appeared to be innovative and original when they were introduced to the Anglo-Saxon economic environment. However Appel observed that Schumpeter’s 1942 work, ‘Capitalism, Socialism and Democracy’,

...in essence presented only what had been written and said decades earlier in the German discussion about the future of capitalism.³⁵³

³⁵⁰ OECD, Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd edition, Paris, 2005.

³⁵¹ Scherer, F.M., New Perspectives on Economic Growth and Technological Innovation, British-North American Committee, Brookings Institution Press, Washington D.C., 1999, p.27.

³⁵² Freeman, C., Systems of Innovation: Selected Essays in Evolutionary Economics, Edward Elgar, Cheltenham, UK, 2008, p.77.

³⁵³ Appel, M., Werner Sombart. Theoretiker und Historiker des Modernen Kapitalismus, Marburg, Metropolis, 1992, p.260, translated and quoted in Reinert, H. and Reinert, E.S., ‘Creative Destruction in Economics: Nietzsche, Sombart, Schumpeter. Accessed at <http://www.othercanon.org/papers/more.asp?id=30> January 20, 2006.

This assertion is also supported by Reinert and Daastol who argue that two of the key features of Schumpeter's economic theory, namely technological innovation and the role of the entrepreneur in introducing innovations

... had been standard features of German economics since its inception with Gottfried von Leibniz and Christian Wolff.³⁵⁴

However, this is not to devalue Schumpeter's theoretical contributions, but to place this in context, Schumpeter's work 'Capitalism, Socialism and Democracy' has also been described as:

... a significant piece of general political theory containing the wisdom which the Hapsburg empire bequeathed to the new empire on the other side of the Atlantic.³⁵⁵

The general ignorance of the theoretical inspirations and context of Schumpeter's work is peculiar. However Reinert illuminates this mystery when he observes that:

... during the period after World War II, Sombart and all pre-war II German economics went into an eclipse. Part of the explanation for this was the rise of mathematization of the profession, which was very much against the German tradition. Another part of the explanation was that to a surprising degree what was a healthy scientific baby was poured out with what was perceived as the post-nazi bath-water. The German tradition in economics came to be represented solely by Marx and Schumpeter, a feature which made these two economists seem much more unique than they in effect are when seen in their own historical context.³⁵⁶

The theoretical influence of Austro-Hungarian émigrés, like Schumpeter, on contemporary thought is considerable. The impact and influence of this Austro-Hungarian theoretical legacy is often overlooked and not understood.

So, in the United States today, [1973] we often seem to be watching, while only half understanding, a bungled remake of some political drama originally played out in the last days of the Hapsburg Empire.³⁵⁷

6.5 Schumpeter's influence on later schools of economic thought

Schumpeter's economic theories have been very influential and have been credited with influencing the schools of thought of Evolutionary Economics as exemplified by Nelson and Winter and also 'New Growth Theory' of Romer and Lucas.

³⁵⁴ Reinert, E., and Daastol, A., 'Exploring the Genesis of Economic Innovations: The religious gestalt-switch and the duty to invent as preconditions for economic growth' in European Journal of Law and Economics, Vol. 4, No. 2/3, 1997, quoted in Reinert, H. and Reinert, E.S., 'Creative Destruction in Economics: Nietzsche, Sombart, Schumpeter. Accessed at <http://www.othercanon.org/papers/more.asp?id=30> January 20, 2006.

³⁵⁵ Francis, M., op.cit., p.72.

³⁵⁶ Reinert, H. and Reinert, E.S., op.cit., pp.19-20,

³⁵⁷ Janik, A. and Toulmin, S., Wittgenstein's Vienna, Weidenfeld and Nicolson, London, 1973, p.270.

However a point of differentiation exists between New Growth Theory and Schumpeterian economic theory in that New Growth Theory is based on neo-classical economic foundations and is ‘... entirely divorced from theories of economic cycles.’³⁵⁸ Schumpeter’s economic theories have also informed techno-economic paradigm theory as developed by theorists associated with the Sussex Policy Research Unit (SPRU) such as Christopher Freeman, Carlotta Perez, Giovanni Dosi and others.³⁵⁹

The Schumpeterian theoretical strand also informs the work of Michael Gibbons and Richard Barras and is also referred to by Michael Porter and Peter Drucker. In Australia, Schumpeter’s theories inspired researchers at the Centre for Technology and Social Change (TASC) at the University of Wollongong and also the Australian Centre for Innovation and International Competitiveness (ACIIC) at the University of Sydney.

6.6 Schumpeterian and Neo-Schumpeterian Kondratiev waves

Neo-Schumpeterian techno-economic paradigm theory draws on the economic theories of Kondratiev and Schumpeter who modelled the regular ‘boom and bust’ economic long wave cycles of capitalist economies. Schumpeter’s 1939 work ‘Business Cycles’ argued that historical evidence suggested ‘that technological innovations tended to cluster in waves’.³⁶⁰ Schumpeter’s theoretical innovation was to postulate that technological change could be useful in understanding the dynamics of ‘Kondratiev Long Waves’ of economic development in capitalist economies. Schumpeter argued that Kondratiev Cycles could be mapped and explained by the introduction of new technology systems and the consequent occurrence of technological revolutions of a periodicity of approximately 60–70 years. Based on historical evidence, Schumpeter classified three Kondratiev waves which consisted of: the Industrial Revolution; the spread of railways; and electrical illumination, industrial chemistry and the automobile.³⁶¹

³⁵⁸ Mjoset, L., *op.cit.*, p.247.

³⁵⁹ Amin, A., ‘Post-Fordism: Models, Fantasies and Phantoms of Transition’, Chapter 1 in Amin, A. (ed.), *Post-Fordism: A Reader*, Blackwell Publishers, Oxford, 1994, pp.11-12.

³⁶⁰ Scherer, F.M., *op.cit.*, p.27.

³⁶¹ *Ibid*, pp.27-28.

In comparison to Schumpeter's model of three Kondratiev long waves, Neo-Schumpeterian theorists have classified five Kondratiev long waves. This difference is partially explained by the passing of time and also technological developments since Schumpeter constructed his theories in the 1930's. Neo-Schumpeterians began constructing their theories in the 1980's.

There is agreement and overlap between Schumpeter and the Neo-Schumpeterians in relation to the first three Kondratiev long waves. For example, both agree that the first major Kondratiev cycle coincided with the Industrial Revolution, the second with the spread of railways, and the third with electrical illumination. However, whereas Schumpeter includes the automobile within the third Kondratiev, Neo-Schumpeterians separate this into a fourth Kondratiev cycle. Neo-Schumpeterians also identify Information and Communication technology as the fifth Kondratiev carrier technology.

Perez's interpretation of these five technological revolutions or Kondratiev Waves is represented below in Table 6.1 – "The industries, infrastructures and paradigms of each technological revolution" which analyses each Technological Revolution by: new technologies and new or redefined industries; new or redefined infrastructures; and techno-economic paradigm or 'common sense' innovation principles.

According to this schema, the introduction and diffusion of new generic technological systems across capitalist economies have consequences for the socio-institutional arrangements of these economies. That is, there is a mismatch between the remnant socio-institutional arrangements of a previous techno-economic paradigm and the new techno-economic paradigm. This theory places contemporary capitalist economies in the fifth Kondratiev wave based on information and communication technology. However, the socio-institutional paradigm is still in place from the fourth Kondratiev which was based on oil, the automobile, mass production and highway networks. A number of theorists have begun theorising the sixth Kondratiev wave; however the implications of this will not be pursued in this thesis.

Neo-Schumpeterian theorists argue that the role of capitalist economy governments is to create a socio-institutional environment that supports the new techno-economic paradigm.³⁶² However, this is no easy task. Kuhn observed in relation to scientific paradigm changes that ‘resistance is inevitable and legitimate ... [and that] a generation is sometimes required to effect the change’.³⁶³ This observation may also be of relevance to changing techno-economic paradigms. This necessitates a process referred to by Schumpeter as ‘Creative Destruction’ as the socio-institutional arrangements of the previous techno-economic paradigm are dismantled to make way for those more appropriate to the new techno-economic paradigm.

³⁶² Romer, P., ‘Beyond Classical and Keynesian Macroeconomic Policy’, Policy Options, July – August, 1994, p.1.

³⁶³ Kuhn, T.S., op.cit., p.152.

Table 6.1 The Industries, Infrastructures and Paradigms of each Technological Revolution

Technological Revolution (core country)	New technologies and new or redefined industries	New or redefined infrastructures	Techno-economic paradigm 'Common sense' innovation principles
FIRST: From 1771 The 'Industrial Revolution' (Britain)	Mechanized cotton industry Wrought iron Machinery	Canals Waterways Turnpike roads Water power (highly improved water wheels)	Factory production Mechanization Productivity/time keeping and time saving Fluidity of movement (as ideal for machines with water – power and for transport through canals and other waterways Local networks
SECOND: From 1829 Age of Steam and Railways (In Britain and spreading to Continent and USA)	Steam engines & machinery (made in iron; fuelled by coal) Iron and coal mining (now playing a central role in growth) (*) Railway construction Rolling stock production Steam power for many industries (including textiles)	Railways (use of steam engine) Universal postal service Telegraph (mainly nationally along railway lines) Great ports, great depots and world wide sailing ships City gas	Economies of agglomeration/ industrial cities/ national markets Power centres with national networks Scale as progress Standard parts/ machine-made machines Energy where needed (steam) Interdependent movement (of machines & means of transport)
THIRD: From 1875 Age of Steel, Electricity and Heavy Engineering (USA and Germany overtaking Britain)	Cheap steel (especially Bessemer) Full development of steam engine for steel ships Heavy industry and civil engineering Electrical equipment industry Copper and cables Canned and bottled food Paper and packaging	World-wide shipping in rapid steel steamships (use of Suez Canal) World wide railways (use of cheap steel rails and bolts in standard sizes) Great bridges and tunnels World wide Telegraph Telephone (mainly nationally) Electrical networks (for illumination and industrial use)	Giant structures (steel) Economies of scale of plant/ vertical integration Distributed power for industry (electricity) Science as a productive force World-wide networks and empires (including cartels) Universal Standardization Cost Accounting for control and efficiency Great scale for world market power/ 'small' is successful, if local
FOURTH: From 1908 Age of Oil, the Automobile and Mass Production (In USA and spreading to Europe)	Mass produced automobiles Cheap oil and oil fuels Petrochemicals (Synthetics) Internal combustion engine for automobiles, transport, tractors, airplanes, war tanks and electricity Home electrical appliances Refrigerated and frozen foods	Networks of roads, highways ports and airports Network of oil ducts Universal electricity (industry and homes) World-wide analog telecommunications (telephone, telex and cablegram) wire and wireless	Mass production/ mass markets Economies of scale (product and market volume)/ horizontal integration Standardization of products Energy intensity (oil based) Synthetic materials Functional specialization/ hierarchical pyramids Centralization/ metropolitan centers – suburbanization National powers, world agreements and confrontations
FIFTH: From 1971 Age of Information and Telecommunications (In USA, spreading to Europe and Asia)	The Information Revolution: Cheap microelectronics Computers, software Telecommunications Control instruments Computer aided biotechnology and new materials	World digital telecommunications (cable, fiber optics, radio & satellite) Internet/ Electronic mail and other e-services Multiple source, flexible use, electricity networks High speed physical transport links (by land, air and water)	Information-intensity (microelectronics based ICT) Decentralized integration/ network structures Knowledge as capital/ intangible value added Heterogeneity, diversity and adaptability Segmentation of markets/ proliferation of niches Economies of scope and specialization combined with scale Globalization/ interaction between global and the local Inward & outward cooperation/ clusters Instant contact and action/ instant global communication

(*) These traditional industries acquire a new role and a new dynamism when serving as the material and the fuel of the world of railways and machinery

Source: Perez, C., 'Finance and technical change: a long-term view' in Hanusch, H. and Pyka, A. (eds.), The Elgar Companion to Neo-Schumpeterian Economics, Edward Elgar, Cheltenham, 2004

6.7 The Concept of ‘Creative Destruction’

The process of displacement of inferior technologies by successful innovations was referred to by Schumpeter as the “the process of creative destruction”. Schumpeter is generally credited with introducing the concept of ‘creative destruction’ into economic theory. For example, Chapter 7 of Schumpeter’s 1942 work ‘Capitalism, Socialism and Democracy,’³⁶⁴ was entitled ‘The Process of Creative Destruction’.

The concept of ‘creative destruction’ is also central to Neo-Schumpeterian economic theories – for example those of Christopher Freeman and Carlotta Perez. However it has been argued that Schumpeter sourced the term ‘creative destruction’ from earlier writings of the economist Sombart and also Nietzsche, who in turn adapted the idea from his ‘educator’ Arthur Schopenhauer, who had sourced the idea from Hinduism³⁶⁵ (the Hindu god Shiva is the god of creation and destruction).

This surprising theoretical genealogy of ‘Creative Destruction’ is illustrative of Popper’s thesis that the source of a conjecture was unimportant – the importance lay in its testing and theoretical utility. The longevity of the theoretical utility of ‘Creative Destruction’ has demonstrated its usefulness as a theoretical metaphor.

Downes links the Schumpeterian business concept of ‘Creative Destruction’ with the Kuhnian science concept of ‘Paradigm Shift’ and argues that the processes are identical. Downes explains that

Bold new experiments, usually the work of young practitioners, directly challenge the core beliefs of the established order, forcing a difficult but critical period or reinvention, followed by another period of normal evolution.³⁶⁶

Gibbons also addresses the issues of techno-economic paradigm change. He argues that

³⁶⁴ Schumpeter, J.A., Capitalism, Socialism and Democracy, George Allen and Unwin Ltd., London, 1961, p.81.

³⁶⁵ Reinert, H. and Reinert, E.S., op.cit.

³⁶⁶ Downes, L., The Laws of Disruption: Harnessing the New Forces that Govern Life and Business in the Digital Age, Basic Books, New York, 2009, p.3.

First it involves a shift in the basic approach of designers, engineers and managers to solving problems pervasive in all sectors of the economy. Second it rests on the universal and low cost availability of a new key factor in production. For example, the key factor was cheap steel from the 1880s to the 1930s, cheap oil from the 1930s to the 1980s, cheap microelectronics currently. Third, before a new techno-economic paradigm can generate a new wave of economic activity, a crisis occurs in the old. The old institutions which were adapted to an increasingly obsolete technological style tend, for a time, to lock out alternative systems. After a period of mismatch between a new technology and the old framework a new paradigm begins to emerge when the new technologies become pervasive enough to seriously threaten existing ways of doing things.³⁶⁷

The next section will discuss socio-institutional changes which accompany changes in techno-economic paradigms, with particular reference to the Fifth Kondratiev wave.

6.8 Theoretical component models of the Fifth Kondratiev

As discussed above, Neo-Schumpeterians argue that every techno-economic paradigm has a generic technology system. Information and communication technology plays this role in the Fifth Kondratiev. A range of socio-institutional models or templates are also integral to, and evolve and guide, each Neo-Schumpeterian techno-economic paradigm.

The Fifth Kondratiev techno-economic paradigm can be deconstructed into its various socio-institutional component models. These include economic, political organisational, production, regulatory, epistemic and narrative models. In addition to new models evolving to assist the introduction of the new paradigm, older models of the previous paradigm must also adapt or make way through the process of ‘creative destruction’.

In the case of the Fifth Kondratiev techno-economic paradigm, the older Fourth Kondratiev models adapted or became obsolete as the newer paradigm emerged. Examples of these are provided in: economic models, Economic Rationalism replacing Keynesianism; political models, Neo-Liberalism replacing Socialism; organisational models, New Public Sector Managements replacing Public Service ethic; production models, Post-Fordism replacing Fordism; regulatory models, deregulation replacing regulation; epistemic models, Counter-Enlightenment

³⁶⁷ Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M., op.cit., p.125.

replacing Enlightenment and its 'Platonic paradigm'; and in narrative models, Fifth Kondratiev replacing Fourth Kondratiev, Postmodernity replacing modernity, etc.

The Enlightenment and Counter-Enlightenment were discussed in previous chapters. Economic Rationalism, Neo-Liberalism, New Public Sector Management and Postmodernity will be examined in Chapter 7. Table 6.2 below tabulates the various theoretical models that have been integral to the Fifth Kondratiev Wave of Information Technology. Section 6.9 will discuss the Production Models of the Fourth and Fifth Kondratiev techno-economic paradigms, Fordism and Post-Fordism.

Table 6.2
Interpretative Theoretical Lens
5th Kondratiev Wave of Capitalist Development
Neo-Schumpeterian (endogenous) Techno - economic paradigm

Generic Technology System	Economic Model	Political Model	Organisational Model	Production Model	Geographic Context	Policy Making Institutions	Leading Economic Sector	Regulatory Model	Epistemic Model	Era Or Narrative Model
Information and Communication Technology Raw Material Digital Information Data	Economic Rationalism (vs. Keynesianism)	Neo-Liberalism Or New Right Eg Thatcher, Reagan Howard (vs. Left, Social Democracy) Ideology disseminated via International and domestic right-wing think –tanks Eg Mt Pelier Society, Centre for Independent Studies	New Public Sector Management Or Public Sector Reform (vs. Public Sector Ethic) Outcome oriented (not process oriented) Similar to Kuhn’s paradigm centred activities i.e. practitioners set problems for themselves within paradigm’s goals and discourse. However ‘progress’ can’t be made beyond goals of paradigm hence no teleology	Post-Fordism (flexible production and delivery) vs. Fordism ‘Mode 2’ (problem-centred research based on short-term multi - disciplinary teams) for research/ knowledge production -lifelong learning -multi careers -reduced union power - satellite campuses - increased casual/ part time - customer service/ customisation - community engagement (eg Gibbons) - uncoupling of research and teaching - uncoupling of teaching material production and delivery - modified gender composition of staff & students	Global and Regional vs. National	Supra – National feeders to national policy-makers Eg. W.T.O. O.E.C.D. I.M.F.	Services (Barras, Miles) Leading Service Sector – Financial Services Lagging Service Sectors – ‘Public Services’ ie Health and Education Higher Education -evidence suggestive of changes to via previous techno – economic paradigms	Deregulation Fee for Service User Pays HECS (vs. Regulation)	Scepticism Counter-Enlightenment Non-Platonic Non-teleological Dynamic evolutionary metaphor Instrumentalism Postmodernism Nietzsche ‘truth as metaphor’ Wittgenstein ‘language games’ Kuhn ‘scientific paradigms’ Dosi ‘technology paradigms’ Perez ‘Techno-economic paradigms’	‘Fifth Kondratiev’ - Freeman and Perez ‘Postmodernity’ - Lyotard ‘High Modernity’ - Giddens ‘Post Capitalist’ - Drucker ‘Post Industrial’ - Bell ‘Second Industrial Divide’ - Piore and Sabel ‘Late Capitalism’ - Mandel

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6.9 Models of Production: Fordism and Post-Fordism

Under the Production Model heading in Table 6.2, Post-Fordism has been identified as a production model theory of the information technology techno-economic paradigm. Post-Fordism has been theorised as replacing Fordism which was the production model theory of the Fourth Kondratiev. Fordism and Post-Fordism will now be examined as a case study illustrating the process of change of production models in a techno-economic paradigm change process.

6.9.1 Fordism

The term 'Fordism' was coined by the Italian theorist, Antonio Gramsci. 'Fordism' was Gramsci's name for the kind of society emerging in the mid-twentieth century, characterized by mass consumption of goods mass-produced increasingly via fixed or so-called "Detroit" automation'.³⁶⁸

The term 'Fordism' referred to the pioneer of the vertically integrated mass-production assembly line model, Henry Ford. Adoption of this model enabled Ford to produce standardised, mass-produced automobiles at a fraction of the cost of traditional craft-based methods of production. In comparison to contemporary standards, the workforce was highly paid, however they were also deskilled and spent their days performing monotonous, repetitive tasks.

Ford's production line model lowered the cost of an automobile so that workers could afford to purchase them thereby creating a larger demand for the product and, due to economies of scale, lowering the price even further. Previous chapters have indicated that Neo-Schumpeterian theorists locate both of these concepts, mass production and Fordism, within the Fourth Kondratiev long-wave cycle which preceded the current Information and Communication Technology Fifth Kondratiev long-wave cycle.³⁶⁹

³⁶⁸ Hakken, D., 'Computing and Social Change: New Technology and Workplace Transformation, 1980-1990', *Annual Review Anthropology*, 22, 1993, p.111.

³⁶⁹ Amin, A., *op.cit.*, p.12.

6.9.2 Post-Fordism

Fordism has been described as ‘Taylorism plus mechanisation’,³⁷⁰ so, it could be argued that post-Fordism could be described as Taylorism plus Information Technology. However, taking into account the focus of post-Fordism on the flexibility of products, processes and employment, it is possible to conceive that whereas Fordism focussed on the breakdown of tasks within a factory structured on a vertical integration model, post-Fordism also breaks down production tasks but sub-contracts out these requirements to competitive supply (clusters). So, it would appear that the post-Fordist version of Taylorism has taken the next step from an ‘assembly line’ based on individuals to an assembly line based on external suppliers competing against one another to supply the highest quality product at the lowest possible price. The intellectual property and design is the key competitive component of any product or service, sub-contractors compete to supply the manufactured components. As the contractual arrangement is a flexible one, component suppliers can be replaced at relatively short notice.

6.9.3 An example of a transition from Fordism to Post-Fordism

A comparison between Fordist and post-Fordist production models can be identified within the higher education sector. For example, in a traditional Fordist higher education scenario, tenured academics were responsible for research, teaching material production, delivery, distribution and also the setting and marking of assignments and exams.

In a post-Fordist scenario of ‘flexible production and delivery’, the tasks of tenured academic staff are disassembled into separate and distinct activities of: research; teaching material production; teaching material delivery; teaching material distribution; and assessment. When these academic tasks are broken down into modular supply chain components, they may be sub-contracted to any number of short-term contract suppliers (generally limited-term contract employees). As higher quality and or cheaper suppliers become available, the post-Fordist system enables cost reductions to be achieved by disintermediating

³⁷⁰ Lipietz, A., ‘The Post-Fordist World: Labour Relations, International Hierarchy and Global Ecology’, *Review of International Political Economy*, 4:1, Spring, 1997: 1-41, p. 2.

the traditional tenured academic out of the new ‘flexible production and delivery’ process. This situation bears some resemblance to Gibbons Mode 1 and Mode 2 typology. However instead of working at the individual and research team level where individuals form short term multidisciplinary research teams around specific research problems, firms form short-term multifunctional research, design and production teams cooperating to produce a product from multiple component and service suppliers.

6.9.4 Varied theoretical approaches to post-Fordism

A variety of theoretical models have been constructed to portray post-Fordism. It has been argued that these theoretical models provide a range of perspectives which are each located at differing levels of analysis. The differing levels of analysis enable the various post-Fordist theories to be viewed as complementing each other rather than competing with one another. A summary of these various approaches to post-Fordism is provided in Table 6.3.

Amin observes that at least three separate theoretical positions can be identified in the post-Fordist debate.³⁷¹ Elam categorises these theoretical models³⁷² as: the Neo-Schumpeterian approach as developed by Freeman and Perez³⁷³ (classified as being at the Meta level of analysis in Table 6.3); the Neo-Marxist or French Regulation School approach³⁷⁴ (classified as being at the Macro level of analysis in Table 6.3); and the Neo-Smithian or flexible specialisation approach as developed by Piore and Sabel³⁷⁵ (classified as being at the Meso level of analysis in Table 6.3).

³⁷¹ Amin, A., *op.cit.*, p.6.

³⁷² Elam, M., ‘Puzzling out the Post Fordist Debate’, Chapter 2 in, Amin, A. (ed.), *Post-Fordism: A Reader*, Blackwell Publishers, Oxford, 1994, p.44.

³⁷³ Examples include, Freeman, C., and Louca, F., *As Time Goes By: From the Industrial Revolution to the Information Revolution*, 2001, and Perez, C., *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*, 2002.

³⁷⁴ Examples include, Aglietta, M., *A Theory of Capitalist Regulation*, 1979, and Boyer, R., *The Regulation School: A Critical Introduction*, 1990.

³⁷⁵ Examples include, Piore, M. and Sabel, C., *The Second Industrial Divide*, 1984.

6.10 Neo-Schumpeterian theory as a meta-theory

The value of locating theories of post-Fordism in Table 6.3 is that it illustrates the utility of Neo-Schumpeterian theory as a meta-theory. That is, it can contain and provide an explanatory model for theories at lower levels of analysis. For example, Neo-Schumpeterian theory can describe the lower-level analytic theories as examples of explanatory theories residing, and attempting to explain phenomena, within the Fifth Kondratiev techno-economic cycle. Structured in this manner, it is also useful as a theoretical framework for assessing implications for the higher education sector.

Similarly, Neo-Schumpeterian theory can usefully explain Fordist theories as theoretical elements inherent in the Fourth Kondratiev techno-economic cycle. So, instead of competing with the various theories, Neo-Schumpeterian theory can be interpreted as overarching other theories and interpreting them as socially constructed elements of a particular techno-economic paradigm.

Whilst the example illustrated above was that of post-Fordism, the meta-theoretical nature of Neo-Schumpeterian theory enables it to also be capable of theoretically positioning other lower-level theories within the framework of particular techno-economic paradigms. For example, Table 6.2 detailed the economic, political, organisational, production, regulatory, epistemological and narrative models utilised as explanatory devices in the Fifth Kondratiev economic cycle.

Level of analysis	Analytical approaches	Main proponents	Argument/focus
Meta	Heterodox School	Freeman; Perez; Nelson and Winter; Soete; Dosi; <i>Gibbons; Barras;</i> <i>Johnston.</i>	Shift in dominant techno-economic paradigm; evolutionary adaptation of society
Macro	Regulationist School	Aglietta; Boyer; Lipietz	Internal contradictions between accumulation regime and mode of regulation
	Amsterdam School	van der Pijl; Overbeek	Retreat from interventionist to monetarist state policies: triumph of neoliberalism in USA and UK
Micro	Cooperative management of firms	Mathews; Coriat; Kenney and Florida	Innovation and flexibility based on labour as a resource rather than as a cost
Meso	Flexible specialisation Thesis	Piore and Sabel; Hirst and Zeitlin; <i>Badham</i>	Networks of small artisan firms represent new type of division of labour; rise of industrial district (Emilia-Romagna)

Table 6.3: Summary of Approaches to Post-Fordism
(based on Ruigrok, W. and van Tulder, R., The Logic of International Restructuring)³⁷⁶
modifications to table denoted by *italicised text*.

6.11 Conclusion

This chapter deconstructed Neo-Schumpeterian cycle theory and identified it as an endogenous economic model based on the theories of Joseph Schumpeter which drew on the instrumentalist methodology of Austrian philosophy of science, Kondratiev long wave economic theory and elements of Marxian theory. Schumpeter's theories were also identified as being firmly grounded in the Counter-Enlightenment tradition and economic theorising that had been underway for some time in Germany and the Austro Hungarian Empire of the late 19th and early 20th

³⁷⁶ Ruigrok, W. and van Tulder, R., The Logic of International Restructuring, Routledge, London, 1995, p.33.

centuries – even though Schumpeter’s theories appeared to be novel and innovative when introduced into the Anglo-Saxon economic tradition. Counter-Enlightenment theories are non-teleological and are based on evolutionary biological metaphors. In short they can accommodate change and innovation within their theoretical structures. As previously discussed in the chapters examining philosophical and historical foundations of the concept of innovation, Counter-Enlightenment theories also reject what has been termed in this thesis as the ‘Platonic paradigm’.

Neo-Schumpeterian theorists were identified as theorists whose conceptual models are based in whole or in part on the theories of Joseph Schumpeter. These theories were explored and the concept of techno-economic paradigms was introduced. Techno-economic paradigm change was demonstrated to involve not only a change in technology systems, but also changes in the supporting socio-institutional structures. This process is referred to as ‘Creative Destruction’ by Schumpeter and Neo-Schumpeterian theorists.

The Fifth Kondratiev techno-economic paradigm was deconstructed into its various component models. These included economic, political organisational, production, regulatory, epistemic and narrative models. It was observed that in addition to new models evolving to assist the introduction of the new paradigm, older models of the previous paradigm must also adapt or make way through the process of ‘creative destruction’. In the case of the Fifth Kondratiev techno-economic paradigm, the older Fourth Kondratiev models adapted or became obsolete as the newer paradigm emerged.

An example of the change of production concepts from the Fourth Kondratiev to the Fifth Kondratiev was provided as the shift from Fordist to post-Fordist ‘flexible production and delivery’ models. It was also demonstrated that the Fordist and post-Fordist concepts could be situated within alternative theoretical frameworks. It was argued that ordering these concepts in this way illustrated the theoretical power of Neo-Schumpeterian theory to create an overview of each techno-economic paradigm and categorise theories at lower conceptual levels within it.

An example of the implications of the transition from a Fourth Kondratiev Fordist model to a Fifth Kondratiev Post-Fordist ‘flexible production and delivery’ model was provided from the Higher Education sector. The example demonstrated potential changes in work organisation for higher education academics and illustrated the transition from full-time tenured positions to part-time or casual positions that can take, and has taken, place in the higher education sector.

Chapter 7 will extend this Neo-Schumpeterian overview to investigate the various socio-institutional component models of the Fifth Kondratiev techno-economic paradigm such as Neo-Liberalism, New Public Sector Management and Postmodernity.

Chapter 7. Political, Economic and Epistemological Theories of the Fifth Kondratiev

Ideology and politics are in the end the guiding forces of the possible.³⁷⁷

...the successful flourishing of the microelectronics revolution ... facilitated the unearthing of the *laissez-faire* philosophies and the neo-classical theories in economics championed by the Thatchers and the Reagans.³⁷⁸

Neoliberalism...proved more than a little compatible with that cultural impulse called 'postmodernism' which had long been lurking in the wings but could now emerge full-blown as both a cultural and intellectual dominant.³⁷⁹

...most social theorists are now in agreement (though they may not use the same terminology to discuss it) that at present we are in transition from one kind of society to another: the current code suggests from modernity to postmodernity.³⁸⁰

Postmodernism is thus the supplanting of the Enlightenment with its roots in seventeenth-century English philosophy by the Counter-Enlightenment with its roots in eighteenth-century German philosophy.³⁸¹

The Enlightenment traced its intellectual heritage to the Socratic philosophers, whereas the Counter-Enlightenment drew its inspiration from the Pre-Socratic philosophers.³⁸²

7.1 Introduction

The previous chapter discussed the theories of Joseph Schumpeter and located them within the context of the German and Austrian Counter-Enlightenment tradition. Neo-Schumpeterian theorists were introduced and identified as theorists whose conceptual models draw on the theories of Joseph Schumpeter. The concept of techno-economic paradigm was discussed and changes in techno-economic paradigms were linked to accompanying changes in socio-institutional structures.

According to Schumpeterian theory, these types of changes were often accompanied by a process of 'creative destruction' whereby socio-institutional arrangements of the

³⁷⁷ Perez, C., 'Rethinking Globalization after the collapse of the financial bubble: an essay on the challenges of the third millennium', Paper presented at the First Globelics Conference Rio, November 2-6, 2003, p.15.

³⁷⁸ Perez, C., Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages, Edward Elgar Publishing Limited, United Kingdom, 2002, p.146.

³⁷⁹ Harvey, D., A Brief History of Neoliberalism, Oxford University Press, Oxford, 2005, p.42.

³⁸⁰ Oliver, M., 'Decoupling Education Policy from the Economy in the Late Capitalist Societies: Some Implications for Special Education', Keynote Speech delivered at the International Special Education Congress 2000, 'Including the Excluded', University of Manchester, 24th-28th July, 2000, accessed at <http://www.isec2000.org.uk/abstracts/keynotes/oliver.htm>

³⁸¹ Hicks, S., Explaining Postmodernism: Skepticism and Socialism from Rousseau to Foucault, Scholarly Publishing, Tempe, 2004, p.43.

³⁸² Stevenson, L., 'private communication', 12/7/11.

previous techno-economic paradigm were dismantled to make way for newer arrangements. Specific examples of socio-institutional changes from the Fourth Kondratiev techno-economic paradigm to the current Fifth Kondratiev techno-economic paradigm were provided.

This chapter will examine the concepts of 'Neoliberalism' and 'postmodernism'. It will also assess their role in the processes of transition linked to a new techno-economic paradigm and related processes of socio-institutional change. The concept of 'Neoliberalism' will be examined and linked to Austrian economic and philosophical theory. 'Neoliberalism', or 'economic rationalism', has been identified by Perez as the political template of the Fifth Kondratiev techno-economic paradigm which has displaced Keynesian economic theory of the Fourth Kondratiev techno-economic paradigm.

Keynesian theory has been linked to Social Democratic theories which were based on Enlightenment theories. It is argued that the transition from the Fourth to the Fifth Kondratiev techno-economic paradigm has involved the use of Neoliberal theories which are based on Counter-Enlightenment thought, replacing Keynesian theories which are based on Enlightenment thought. Previous chapters argued that Enlightenment thought, based on Platonic philosophy, was not conducive to innovation. Due to this intellectual heritage, it will be argued that Keynesian economic theory also contains a lacuna in relation to innovation.

The chapter's focus will then shift to an examination of postmodernism. The theoretical findings of previous chapters, and their implications for innovation, will be utilised by linking the phenomenon of postmodernism to the German and Austrian Counter-Enlightenment tradition which rejected Platonic philosophy. It will be argued that postmodernism's theoretical ancestry can also be traced to theorists who were educated in the elite Viennese Gymnasiums of the nineteenth and twentieth centuries which, in turn, were influenced by the Counter-Enlightenment tradition.

The sceptical theories of postmodernism can be directly linked to the mature works of students of the Austrian Gymnasium system such as Wittgenstein, Hayek, Popper and Schumpeter. As previously discussed, these theorists have been extremely

influential in shaping the intellectual landscape which dominates contemporary economic, political, scientific and philosophical thought in the twentieth and twenty-first centuries. Their combined influence has particularly shaped contemporary attitudes and approaches to innovation.

The phenomena of innovation and technological and socio-institutional change have been linked to the concepts of Neoliberalism and postmodernism by a number of theorists. As such, their theories are also playing a significant role in assisting the current techno-economic and socio-institutional paradigm change. It will be observed that the ascendancy of theories drawing on the sceptical tradition appear to have coincided with techno-economic paradigm changes and have assisted the ‘creative destruction’ process involved in techno-economic and socio-institutional paradigm transitions. ‘Philosophical Scepticism’ could be said to act as an intellectual ‘solvent’ by questioning the ‘theoretical glue’³⁸³ of previous techno-economic paradigms’ founding premises and belief systems.

The political and economic philosophies that assist the introduction of new techno-economic paradigms and socio-institutional arrangements are those which assist in the ‘creative destruction’ of those which were in place for the previous techno-economic paradigm. In this case, they were social democracy, Keynesianism, regulation and centrally planned economies. The contemporary political and economic philosophies identified as assisting in the process of ‘creative destruction’ of the previous Keynesian techno-economic paradigm are ‘neoliberalism’ or ‘economic rationalism’ which promotes competition, deregulation, individualism and market-led economies.

7.2 Information and Communication Technology in the Fifth Kondratiev

*Information technology is the privileged technology of neoliberalism.*³⁸⁴

As discussed above, Neo-Schumpeterian theorists argue that the new techno-economic paradigm is based upon Information and Communication Technology (ICT). The generic technology in this techno-economic paradigm is the

³⁸³ This term originally used by Reed, M., referred to by Thompson, P. and McHugh, D., Work Organisations: A Critical Introduction, (Second Edition), Macmillan Press, London, 1995, p.381.

³⁸⁴ Harvey, D., op.cit., p.159.

microprocessor which has numerous applications across multiple carrier branches of the economy. The distributive network is the telecommunication system, more recently exemplified by the Internet. The power of ICT lies in its ability to digitise, process, store, manipulate and distribute the ‘raw material’ of this paradigm which is digital content in the form of data, information (which can be text, sound or graphic), and knowledge.

7.2.1 Socio-institutional implications of the Fifth Kondratiev

New techno-economic paradigms also have socio-institutional implications.

According to Freeman, these ‘socio-institutional’ implications include

...not only social, political and managerial change’ and ‘...management and organisation at the level of the firm ... [but also] the entire system of social and political regulation. This is particularly obvious in such areas as education and training, where the strong demand for new skills drives the changes...³⁸⁵

The socio-institutional implications of the Fifth Kondratiev long wave or Information and Communication Technology paradigm will now be discussed, commencing with the Neoliberal political philosophy which has been identified by Perez as a template of change for the new techno-economic paradigm.

7.2.2 Neoliberalism as a Socio-institutional Change Template

Previous chapters have discussed the Neo Schumpeterian theory of techno-economic paradigms (or Kondratiev cycles). Neo-Schumpeterian theorists, such as Freeman and Perez, acknowledge the importance of socio-institutional arrangements in the transition to a new techno-economic paradigm. Carlotta Perez argues that until the mismatches between a new techno-economic paradigm and the socio-institutional structures of the previous techno-economic paradigm are overcome, an economic system will not return to a full growth potential.

Therefore, according to this perspective, leading economies at the international level will be those which are most successful at rapidly reforming their socio-institutional structures to harness the ‘best practise’ efficiencies of a new techno economic paradigm. However this raises the question as to how an economy would go about

³⁸⁵ Freeman, C., ‘Preface’, in Perez, C., op.cit., p.x.

setting in place ‘appropriate’ reforms which would be implemented by a national economy to achieve these ends.

According to the Neo-Schumpeterian theorist, Carlotta Perez, “the question of social and institutional change is a political question”.³⁸⁶ Perez further argues that ‘... neoliberalism is the only coherent programme that has adopted the present [techno-economic] paradigm’.³⁸⁷ However, Perez’s observations do not necessarily imply that Neoliberalism is the only possible political programme that could guide the socio-institutional adaptations to the new techno-economic paradigm.

Illustrating this, Perez argues that

What a paradigm determines is the vast range of the possible and that space is very wide indeed.³⁸⁸

To demonstrate this point, Perez observes that in the previous techno-economic paradigm (the Fourth Kondratiev), four different socio-institutional systems were applied by adapting nations, with varying degrees of success. According to Perez, these Fourth Kondratiev socio-political models included: Keynesian democracies; Nazi-Fascism; Soviet Socialism; and (in the Third World) State Developmentalism.³⁸⁹

Therefore, according to these theoretical considerations, the socio-institutional outcomes of a new techno-economic paradigm cannot be predetermined but are the result of ongoing negotiations between the various institutions and interest groups, each with their own sets of agendas. So, although Perez argues that it is possible for a range of socio-political models to assist the transition to a new techno-economic paradigm, Perez has also observed that currently, Neoliberalism is the only one to have done so.³⁹⁰ It will be recalled that a key part of the introduction of a new techno-economic paradigm and its accompanying socio-institutional arrangements

³⁸⁶ Perez, C., ‘Technological Revolutions, Paradigm Shifts and Socio-Institutional Change’ in Reinert, E. (ed.), Globalisation, Economic Development and Inequality: An Alternative Perspective, Edward Elgar, Cheltenham, UK downloaded from <http://www.carlotaperez.org/indexofpapers1.htm>, p.23.

³⁸⁷ Perez, C., ‘Technological Change and Opportunities for Development as a Moving Target’, CEPAL Review, 75, December, 2001, p.128.

³⁸⁸ Perez, C., ‘Technological Revolutions, Paradigm Shifts and Socio-Institutional Change’, op.cit., p.20.

³⁸⁹ Ibid., and also in Perez, C., op.cit., 2002, p.7.

³⁹⁰ Perez, C., op.cit., 2001, p.128.

is the ‘creative destruction’ of the socio-institutional arrangements of the previous techno-economic paradigm. Further demonstrating her Schumpeterian theoretical credentials, Perez argues that

The neo-liberal version of globalization applied up to now can be said to have accomplished the “destruction half” of institutional creative destruction. Perhaps that was unavoidable given the differences between the mass production paradigm and this one and the need to dismantle much of the institutional framework set up for the previous. ... But, a new global framework adequate to the new paradigm has not been put in place. ... Ideology and politics are in the end the guiding forces of the possible. The neo-conservative forces are involved in attempting to bring back the casino economy and in trying to solve complex socio-political problems with war. The left is resisting globalization, in general, assuming it is necessarily neo-liberal.³⁹¹

Perez has argued that Neoliberalism has played a key role in the introduction of the new information technology techno-economic paradigm and the ‘creative destruction’ of the previous techno-economic paradigm. We will now turn our examination to this by discussing definitions of Neoliberalism, examining its political template and contrasting it with the previous Keynesian paradigm.

7.2.3 Definitions of ‘Neoliberalism’

‘Neoliberalism’ broadly means the project of economic and social transformation under the sign of the free market.³⁹²

Although the term ‘Neoliberalism’ is often referred to in the literature, it is used in such a way that assumes the reader is familiar with its underlying political and economic philosophies and policies. There appears to be no definitive reference to ‘Neoliberalism’ in Perez’s work. Other sources vary in the characteristics they attribute to the term, however one source deftly summarises ‘Neoliberalism’ as giving ‘primacy to the market over the state as a societal steering mechanism...’³⁹³ Another source supports and expands upon this definition of Neoliberalism arguing that

The free market is the central image in neoliberal discourse, and deregulation of markets, especially capital markets, was among the earliest and most important neoliberal policies.³⁹⁴

³⁹¹ Perez, C., *op.cit.*, 2003, pp.15-16.

³⁹² Connell, R., Fawcett, B. and Meagher, G., ‘Neoliberalism, New Public Management and the human service professions: Introduction to the Special Issue’, *Journal of Sociology* 45 (4), 2009, p.331.

³⁹³ Henry, M., Lingard, B, Rizvi, F. and Taylor, S., *The OECD. Globalisation and Education Policy*, IAU Press, Pergamon, Oxford, 2001, p.28.

³⁹⁴ Connell, R., Fawcett, B. and Meagher, G., *op.cit.*, p.331.

Campbell argues that ‘Neoliberalism is a particular organisation of capitalism. Its birth consisted of a reorganisation of the previous organisation of capitalism’.³⁹⁵ Campbell’s analysis can be interpreted as being consistent with Perez’s in that, according to these two analytical models, a particular techno-economic paradigm can potentially adopt a variety of political templates.

For example, according to Campbell’s theoretical unpacking, globalisation, technological change driven internationalisation and intensified international competition would have all been possible in capitalist economies other than those adopting Neoliberalism as a template. Perez’s identification of four different capitalist models adapted by various nations in the ‘Fourth Kondratiev’ techno-economic paradigm provided an illustration of this phenomenon earlier in this chapter.³⁹⁶

Peters and Roberts observe that in Australia, ‘Neoliberalism’ is also used interchangeably with the terms ‘Economic rationalism’ or ‘free market liberalism.’³⁹⁷ The appropriation of the word ‘rational’ to ‘economic rationalism’ has been described as a ‘propaganda coup of the highest order’.³⁹⁸ However, the term was used previously by Weber in his 1904 work ‘The Protestant Ethic and the Spirit of Capitalism’ and also in 1926 by Tawney in ‘Religion and the Rise of Capitalism’.³⁹⁹ In the Australian context, the term came to prominence with the 1991 publication of Pusey’s work ‘Economic Rationalism in Canberra’.⁴⁰⁰ Neoliberalism has also been referred to as ‘Thatcherism’ in the United Kingdom, ‘Reagonomics’ in the United States and ‘Rogernomics’ in New Zealand (after the

³⁹⁵ Campbell, A., ‘The Birth of Neoliberalism in the United States: A Reorganisation of Capital’, Chapter 22 in Saad-Filho, A. and Johnston, D., Neoliberalism: A Critical Reader, Pluto Press, London, 2005, p.197.

³⁹⁶ Perez, C., ‘Technological Revolutions, Paradigm Shifts and Socio-Institutional Change’ op.cit., p.20.

³⁹⁷ Peters, M. and Roberts, P., University Futures and the Politics of Reform in New Zealand, Dunmore Press, New Zealand, 1999, p.11. and also Marginson, S., The Free Market: A Study of Hayek, Friedman and Buchanan and their Effects on the Public Good, Public Sector Research Centre, University of New South Wales Printing Unit, 1992, p.2.

³⁹⁸ Ormerod, P., The Death of Economics, Faber, London, 1994, pp.111-112.

³⁹⁹ Burton, T., Dollery, B. and Wallis, J., ‘A note on the Debate over “Economic Rationalism” in Australia: An Application of Albert Hirschman’s *Rhetoric of Reaction*, University of New England School of Economics, Working Paper Series in Economics, No.2001-15 – December 2001, p.3.

⁴⁰⁰ Pusey, M., Economic Rationalism in Canberra: A Nation Building State Changes its Mind, Cambridge University Press, Cambridge, 1991.

respective championing Prime Minister, President and Treasurer). Neoliberalism has also been identified as a ‘conservative economic philosophy’.⁴⁰¹

The term ‘Neoliberalism’ is most often encountered as referring to economic philosophies applied in Latin America and New Zealand (where the term is used to refer to this particular set of economic policies). Another term used interchangeably with ‘Neoliberalism’ is ‘market fundamentalism.’⁴⁰² The terms ‘Washington Consensus’ (in popular usage, however this is contested by John Williamson, the economist who coined the term⁴⁰³) and ‘Chicago School’ are also occasionally used synonymously with ‘Neoliberalism’. Having identified the inter-changeability of the terms ‘Neoliberalism’ and ‘Economic rationalism’, the terms will be equated for the purposes of this thesis.

7.2.3 Distinguishing features of ‘Neoliberalism’

...neoliberalism is not just an economic policy agenda...it is also an agenda of cultural change and institutional change...⁴⁰⁴

Astute observers who have witnessed regulatory changes in Australia over the last thirty years will be familiar with some of the outcomes of Neoliberal inspired policies, even though they may not be aware that these changes formed part of a Neoliberal informed restructuring program. In the Australian context, an obvious example is the floating of the Australian dollar in December, 1983.

Peters and Roberts have compiled a comprehensive list of policies which formed part of the Neoliberal restructuring program. For example, they argue that:

⁴⁰¹ Palley, T., ‘From Keynesianism to Neoliberalism: Shifting Paradigms in Economics’, Chapter 2 in Saad-Filho, A. and Johnston, D., *op.cit.*, p.20.

⁴⁰² Williamson, J., ‘What should the bank think about the Washington Consensus?’, Paper prepared as a background to the World Bank’s World Development Report 2000, July 1999, Institute for International Economics, p.1, accessed at <http://www.iie.com/publications/papers/paper.cfm?ResearchID=351> July 23, 2006.

⁴⁰³ Williamson, J., *op.cit.*

⁴⁰⁴ Connell, R., Fawcett, B. and Meagher, G., *op.cit.*, p.333.

Some distinguishing features of the neo-liberal paradigm for economic restructuring include the: floating of the exchange rate; encouragement of foreign direct investment; downsizing and commercialisation of the public sector;⁴⁰⁵ the reduction of the role of the state; the privatisation of state assets; the abolition of state subsidies and tariffs, allowing 'free market forces' to prevail; and the encouragement of high levels of foreign direct investment with the consequences of providing a high degree of 'freedoms' to multinational corporations at the expense of civil society and public good institutions at the national level.⁴⁰⁶

The distinguishing features of Neoliberalism as identified by Peters and Roberts are placed in context when it is recognised that they were in stark opposition, and a reaction, to features of the previous economic paradigm, 'Keynesianism'. Therefore, according to the principle of 'Creative Destruction' the introduction of Neoliberalism necessitated the partial or whole removal of Keynesian economic and institutional arrangements. Harvey supports this interpretation when he argues that,

The process of neoliberalization has ... entailed much 'creative destruction' ... of prior institutional frameworks and powers...⁴⁰⁷

This interpretation is very compatible with Neo-Schumpeterian techno-economic paradigm change theories. From a theoretical innovation perspective, this process of creative destruction which removed the previous Keynesian socio-institutional arrangements also '... provided an ideal corrective to Keynes's fatal omission of innovation's important role in capitalist evolution.'⁴⁰⁸

7.2.4 Neoliberalism as a reaction to Keynesian economics

Neoliberalism is a particular organisation of capitalism. Its birth consisted of a reorganisation of the previous organisation of capitalism [Keynesianism].⁴⁰⁹

To clarify an understanding of Neoliberalism as an ordering principle of capitalism, it is useful to examine it within the context of the previous capitalist organisational ideology which is referred to as 'Keynesianism'. The Keynesian economic model came to prominence as a response to the Great Depression of the 1930s and remained the dominant economic paradigm until the 1970s.⁴¹⁰ However, it should be noted that Keynesian economics '...was based on *political*, not economic

⁴⁰⁵ Peters, M. and Roberts, P., *op.cit.*, p.58.

⁴⁰⁶ *Ibid.*, p.79.

⁴⁰⁷ Harvey, D., *op.cit.*, p.3.

⁴⁰⁸ McCraw, T., *op.cit.*, p.492.

⁴⁰⁹ Campbell, A., *op.cit.*, p.197.

⁴¹⁰ Palley, T., *op.cit.*, p.21.

foundations'.⁴¹¹ In fact a biographer of Keynes described him as '...a political economist.'⁴¹² This observation reinforces Perez's assertion that 'Ideology and politics are in the end the guiding forces of the possible'.⁴¹³

According to Keynes biographer, '...the unstated message' of Keynesianism was 'the state is wise and the market is stupid'.⁴¹⁴ This is in direct contrast to Neoliberalism which regards the market as 'wise'. Campbell has identified the key elements of Keynesian economic policies as:

... specific restrictions on certain behaviours of some capitals, above all finance capitals both domestic and international behaviours; macroeconomic intervention policies to stimulate the economy, both monetary and fiscal'; and 'certain labour and welfare policies'.⁴¹⁵

However, one of the shortcomings of Keynesian economic policy was its lack of a theoretical treatment of the important role of innovation in dynamic, capitalist economies. For example, in what is generally regarded as Keynes' most important work, 'The General Theory of Employment, Interest and Money',⁴¹⁶ Keynes does not make a single reference to innovation. This deficiency in Keynesian economic theory was criticised by later, mainly Austrian, economic theorists.

The 1970s and 1980s witnessed the end of the post-war long boom and the collapse of Keynesian techniques of national economic management due to the 'failure of Keynesian economists to provide answers to the combined problems of inflation and unemployment'.⁴¹⁷ This signalled an end to Keynesian inspired government intervention in the economy and a reduction in the size of government. In the Australian context, Macintyre and Marginson claim that following the crisis of the Keynesian economic model

⁴¹¹ Cockett, R., Thinking the Unthinkable: Think-Tanks and the Economic Counter-Revolution, 1931- 1983, Fontana Press, London, 1995, p.46.

⁴¹² Cockett, R., op.cit., p.46.

⁴¹³ Perez, C., op.cit., 2003, p.15.

⁴¹⁴ Yergin, D. and Stanislaw, J., op.cit., p.42.

⁴¹⁵ Campbell, A., op.cit., p.189.

⁴¹⁶ Keynes, J.M., The General Theory of Employment, Interest and Money, Macmillan, London, 1936.

⁴¹⁷ Sawyer, M., Australia and the New Right, George Allen and Unwin, North Sydney, 1982, p.1.

...there was a move to reduce public outlays, deregulate and seek greater competitive efficiency by exposing public institutions to market forces. The new orthodoxy affected health, telecommunications and other utilities as well as education, and it subsumed the distinctive features of public policy ... that had served national goals. The expectation was that such changes would assist Australia to compete in the global economy...⁴¹⁸

The ‘winding back of Keynesian economic policies and their replacement with neoliberal policies was a process that spanned many decades’.⁴¹⁹ The task of changing public attitudes from one of active hostility to passive acceptance involved all the factors that are involved in a Kuhnian paradigm shift. Entrenched interests that stood to lose under the new Neoliberal paradigm mounted theoretical counter-attacks in an attempt to resist the changes. However philosophers and economists had been preparing the Neoliberal economic and political philosophy for some time and were well organised and proceeded to move towards achieving hegemony. Tracing the process involved in Neoliberalism gaining a hegemonic ideological position is instructive in itself.

7.2.6 Origins of Neoliberalism

One of the most influential societies contributing to the origin of the contemporary Neoliberal landscape is the Mont Pelerin Society. The Mont Pelerin Society was strongly influenced by Austrian economics due to the origins of many of its members. It also provides further evidence of the influence of Viennese intellectual refugees in the shaping of contemporary economic, political and philosophical issues. Although a number of theorists have contributed to the construction of contemporary neoliberal economic theory, Friedrich von Hayek has been identified as ‘neoliberalism’s guru’.⁴²⁰

After leaving Austria, Hayek’s influence became widespread on numerous continents partially due to Professorial appointments at several centres of influence.

Peet records that

Hayek became a professor at the London School of Economic (1931–1950), the University of Chicago (1950–1961), and Freiburg University in West Germany (until his death in 1992). Von Hayek was also mentor to the Mont Pelerin Society, begun in 1947 in Switzerland.⁴²¹

⁴¹⁸ Macintyre, S. and Marginson, S., ‘The University and its Public’ in Coady, T., Why Universities Matter, Allen and Unwin, St.Leonards, 2000, pp.66-67.

⁴¹⁹ Campbell, A., op.cit., p.189.

⁴²⁰ Peet, R., ‘Globalism and Neoliberalism’, Chapter 1 in Unholy Trinity: The IMF, World Bank and WTO, Zed Books, London, 2003, p.10.

⁴²¹ Ibid.

7.2.7 *Hayek, Friedman and the Mont Pelerin Society*

The Mont Pelerin Society was established in 1947 by a small group of classical liberal intellectuals. The term “liberal”, in its European sense, epitomises ‘a preference for minimal and dispersed government...’⁴²² The society was founded by the Austrian economist Friedrich Hayek. Other founding members of the society included ‘future Nobel laureate economists Milton Friedman, George Stigler, and Maurice Allais.’⁴²³ Other members included philosophers Karl Popper, Michael Polanyi and ‘Hayek’s mentor Ludwig von Mises.’⁴²⁴

The ‘economic rationalist’ (or ‘neoliberal’) blueprint for reform can be identified in the works of the above economists. In particular, the works of Hayek and Friedman. For example, Friedman argued in his 1962 work titled ‘Capitalism and Freedom’ for the establishment of floating exchange rates, free trade, for-profit educational institutions, educational ‘vouchers’ and a student contribution scheme.⁴²⁵ The Mont Pelerin Society can be identified as a response to the predominant Keynesian economic theories of the time. The founder, Hayek, has been described as ‘...the most vocal critic of Keynes’ work [which] ... Hayek believed was based on error.’⁴²⁶

Neoliberalism, as exemplified by Hayek, argued that politics should not aim for any particular end point or goal, but instead allow political, institutional and social arrangements to evolve of themselves in the marketplace. Ideally, according to Hayek, this removes the necessity for large centralised government structures formulating and implementing policy. A number of arguments were offered to justify this, for example, Hayek argues that a centralised government cannot possibly process and distribute all the relevant information from widespread sources in a timely or efficient manner. He also criticised ‘the limitations and rigidity of central planning and, its fatal flaw, its inability to innovate.’⁴²⁷

⁴²² Mont Pelerin Society, ‘About the Mont Pelerin Society: Short History and Statement of Aims’, accessed at <http://www.montpelerin.org/aboutmps.html>, November 27, 2001.

⁴²³ Postrel, V., ‘After Socialism’, *Reason*, November, 1999, accessed at <http://reason.com/9911/fe.vp.after.shtml>, downloaded Tuesday, November 27, 2001.

⁴²⁴ *Ibid.*

⁴²⁵ Friedman, M., *Capitalism and Freedom*, The University of Chicago Press, Chicago, 1962, pp. 71, 73, 89 and 105.

⁴²⁶ Yergin, D. and Stanislaw, J., *op.cit.*, p.142.

⁴²⁷ *Ibid.*, p.22.

The collapse of the Soviet Union was cited as an example of the failure of central planning and distribution. Economic rationalists such as Hayek argued that the ‘market’ is much more efficient at achieving efficient allocation of resources. For example, Olssen and Peters support this observation when they comment that:

Amongst the major themes of his [Hayek’s] economic and social philosophy are his argument that ‘local knowledge’, as is found in markets, is always more valid and effective than the forms of codified text-book-type knowledge that it is possible to introduce through planning. For this reason, markets have distinct advantages over state regulation or planning.⁴²⁸

Hayek’s philosophical worldview reflected that of his educational background in the Austrian School of Economics tradition. A recent observer argues that ‘Evolution in non-predetermined ways is the model that underlies the Austrian worldview, as well as most of the liberal reforms of the past 20 years’.⁴²⁹

Reflecting its English liberal philosophical heritage, the ‘Austrian worldview’ rejects any

...design or plan for society - religious, utopian, or ethical. Liberals feel that society and state should not have fixed goals, but that ‘process should determine outcome’. This anti-utopianism became increasingly important in liberal philosophy, in reaction to the Communist centrally-planned economies: it anticipated the extreme deregulationism of later neo-liberalism.⁴³⁰

From this perspective, the Mont Pelerin Society can be interpreted as providing the theoretical critiques of Keynesianism which were required to begin the process of ‘creative destruction’ of the Keynesian theoretical paradigm. The theories of the Mont Pelerin Society began to gain influence when they were adopted by the British government of Margaret Thatcher and, in turn, the United States government of Ronald Reagan.

Harvey argues that popular consent was generated to legitimize neoliberalism through diverse channels. For example he observes that:

⁴²⁸ Olssen, M., and Peters, M.A., ‘Neoliberalism, Higher Education and the Knowledge Economy: From the Free Market to Knowledge Capitalism’, *Journal of Education Policy*, Vol.20, No.3, May, 2005, p.317.

⁴²⁹ Kasper, W., ‘Review of Baumol, W., “The Free Market Innovation Machine: Analysing the Growth Miracle of Capitalism”, Princeton University Press, 2002, in *Policy*, Vol.19, No.2, Winter, 2003, p.55.

⁴³⁰ Treanor, P., ‘Neoliberalism: Origins, Theory, Definition’, accessed at <http://web.inter.nl.net/users/Paul.Treanor/neoliberalism.html>, December 6, 2003.

Powerful ideological influences circulated through the corporations, the media, the numerous institutions that constitute civil society – such as universities, schools, churches and professional associations. The ‘long march’ of neoliberal ideas through these institutions that Hayek had envisioned back in 1947, the organisation of think-tanks (with corporate backing and funding), the capture of certain segments of the media, and the conversion of many intellectuals to neoliberal ways of thinking, created a climate of opinion in support of neoliberalism as the exclusive guarantor of freedom. These movements were later consolidated through the capture of political parties and, ultimately, state power.⁴³¹

Drawing on the theories of Classical Liberalism, the origins of the ideology of neoliberalism have been traced to ‘a number of coordinated centres of influence and persuasion’ including:

- ‘the Austrian School of Economics in Vienna in the early twentieth century;
- the London School of Economics in the 1930s;
- the Institute of Economic Affairs;
- the Centre for Policy Studies and Adam Smith Institute in London;
- the ordo-economics school of Walter Eucken and Franz Böhm at Freiburg;
- the Hoover Institution at Stanford University in California; and
- the intellectual capital of neoliberalism ... the Chicago School of Political Economy.’⁴³²

The gradual alteration of the climate of opinion towards neoliberal ideals also exercised an increasing influence over international and national policy making institutions.

7.2.8 The role of international and national institutions in propagating neoliberal discourse.

Neoliberal ideas and practices are dispersed in varying degrees of concentration across a vast intellectual, political and policy terrain, including international organisations, states, transnational corporations, academic approaches and development interventions.⁴³³

The construction and propagation of Neoliberal discourse by think tanks, media and research institutes influenced international policy organisations such as the International Monetary Fund (IMF) the World Bank and the OECD among others. International policy organisations such as these are extremely influential in the construction of national policies. The IMF and World Bank had traditionally been guided by Keynesian economics. However, according to Harvey, Joseph Stiglitz, former Chief Economist at the World Bank, refers to

⁴³¹ Harvey, D., *op.cit.*, p.40.

⁴³² Peet, R., *op.cit.*, p.9.

⁴³³ Sinha, S., ‘Neoliberalism and Civil Society: Project and Possibilities’, Chapter 19 in Saad-Filho, A. and Johnston, D., *op.cit.*, p.163.

...a 'purge' of all Keynesian influences from the IMF in 1982. The IMF and the World Bank thereafter became centres for the propagation and enforcement of 'free market fundamentalism' and neoliberal orthodoxy.⁴³⁴

In the case of Australia, Pusey argues that many

...conduits and agencies have helped to mediate economic rationalism into the Canberra state apparatus. These include Australia's foreign owned media, the New Right 'think tanks' and research centres that have had an enormous success in penetrating the Canberra apparatus, and thirdly, international economic organisations such as the World Bank and OECD'.⁴³⁵

In Australia, various think-tanks inspired by the Mont Pelerin Society, such as the Centre for Independent Studies, have popularised these economic and political philosophies. The Centre for Independent Studies was established in Sydney in 1976 following an Australian lecture tour by the Austrian economist Hayek. A sister organisation to the Centre for Independent Studies is the London-based Institute for Economic Affairs.

The Council of Advisers of the Centre for Independent Studies included F.A. Hayek, the prominent Austrian economist whose economic theories have contributed to shaping economic policy in most OECD countries. Members of the Centre for Independent Studies quarterly publication 'Policy' Editorial Advisor Council include prominent Australian academics Professor Lauchlan Chipman, Professor Ian Harper and Professor Warren Hogan.⁴³⁶

Professors Harper and Hogan are noteworthy in that they were prominent supporters of the Neoliberal inspired deregulation of the Australian financial sector. Hogan was a member of the Australian Federal Government's Campbell Committee Inquiry into the Australian Banking Sector which recommended the deregulation of the Australian Financial Sector. Hogan is also noteworthy as a Professor of Economics at the University of Sydney. Following his appointment in this post, the curriculum of the Economics Faculty was radically altered at the expense of the School of Political Economy which was disbanded (it had taught alternative economic theories to those of the free-market Monetarists).⁴³⁷

⁴³⁴ Harvey, D., *op.cit.*, p.29.

⁴³⁵ Pusey, M., *op.cit.*, p.13.

⁴³⁶ Centre for Independent Studies Limited, *Policy, Vol.18, No. 2*, Winter, 2002, Centre for Independent Studies Limited, St. Leonards, N.S.W.

⁴³⁷ Martin, B., Baker, C., Manwell, C., Pugh, C., (eds.), *Intellectual Suppression: Australian Case Histories, Analysis and Responses*, Angus & Robertson, North Ryde, N.S.W., 1986.

Another example of a Neoliberal philosophy ‘champion’ assisting the process of diffusion of Neoliberal ideas was Professor Lauchlan Chipman. Professor Chipman is a regular spokesperson, in print and at conferences, arguing for deregulation and for-profit universities. Chipman is the former Vice-Chancellor of Central Queensland University. Prior to this he held the posts of Pro Vice-Chancellor and also Professor and Head of the Department of Philosophy at the University of Wollongong. Chipman was a member of the Australian Committee to Review Higher Education Financing and Policy, also known as the West Review Committee which sat from January 1997 to April 1998. The final report of the West Committee, ‘Learning for Life’ ‘marked the official arrival of a pervasive market-logic in the organisation of Australian Higher Education.’⁴³⁸ Chipman has championed the concepts of ‘for-profit’ universities and ‘educational vouchers’ in the Australian media.

Other examples of the Neoliberal network of influence include Andrew Norton, who was a Centre for Independent Studies Research Fellow, the Director of the CIS Liberalising Learning Program, and Dr David Kemp’s Higher Education Adviser from 1997-1999. Dr. Kemp was the Minister for Education in the Howard Federal Government’s first and second terms of office. The Melbourne equivalent of the CIS is the Centre of Policy Studies housed at Monash University.

7.2.9 The Hegemony of Neoliberal discourse

The combined efforts of theorists and institutions such as these resulted in Neoliberalism becoming ‘...hegemonic as a mode of discourse’.⁴³⁹ Harvey argues that the hegemony of Neoliberal discourse

...has pervasive effects on ways of thought to the point where it has become incorporated into the common-sense way many of us interpret, live in, and understand the world.⁴⁴⁰

For example, by adopting a reflexive approach to this thesis, it is apparent that the hegemony of Neoliberal discourse has shaped the perspective and framing of one of the topics of concern, that is, ‘higher education sector innovation’, and is therefore a

⁴³⁸ Marginson, S., and Considine, M., The Enterprise University: Power Governance and Reinvention in Australia, Cambridge University Press, Cambridge, 2000, p.36.

⁴³⁹ Harvey, D., op.cit., p.3.

⁴⁴⁰ Harvey, D., op.cit., p.3.

product of the theoretical concerns of Neoliberal discourse. Earlier references to Kuhn and Perez in this thesis will also have alerted the reader to the similarity between this description of ‘Neoliberal hegemony’ and Kuhn’s description of a ‘normal science paradigm’ and also Perez’s description of a ‘techno-economic paradigm’.

The dispersion of Neoliberal discourse throughout organisations was not an automatic process. For example, Australian Public Sector organisations were structured upon Keynesian and Enlightenment principles. However, the implementation of Neoliberal principles into the Public Sector required an appropriate organisational theory.

7.2.10 Neoliberalism, Innovation and Public Sector Reform

...new public management theory, the organisational accomplice to neo-liberal economic theory⁴⁴¹

Deem argues that ‘Neoliberal discourse makes market-based conceptions of enterprise, entrepreneurship and innovation the dominant values and symbols.’⁴⁴² The ascendancy of the Neoliberal market-based discourse in OECD capitalist economies has witnessed an increasing reference to public-sector based organisations as constituting sub-sectors of the service sector of the broader private economy. This phenomenon has occurred in parallel to other Neoliberal inspired economic reforms within the public sector such as Public Sector Reform. Public Sector Reform is referred to by many names. For example, according to O’Brien,

Public sector restructuring has been variously called managerialism, New Public Sector Management, entrepreneurial government, post bureaucratic management and corporate management. The users of the different terms would agree that public administration has been replaced by public management.⁴⁴³

Connell argues that Neoliberal inspired New Public Management theory imports ‘schemes of organisation and control...from business to public institutions’.⁴⁴⁴ One

⁴⁴¹ Henry, M., Lingard, B., Rizvi, F., and Taylor, S. (eds.), *op.cit.*, p.99.

⁴⁴² Deem, R., Hillyard, S. and Reed, M., *Knowledge, Higher Education and the New Managerialism: The Changing Management of UK Universities*, Oxford University Press, USA, 2007, p.15.

⁴⁴³ O’Brien, J. and O’Donnell, M., ‘New Public Sector Management and Public Sector Employment Relations: United Kingdom, the United States and Australia’, *The Economic and Labour Relations Review*, Vol.13, No.1, June, 2002. Accessed at http://lcsw.labor.net.au/labor_review/90/update901.html, October 22, 2002.

⁴⁴⁴ Connell, R., Fawcett, B. and Meagher, G., *op.cit.*, p.334.

of the outcomes of the importation of New Public Management business organisational models into public institutions was that ‘...representative bureaucracy and industrial democracy’ were replaced ‘...by a new ethos of managerialism’.⁴⁴⁵ Another outcome was the ‘...shift from many-levelled, finely graded bureaucratic pyramids with strong professional specialisations, to ‘flat’ organizational structures and generic skills’.⁴⁴⁶

Deem argues that ‘...public sector work...differs significantly from that of the private sector in being more enduring and not oriented towards rapid product/service innovation’.⁴⁴⁷ This polarisation of organisational values between the private sector, which values innovation, and the public sector, which places value in conservatism and is not oriented towards rapid innovation, is a significant dichotomy within the context of Neoliberal inspired Public Sector Reform.

This dichotomy could also be said to reflect the Socratic/Pre-Socratic and Enlightenment/Counter-Enlightenment dichotomies previously discussed. For example, the Socratic and Enlightenment philosophies drew on the beliefs of enduring idealised values located in Platonic ‘forms’ which were not conducive to innovation. In contrast to this, Pre-Socratic and Counter-Enlightenment beliefs eschewed idealised values and were more pragmatic and materialistic and supportive of innovations.

Ball argues that Public Sector reforms

...play an important part in aligning public sector organisations with the methods, culture and ethical system of the private sector. The distinctiveness of the public sector is diminished. Indeed, such alignments create the pre-conditions for various forms of ‘privatization’ and ‘commodification’ of core public services.⁴⁴⁸

Neoliberal inspired Public Sector Reform’s role in preparing former public sectors for the competitive marketplace correlates with Barras’ insight that ‘public service sectors’ such as higher education needed to be transformed before they could become innovative. This aspect will be explored in further detail below.

⁴⁴⁵ Ibid.

⁴⁴⁶ Ibid.

⁴⁴⁷ Deem, R., Hillyard, S. and Reed, M., op.cit., p.41.

⁴⁴⁸ Ball, S., ‘The Teacher’s Soul and the Terrors of Performativity’, Journal of Education Policy, 2003, Vol.18, No.2, p.216.

Supporting this observation, Peters argues that this shift from a social democratic model to a neoliberal model reconstructed the manner in which education was perceived. Peters argues that

... under a social democratic model ... [education was] regarded as a universal welfare right'. However, under neo-liberalism it '... has been recast as a leading subsector of the economy and one of the main enterprises of the future "postindustrial" economy.'⁴⁴⁹

This is a significant statement. For example, Chapter Two discussed the statistical representation of education, and particularly Higher Education, as a sub-sector of the Services Sector. One of the outcomes of the reframing of education by Neoliberalism and new public management has been the '...delegitimizing [of] activities and values once associated with higher education – intellectual inquiry, social critique, curiosity-driven research, academic freedom and tenure'.⁴⁵⁰

Peters also observes that the Social Democratic model was based on principles of the Enlightenment. The Enlightenment ... proposed a '...narrative of emancipation through knowledge'.⁴⁵¹ Downes illuminates this statement when he observes that

Enlightenment thinkers ... believed that widespread knowledge would give average people the ability to reason for themselves.⁴⁵²

However, following the Counter-Enlightenment and '...the "crisis of reason" ... brought to our attention by epistemologists such as ... Wittgenstein and ... Kuhn', the grounds of the legitimation of knowledge and education have been questioned.⁴⁵³ Pusey also supports this interpretation when he argues that

According to the high theory of the doctrine of economic rationalism, epistemology [theories of knowledge] has followed ontology [theories of existence] (and philosophy) into oblivion.⁴⁵⁴

The linking of the Social Democratic Keynesian model with the principles of the Enlightenment and in particular, with the notion of 'emancipation through knowledge', provides an interesting and significant contrast to the Neoliberal model which is based upon the Counter-Enlightenment's questionings of 'the legitimation

⁴⁴⁹ Peters, M., (ed.), Education and the Postmodern Condition, Bergin and Garvey, Westport, 1995, pp.xxx-xxxi.

⁴⁵⁰ Henry, M., Lingard, B, Rizvi, F. and Taylor, S., op.cit., p.169.

⁴⁵¹ Peters, M., (ed.), op.cit., 1995, p.xxxv.

⁴⁵² Downes, L., The Laws of Disruption: Harnessing the New Forces that Govern Life and Business in the Digital Age, Basic Books, New York, 2009, p.202.

⁴⁵³ Peters, M., (ed.), op.cit., 1995, p.xxxiv.

⁴⁵⁴ Pusey, M., op.cit., p.21.

of knowledge and education'. It will be recalled that the Neoliberal model recasts education as a sub-sector of the postindustrial economy.

7.2.11 Performativity: the new legitimization of knowledge

Drawing on its Counter-Enlightenment theoretical roots, which rejected the 'Platonic paradigm' and questioned the basis of reason as the foundation of knowledge and buttressed by postmodern approaches to knowledge, Neoliberalism has based the new legitimization of knowledge on what has been termed 'performativity'. Peters, referring to Lyotard, argues that

Science and education are to be legitimated, in de facto terms, through the principle of performativity, that is, through the logic of maximization of the system's performance...⁴⁵⁵

Henry et. al. support this perspective and its implications and also link this development to postmodernity when they argue that

Performativity also relates to deeper epistemological changes [and] accompany what some see as postmodernity. As a consequence, there has been a greater recognition of the perspectival character of all knowledge claims... One result ... of the foregrounding of a culture of performativity has been the weight placed on the instrumental, operational and measurable rather than on claims made on the basis of truth.⁴⁵⁶

Examples of the introduction of 'performativity' measures in the higher education sector include the increasing use of 'Key Performance Indicators (or KPI's) and the rise of the 'audit culture'. For example, the University of Wollongong has appointed an Audit Officer whose sole function is to audit the performance of operational units on a range of measures, including financial, health and safety, security (physical and information), marketing, policy compliance, etc. The introduction of annual staff 'performance planners' also provides another example of the manifestation of the concept of 'performativity' in higher education settings.

7.3 Postmodernism and Knowledge production

Varying definitions of postmodernity and postmodernism can be located in the relevant literature. Whilst some sources refer to postmodernity as an era and postmodernism as a movement, others use the terms interchangeably. The latter practice will be adopted for the purposes of this thesis.

⁴⁵⁵ Peters, M., (ed.), op.cit., 1995, p.xxx.

⁴⁵⁶ Henry, M., Lingard, B, Rizvi, F. and Taylor, S., op.cit., p.34.

Sim argues that ‘A concern with knowledge production is in fact now seen as one of the hallmarks of a postmodern society’.⁴⁵⁷ Gibbons’ seminal work ‘The New Production of Knowledge’ can be interpreted as an example of this. Gibbons’ work, which was discussed in previous chapters, posited the knowledge production categories of ‘Mode 1’ and ‘Mode 2’. Gibbons also links ‘Mode 2’ knowledge production activities and postmodernism when he observes that

Mode 2 as expressed in the humanities and the arts, although not to be equated with postmodernism, shares in some of the same impulses.⁴⁵⁸

Cast in this light, Lyotard’s work ‘The Postmodern Condition’ which also addresses contemporary issues related to knowledge production, is particularly interesting as it also links the concepts of knowledge production and postmodernism. For example, Sim observes that Lyotard’s book ‘The Postmodern Condition: A Report on Knowledge (1979) is widely considered to be the most powerful theoretical expression of postmodernism’.⁴⁵⁹ Sim further observes that ‘The Postmodern Condition argues that knowledge is now the world’s most significant commodity...’⁴⁶⁰ In this respect, Lyotard is in agreement with the knowledge economy theorists discussed in Chapter 2.

A variety of conceptualisations or narratives have been constructed to reflect the new concern with knowledge production. Valimaa and Hoffman classify some of these conceptualisations and their disciplinary origins. They also identify the concepts’ ideological and performative role in legitimating and increasing the systemic efficiency of the Neoliberal socio-institutional template. For example they argue that

The Knowledge Society has been developed by sociologists, Knowledge Economy by economists and Learning Society by educators. These concepts... operate like *performative ideologies* rather than academic theories.⁴⁶¹

This can be interpreted as indicating these theories are used as idealised templates to guide the construction of institutions and policies more compatible with the new

⁴⁵⁷ Sim, S. (ed.), *The Routledge Companion to Postmodernism*, (2nd ed.), Routledge, London, 2005, p.288.

⁴⁵⁸ Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M., *op.cit.*, p.98.

⁴⁵⁹ Sim, S. (ed.), *op.cit.*, p.3.

⁴⁶⁰ *Ibid.*, p.7.

⁴⁶¹ Valimaa, J. and Hoffman, D., ‘Knowledge Society Discourse and Higher Education’, *Higher Education*, Vol.56, 2008, p.285.

techno-economic paradigm based on knowledge and information and communication technology. Consistent with previous discussions of the status of knowledge, these concepts can be viewed as ‘performative ideologies’. Therefore, in common with narratives, they are not making ‘truth-based’ claims.

In Chapter Five it was observed that

Neo-Schumpeterian theorists argue that the role of capitalist economy governments is to create a socio-institutional environment that supports the new techno-economic paradigm.⁴⁶²

Performative ideologies appear to assist the process of increasing the efficiency and also reducing the mismatch between a new techno-economic paradigm and its newer, more compatible socio-institutional arrangements, whilst assisting the removal of the older mismatched socio-institutional arrangements of the previous techno-economic paradigm.

7.3.1 Techno-economic paradigm change, postmodernism and creative destruction

...postmodernism...seeks not to find the foundations and conditions of truth but to exercise power for the purpose of social change.⁴⁶³

The process of technological and socio-institutional change appears to require political and epistemological philosophies that enable a series of transitions to take place. These political and epistemological philosophies need to be capable of supporting justifications of the ‘de-rigidifying’ of institutional structures and social and industrial relations. In short, they need to be able to accommodate what Schumpeter refers to as the process of ‘creative destruction’. Therefore, the political and epistemological philosophies required to assist this process would need to be fluid enough to accommodate evolving technological, institutional and social changes. This would seem to indicate that they would not embody a guiding ideal or teleology found in Platonic and Platonic inspired philosophies, as discussed in earlier chapters.

⁴⁶² Romer, P., ‘Beyond Classical and Keynesian Macroeconomic Policy’, *Policy Options*, July – August, 1994, p.1.

⁴⁶³ Lentricchia quoted in Hicks, S., *op.cit.*, p.184.

Writers from the postmodernist genre appear to meet this criterion. Postmodernist writers such as Foucault, Rorty and Derrida are highly critical of Platonic philosophy. For example, Foucault's postmodern philosophy claims that '...its arch-enemy is Plato.'⁴⁶⁴ The postmodern writer and philosopher, Jacques Derrida, can perhaps be identified as conducting the cultural and textual equivalent of Schumpeter's 'Creative Destruction' process. Habermas argues that '... Derrida's enterprise; destruction is renamed deconstruction'.⁴⁶⁵ Habermas observes that Derrida '...calls his procedure deconstruction because it is supposed to *clear away* the ontological *scaffolding* erected by philosophy...'⁴⁶⁶

Based on observations presented earlier in this thesis, it can be concluded that postmodernism also shares the goal of clearing away many of the activities of earlier philosophies such as ontology, epistemology and also teleology typical of Platonic philosophy. Therefore it can be located with the theories of Neoliberalism (or economic rationalism), the Sceptical philosophical traditions, Counter-Enlightenment thought, and the educational curriculum of the Viennese Gymnasium, which also shared similar goals. The implications of this for innovation theories is that they will be socially constructed, non-teleological, and anti-foundational – that is they will not claim to be a unique representation or model of an 'underlying reality' or 'truth'. Therefore, the further implication is that the foundational philosophies of the 'concept of innovation' will reject all the philosophical elements present in Platonic philosophy.

If the proposition is accepted that a philosophical paradigm change also accompanies techno-economic and socio-institutional changes, then it is possible to locate the phenomenon of postmodernism, the latest iteration of philosophical scepticism, as another component of the change process. This aspect will be addressed in the next section by examining this philosophical transition and relating it to the conclusions drawn in previous chapters.

⁴⁶⁴ Dreyfus, H., and Rabinow, P., Michael Foucault: Beyond Structuralism and Hermeneutics, (second edition), The University of Chicago Press, Chicago, 1983, p.106.

⁴⁶⁵ Habermas, J., (translated by Lawrence, F.), The Philosophical Discourse of Modernity, Polity Press, Cambridge, 1987, p.161.

⁴⁶⁶ Ibid., p.189.

7.4 Postmodernism, Counter-Enlightenment Scepticism and Innovation

The key to change is in the capacity of the belief system to call itself into question ⁴⁶⁷

Sim links the concepts of postmodernism and scepticism. For example, he argues that

One of the best ways of describing postmodernism as a philosophical movement would be as a form of scepticism ... and that puts it into a long-running tradition in Western thought that stretches back to classical Greek philosophy. Scepticism ... sets out to undermine other philosophical theories claiming to be in possession of ultimate truth, or of criteria for determining what counts as ultimate truth.⁴⁶⁸

This definition of postmodernism reinforces the educational philosophies provided to students of the Viennese Gymnasiums and Viennese theorists as anticipating ‘important postmodern themes’.

Theorists have linked Postmodernism with Counter-Enlightenment thought. Hicks argues that ‘Postmodernism is the end result of the Counter-Enlightenment attack on reason.’⁴⁶⁹ Hicks also links Postmodernism to the Counter-Enlightenment and its role in displacing Enlightenment thought. For example he argues that

Postmodernism is thus the supplanting of the Enlightenment with its roots in seventeenth-century English philosophy by the Counter-Enlightenment with its roots in eighteenth-century German philosophy.⁴⁷⁰

7.4.1 Postmodernism and innovation

Postmodern ‘scepticism is the natural complement to continuous change...’⁴⁷¹

The sceptical element of postmodernism has been utilised to question and undermine beliefs and narratives of previous paradigms. It has also been argued above that ‘postmodernism’ can assist in the innovation processes of techno-economic paradigm change and the accompanying socio-institutional transformations. Wolin argues that ‘...postmodern change is predominately a matter of technological innovation and development...’⁴⁷² Kiesler effectively links this definition to the socio-institutional aspects of Neo-Schumpeterian techno-economic

⁴⁶⁷ Rochet, C., Chapter 19 in Dreschler, W., Kattel, R. and Reinert, E. (eds.), *Techno-Economic Paradigms: Essays in Honour of Carlota Perez*, Anthem Press, London, 2009, p.383.

⁴⁶⁸ Sim, S. (ed.), *op.cit.*, p.3.

⁴⁶⁹ Hicks, S., *op.cit.*, p.27.

⁴⁷⁰ *Ibid.*, p.43.

⁴⁷¹ Wolin, S., *op.cit.*, 2004, p.605.

⁴⁷² Wolin, S., *op.cit.*, p.605.

change when he argues that ‘Technological change can be viewed as ...one variant of organizational change or innovation.’⁴⁷³

7.4.2 Postmodernity and socio-institutional change

Giddens links postmodernism to institutional change. For example he observes that

... post-modernity is ... concerned with changes to institutions and conditions.⁴⁷⁴

The socio-institutional changes accompanying techno-economic paradigm change is not a one-off event, it is a continual process. This position is supported by Smart who asserts that

In a time of permanent transition, where change has become a routine feature of everyday life, social, cultural, and economic institutions must of necessity continually readjust to the changing world around them.⁴⁷⁵

Three aspects of Postmodernism, intellectual, technological and social, have been identified by theorists and linked to the process of institutional change. The intellectual aspect has been identified as the ascendancy of German/Austrian counter-enlightenment philosophy over the previous English enlightenment philosophy. The technological aspect relates to the deployment of information and communication technology. The alignment of German counter-enlightenment philosophy with sceptical postmodernism theoretically assists the processes of techno-economic paradigm change by providing a basis for questioning assumptions of the previous techno-economic paradigm. It also represents the ascendancy of the German educational model of scientific/technological disciplines over humanities disciplines. In the higher education context, it is interesting to note that Gibbons relates the Mode 2 knowledge production model to engineering research models.

Downes addresses the issue of institutions adapting to changing technological paradigms, when he observes that ‘...technological breakthroughs ...inevitably lead to dramatic changes in the short term. But the real transformation comes later, as

⁴⁷³ Kiesler, S. and Sproull, L. (eds.), Computing and Change on Campus, Cambridge University Press, Cambridge, 1987, p.226.

⁴⁷⁴ Giddens, A., op.cit., p.163.

⁴⁷⁵ Smart, B., ‘Accounting for Anxiety: Economic and Cultural Imperatives Transforming University Life’, in Hayes, D., and Wynyard, R., (eds.), The McDonaldization of Higher Education, Bergin and Garvey, Westport, 2002, p.50.

human systems – economic, social, legal – struggle to catch up’.⁴⁷⁶ Downes offers an explanation for the differing rates of change of technology systems and socio-institutional systems when he argues that ‘...technology changes exponentially, but social, economic, and legal systems change incrementally’.⁴⁷⁷

7.5 Conclusion

This chapter examined the role of Neoliberalism as a techno-economic change template. Perez argued that the adoption of Neoliberalism for this purpose was not the only political option and gave examples of the variety of political templates that had been adopted to assist the introduction of the Fourth Kondratiev.

Neoliberal policies were discussed and the origins of Neoliberalism illuminated. Public and private sector organisations and think–tanks which assisted in the dissemination of Neoliberal ideas and policies were also identified. Neoliberalism and the Neoliberal theorists were demonstrated to be reacting to the previous organisational model of capitalism, Keynesianism. Neoliberal theorists argued that one of the failings of Keynesianism was its failure to consider the important role of innovation in dynamic capitalist economies.

The Keynesian model was linked to Enlightenment ideals, whereas the Neoliberal model was linked to the Counter-Enlightenment. These alignments had significant implications for the interpretation of the role of education in society and marked a shift from viewing the role of education as emancipating people from ignorance, to recasting education as a sub-sector of the post-industrial economy.

The Counter-Enlightenment questioning of the foundations of knowledge also had implications for neoliberal understandings of the role of knowledge. From the Neoliberal perspective, the value of knowledge was not based on its ‘truth value’, but on its ‘performativity’. That is, on its ability to increase the efficiency of the system’s performance. Examples of the implementation of the ‘performativity’ narrative were provided in the higher education organisational context. Neo-Schumpeterian theory argues that the role of governments is to create a socio-

⁴⁷⁶ Downes, L., *op.cit.*, p.9.

⁴⁷⁷ *Ibid.*, p.2.

institutional environment to assist the introduction of the new techno-economic paradigm. It was argued that ‘performativity’ can be interpreted as assisting this goal.

The Neoliberal inspired organisational theory, New Public Management, assisted the importation of Neoliberal market-driven philosophies into the Public Sector. This development also contributed to changing perspectives of the role of education. In effect it shifted the value of education from being a ‘social good’ to an ‘economic good’ and prepared the sector for exposure to increased competition in an education marketplace.

The Neo-Schumpeterian literature does not mention the role philosophy plays in the change of a techno-economic paradigm. The argument was presented that periods of rapid innovations seem to require a philosophy such as ‘postmodernism’ that is flexible enough to accommodate and assist the change process. In addition, it was argued that postmodern philosophy sits easily within, and in many ways supports, a neoliberal discourse which also negates the necessity or usefulness of the ‘grand narratives’ or teleologies dismissed by postmodern theorists such as Foucault, Rorty, Derrida and Lyotard.

The chapter also linked postmodern theorists to a rejection of the ‘Platonic paradigm’. It was also concluded that Postmodernism also shares the goal of clearing away many of the activities of earlier philosophies such as ontology, epistemology and also teleology typical of Platonic philosophy. The logical implication of these conclusions is that philosophies supportive of the ‘concept of innovation’ will necessarily reject all the philosophical elements of the ‘Platonic paradigm’. It was observed that a flexible philosophy such as ‘Postmodernism’ could be interpreted as assisting in the process of socio-institutional change that accompanies a techno-economic paradigm shift. In short, ‘Postmodern’ philosophy assists the process of innovation.

The chapter closed by offering an explanation for the asynchronous time-frames involved in technological change and socio-institutional change. Downes claimed that socio-institutional change struggles to keep pace with technological change.

The next chapter will introduce the theories of the Neo-Schumpeterian theorist, Richard Barras. Barras argues that each techno-economic paradigm has a 'leading sector' and a 'lagging sector'. Barras believes that the 'leading sector' can provide a valuable demonstration effect of the innovation possibilities of a new techno-economic paradigm to 'lagging sectors'. Following an exploration of Barras' theories, a case study will examine the 'leading sector' of the current techno-economic paradigm, the financial services sub-sector.

Chapter 8. Techno-Economic Paradigms and Innovation in the Service Sector

... as the Service Revolution moves to a much broader span of industries [the] sectors likely to undergo the most radical transformations are those with a strong knowledge base to their product – such as education ...⁴⁷⁸

... profound institutional and organisation changes will be needed to allow the new services to emerge, particularly in politically sensitive public service sectors such as education...⁴⁷⁹

... it may not even be possible to achieve the full potential rate of service innovation, due to factors such as organisational inertia.⁴⁸⁰

8.1 Introduction

Previous chapters examined the theoretical foundations of Neo-Schumpeterian theory and concluded that they were based on anti-Platonic Counter-Enlightenment theories which held the potential for explaining and assisting change processes and the disequilibrium associated with innovation. Neo-Schumpeterian theory, as conceptualised by Carlotta Perez, is based on a conceptual framework based of ‘techno-economic paradigms’ and accompanying socio-institutional changes. A techno-economic paradigm has been defined by Perez as:

A best-practice model made up of a set of all pervasive generic technological and organizational principles, which represent the most effective way of applying a particular technological revolution and of using it for modernizing and rejuvenating the whole economy. When generally adopted, these principles become the common-sense basis for organizing any activity and structuring any institution.⁴⁸¹

It was also argued that techno-economic paradigm theory’s comprehensive explanatory power provided it with the ability to subsume other theories and explanatory models within its conceptual framework.

Neo-Schumpeterian techno-economic paradigm theory draws on the theories of Kondratiev and Schumpeter who postulated that the regular ‘boom and bust’ economic long wave cycles of capitalist economies could be mapped and explained by the introduction of new technology systems and the consequent occurrence of technological revolutions of a periodicity of approximately 60–70 years. Five of

⁴⁷⁸ Barras, R., ‘Interactive Innovation in Financial and Business Services: The Vanguard of the Service Revolution’, *Research Policy*, 19, (1990), p.235.

⁴⁷⁹ *Ibid.*

⁴⁸⁰ Barras, R. and Swann, J., ‘Information Technology and the Service Sector’, Chapter 13 in Marstrand, P. (ed.), *New Technology and the Future of Work and Skills*, Frances Pinter, London, 1984, p.222.

⁴⁸¹ Perez, C., *op.cit.*, 2002, p.15.

these Kondratiev long waves have been identified by these theories. The Fifth Kondratiev carrier technology is identified as Information and Communication technology.

Although a number of theorists have commenced theorising the Sixth Kondratiev based on environmental technologies,⁴⁸² space limitations prevent this line of enquiry being pursued at length. However, it will be noted that almost all universities have commenced examining the role of environmental technologies within the university built environment. The main motivation at this point appears to be long-term operational cost reductions which justify the initial capital outlay.

In relation to the Fifth Kondratiev, Neo-Schumpeterian theory argues that although the introduction of information and communication technology (ICT) into service sectors is an innovation in itself, it also initiates a set of wider social and organisational changes. It is an extremely complex process involving dynamic, interactive changes in economic, political and philosophical systems and beliefs over an extended period of time. According to this schema, the introduction and diffusion of new generic technological systems will also have consequences for the existing socio-institutional arrangements of capitalist economies. That is, a mismatch occurs between the remnant socio-institutional arrangements of the previous techno-economic paradigm and the new techno-economic paradigm.

The previous chapter discussed the role of Neoliberalism and postmodernism in deconstructing the previous techno-economic and socio-institutional paradigms and providing a template to assist the installation of the new techno-economic paradigm and its accompanying socio-institutional changes. This chapter will argue that techno-economic paradigm theory also has the potential for identifying innovation trends from leading services sub-sectors and generalising these trends to lagging services sub-sectors. According to this theoretical framework, each technological revolution or 'Kondratiev Wave' will have a 'leading sector' that is the first to embrace and adapt the new technological paradigm to their organisational requirements. The so called 'leading sector' will provide examples to other 'lagging

⁴⁸² Moody, J. and Nogrady, B., The Sixth Wave, Random House Australia, 2010.

sectors' on the potentials and possibilities of the new technological paradigm for organisational and process and product efficiencies and innovations.

This chapter will introduce the theories of Richard Barras and his model of Innovation in the Services Sector. The theories of Barras have not been without critics; however the elements of his theories examined here are still sound within a Neo-Schumpeterian theoretical framework. Although Barras' theories were constructed in the 1990's and may appear dated, the Neo-Schumpeterian theoretical elements of concern to this thesis are unique to Barras and therefore critical components of this analysis. In addition, later chapters will empirically test elements of his theories and will therefore provide the opportunity for his relevant conjectures to be refuted.

Although Barras primarily examines product and process innovations facilitated by information technology in the Financial Services Sector, he refers in passing to other sub sectors of the Services sector such as Health and Education within the context of Public Services. Barras argues that in the Fifth Kondratiev, based on Information Technology, the Financial Services Sector has been the 'leading sector' and services which had largely been in the public sector, such as health and education are the 'lagging sectors'.

This chapter will draw out the threads of Barras' argument as it relates to lagging 'Public Services' and establish how his model suggests that it may be useful in forecasting innovations in the Higher Education sector. The chapter will then construct a case study based on innovations in the retail banking sector as a benchmark to compare to innovations in the higher education sector in the next chapter. Following Barras' example, the banking sector innovation case studies used in this chapter to illustrate the argument mainly focus on retail banking. It should be noted that innovations were also implemented in the 'back office' and investment banking systems. However, for the purposes of this thesis, the retail banking innovation case studies are more appropriate. The comparative case studies will then form a limited sample basis for assessing if the potential exists for innovation trends in the 'leading services sub-sector' to foreshadow innovation trends in the 'lagging services sub-sector' as Barras suggests.

8.2 The Barras Theory of Service Sector Innovation

The theories of Richard Barras draw on Neo-Schumpeterian models based on Perez, Freeman, Nelson and Winter, Schumpeter and Kondratiev. These ‘cyclical theories’ argue that Capitalist economies undergo semi-regular evolutionary cycles of varying lengths. The roles and functions of technologies, technological systems and entrepreneurs vary in each particular model. However, there is general agreement throughout the models that the most wide-ranging innovations are introduced and assisted not just by stand-alone technologies, but also by their transport infrastructures. For example, the technological possibilities of the stationary steam engine were transformed by railroad networks. Similarly, stand-alone computer terminals were revolutionised by internet networks.

The combination of a technology and its network has been referred to as a ‘socio - technology system’ by Carlotta Perez. A further defining feature of a technology system is that it can be applied to all sectors of an economy - primary, secondary and tertiary (roughly interchangeable as agricultural, manufacturing/industrial and service sectors of the economy). These technology systems promote innovation by automating physically repetitive tasks in a systematic manner and freeing up labour formerly occupied in these tasks to shift to less physically repetitive and more demanding tasks. For example, freed agricultural and cottage industry labourers transferred to cities and participated in the steam engine powered industrial revolution in manufacturing.

In common with other Neo-Schumpeterian theorists, Barras locates contemporary capitalist economies in the Fifth Kondratiev techno-economic paradigm based on Information and Communication Technologies. Barras refers to this as the ‘information economy in which the most important commodity to be produced and consumed is information rather than manufactured goods.’⁴⁸³ Barras expands on this point by arguing that

...the progression from manufacturing to information economy lifts information from merely being an essential factor of production in the economy into being its most important product.⁴⁸⁴

⁴⁸³ *Ibid.*, p.216.

⁴⁸⁴ *Ibid.*, p.220.

He is thus in agreement with many other theorists who have argued of the increasing economic importance of the production and use of information or knowledge.

However, as discussed in previous chapters, the socio-institutional paradigm is still in place from the Fourth Kondratiev which was based on Oil, the Automobile, mass production, manufactured goods and highway networks.

Innovative new technological systems are generally applied firstly in a 'leading', or 'vanguard', sector of the economy from where they are then generalised throughout the remainder of the economy. This phenomenon has been referred to by Barras as 'leading' and 'lagging' innovation adopters. Barras argues that a

... unique conjunction of factors [are] favouring financial and business services as the vanguard sector of the Service Revolution.⁴⁸⁵

In addition, he argues that innovations from the leading sector may also be applicable to other 'lagging' 'public' service sectors such as health and education. However, he argues that before these innovations can be introduced to these 'public sectors' these sectors will need major reforms of their industrial relations and competitive practices. These 'lagging sectors' will adapt, to a greater or lesser extent, the reform templates pioneered by the leading sector. These in turn will have been shaped by the contemporary overarching economic, financial, political, legal, social, intellectual and ideological frameworks which contribute to shaping an innovation environment.

8.2.1 Potential transformation similarities of leading and lagging sectors

Barras alludes to the potential similarities in the pattern of transformation between the vanguard service sector of financial and business services and of public service sectors with a 'strong knowledge base' such as education. This assumption warrants further investigation as to the sector's common underlying forces which are shaping similar, although asynchronous patterns of development. Barras constructs a clear argument for the transformative power of the microprocessor ushering in a new techno-economic paradigm. However he is relatively silent regarding the economic, political and philosophical beliefs underlying the political agenda enabling radical and profound institutional and organisational changes firstly in the financial services

⁴⁸⁵ Barras, R., *op.cit.*, (1990), p.215.

sector and, in turn, the public sector. These economic, political and philosophical issues have been addressed at length in previous chapters. It was observed that, based on an examination of the philosophical and historical foundations of the concept of innovation, one of the key factors related to the overturning of the anti-innovation 'Platonic paradigm' and the development of philosophical, economic and political theories drawing on a sceptical, Counter-Enlightenment tradition supportive of innovation and the theorising of innovation.

As previously noted, Barras argues that technological, market and institutional conditions favouring innovation in a particular industry cannot be treated in isolation. Each interacts with the other, resulting in feedback which either stimulates or inhibits innovation within the adopting industry. Each set of conditions is changing continuously. Firms within the adopting sector must therefore operate in an uncertain and changing environment, matching the known possibilities of the available technology with their perception of evolving needs and demands within their product markets. According to Barras,

... these accelerating processes of technological, market and institutional change... create ... opportunities for the much wider spread of product innovations among other lagging sectors of the economy.⁴⁸⁶

Barras further argues that these innovations in '... the financial and business services sector sets the parameters of the emerging Service Revolution'.⁴⁸⁷ He suggests that the Service Revolution '... may proceed from its first to its second phase as the focus of innovation shifts from the vanguard sector of financial and business services to a much broader range of "higher level" knowledge-based services, many of which are currently delivered by the public sector'⁴⁸⁸ such as higher education. In Barras' words,

The sectors likely to undergo the most radical transformation are those with a strong knowledge base to their product – such as education and training, health and welfare, public administration, entertainment and leisure.⁴⁸⁹

Barras argues that the vanguard industries are not the only sectors adopting and using the new technology in the first phase of each technological revolution,

⁴⁸⁶ Ibid., pp.226-227.

⁴⁸⁷ Ibid.

⁴⁸⁸ Ibid., p.215.

⁴⁸⁹ Ibid., p.235.

however they are the ones in which conditions are right for the most rapid initial take-up, leading to the most growth in output and the most far-reaching product and process innovations. As previously discussed, Barras argues that the vanguard sector will ‘... provide a demonstration effect for others to follow ...’⁴⁹⁰ One example of this is provided by the projected impact on organisational structures. For example, he argues that the information technology network

...allows for highly efficient communication between functionally and locationally separate units of business activity. Consequently, there appears to be the prospect of a shift to a more dispersed pattern of smaller production units, linked within ever-more integrated corporate structures – particularly in those service industries in which information is not just a factor of production but also the main product.⁴⁹¹

This process is also assisted by what Barras identifies as the shift of

...the locus of service delivery from the point of production...to the point of consumption...weakening the need for spatial proximity between producers and consumers and further shifting the balance towards the preferences of households rather than businesses as the key determinants of location of economic units.⁴⁹²

Barras further argues that this shift in the ‘locus of delivery’ also effects ‘... the qualitative nature of the service changes with an emphasis on increased flexibility and improved information for consumers...’⁴⁹³

With these considerations in mind, the next section will examine what Barras refers to as the vanguard sector of the ICT paradigm, the financial services sector. The next section will also update Barras’ 1990 research by including more contemporary examples of financial services innovation and argue that they can be interpreted as representing a continuation of the developments foreshadowed by Barras.

The purpose of this examination is to undertake the preliminary steps necessary for a case study for comparison with what Barras refers to as a ‘lagging services sector’, the higher education sector, in the next chapter. The dominant focus of the case studies will be on the introduction of innovative technologies which increase organisational operational efficiencies. As previously discussed, there are also numerous potential ‘socio-institutional’ innovations generated by the introduction of

⁴⁹⁰ *Ibid.*, p.236.

⁴⁹¹ *Ibid.*, p.219.

⁴⁹² Barras, R., ‘Technical Change and the Urban Development Cycle’, *Urban Studies*, 24, (1987), p.25.

⁴⁹³ Barras, R., ‘Towards a Theory of Innovation in Services’, *Research Policy*, 15, (1986), p. 168.

innovative technologies of a new techno-economic paradigm. Apart from the examples of these provided earlier in the thesis, potential socio-institutional innovations will be acknowledged but then placed aside. Space limitations dictate that additional potential socio-institutional innovations can only be acknowledged as possibilities and suggested as fertile areas of investigation for future researchers.

The intent of the two case studies, focussing on the introduction of innovative technologies, examined herein is to establish if it is possible, as Barras suggests, to utilise the experiences of the ‘leading’ or ‘vanguard services sector’ to provide a demonstration effect of potential innovation trends for ‘lagging service sectors’ such as the higher education services sub-sector. If it is possible, this may assist in the Neoliberal-informed goal of increasing the ‘performativity’⁴⁹⁴ of service sector systems.

8.3 The Vanguard role of financial services in the service sector

In the business world, financial services were amongst the first to use mainframes in support of their standard delivery of services.⁴⁹⁵

According to Barras’ innovation model discussed above, financial and business services have acted in the vanguard role and introduced, through diffusion, radical innovation into a ‘wider span’ of the service sector. It is increasingly evident that innovative technologies, processes and practices are transforming the broader economy. Perez also recognises the leading role played by financial services in leading a new techno-economic paradigm. Perez argues that:

...the most demanding test bed of the technological revolution is the financial world itself, always ready to increase the speed of transactions and expand their range. By becoming one of the most willing and daring clients for its products and services, financial capital propels each technological revolution in an indirect but extremely important way. Among the technological, infrastructural and organizational innovations of each paradigm, there are those that accelerate the transport and transmission of goods and information. These can usually serve in turn as a source of innovation in money, banking and the financial sector itself.⁴⁹⁶

Financial services providers have a long history of adapting new technologies to increase the speed of the provision of financially relevant information and also

⁴⁹⁴ This term is used in the sense defined in the relevant literature. Refer to discussion in Chapter 7.2.11.

⁴⁹⁵ Australian Government Productivity Commission, ICT Use and Productivity: A Synthesis from Studies of Australian Firms, Commission Research Paper, Canberra, 2004, p.30.

⁴⁹⁶ Perez, C., op.cit., p.96.

enhance service delivery. At its most basic level, financial services have always involved a service transaction between a client and a service provider.

Perhaps one of the earliest financial innovations was the use of promissory notes as portable representations of gold or currency, thereby saving the traveller or organisation the trouble of the physical transportation and security required for transporting large amounts of cash or precious metals. Promissory notes were a significant innovation and they were a first step towards the symbolic representation of financial information.

Consoli identifies the introduction of the telegraph in 1845 as the first significant technological change in the financial services sector. According to Consoli, the introduction of this technological innovation increased the speed of communication of financial information and also enabled increased ‘coordination between the head office and the branches’.⁴⁹⁷

Perez argues that the finance sector has played a significant vanguard role not only in the current techno-economic paradigm but also in each previous techno-economic revolution. An example of this is provided by Rothschild’s Bank in 1870 when they used a combination of carrier pigeon service and the first microfilm. This combination enabled the carrier pigeons to carry increased amounts of sensitive, financially relevant information across enemy lines during the Franco-Prussian War and assist the bank to make financially well-informed decisions.⁴⁹⁸

Perez provides other examples of the leading role of the finance sector in previous techno economic revolutions. More specifically she argues that:

⁴⁹⁷ Consoli, D., ‘The Dynamics of Technological Change in UK Retail Banking Services: An Evolutionary Perspective’, *Research Policy*, 34, (2005), p.472.

⁴⁹⁸ Wilson, D., *Rothschild: A Story of Wealth and Power*, Andre Deutsch Ltd., London, 1988, p.209.

Whether it was gold ingots or information that they had to relay, banks were among the early clients of the penny post, the railways and the telegraph on the national level in the early days of the second surge, as well as of international railways, telegraph and steamships, together with the telephone, typewriter and calculator from the beginning of the third revolution. ... The pace of adoption of information and telecommunication technologies by the banking and financial systems was equally breathtaking since the 1970s. ... This early adoption accelerates the formation of larger and larger networks of banks and financial nets. Branch banks developed into national networks in England as soon as the railway and telegraph networks made it possible; the same occurred later worldwide when long-distance telegraph permitted British national bank networks to connect with international branches. Since the 1970s and 1980s, instant global money and finance movements as well as universal credit cards began giving shape to world-scale financial service super-markets and other globalised networks. These organisational models appear earlier and prefigure what will gradually become the scale and the structure of the largest production and commercial enterprises under each new paradigm.⁴⁹⁹

In addition to the introduction of technological innovations, a subtler shift in perceptions of the role banks in society was also underway. For example, the Keynesian perspective viewed, particularly retail, banks as providing a public service as a 'social good' and an element in the Keynesian 'nation building' program. Full-time, permanent staff (generally male) employed as 'bankers' were well respected, conservative members of society who could 'start at the bottom and work their way up the career ladder'. Over a period of decades, this perception shifted to one more aligned with 'Neoliberal' principles. That is, banking became a 'market-based, competitive, user-pays' business focused on innovative, competitive, profit-generating activities. Increasingly, staff employed by the banking industry were part-time or casual (generally female) with no real career prospects. This is also suggestive of parallels in the higher education sector.

8.4 Financial Services Sector Innovation

The first mainframe computer introduced into the banking sector was the IBM System 360 which was purchased in 1966 and gradually introduced operationally by the Bank of America as finance software programs were written.⁵⁰⁰ Consoli observes that as the roll-out of the IBM System 360 became more widespread in the finance sector, it provided a stark contrast to the 'sluggish adaptation of the organisation of banks ... which was mainly circumscribed in back-office procedures'.⁵⁰¹ This observation was supported by an analyst quoted by Reinecke

⁴⁹⁹ Perez, C., *op.cit.*, p.96.

⁵⁰⁰ McKenney, J., *Waves of Change: Business Evolution through Information Technology*, Harvard Business School Press, Boston, 1995, pp.79-84.

⁵⁰¹ Consoli, D., *op.cit.*, pp.467.

‘who concluded that managers tended to introduce computers in such a way that internal organisation and work structures are changed as little as possible’.⁵⁰² At this phase of the introduction of computing into the finance sector,

...automation was merely aimed at supporting the expansion of the branch networks to accommodate the growing customer base.⁵⁰³

Reinecke argues that ‘The technological development of banking in the first half of the 1980s was dominated by the expansion of networks of automatic teller machines and the central computing facilities to back them up’.⁵⁰⁴ The introduction of electronic banking and ATMs was estimated by one source to reduce transaction processing costs by half.⁵⁰⁵

Barras used retail banking as an illustration of developments in the banking technology system and the service innovations they enabled. Table 8.1 describes these developments as they stood in 1990.

Period	Technological Possibilities	Application	Type of Service Innovation	Industry Structure	Market Demand
Mid 1960s- mid 1970s	Mainframe computers	Automated transactions & financial records	Improved efficiency	Clearing bank cartel	Growth of personal accounts & transactions
Mid 1970s- mid 1980s	Corporate networking with dumb terminals	Automated cash dispensing (ATMs)	Improved quality	Deregulation/ increased competition	Extended and easier access
Mid 1980s- mid 1990s	Corporate networking with intelligent terminals	Financial/ customer information systems	Improved/new services	Integration of financial industries	Financial advice & broader range of services
1990s-	ISDN networking	Cashless shopping (EFTPOS) Home banking	New services	Integration of banking & shopping	Convenience & flexibility

Table 8.1: Technology and Service Innovations in Banking: 1960s-1990s

Source: Barras, R., 'Interactive Innovation in Financial and Business Services: The Vanguard of the Service Revolution', *Research Policy*, 19, (1990), p.227.

⁵⁰² Reinecke, I., *The Money Masters: Banks, Power and Economic Control*, William Heinemann, Australia, 1988, p.108.

⁵⁰³ Consoli, D., *op.cit.*, pp.467.

⁵⁰⁴ Reinecke, I., *op.cit.*, p.184.

⁵⁰⁵ Charles Forbes, Chemical Bank Executive Vice-President, quoted in Reinecke, I., *op.cit.*, p.102.

In addition to the technological and service developments in retail banking outlined by Barras in his 1990 paper, Barras had also predicted the

...shift to a more dispersed pattern of smaller production units⁵⁰⁶

We will now turn to an examination of the various distribution models enabled by the introduction of ICT innovations into the financial services sector.

8.5 ICT enabled organisational innovations in retail banking

8.5.1 The satellite bank branch model

Reinecke observes the 1980s also witnessed the evolution of a new organisational structure by banks both in Australia and internationally. Based on the North American banking experience where peripheral bank branches were referred to as ‘satellites’, the ‘satellite’ banking model gathered administrative power ‘into a central branch while a cluster of service branches was devoted to transmitting money, satisfying routine customer needs and marketing services’.⁵⁰⁷

According to figures from US banks, satellite branches reduced operating costs by twenty-five per cent when compared with a conventional bank branch.⁵⁰⁸ The advent of the satellite banking model had a number of negative employment and career effects for bank staff employed in the satellite branches, including staff reductions and ‘career logjams as the number of management posts declined’.⁵⁰⁹ Reinecke also attributes the ‘sharp increase in the numbers of part-time employees’ in the banking sector to the ‘combined effect of new technologically based services’.⁵¹⁰

8.5.2 The on-line bank: no branch model⁵¹¹

The shape of things to come in the financial services sector was provided by a British bank in the early 1990s. Britain’s FirstDirect Bank had no branches, with

⁵⁰⁶ Barras, R., *op.cit.*, 1990, p.219.

⁵⁰⁷ Reinecke, I., *op.cit.*, pp.112-113.

⁵⁰⁸ *Ibid.*, p.112.

⁵⁰⁹ *Ibid.*, p.113.

⁵¹⁰ Reinecke, I., *Ibid.*, p.103.

⁵¹¹ These five sections are based on knowledge gained by L. Stevenson whilst conducting research at the ‘Centre for Technology and Social Change’ at the University of Wollongong in the 1990s. Refer to Bibliography for a representative list of publications by Stevenson, L.

all services provided remotely by phone and available 24 hours a day, seven days a week. FirstDirect was wholly owned by Midland Bank, but operated as an autonomous division. All customer contact and transactions were handled over the telephone, through the post or via a shared ATM/EFTPOS network. Customers had access to a number of services including payment of bills, provision of mortgage finance, share dealing, personal loans, insurance products and foreign exchange. Savings made through not maintaining branches enabled FirstDirect to increase its competitiveness by offering higher interest rates and lower fees to its customers.⁵¹²

In Australia, the Over 50s Friendly Society was the first Australian financial institution to follow FirstDirect's lead by having no branch network at all. Its customers conducted all their transactions by telephone.

8.5.3 The entry of foreign competition into the Australian financial sector

The Neoliberal policy-inspired opening of the Australian banking sector to the entry of fifteen foreign banks that were granted licenses in the early 1980s to operate in Australia appeared to offer the potential of increasing competition in the Australian financial services sector. However the advantage of domestic banks with established branch networks and customer bases proved to be a formidable barrier to any potential new competitors. Any new foreign banks wishing to enter the Australian banking market were confronted with huge front-end costs to establish rival branch networks, in addition to the challenge of establishing an economically viable customer base.

In anticipation of the increased competition from the foreign banks, the domestic banking sector had undergone a period of amalgamation and rationalisation through a process of mergers and acquisitions which consolidated their positions and also prepared them for internationalisation themselves.⁵¹³

⁵¹² Stevenson, L., "Branch Banking: Is it Being 'Ringbarked'?" in Bankwatch: A Survey of Major Developments Affecting the Banking Industry, Issue Number 5, Australian Bank Employees Union, April, 1990, pp.4-9.

⁵¹³ Ibid.

8.5.4 The limited branch model⁵¹⁴

One of the new foreign banks, Chase AMP Bank, chose a combination model to enter the Australian market. It operated only eight retail branches in major capital cities. However agreements with other banks enabled customers to access their accounts through a network of 1300 ATMs. Sub-agency arrangements through 20 AMP sales offices and 160 MBF offices boosted Chase AMP's network to nearly 1400 access points.

Citibank provided another example of a foreign 'niche' bank strategy to establish a widespread network without the expense of 'bricks and mortar' branches. Citibank, which initially had 15 branches, had no interest in establishing a widespread branch network. Citibank's strategy was similar to that of Chase AMP, in that it established arrangements enabling customers to access around 1300 ATMs through the NAB/ANZ ATM network. Citibank also established arrangements through department stores, real estate agents and even chemists, for customers to access their accounts. Citibank's Australian strategy was so successful that they adopted it globally. Strategies adopted by Chase AMP and Citibank provided a wide access capability to their customers, whilst significantly reducing overheads through minimal branch networks, and hence staff.

The lack of a widespread broadband telecommunications network and the relatively undeveloped state of Information Technology in the early 1990s restricted the potential of the 'no-branch' model. Although attractive to financial services providers, due to the huge potential for reduced overheads and increased profit margins via reduced staff and branch requirements, the Australian customer base was not yet ready for such a radical and revolutionary shift in the way financial services were provided. Another factor limiting its success was consumer preference for the traditional or modified branch network model where there was a sense of a bank's physical presence in 'bricks and mortar'. The modified form of branch banking offered customers increased 24/7 access and also more outlets to access their accounts.

⁵¹⁴ Stevenson, L. and Lepani, B., Finance Sector Union Strategies in a World of Change, Report for presentation at the 'International Federation of Commercial, Clerical, Professional and Technical Employees' Conference, San Francisco, August, 1991, Finance Sector Union, June, 1991, p.71.

So although the public was willing to embrace increased convenience, they were not yet ready for the disappearance of the bank branch from their local shopping centre. The lesson for the finance sector, and the services sector more broadly, at this time was that although the public was ready for the 24/7 provision of decentralised services through a combination of plastic cards and alternative access outlets such as ATMs, EFTPOS machines and telephone banking, the majority of customers were unwilling at this stage to accept financial services without the physical presence of a well-established branch network from an already established financial services provider. Armed with this knowledge, the Australian banks set their long-term strategies and began a slower-paced, incremental change model.

8.5.6 The reduced branch model

The early 1990s not only witnessed the continuing process of takeovers and mergers in the financial services sector, it also saw a continuing roll-out and expansion of ATMs and EFTPOS terminals. One of the outcomes of the takeover and merger process was the duplication of branches of the new, merged financial entities in cities and towns. So, often, another outcome of a merger or acquisition would be the closure of duplicate branches in the branch network and also the centralising and merging of the head office functions of the respective merged banks. One of the predictable outcomes of this process was increased job losses in the finance sector.

8.5.7 The sell and lease-back branch model⁵¹⁵

Commencing in the late 1980s and continuing into the early 1990s, the major Australian banks began a process of selling off a number of their operational branch premises and then leasing them back on a five year lease. Various reasons were offered for this including the reduction of administrative load involved in multiple small property holdings, and also the raising of capital to fund other areas of expansion. As the process of mergers, acquisitions and rationalisation continued, many of the leases of the buildings formerly owned by the banks were

⁵¹⁵ Stevenson, L., "Branch Banking: Is it Being 'Ringbarked'?" [op.cit.](#)

not renewed after the initial five years. This strategy enabled the merged bank entity to shed duplicate branches in the same geographical area.

Analysing the streetscape of many large towns today, it is fairly easy to identify former bank branch buildings, built in the older bank branch style suited to traditional non-electronic banking, which no longer house banks. Many of the banks which previously occupied these buildings no longer exist due to mergers or acquisitions. Examples of these include, The E.S.&A Bank., National Mutual Royal Bank, State Bank of New South Wales, the Rural Bank and the Advance Bank, to name but a few.

The key lesson from the early unsuccessful introduction of branchless banking was that the public needed time to adjust and adapt to the changes that were technologically possible, but were socially before their time. In short, as discussed in the previous chapter, the pace of technological change was not matched by the much slower pace of social change.

Generational change also assisted in the gradual process of customers adapting and embracing the new ways of banking made possible by the combination of new technology systems and also prepared the public for the next development in retail banking services – mobile banking. It also signalled the next stage in the shift of ‘...the locus of service delivery from the point of production ... to the point of consumption...’⁵¹⁶ which was made possible by evolving ICT products, applications and networks.

8.5.8 Internet banking

The increase in deployment and download speeds of the broadband telecommunications network assisted the technical possibilities and also the social acceptance of internet-based banking. Internet banking could be accessed via fixed computer terminals, and later by laptop computers with access to a ‘Wi-Fi’ network. By the late 2000s, every Australian bank provided on-line internet-based banking services. However, although this development increased flexibility and convenience of access for customers, it was still dependent on a geographically-

⁵¹⁶ Barras, R., ‘Technical Change and the Urban Development Cycle’, *Urban Studies*, 24, (1987), p.25.

fixed point-of-access in the form of a fixed computer with internet access. The development of short-range Wi-Fi networks slightly increased the geographical mobility and flexibility of access; however the benefits were relatively limited.

The next developmental stage in banking technological innovations required a more powerful mobile telecommunications network and devices and software applications capable of utilising these developments.

8.5.9 Mobile phone banking applications

In the services sector, the banking industry was an early adopter of mobile phone based applications. In the Australian context, these services became available for some banking customers in early 2009. Access to this service was limited to bank customers that owned a compatible mobile phone device and had access to fast, mobile phone network coverage. An early complicating factor for the roll-out of these mobile phone applications was the existence of two different mobile phone software platforms. Specifically, these were the Apple iPhone platform and the Android platform. Initial rollout of mobile phone banking applications was confined to iPhones however the majority of Australian banks made Android versions available at a later date.

Specific examples of the availability of these applications from major Australian banks include the Commonwealth Bank, which was the first Australian bank to launch mobile phone banking applications in March, 2009.⁵¹⁷ As at October, 2011, the ANZ Bank also had an iPhone mobile application but not an Android application. The ANZ website indicated it would be releasing an Android application later in 2011.⁵¹⁸ Westpac Bank supported both iPhone and Android mobile phone applications in October 2011.⁵¹⁹

The development of mobile phone banking applications signalled the next phase of the information technology revolution in the services sector. These applications

⁵¹⁷ Commonwealth Bank website accessed at <http://www.commbank.com.au/mobile> October 18, 2011.

⁵¹⁸ ANZ Bank website accessed at <http://www.anz.com/personal/ways/mobile-banking/faqs/> October 18, 2011.

⁵¹⁹ Westpac Bank website accessed at <http://www.westpac.com.au/personal-banking/mobile-banking/start-banking-on-the-move/> October 18, 2011.

made access to banking services truly mobile and enabled even more geographically dispersed customer access to banking services. Of course the limits of this geographical dispersal were determined by mobile phone network coverage and download speeds.

8.5.10 Tablet banking applications

Internationally, the first Tablet banking services were made available by Spanish Bank, Banco Sabadell, in April 2010.⁵²⁰ Financial services providers in the United States also offer tablet banking services. Among these are the Bank of America and also American Express.

In the Australian context, National Australia Bank (NAB) and St George Bank released I Pad and Android tablet applications which enabled customers to access the NAB and St George Bank internet websites in May, 2010. However in March 2011 NAB and St George Bank released tablet specific applications for I Pad and Android tablets.⁵²¹ The Commonwealth Bank also released I Pad and Android tablet applications which enabled customers to access the Commonwealth Bank internet website in May, 2010. The Commonwealth released an I Pad and Android specific application in July 2011.

Table 8.2 below, based on Table 8.1, has been modified to include financial innovations introduced since Barras constructed his table in the 1990s. For instance, internet, mobile phone and tablet computer banking services have also been included.

8.5.11 Overview of banking technology and service innovations: 1960s-2011

Significant technological and service innovations in the banking services sector have been summarised in Table 8.2 below and include contemporary analysis and examples based on research conducted by the author for this thesis.

⁵²⁰ IT News, 27/5/10, accessed at <http://www.itnews.com.au/News/176137,stgeorge-nab-to-launch0ipad-banking-apps.aspx> October 18, 2011.

⁵²¹ NAB Bank website accessed at <http://www.nab.com.au/wps/wcm/connect/nab/campaigns/personal/31/1> October 18, 2011.

Period	Technological Possibilities	Application	Type of Service Innovation	Industry Structure	Market Demand
Mid 1960s- mid 1970s	Mainframe computers	Automated transactions & financial records	Improved efficiency	Clearing bank cartel	Growth of personal accounts & transactions
Mid 1970s- mid 1980s	Corporate networking with dumb terminals	Automated cash dispensing (ATMs)	Improved quality	Deregulation/ increased competition	Extended and easier access
Mid 1980s- mid 1990s	Corporate networking with intelligent terminals	Financial/ customer information systems	Improved/new services	Integration of financial industries	Financial advice & broader range of services
1990s-	ISDN networking	Cashless shopping (EFTPOS) Home banking	New services	Integration of banking & shopping	Convenience & flexibility
2000s -	Broadband Internet	Fast, self-service home banking Transactions 'Non-bank, Internet – based Lenders	funds transfer bill payment loan applications	Globalising Internationalising	Increased convenience & flexibility
2009-2011	Mobile phone Network Laptop Handheld Mobile phone Tablet mobile	Mobile self-service banking	funds transfer bill payment account balance mini statements	Consolidation Strategic partnerships with Telcos	24/7 access Increased convenience, flexibility & mobility

Table 8.2: Technology and Service Innovations in Banking: 1960s-2011

This table is a modified and updated version of the table which originally appeared in Barras, R., 'Interactive Innovation in Financial and Business Services: The Vanguard of the Service Revolution, *Research Policy*, 19, (1990), p.227.

8.6 Conclusion

This chapter introduced the Neo-Schumpeterian theories of Richard Barras and his proposition that the leading services sub-sector may provide guidance as to potential innovations for the lagging service sub-sectors. Barras and Perez concur in their assessment that the leading services sub-sector in the Fifth Kondratiev techno-economic paradigm is financial services. Barras argues that the higher education sector can be located amongst the lagging services sub-sectors. A range of examples were provided which illustrated the finance services sub-sectors leading role in not only the current techno-economic paradigm, but also in previous techno-economic paradigms. A number of case studies were presented

which illustrated the gradual introduction of information and communication technology innovations into the banking sector. Although the dominant focus was on technological innovations, organisational innovations enabled by these technological innovations were also illustrated. For example, the introduction of technological innovations into the banking services sector enabled more geographically-dispersed service delivery in the form of satellite branches, ATMs, EFTPOS, fixed-line telephone banking, internet banking, and also mobile applications such as mobile phone banking and ‘tablet banking.’

These technological and organisational innovations also succeeded in ‘shifting the locus of delivery from the point of production to the point of consumption’ as Barras had suggested in his 1987 paper. This shift in the locus of delivery also resulted in an increase in the phenomenon of ‘self-service’ banking. Self-service banking effectively displaced some of the workload from banking staff to customers. This workload displacement, along with a number of other factors such as mergers, acquisitions and changing industrial relations legislation informed by Neoliberal philosophies, also contributed to a reduction in banking workforce numbers and an increase in the percentage of part-time and casual positions in the sector. There was also a significant increase in the number of female staff as a proportion of overall banking workforce numbers.

It will be recalled that in previous chapters, Perez argued that Neoliberalism was the only political model that had adopted the Fifth Kondratiev techno-economic paradigm. Neoliberal-inspired policies deregulated the financial services sector and made possible many of the transformations that have been implemented. For example, employment policies in the financial services sector which have resulted in the increase in casual and part-time positions can be interpreted as manifestations of post-Fordist workforce flexibility policies. In addition, there was a gradual shift in perception of the role of banks; conservative Keynesian, nation-building, public service philosophies were replaced by Neoliberal inspired market-based philosophies which valued competition, innovation and ‘user-pays’ profit generation.

Barras observed that innovations in the financial services sector would provide many lessons on potential innovations in public sectors such as education and health. For example he argued that innovations in the financial services sector ‘...provided a demonstration effect for others to follow...’⁵²² In 1990 Barras exhorted us to

... learn the many lessons it is offering in order to successfully industrialise those branches of knowledge which are socially more useful and culturally more advanced than that concerned purely with the making and spending of money.⁵²³

The next chapter will attempt to put Barras’ advice into practice by comparing the lessons demonstrated by the leading services sub-sector, financial services, with a lagging services sub-sector which can be characterised as a ‘more socially useful and culturally advanced branch of knowledge’ – the higher education services sector.

⁵²² Barras, R., *op.cit.*, (1990), p.236.

⁵²³ *Ibid.*

Chapter 9. Innovation in the Higher Education Sector: The Fifth Kondratiev Lagging Services Sub-Sector

...the rational myth of innovation restructures processes of invention and innovation, presenting them as though seen after the fact in the spirit of the production process itself. Out of disorderly, uncertain, random processes, it makes something orderly and sequential, subject to familiar techniques of management.⁵²⁴

9.1 Introduction

Previous chapters have established the lack of a theory of innovation in the higher education sector and investigated the historical, philosophical and political reasons for this situation. One of the goals of this thesis was the identification and extension of a potential theoretical framework to conceptualise innovation in the higher education sector. Based on counter-enlightenment and sceptical philosophical foundations which reject the anti-innovation Platonic paradigm, the multidisciplinary theories of the Neo-Schumpeterians Perez and Barras have provided a framework on which to base a potential theory of innovation in the higher education services sector. It has also provided direction for identifying innovative trends in the higher education services sector.

Barras argued that the 'leading' service sector, in this case the finance sector, could provide a demonstration effect for 'lagging' sectors and thereby suggest innovative directions for development. Barras' theory also inspired a methodology for comparing 'leading' and 'lagging' service sectors to gain insights and guidance into potential innovation trends. The previous chapter constructed a case study of the 'leading' services sub-sector, the finance sector.

This chapter will construct a case study of one of the 'lagging' services sub-sectors, the higher education sector. The purpose of constructing the two case studies is to provide a comparison between innovative developments in the 'leading' sector and 'lagging' sector and also 'test' Barras' assertion that the 'leading' sector could provide a demonstration effect for the 'lagging' sector.

⁵²⁴ Schon, D., Technology and Change: The New Heraclitus, Pergamon Press, 1967, p.72.

If this comparative case study methodology strategy provides evidence suggestive of the practical utility of Barras' initial assertion, it would contain the potential to contribute to qualitative 'scenario building' forecasting techniques⁵²⁵ such as 'horizon scanning' and 'trend impact' analysis.⁵²⁶ If the comparative case study methodology strategy does contain this potential, it could also assist higher education strategists by effectively offering a 'preview' of potential innovation strategies and directions for the higher education sector. In this sense, it would be able to take advantage of higher education's 'lagging sector' status. This model may also have broader application in the construction of government policies seeking to assist innovation in other 'lagging' service sectors in general, such as health for example.

The next section will commence a case study of what Barras refers to as a 'lagging' service sub-sector, the higher education sector.

9.2 Changing ideas of universities

The idea of a university or 'academy' can be traced back to Plato in ancient Greece. As an institution, universities have demonstrated a durability and adaptability which has enabled them to survive social, political, religious, economic and philosophical upheavals. Sixty-two Western universities which were in existence in 1530 still survive today.⁵²⁷ However, as demonstrated in earlier chapters, the contents and epistemologies of their curricula have also adapted and therefore contributed to their longevity. Wissema has conceptualised 'three generations of universities'.

The medieval or first generation university; the Humboldt [originating in Germany] or second generation university; and the third generation university [which] ... is still in the future; universities are currently in a transition phase...⁵²⁸

⁵²⁵ Porter, M., Competitive Strategy: Techniques for Analysing Industries and Competitors, The Free Press, London, 1980, p.234.

⁵²⁶ OECD, Knowledge Bank: Futures Thinking, accessed at http://www.oecd.org/domcument/43/0,3746,en_36702145_36702245_37626859_1_1_1_1.00. Html October 10, 2011.

⁵²⁷ Coaldrake, P. and Stedman, L., On the Brink: Australia's Universities Confronting their Future, University of Queensland Press, St. Lucia, 1998, p.7.

⁵²⁸ Wissema, J., Towards the Third Generation University: Managing the University in Transition, Edward Elgar, Cheltenham, 2009, p.3.

In comparison to Europe, the history of universities in Australia is relatively recent. The first university to be established in Australia was the University of Sydney which was founded in 1850.⁵²⁹ Three further universities were established in 19th Century Australia, the University of Melbourne in 1853, the University of Adelaide in 1874 and the University of Tasmania in 1890.⁵³⁰ Even during this early period, changing influences on the structure and operation of the universities were evident. Initially influenced by the Oxford and Cambridge religious traditions, there was a gradual shift in the late 19th Century to the more secular, utilitarian influences exemplified by institutions such as the University of London and Scots Universities such as the University of Edinburgh and increasingly the newer institutions being established in the U.S.A.⁵³¹ Haines records that

After about 1850, Oxford and Cambridge produced excellent civil servants and administrators; they did not however, produce the men and women able to lead in doing the work of an industrialised society.⁵³²

Some of the reasons for this state of affairs have been identified in previous chapters. These included the influence of Platonic philosophy on British education and attitudes to theoretical treatments of innovation. Haines argues that it was only the imminent threat of German universities eclipsing British universities in the fields of science and technology in the nineteenth century and its implications for industry, trade and defence that spurred changes to the British university system.⁵³³

The growth in the number and size of Higher Education Institutions and Universities in Australia steadily increased throughout the 20th Century. Funding for the Australian universities was initially provided by private benefactors and the various States in which the universities were established.

⁵²⁹ Henwood, B., Australia's First: The University of Sydney - Celebrating 150 Years, Focus Publishing, Edgecliff, 2000, p.15.

⁵³⁰ Coaldrake, P. and Stedman, L., op.cit., p.9.

⁵³¹ Ibid.

⁵³² Haines, G., German Influence Upon English Education and Science, 1800 –1866, Stonington Publishing Company, Connecticut, 1957, p.xii.

⁵³³ Ibid., p.60.

9.2.1 Keynesian influences in university policies

This funding arrangement continued until the end of World War 2 when the Commonwealth provided specific funding on a limited scale through its Commonwealth Reconstruction Scheme. During this period, Keynesian public policies of nation-building influenced the growth and role of universities.⁵³⁴ Direct Commonwealth grants to universities commenced in 1951.⁵³⁵ This funding arrangement continued until 1974 when ‘the Commonwealth assumed full responsibility for funding higher education’.⁵³⁶

9.2.2 Neoliberal influences in university policies

During this era, various Committees investigated the tertiary education sector, the findings of the Martin Committee in 1964 lead to the establishment of the ‘so-called binary system of higher education’.⁵³⁷ The findings of the Martin Committee have also been identified as being influenced by Keynesian public policies.⁵³⁸ However by 1975, Keynesian policies were being actively challenged by Neoliberal inspired policies. Marginson observes that ‘The Keynesian policy consensus was shattered in business, government and the economics profession and public life’.⁵³⁹

The Australian higher education binary system remained in place until 1988 when Neoliberal inspired reforms overseen by the Federal Minister for Education, John Dawkins, resulted in

The 1988 White Paper [which] heralded a major change in the Australian Higher Education System ... and were the result of pressures arising from the situation of higher education within the public sector and the broader movements of public sector reform.⁵⁴⁰

One of the initiatives introduced by the Dawkins White Paper was the change in the university organisational structures and philosophies. The White Paper’s

⁵³⁴ Marginson, S. and Considine, M., The Enterprise University: Power, Governance and Reinvention in Australia, Cambridge University Press, Cambridge, 2000, p.23.

⁵³⁵ Coaldrake, P. and Stedman, L., op.cit., p.12.

⁵³⁶ Ibid, p.17.

⁵³⁷ Ibid, p.14.

⁵³⁸ Marginson, S. and Considine, M., op.cit., p.23.

⁵³⁹ Marginson, S., Markets in Education, Allen and Unwin, 1997, p.55.

⁵⁴⁰ Coaldrake, P. and Stedman, L., op.cit., p.19.

‘... key to reform was to imagine the university as a corporation in its own right’.⁵⁴¹ This Neoliberal inspired policy rhetoric acted as a legitimating narrative for the introduction of New Public Management techniques into the university organisational setting and the gradual replacement of Keynesian, nation-building policies and collegial governance structures. For example, the White Paper ‘...demanded strong managerial modes of operation and more streamlined decision-making processes’ to replace the existing governing councils which were characterised as being ‘...too large ... [with] academic structures too committed to representative politics rather than corporate efficiency’.⁵⁴²

9.2.3 Mergers and amalgamations in the higher education sector

Following this review, the Federal Minister for Education, John Dawkins, discontinued the binary system and a series of amalgamations took place which resulted in the ‘eighteen universities and forty-seven CAEs [Colleges of Advanced Education] that existed in 1985 [being] reformed into thirty universities in 1991, and thirty-five by the end of 1994.’⁵⁴³ It has been argued that these amalgamations contributed to ‘...the shift from an elite to a mass higher education system.’⁵⁴⁴

Marginson and Considine argue that the increased participation levels in higher education helped ‘...manage a youth unemployment problem ... [and that]... Full education emerged as a substitute for full employment...’⁵⁴⁵ The shift to a mass higher education system signalled the increase in student enrolment numbers, although neoliberal rhetoric would recast ‘students’ as ‘customers’.⁵⁴⁶ The growth in student enrolments also coincided with significant technological innovations which are still contributing to the reshaping of organisational products and processes in the higher education services sector.

⁵⁴¹ Marginson, S. and Considine, M., The Enterprise University: Power, Governance and Reinvention in Australia, Cambridge University Press, Cambridge, 2000, p.59.

⁵⁴² Ibid, p.61.

⁵⁴³ Coaldrake, P. and Stedman, L., op.cit., p.19.

⁵⁴⁴ Patience, A., ‘Beyond Silencing the Academy’, in James, P. (ed.), Burning Down the House: The Bonfire of the Universities, Arena Publications, Fitzroy, 2000, p.34.

⁵⁴⁵ Marginson, S. and Considine, M., op.cit., pp.29-30.

⁵⁴⁶ Pick, D. and Taylor, J., ‘Economic Rewards are the Driving Factor: Neoliberalism, Globalisation and Work Attitudes of Young Graduates in Australia’, Globalisation, Societies and Education, Vol.7, No.1, March, 2009, p.69.

9.3 Innovation in the higher education sector

The mid to late 1980s were also significant for technological and institutional innovations in the higher education sector. The quote below, from 1987, provides a baseline for establishing a timeframe for the introduction of Information and Communication Technology innovations into the Higher Education sector.

The only modern technological innovations that have been unambiguously fundamental to higher education are the invention of the printing press and the development of books as depositories of information, knowledge, beauty and speculation. Everything else has made, at most, small incremental refinements in a basic educational technology that consists of a group of teachers and students sitting on rocks and talking about books they have read.⁵⁴⁷

A literature search on the history of the introduction and use of information technology and communication systems in Australian Higher Education Institutions has revealed that there does not appear to have been a comprehensive history compiled on this area. Organisational changes in the Higher Education sector which were enabled by the introduction of technologies are also lacking a sustained analysis. However some papers and publications were identified which examined various aspects of these areas in isolation, so these will be reviewed and used as appropriate. Therefore the following section has been largely based on the author's own experience and memories of the history of the introduction of computing systems at the University of Wollongong, as a staff member from 1986 to 2012 at various University of Wollongong and University of Sydney academic departments, research centres and campuses.⁵⁴⁸ These observations are supplemented and supported where relevant literature has been identified.

During the research phase of this chapter it was discovered that the history of the introduction of information technology innovations into the University of Wollongong had not been documented. As a consequence of this finding, detailed information has been included in this chapter so that a textual record would exist for future researchers investigating the timing and examples of higher education

⁵⁴⁷ Kiesler, S. and Sproull, L. (eds.), Computing and Change on Campus, Cambridge University Press, Cambridge, 1987, p.24.

⁵⁴⁸ 1986 to 1992 - the Department of Psychology, the Department of Science and Technology Studies and the Centre for Technology and Social Change at the University of Wollongong; 1992 to 1993 - the Australian Centre for Innovation and International Competitiveness at the University of Sydney; 1994 to 1997 - the Department of Science and Technology Studies at the University of Wollongong; 1997 to 2000 - Graham Park Campus, Berry, University of Wollongong; 2000 to 2012 - Shoalhaven Campus, Nowra, University of Wollongong.

innovation during this period of transformation. Previous studies have identified the potential pitfalls of documenting organisational technological change. For example Kiesler et al argue that:

In most field research on new technology, the investigator has access to only one set of direct observations (usually in the midst of technological change or soon after the technology has become routine). In order to infer what is changing, the investigator must rely on retrospective, often biased evidence about the past or on projections of the future.⁵⁴⁹

Therefore, this account is offered with this caveat in mind.

9.4 Information technology in the Higher Education sector

The introduction and use of information technology in the higher education sector can be usefully divided into a number of periods. In this chapter, the five periods will be defined as: The Mainframe era; the standalone Personal Computer (including IBM/clones and Apple computers) era; the networked Personal Computer era; the Internet era and the mobile communication era. These ‘eras’ were not of course so cleanly defined in actuality, there was a great deal of overlap and duplication as newer systems were introduced and in turn replaced. However the use of this ‘five era typology’ assists in the task of tracing the developments of computing systems into a university environment and also the organisational changes they assisted in enabling.

9.4.1 The Mainframe Era

Early use of mainframes was largely confined to the storage and analysis of large information banks in government agencies and universities.⁵⁵⁰

The histories of universities and digital computing have long been intertwined.

Duderstadt observes that the

... digital computer was first developed in the laboratories of university scientists and engineers... for the solution of particular research problems such as complex mathematical equations arising in physics and engineering.⁵⁵¹

⁵⁴⁹ Kiesler, S., Obrosky, S. and Pratto, F., ‘Automating a University Library’, in Kiesler, S. and Sproull, L. (eds.), *op.cit.*, p.147.

⁵⁵⁰ Australian Government Productivity Commission, *ICT Use and Productivity: A Synthesis from Studies of Australian Firms*, Commission Research Paper, Canberra, 2004, p.30.

⁵⁵¹ Duderstadt, J.J., Atkins, D.E., and Van Houweling, D., *Higher Education in the Digital Age: Technology Issues and Strategies for American Colleges and Universities*, American Council on Education/ Praeger Publishers, Westport, 2002, p.38.

However, because of the extremely specialised nature of these applications, very few university staff or students had the access or the understanding to use these facilities. The computer user base didn't broaden significantly until mainframe computers such as the IBM 704 series began to be installed and used on campuses in the United States in the early 1960s.⁵⁵² The IBM 704 series was 'capable of more general applications' and although 'more faculty and students had access to such machines, their cost, size and complexity demanded unique facilities ...attended by specialised staff...'⁵⁵³

To use these machines, one first had to obtain an account, then use a keypunch to prepare a deck of cards containing the program and data, submit these as a "batch job" to the computer centre...and then wait for hours (sometimes days) for the job to be run ... on the computer and the output to be available as printed stacks of paper.⁵⁵⁴

In common with the financial services sector, the first use of computing consisted mainly of the installation of large mainframe computers in administrative roles and, in the university context, also as research tools. In the university context, 'business and administrative computing was generally kept quite separate from academic computing'.⁵⁵⁵ However, in both roles, their main function was that of calculating and collating data. One commentator has argued that the

...most significant breakthrough of the 1960s was the introduction of time-sharing operations that allowed large numbers of users to simultaneously access mainframe computers remotely, through teletypes or CRT [Cathode Ray Tube] – display terminals.⁵⁵⁶

The mainframe provided the computing power which was delivered to users via 'slave' or 'dumb' terminal Cathode Ray Tube (CRT) screens whose 'background was invariably black, providing a contrast to the phosphorescent green (sometimes white) letters'.⁵⁵⁷ Users communicated with the mainframes with text commands typed in via keyboards. Various iterations of the mainframe computers were introduced as the technology improved, however in this generation of computing in higher education the function remained more or less the same.

⁵⁵² Ibid, p.39.

⁵⁵³ Ibid.

⁵⁵⁴ Ibid.

⁵⁵⁵ Ibid.

⁵⁵⁶ Ibid.

⁵⁵⁷ Levy, S., 'Insanely Great: An Ode to an Artefact – the Computer that Changed Everything', Random Access, 1995 Archive, accessed at http://www.gulker/Insanely_Great.html, June 17, 2007.

Organisationally, this development enabled hundreds of university staff and students to gain access and familiarity with computing resources. This not only broadened the usage of computers in research applications but also enabled the advent of computer assignments in the curriculum of ‘disciplines such as engineering’.⁵⁵⁸ This period of computing was typified by non user-friendly mainframe computers using specialised computer languages and, generally, punch cards for data input. The user base was generally restricted to research or administrative applications and was not generally available, or used by, the wider academic or general staff community at universities. This situation remained the case until the introduction of smaller and more portable, personal computers.

9.4.2 The ‘Standalone’ PC era

The early 1980s witnessed the small scale introduction of stand alone Personal Computers and Word Processors for administrative tasks. Initially, their introduction was in the context of replacing the manual typewriters that had traditionally been used by administrative staff. The major efficiencies delivered by the replacement of typewriters by word processors and PCs in an administrative role was the ability of the PCs to store document files once they had been typed so that they could be used again in future if the need arose, whereas with a typewriter, new documents had to be typed every time they were required.

For Departmental Secretaries, the introduction of PCs and Word Processors reduced the number of keystrokes that their roles required of them over a given period and freed up time that could be utilised in other areas of their roles. However, Departmental Secretaries were still largely responsible for typing up academic’s handwritten manuscripts and this would remain the case until academics became ‘computer literate’ and were able, or required, to provide ‘self-service’ in the production of their own typed manuscripts. The diffusion of the ‘self-service principle’, of supermarkets, petrol stations and ATMs, to academics is a process innovation typical of the service sector.

⁵⁵⁸ Duderstadt, J.J., Atkins, D.E., and Van Houweling, D. *op.cit.*, p.39.

Another advantage of the PC-produced documents is that multiple copies of the one document could be produced via the computer printer immediately 'in house'. The older alternative to this was typewriter produced documents, which required multiple copies, would be sent to a Printery shop where they would be printed up in multiple copies with a turnaround time of days or sometimes weeks. The other alternative for producing multiple copies of documents was a Roneo or Gestetner machine which required a 'stencil original' to be typed up and attached to the Gestetner machine which would then be manually operated to produce multiple purple-inked, white spirit-scented copies (white spirit was used as a thinning medium for the Gestetner machine). Photocopying machines were not widespread at this point in time.

The old typewriter technology was gradually replaced by the newer PC technology, however organisational structures remained largely unaffected initially as the possibilities for organisational efficiencies of the new technology demonstrated in other sectors had not yet been foreseen, nor implemented in the higher education context.

The diffusion of the PCs into research and academic roles was a much slower process. Although the IBM PC was introduced in 1981⁵⁵⁹ and the Apple Macintosh in 1984, the diffusion process was complicated by the incompatibility of the two main suppliers of PCs: IBM (or IBM compatibles); and Apple. Apple computers were initially introduced into the Australian university context through the Apple II and 'Lisa' models in the early 1980s. The Apple II used the conventional computing text line operating system interface, however it was one of the first computers with a colour display and has been described as 'probably the first user-friendly system.'⁵⁶⁰

⁵⁵⁹ McCredie, J., 'Planning for IT in Higher Education: it's not an Oxymoron', *Educause Quarterly* – Number 4, 2000, p.20.

⁵⁶⁰ Accessed at <http://oldcomputers.net/appleii.html> , June 17, 2007.

Case Study 9.1: The Gradual Diffusion of PCs and Apple Computers into a University Context – A Student's Experience.

It is illuminating to review the gradual changes in the form of student essay submissions as an indicator of the progression to utilising the new technology in an academic setting. Reviewing the author's undergraduate essay submissions from 1984 revealed that around half of those submitted were handwritten on ruled foolscap paper, the other half being typewritten (double spaced to allow room for marker's comments) with a manual typewriter on white A4 paper. However, the essays from 1985 reveal that all of the assignments were manually typewritten on white A4 paper. This was a reflection of the changing requirements of assignment submissions – from 1985, Faculty of Arts departments at the University of Wollongong would no longer accept hand-written assignments. Prior to this student folklore held that a typewritten assignment generally received around 10 per cent higher grades than its handwritten equivalent due to it being easier to read for the marker. 1986 was clearly a watershed, all assignments from this time to the final set of undergraduate assignments submitted in February, 1988, were produced on various models of the Apple Macintosh and printed (in a Chicago typeface) on white, perforated A4 paper by an Apple Imagewriter dot matrix printer. Apple Imagewriter printers used continuous feed, perforated A4 paper which had sprocket holes in strips along the sides of the A4 sheets. Continuous feed paper folded and stacked in a concertina-like manner as it was fed out of its cardboard box and also as the printed pages emerged from the printer. The paper was loaded onto tractor feed sprocket wheels which fed the paper into the printer. Printed documents from this type of printer could be identified by the perforation tears around every edge of the document. Final preparation of a document printed on an Imagewriter consisted of tearing off the perforated sprocket hole strips on each side of the A4 sheets and also tearing along the perforations between each A4 sheet to separate the pages. Postgraduate assignments submitted in 1989, reflect the ongoing diffusion of technological change – they are also produced on an Apple Macintosh, but printed by an Apple Laserwriter on white A4 paper.

The Apple Lisa model, introduced in 1983, was revolutionary in that it was the first computer to introduce a purpose-designed Graphical User Interface (GUI), which is the familiar icon-based desktop interface known to Apple and Microsoft Windows users today.⁵⁶¹ Although the Lisas were relatively expensive (\$US10,000 in 1983) some of them were introduced into university settings (for example the Department of Psychology, at the University of Wollongong had a 'Lisa' which by 1986 was being used by Administrative staff for word processing tasks).

The Apple Macintosh (Mac), released in 1984, was technically more efficient than the Lisa and also a fraction of the cost (\$US2,495.00 as compared to the Lisa's 1983 \$US10,000 price tag).⁵⁶² The technical advances of the Mac were such that the introduction of the Mac '...had the effect of rendering the Lisa a bulky doorstop'.⁵⁶³ Levy observes that the shape of the Macintosh computer has become a cultural icon, '...as instantly recognisable as a Volkswagen or a Coke bottle.'⁵⁶⁴

The introduction of Macintosh Computers at the University of Wollongong in 1984 seemingly created a 'computing cultural divide' between the Science-based faculties, which preferred IBM compatible PCs, and the Arts (or Humanities) Faculties which preferred the Apple Macintoshes. At the time, a common explanation for the adoption of the Macs by the Arts Faculties was that they were 'user-friendly' (due to their Graphical User Interface). This encouraged and enabled many Arts Faculty staff and students, who would not have ordinarily considered using a PC-formatted computer, to take up the challenge of learning how to use a 'new technology' in an academic context.

This was a key turning point for universities in that many more staff and students, than otherwise would have been the case, adapted to and learnt the new technology and therefore would be prepared for the future diffusion of IT into

⁵⁶¹ Accessed at <http://www.vectronicsappleworld.com/macintosh/lisagui.html>, June 17, 2007.

⁵⁶² *Ibid.*

⁵⁶³ Levy, S., *Insanely Great: The Life and Times of the Macintosh, the Computer that Changed Everything*, Penguin Books, New York, 1994, p.149.

⁵⁶⁴ Levy, S., 'Insanely Great: An Ode to an artefact – the computer that changed everything', *Random Access, 1995 Archive*, accessed at [http://www.gulker/Insanely Great.html](http://www.gulker/Insanely%20Great.html), June 17, 2007.

Internet enabled permutations. It also validated Apple Computer's foresight in recognising the key role of universities in diffusing innovations such as the computer.

...Some of the visionaries were at Apple. ... They saw the education market, and especially Universities, as key to transforming perceptions and use of computers. At the time, desktop computers weren't a new idea; we'd had so-called microcomputers for some time, largely sold through electronics hobbyist outlets and specialist dealers.⁵⁶⁵

The introduction of Apple computers into the university environment was assisted by the establishment of 'Apple University Consortiums' (AUC) at nine Australian universities in 1984 when the 'Mac' was first released.⁵⁶⁶ Similar consortiums were also established in New Zealand, Canada, the United States and the United Kingdom.⁵⁶⁷ The University of Wollongong was one of the initial nine Australian member universities of the AUC. The university context of 1984 was very different to that of universities today. An insight into universities circa 1984 is provided by the following quotation:

At that time [1984], Universities did not have departments or divisions with names like Information Technology Services or Information Services. We had Computer Centres, and the focus was very much on the computation and not so much on the information. Users (and we certainly called them users back then, not clients or customers) were predominately from the numerical disciplines. Around that time, I can recall a serious argument being put up in my university to the effect that word-processing was an abuse of scarce computational resources.⁵⁶⁸

At the University of Wollongong, the Apple Consortium was initially located in the University Library premises. It offered 'special discounts on [Apple Macintosh] machines, software and courseware. ... The Consortium [also] conducted computer literacy courses.'⁵⁶⁹ The University of Wollongong Apple University Consortium,

⁵⁶⁵ Young, S., 'Collaboration amidst Competition: The Apple University Consortium as Successful Co-opetition', Paper presented at the Educause in Australia Doing IT right – "People and Technology" Conference, 18–21 April, 1999, Sydney, Australia, p.1, accessed at <http://www.caudit.edu.au/educauseaustralia/1999/papers/pdf/StephenYoung.pdf> June 11, 2007.

⁵⁶⁶ Apple University Consortium, AUC: Apple University Consortium – About the AUC, accessed at <http://www.auc.edu.au/About+the+AUC> June 11, 2007, p.1.

⁵⁶⁷ Young, S., op.cit.

⁵⁶⁸ Ibid.

⁵⁶⁹ Aungles, S., 'Information Technology and the Transformation of the Academic Workplace?', Science and Technology Analysis Research Programme. Working Paper No.13, March, 1994, p.8, accessed at <http://www.uow.edu.au/arts/ssmac/science/UOW018688.html> May 31, 2007.

Initially sold approximately \$2 million of computer equipment annually within the university. By December 1989, 1,400 Macintosh systems had been sold. IBM equipment was also available but few people in the university were even aware of its existence as the outlet was almost hidden. The services have now [1994] been 'rationalised', both IBM and Apple Macintosh machines are now available from the same location.⁵⁷⁰

The diffusion of computers in university departments varied according to a particular department's funding and equipment allocation. In the Department of Psychology at the University of Wollongong for example, the diffusion of computing initially consisted of mounting one or two Macintoshes on wheeled computing desks and physically rolling the computer from one office to another as required. Departmental academics and administrative staff could book the computer for a number of hours via a paper-based booking system. As newer computers were purchased and introduced, the older models gradually began to make their way onto the desks of academics. Research grants also assisted the purchase of computers for academic use beyond those purchased from departmental funding sources. Due to the portability and availability of 'travel bags' for Macintoshes some departments also made some of the older Macintoshes available for overnight and weekend loan to academics.

Although the availability of Macs to academics was a small step forward, it initiated the beginnings of organisational changes and a gradual shift in workloads. For example, as academics began to type their own manuscripts, instead of handwriting them, the need to pass on handwritten manuscripts to Departmental Secretaries for word processing was alleviated and thereby freed up administrative time that could be utilised on other tasks. However, this was not a straight swap of a task from one to the other, *some* academics dispensed with the handwriting of manuscripts altogether (although some academics still prefer to write first drafts by hand) and began the drafting of manuscripts on the computer. This had a number of advantages, firstly it was more efficient due to it cutting out 'double handling' of text and secondly, once the text of a manuscript was entered into the computer, it was possible to correct errors and redraft manuscripts on the screen due to the electronic 'cut and paste' feature.

⁵⁷⁰ Ibid.

Case Study 9.2: The Apple Macintosh: A Brief History of Technical Innovations 1984–1986

The Apple Macintosh was initially introduced in the 128K RAM, 3.5 inch floppy disk (single sided 400KB) version, with gradual upgrades to the 1MB MacPlus. The ‘Mac’ continued throughout the 1980s and 1990s as newer, faster and larger memory models became available.

Initially the Macintoshes were configured with only one floppy disk drive which used single sided 400KB disks. As software programs became more ‘memory hungry’, the single floppy disk drive was often subjected to a process called the ‘floppy disk shuffle’ – inserting and removing two floppy disks in turn (and multiple times) to load both the computer operating system software and also the software application programs which were stored on either disk. The ‘floppy disk shuffle’ could be alleviated by connecting an additional external floppy disk drive, although these were fairly rare. However this still restricted the memory capacity to two 400KB single-sided disks. Today this seems a small amount of memory, but it was quite adequate for the early Macintosh software programs which used relatively little memory.

The advent of the 1MB MacPlus in 1986 was significant for a number of reasons. Firstly, the 1MB RAM translated into faster loading times for computer operating systems and software applications. The MacPlus used 800K floppy disks (and could also read the 400K disks) which increased the amount of data that could be stored on each disk. Arguably, one of the most important features of the MacPlus was the SCSI connection port which enabled peripheral devices such as fast hard disk drives (initially of 20 MB and 40 MB capacities) to be connected to the MacPlus for an increased data storage capability. These improvements enabled Macintoshes to be increasingly used in research support roles due to their increased ability to store and process ‘memory hungry’ data analysis software applications and research data.

Case Study 9.3: Academic Career Ladders - 1986

The academic career ladder in 1986 was based on PhD students or recently completed PhDs gaining a permanent position as a Tutor which was a stepping stone to a tenured academic position – generally a Lectureship. Tutor's duties would include teaching tutorial classes and general departmental duties in addition to establishing a research track record. Career progression was based on research output and/or success in gaining research funding. From Lecturer, a typical academic career path would proceed to Senior Lecturer, Associate Professor and then perhaps, Professor. Academic career paths could be extended beyond that of Professor by taking on Faculty or Academy posts such as Dean of Faculty or Vice Chancellor among others.

Fast-forward: 2011

The academic career path stepping stone of Tutor has effectively been casualised. Career track positions commencing at the level of Tutor are extremely rare. Those fortunate enough to win a position at this level are referred to as Level A Associate Lecturers. The title of Tutor has become informally associated with the peripheral sessional casual staff that may or may not be completing a PhD.

Initially, the stand alone PCs and Macs were not networked and were true stand alone machines, however they could be connected to peripheral devices such as printers and scanners etc. Inter-organisation communication was still largely achieved through paper-based Memos and an internal organisation mail delivery service. The arrival of hard disk Macintoshes in the late 1980s enhanced their ability to store more data and hence enhanced their usability within a university context.

In the research context, requests for copies of research papers from academic colleagues was also a paper and post based process which, from the posting of the initial paper-based request could take weeks for a research paper to arrive, thereby slowing down the research process considerably. In the context of teaching, things largely remained the same as they had been – instead of hand-written or typewritten overheads and handouts, the materials were produced using word-processors.

Case Study 9.4: Departmental Secretaries and Salary Distribution - 1986

In 1986, Departmental Secretaries (as they were called then – the title has since been changed to Administrative Assistant at the University of Wollongong) had the task of distributing staff ‘salary – cheque envelopes’ which contained a staff member’s salary-cheque and pay slip every Thursday fortnight. This had been the procedure for many years prior. When staff received their cheque, they would walk to the on-campus’ bank and deposit it in their account or cash it on provision of suitable identification - their university staff card for example. An agreement existed with the on-campus bank branch that staff were not required to hold an account with the bank to cash their salary cheque.

Fast-forward: 2011

University staff salaries are deposited via direct electronic bank deposit. To receive their salary, university staff are compelled to hold a current bank account for their salary to be deposited. Employers do not offer to cover the cost of employees’ bank fees entailed in the requirement to hold an account to receive their salary.

Access to computing resources was provided to university students in a variety of ways. Those who were financially able could purchase discounted Apple Computers through the AUC. Computer resources were also provided in Computer Access Centres, at the University of Wollongong these were housed within the Library Building. A 1991 photo shows students in the University of Wollongong Library Computing Access Centre sitting in front of Macintosh Classic computers.⁵⁷¹ The Macintosh Classic model had been released by Apple Computers in 1990.

9.4.3 The ‘Networked’ PC era

In the early 1990s, the next leap forward was the networking of Departmental PCs and Macintoshes into Local Area Networks (LAN). Networked computers could access a common departmental printer and computer server (generally of around 30 MB capacity) on which shared departmental files could be stored. This

⁵⁷¹ Castle, J., University of Wollongong: an Illustrated History 1951-1991, University of Wollongong, 1991, p.52.

development also ushered in a limited form of email communication between departmental computers connected to the intranet. The Australian Academic Research Network (AARNET) was also developed around this time and was generally considered as a forerunner of Internet sites in Australia. The AARNET provided a basic Internet platform and search engine which was initially confined to Australian Universities but which was eventually connected to International universities and ultimately the Internet itself. Laptop computers became more widely available during this period – popular with academics who could work on their laptops on the train trip to university and unintentionally also raise the public’s awareness of computers.⁵⁷²

In the mid 1990s, the email facility of the IT revolution had improved to the point where researchers could email a request for a research paper to a colleague at another domestic or international university. This accelerated the process immensely, yet the delivery of the material was still by ‘snail mail’. Software applications had by this stage developed beyond the basic word processing packages which had largely been the staple software package of earlier times. Database software such as Microsoft File Manager and Microsoft Excel had become available in the early 1990s.

9.4.4 The Internet Era

The next generation of change, in the closing years of the twentieth century, involved the broader networking of computing facilities into the Internet (the commercial commodity Internet around 1990 and the World Wide Web around 1993).⁵⁷³ The growth of the Internet was accompanied by an increasing use of the Internet for research, teaching and administrative activities. An example of the degree of change ushered in during this period is provided by access to research papers, which could be searched for and accessed ‘online’.

⁵⁷² The author recalls seeing a ‘laptop’ used in this context in 1989 when an academic in the Department of Science and Technology Studies, Richard Badham, used a Macintosh Portable (released in 1989) whilst commuting on the one hour train journey between Berry and Wollongong train stations. In the process he also raised public awareness of the use of computers. He commented at the time that when fellow passengers showed an interest in the Macintosh Portable he would give an impromptu demonstration of its capabilities.

⁵⁷³ McCredie, J., ‘Planning for IT in Higher Education: it’s not an Oxymoron’, *Educause Quarterly* – Number 4, 2000, p.20.

As Barras had predicted in his 1987 paper, the Internet era also enabled the establishment of smaller geographically-remote satellite campus sites. Neo-Schumpeterian authors such as Christensen have also identified the role that the implementation of these newer ICT-based technologies play in not only introducing ‘disruptive innovation’ into the higher education organisational environment, but also contribute towards redefining their roles, processes and functions.⁵⁷⁴

9.4.4.1 The satellite university campus model

In the teaching context, the University of Wollongong began establishing satellite campuses and education centres in the early 1990s. The establishment of satellite sites was made possible by the growth of Information Technology and Communication technologies. The Neo-Schumpeterian definition of innovation would also encompass the establishment of a geographically remote university satellite campus. As discussed in the previous chapter, the establishment of satellite branches had already commenced sometime previously in the leading services sub-sector, retail banking.

9.4.4.2 Flexible delivery

The University of Wollongong also made a conscious decision to pilot the ‘flexible delivery’ of subjects to a temporary satellite campus at Berry, New South Wales in the late 1990s. ‘Flexible delivery’, as a service delivery strategy, can be viewed in isolation or paired with the concept and/or practice of ‘flexible production’. These ‘Flexible’ concepts can be situated within ‘Post-Fordist’ organisational concepts and located within the group of newer Fifth Kondratiev narratives which were discussed in previous chapters.

Daniels et al contrast the ‘flexible production’ concept with concepts of mass production and Fordism. ‘Fordism was Gramsci’s name for the kind of society emerging in the mid-twentieth century, characterized by mass consumption of goods mass produced increasingly via fixed or so-called “Detroit” automation.’⁵⁷⁵ Previous chapters have indicated that Neo-Schumpeterian theorists locate both of

⁵⁷⁴ Christensen, C. and Eyring, H., *The Innovative University: Changing the DNA of Higher Education from the Inside Out*, Jossey-Bass, San Francisco, 2011, pp.xxv, 17 and 406.

⁵⁷⁵ Hakken, D., ‘Computing and Social Change: New Technology and Workplace Transformation, 1980-1990’, *Annual Review Anthropology*, 22, 1993, p.111.

these concepts, mass production and Fordism, within the Fourth Kondratiev long-wave cycle which preceded the current Information and Communication Technology Fifth Kondratiev long-wave cycle.⁵⁷⁶

The concept of 'flexible production' emphasises the role of vertical disintegration and the social division of labour, the antithesis of the Fordist system of mass production which suffers from rigidity and, therefore, an inability for firms to adapt quickly to technological innovation or to the increasingly international markets within which they have to compete.⁵⁷⁷

Levidow argues that universities 'marketisation agendas link two neoliberal meanings of flexibility. First, student-customers (or their business sponsors) seek learning for flexible adaptation to labour-market needs. Second, global competitors flexibly design and sell courses according to consumer demand, so universities must anticipate and counter such competition'.⁵⁷⁸

9.4.4.3 Videoconference lectures

A pilot program of videoconference lectures were produced and delivered to a temporary University of Wollongong satellite campus at Graham Park in Berry, New South Wales. Initial videoconference lectures were delivered via the narrow band telephone network in 1997. The transmission quality of these initial videoconferences suffered due to the narrow bandwidth on which they were being transmitted. Graphics and sound were not always synchronised and the graphics transmission tended to be a rapid succession of freeze frames of the lecturer occasionally interspersed with continual footage.

9.4.4.4 Satellite campuses and core and periphery staffing

The satellite campus at Graham Park was also innovative in its staffing profile. The majority of permanent staff members were general administrative staff. The Campus Manager, although an academic, performed administrative and managerial duties. Tenured lecturers either video-conferenced their lectures to the satellite campus, or, as was more often the case, would provide lecture notes and readings to students to prepare for the subject's tutorial where subject matter

⁵⁷⁶ Amin, A., 'Post-Fordism: Models, Fantasies and Phantoms of Transition', Chapter 1 in Amin, A. (ed.), *Post-Fordism: A Reader*, Blackwell Publishers, Oxford, 1994, p.12.

⁵⁷⁷ Bryson, J., Daniels, P. and Warf, B., *Service Worlds: People, Organisations, Technologies*, Routledge, London, 2004, p.79.

⁵⁷⁸ Levidow, L., 'Neoliberal Agendas for Higher Education', Chapter 18 in Saad-Filho, A. and Johnston, D., *Neoliberalism: A Critical Reader*, Pluto Press, London, 2005, p.160.

would be discussed by the casual sessional tutor. The majority of teaching staff were sessional casuals who were hired from the local area surrounding the satellite campus or, in some rarer cases, travelled from the Wollongong Campus. Occasionally a tenured lecturer would visit the campus to deliver a lecture.

The closing of the Graham Park Campus in Berry and its relocation to the newly constructed Shoalhaven Campus at West Nowra in 2000 also witnessed a significant improvement in videoconferencing capabilities. The new campus had a broadband microwave link which beamed the University of Wollongong's videoconference, internet and phone traffic from the main Wollongong campus to its satellite campus and education centres at Nowra, Bateman's Bay, Bega and Moss Vale. The broadband videoconference link significantly improved the quality of videoconference broadcasts – the jerkiness and freeze-frame phenomena were eliminated and the graphics and audio were also synchronised.

In the teaching context, students could now participate in online subject-related discussion groups and also access subject outlines and reading materials online. Broadband videoconferencing enabled lectures to be delivered to the University of Wollongong's four remote campuses simultaneously. Some subjects were delivered in their entirety over the Internet via a proprietary software package named 'WebCT', which was one of a variety of proprietary software packages developed for this purpose.

In addition to providing videoconference lectures to geographically remote 'satellite' campuses (which had themselves been made possible by the IT paradigm) the broadband microwave link also facilitated virtual meetings between staff at various campus locations. Apart from the efficiencies gained through the redundancy of paper-based materials in many of these scenarios, the speed of delivery of materials and communication between students and teaching staff was also enhanced. These developments also contributed to decreasing the sense of 'regional isolation' for students and staff based at satellite campus and education centre sites.

As the final draft of this thesis is being prepared, Massive Online Open Courses (MOOCS) are rapidly increasing in both student enrolment numbers and also recognition and consideration by university management committees. For example, MOOCS courses have successfully been run by a number United States universities and are currently being piloted in Australia. The potential implications of MOOCS are enormous and in many respects represent the next phase of the Fifth Kondratiev in the higher education sector. For example, MOOCS leverage on the widespread Information and Communication Technology infrastructures in universities and in society more broadly. The potential disintermediation made possible by MOOCS dwarfs developments recently witnessed in the higher education sector by potentially delivering globally-produced university-level courses to local, regional, satellite campuses. MOOCS also contain the potential to bypass local university campuses if students adopt a full distance-education model. Perhaps there are lessons to be learnt from the rollout of electronic banking in Australia where it was demonstrated that many customers preferred a combination of ‘bricks and clicks’ that is an online environment and also the physical presence of a satellite campus for staff and peer support.

9.4.4.5 Self-service university services

In the student services context, as with the financial services context (and in keeping with the self-service process innovation common to service sector applications discussed earlier in this chapter), the broadband internet applications enabled an increasing shift of the client service administrative workload to the clients (students) themselves. This is manifesting in the form of customer self-service applications which are increasingly present in Enterprise Resource Planning systems (ERP) currently being implemented in numerous universities.⁵⁷⁹

In the university ERP application, students now enrol and withdraw from degree subjects online without involving university ‘front desk’ Administrators in the process. The payoff for students was the end of the need to queue for hours in the Administration Building to add or withdraw from subjects. From a university

⁵⁷⁹ Cornford, J. And Pollock, N., Putting the University Online: Information, Technology and Organisational Change, Open University Press, Buckingham, 2003, p.20.

administration viewpoint, many staffing efficiencies were also gained from this disintermediation.

Cornford and Pollock observe that the process of shifting university service provision from a 'staff-mediated' process to a 'self-service' process assists in clarifying and making '...explicit the various roles and responsibilities within the university' and assists in the processes of organisational change.⁵⁸⁰ They further observe that the new technologies also assist in the introduction of Neoliberal-inspired managerialism into the university system.⁵⁸¹

9.4.5 The mobile communication era

The next, and most recent and contemporary, stage in higher education technology innovation is the mobile communication era. This can be divided into two categories: the mobile phone; and mobile tablet computing.

9.4.5.1 The mobile phone

Internationally, numerous universities have mobile phone applications. Whilst this survey is not comprehensive, the majority of universities offering mobile applications (or 'apps') appear to be in the United States. For example, at the time of writing in October 2011, the following US universities offered mobile phone applications to their students: West Virginia University; University of Washington; MIT; and Adelphi University.⁵⁸² In the United Kingdom, Oxford University also has a mobile phone application available for students.⁵⁸³

In the Australian context, the University of Melbourne launched a mobile phone application in July 2010. As at January 2011, eight Australian universities had some form of mobile phone application on offer. These universities included: the Australian National University; Swinburne University of Technology; University of Melbourne; University of NSW; La Trobe University; and RMIT. As at July 2011, the University

⁵⁸⁰ *Ibid.*, p.97.

⁵⁸¹ *Ibid.*, p.70.

⁵⁸² Fienen, M., 'Best of the Mobile Higher Ed Web', *EduGuru*, 17/5/2010, accessed at <http://doteduguru.com/id5154-best-of-the-mobile-higher-ed-web.html> October 20, 2011.

⁵⁸³ Information accessed at <http://m.ox.ac.uk/desktop/> October 20, 2011.

of Wollongong (UOW) had appointed a Mobile Web Project Officer to develop a UOW mobile application strategy and implementation plan.

9.4.5.2 The tablet

In the United States, Ashford University in Iowa, has made tablet applications available enabling enrolled students to access, via their tablet computer, course notes, online discussions and also check their progress in their degree.⁵⁸⁴ The University of Louisville School of Engineering has made it a requirement that students purchase a tablet for class use in 2011.⁵⁸⁵ In Australia, the University of Melbourne commenced a 50 student iPad tablet pilot program in August 2010.⁵⁸⁶ More recently, as this thesis is pending submission for examination, the University of Western Sydney has issued each new 2013 enrolling student with an iPad.⁵⁸⁷

⁵⁸⁴ Information accessed at <http://market.android.com/details?id=edu.ashford.talontablet> October 20, 2011.

⁵⁸⁵ Information accessed at <http://louisville.edu/speed/academics/tablet-pc> October 20, 2011.

⁵⁸⁶ Information accessed at http://www.techworld.com.au/article/358389/melbourne_uni_begins_50_student_ipad_pilot October 20, 2011.

⁵⁸⁷ University of Western Sydney, [iPad initiative](http://www.uws.edu/learning_teaching/ipad_initiative), accessed at http://www.uws.edu/learning_teaching/ipad_initiative February 28, 2013.

Case Study 9.5: The University Library

The role and function of University Libraries, and those who staff them, have also changed significantly due to technological and organisational transformations. Clearly the ‘physical building footprint’ of most established university libraries still consists of providing shelving and storage facilities for the ‘hard copy’ resources in the forms of books, journals and multimedia and also the human resources required for their sorting, stacking and circulation. However, the access, storage and retrieval of information about these resources, and also the media format of some of these resources, have undergone a revolutionary transformation.

A good example of these transformations is provided by the University Libraries’ catalogue system. Traditionally, a university libraries’ catalogue system consisted of a paper-based index card system housed in rows of wooden drawer cabinets. Libraries commenced their transformation process by replacing their paper-based index card system with on-line catalogues around 1986. Catalogues were accessed via a phosphor–green screen ‘dumb-terminal’ connected to a mainframe computer. The index card system, however, was initially kept concurrently with the on-line cataloguing system in case of computing system failure. The introduction of the library computer catalogue system increased efficiencies in a number of ways for both staff and library users. For staff, it reduced the workload involved in cataloguing books, journals and media.

Additionally, once this cataloguing information was captured on a database, it became possible to manipulate it in other ways. For example, it streamlined the process of performing a catalogue search by author, title, subject, ISBN or keyword. These searches could now be performed at the touch of a button, instead of thumbing through dozens of catalogue index cards individually. The information sorting potential of online catalogue searches were also extended through the introduction of internet network connections.

Case Study 9.5: The University Library (continued)

This development enabled staff and library users to not only search the catalogue of their local university library, but also the catalogues of libraries interstate and overseas. This feature also streamlined Inter Library Loan processes for library staff, transforming it from a 'snail mail' based process to an on-line search, locate and request process. These developments also assisted the development of geographically remote 'satellite campuses. Staff and students based at a satellite campus could request Inter Library Loans on-line and have them delivered to their satellite campus by 'snail mail' or, in the case of some journal articles, on-line.

The progression from index card catalogues to online catalogues has now also been supplemented by the increasing availability of online journals, monographs and databases. This can be viewed as a classic example of a service sector innovation whereby ICTs have effectively created the potential disintermediation of an existing storage, processing and delivery organisation. For example, Trow argues that information and communication technologies have undermined 'the old functions of the university library'.⁵⁸⁸ He observes that 'Information comes online from everywhere, and liberates scholars from dependence on their own libraries'.⁵⁸⁹ Trow further argues that: 'University libraries are seeking new functions, and may find some, but whatever they may be it is likely they will be less in integrating the university than in adapting to the centrifugal tendencies of the new technologies'.⁵⁹⁰

This period also witnessed the transition from 'check-out cards' in each library book to barcodes and 'barcode reader guns' which speeded the checkout process of library books considerably.

⁵⁸⁸ Trow, M., 'Some consequences of the new ICTs for HE', in Robins, K. and Webster, F., The Virtual University? Knowledge, Markets and Management, Oxford University Press, Oxford, 2002, p.306.

⁵⁸⁹ Ibid.

⁵⁹⁰ Ibid.

Period	Technological Possibilities	Application	Type of Service Innovation	Industry Structure	Market Demand
Mid 1970s-1980s	Mainframe computers	Back office data processing of transactions & student records	Improved efficiency	Pre Dawkins cartel	Growth of student numbers
Mid 1980s-mid 1990s	Corporate networking with dumb terminals	Batch processing of statistical data. Early library catalogue search applications	Improved quality	Deregulation/ increased competition	Extended and easier access
Mid 1980s-mid 1990s	Corporate networking with intelligent terminals	Staff and student access to word processing and basic data software applications	Increased staff/ student computer literacy	Amalgamation of tertiary education	'Massification' of university education. Increased ratios of female students and staff.
1990s-	ISDN networking and increasingly powerful PC and mainframe processing power	Early intranet services email applications. Increasingly powerful and 'memory hungry' software applications		Integration	Convenience & flexibility
2000s-	Broadband Internet	Fast, on-line, international research capability. Desktop library catalogue access. Increased self – Service applications. Videoconference delivery of lectures and tele-meetings to remote campuses. on-line delivery of study materials. International collaboration in delivery of degree program subject materials and lectures.	'Just in time' information access		
2009-2011	Mobile phone Network Laptop Handheld Mobile phone Tablet mobile	Mobile access to university self-service applications	Access to university course and degree information	Consolidation Strategic partnerships with Telcos	24/7 access Increased convenience, flexibility & geographical mobility

Table 9.1: Technology and Service Innovations in Australian Higher Education 1970s-2011

This table is a modified and updated version of the table which originally appeared in Barras, R., 'Interactive Innovation in Financial and Business Services: The Vanguard of the Service Revolution, *Research Policy*, 19, (1990), p.227.

Case Study 9.6: The 'Creative Destruction' of Obsolete Technologies

Another set of technologies that were gradually made obsolete by the introduction of Information and Communication Technology into the University Library setting were the Microfilm reader machines and microfilm rolls and also the Microfiche reader machines and microfiche slides. This could be interpreted as an instance of Schumpeter's 'creative destruction', as newer technologies replace the function of older, obsolete technologies.

Microfilm

Microfilm machines consisted of two main elements: the spool winding mechanism which was used to load the microfilm onto the machine; and also the microfilm viewing screen onto which a microfilm-specific electric bulb projected a magnified, backlit image of the microfilm so they could be read. Accessing images of documents stored on microfilm involved loading the relevant reel of microfilm onto the feed spool of the machine and then manually (or in some cases mechanically) winding through the microfilm reel until the required document or page image was located. If the microfilm machine wasn't connected to a printer, which was generally the case, the researcher would transcribe details from the located document image/s.

Microfiche

Microfiche machines also consisted of two main elements, the glass platens into which the microfiche sheets were loaded, and also the microfiche viewing screen onto which a microfiche-specific electric bulb projected a backlit image of the microfiche which was projected so the researcher could read them. Microfiche sheets consisted of multiple cells of information which were alphanumerically categorised for indexing purposes. Microfiche sheets generally devoted the first few cell frames to an index of the images stored on each particular microfiche sheet. Researchers would first consult the microfiche index to locate the relevant microfiche frame required. Unless the microfiche was connected to a printer, which was fairly rare, the researcher would transcribe the relevant accessed information.

***Case Study 9.6: The ‘Creative Destruction’ of Obsolete Technologies
(continued)***

The effects of the introduction of information and communication technology on the use and future of microfilm and microfiche machines weren't immediately obvious as initially, information available on microfilm and microfiche wasn't readily available on any other forms of media. However, gradually as the abilities of ICT increased, particularly with the introduction of broadband internet services, information migrated to the new internet platform. Information was much easier to access via the internet in comparison to the microfilm and microfiche machines, so gradually they were either moved into library store rooms or sold off.

**9.5. Overview of higher education technology and service innovations:
1970s-2011**

It will be recalled that in Section 9.3, a 1987 quotation was used to establish a baseline for the introduction of innovative technologies and practices into the higher education sector. There is little doubt that the quote's author would be obliged to acknowledge that there has been significant innovation in the higher education sector over the last twenty-five years.

Significant technological and service innovations in the higher education services sector have been summarised in Table 9.1. A standard tabular form was used to present innovations for both the banking and higher education sectors for ease of comparison. As acknowledged in each table, it builds upon and expands the original table constructed by Barras in his 1990 paper.

In addition to the higher education innovation table, a range of examples have been provided to illustrate innovative developments in the higher education sector. Some of these are distinct from banking sector innovations. Videoconference lectures are one example of this. However, they have been included to illustrate the range and scope of innovations introduced into the higher education sector. They are also illustrative of Barras' 1987 prediction that the introduction of information technology and communication applications would enable an increased geographical distribution of service delivery. They also represent an example of the 'shifting of the locus of delivery from the point of production to

the point of consumption', as suggested by Barras. The shift in the locus of delivery has also resulted in an increase in the phenomenon of 'self-service' by university students.

The next section will compare the nature and timing of innovative developments in the 'leading' and 'lagging' service sub-sectors to establish if developments in the 'leading' sector can provide a demonstration effect of innovative possibilities for the 'lagging' sector.

9.5.1 Comparison between leading and lagging services sub-sectors

Previous chapters have discussed the intersection of various forces impacting both the banking sector and the higher education sector which have enabled and encouraged innovation. These included the replacement of Keynesian policies with Neoliberal policies, the introduction of new information and communication technologies and also socio-institutional changes.

The replacement of Keynesian policies with neoliberal policies witnessed a shift in perspective from the nation-building capabilities of economic sectors to their ability to compete in a globalised marketplace. The banking and higher education sectors both experienced the results of this change in perspective. In the Australian context, the shift to a Neoliberal perspective in the banking sector resulted in the sale of publicly-owned banks such as the Commonwealth Bank and also the State Bank of NSW. It also resulted in the amalgamation and merging of a number of banks and financial institutions, increased competition, deregulation and the introduction of 'user-pays' fees and charges.

Higher education was also affected by this change of perspective, in some respects, perhaps more so. Similarly, a series of amalgamations took place following the 1987 Neoliberal-informed Dawkins inquiry into the Australian higher education sector. The first tranche of user-pays university student fees, which were steadily increased over the following years, were also introduced. Neoliberal policies contributed to shaping numerous other developments in the services sector; however, as previously discussed, they are not the dominant focus

of interest of this comparison. The compilation of innovations detailed in Tables 8.2 and 9.1 will form the main basis for comparison.

9.5.2 Interpretation of the tables

Referring to Tables 8.2 and 9.1, the tables give an immediate impression that similar lines of technological innovation development have been taking place in the ‘leading’ and ‘lagging’ services sub-sectors. To some degree, this is an artefact of the formatting of the two tables; however it does illustrate the point that similar information and communication technologies have been utilised by both sub-sectors. Caution should be exercised in taking the tabular representations of the introduction and timing of the various innovations to literally.

There are at least two reasons for this cautionary note. Firstly, the ‘tidy’ presentation of this information in tabular form can mislead by disguising the ‘messy’ reality of innovation. For example, the tables only represent successful instances of the introduction of various forms of information technologies. The false starts, unsuccessful experiments, and dead-ends are not represented. Van de Ven characterised this non-linear innovation process as the ‘innovation journey’. Results of his comprehensive studies into the ‘innovation journey’ highlighted that the ‘innovation journey’ is not sequential or orderly but is best characterised as a ‘nonlinear dynamic system’.⁵⁹¹ Van de Ven’s conclusions also reinforce Schon’s observations on the ‘rational myth of innovation’. According to Schon, the ‘rational myth of innovation’ restructures the ‘...disorderly, uncertain, random processes...’ of innovation into ‘...something orderly and sequential, subject to the familiar techniques of management’.⁵⁹²

Secondly, the tables should not be interpreted as representing simply a linear progression from one development to the next. They actually represent a cumulative multidimensional expansion in the capabilities of the respective institutions’ ICT systems for storage, manipulation, processing and delivery of their specific service and products. Each ICT development has contributed to

⁵⁹¹ Van de Ven, A., Polley, D., Garud, R., and Venkataraman, *The Innovation Journey*, Oxford University Press, New York, 1999, p.5.

⁵⁹² Schon, D., *Technology and Change: The New Heraclitus*, Pergamon Press, 1967, p.72.

extending and expanding the power and the reach of the distribution points of the institution's ICT system but simultaneously, each level is also still evolving and becoming more sophisticated and efficient as new hardware processing systems and new software applications are developed and become available.

9.6 Conclusions

A comparison of the Innovation Tables 8.2 and 9.1, suggests that there are similarities in the introduction of innovations between the two services sub-sectors – the financial services and higher education. There are a range of factors that have contributed to this situation. Previous chapters have examined the grouping of both the financial services and higher education into the services sector by authors of neoliberal inspired concepts and policies. Neoliberal policies such as 'New Public Management' have increasingly transformed the higher education sector from a 'public service' to a sector more resembling the private sector in structure and outlook. From this perspective, it is not surprising that it increasingly shares a number of similar qualities with the financial services sector. The main and crucial point in the comparison of the two sectors was the asynchronous nature of the introduction of innovations. Barras suggested that the 'leading' sector, financial services, would introduce innovations first and provide a demonstration effect for 'lagging' sectors such as higher education.

One of the consequences of the retrospective examination of the introduction of the innovations into the 'leading' and 'lagging' services sector was that the 'exact timing' of the introduction of each innovation in each sector was not available. However, in most cases the month and year of the introduction of the innovation in question was provided. Cautions regarding interpretation of the tables were also offered in the previous section. However, in conclusion, the material compiled here suggests support for the proposition that the 'leading' services sector, financial services, can provide a demonstration effect of innovations for 'lagging' sectors such as higher education to consider when contemplating potential innovation strategies. However, the caveat recorded in the quote at the commencement of this chapter regarding the 'rational myth of innovation' should be considered.

The strategy proposed here contains the potential to contribute to qualitative ‘scenario building’ forecasting techniques.⁵⁹³ For example, the strategy of identifying trends in ‘leading sectors’ to identify trends in ‘lagging sectors’ would satisfy the requirement of what the OECD refers to as ‘forward thinking methodologies’ such as ‘horizon scanning’ and ‘trend impact’ analysis.⁵⁹⁴ This strategy also contains the potential to contribute to what Drucker has referred to as ‘systematic innovation’. According to Drucker, ‘Systematic innovation ... consists in the purposeful and organised search for changes, and in the systematic analysis of opportunities such changes might offer for economic or social innovation’.⁵⁹⁵ The proposed ‘forward thinking methodology’ of innovation trends identification is located within a Neo-Schumpeterian theoretical framework, which itself is based on a Counter-Enlightenment sceptical philosophy which rejected the ‘Platonic paradigm’. Therefore it embraces a broad perspective which has the ability to group diverse change variables into structured, theoretically consistent representations. Additionally, as the innovation trend identification methodology has been specifically constructed to target innovation in the higher education sector, it possesses the advantage of being more than a generic ‘horizon scanning’ strategy.

Utilising Barras’ leading and lagging sub-sector approach, the model can assist higher education strategists by effectively offering a ‘preview’ of potential innovation strategies and directions for the higher education sector. In this sense, it is taking advantage of higher education’s ‘lagging sector’ status. For example, although the ‘leading sector’ has innovative advantage, it also has the expense of high risk, experimental innovative strategies. Analysts have observed that the ‘leading edge’ can easily become the ‘bleeding edge’. Anderloni et.al. support this observation when they state that ‘Innovations are expensive for the innovator, involving costs not incurred by imitators.’⁵⁹⁶

⁵⁹³ Porter, M., Competitive Strategy: Techniques for Analysing Industries and Competitors, The Free Press, London, 1980, p.234.

⁵⁹⁴ OECD, Knowledge Bank: Futures Thinking, accessed at http://www.oecd.org/document/43/0,3746,en_36702145_36702245_37626859_1_1_1_1,00. Html October 10, 2011.

⁵⁹⁵ Drucker, P., Innovation and Entrepreneurship: Practice and Principles, Heinemann, London, 1985, p.31.

⁵⁹⁶ Anderloni, L., Llewellyn, D.T. and Schmidt, R.H. (eds.), Financial Innovation in Retail and Corporate Banking, Edward Elgar, Cheltenham, 2009, p.56.

So in this case, one of the advantages of being a ‘lagging sector’ consists of being in a position to observe and avoid the expensive mistakes made by the leading sector as they seek to competitively adapt to the new techno-economic paradigm. However, this is premised on the ‘lagging sector’ actually putting in place strategies to observe and interpret the successful and unsuccessful innovations in the ‘leading sector’.

Whilst the dominant focus of the previous two chapters has been on the introduction of technological innovations into the services sector, numerous examples of organisational, production and process innovations have also been provided to illustrate potential research directions for future research. Earlier chapters emphasised that *attitudinal* change to innovation was required prior to innovation itself being accepted, theorised and then, actively promoted. Therefore the philosophical and historical foundations of the concept of innovation contained numerous implications for contemporary higher education as a services sector. In summary, and ironically, the beliefs of the founder of the Academy, Plato, needed to be questioned and overturned before innovation could be theorised, service sector innovation conceptualised, and attempts made to explore the potential for a theory of innovation in the contemporary higher education sector.

The following chapter will present the thesis conclusions and implication and also suggest areas for future research.

Chapter 10. Conclusions and implications

10.1 Introduction

This concluding chapter will highlight the findings of this thesis and the results of the conclusions drawn from an examination of the philosophical and historical foundations of the concept of innovation and some of their implications for contemporary higher education as a service sector. This will be based upon the findings of the study of the philosophical and historical foundations of the concept of innovation and also the preliminary investigation of an outline of a proposed Neo-Schumpeterian model of innovation of the higher education sector. The comparative studies of the leading and lagging service sub-sectors, banking and higher education, will also be discussed and conclusions drawn.

10.2 Confirmation of hypothesis

Based on an examination of the implications of the philosophical and historical foundations of the concept of innovation the thesis has demonstrated that it is theoretically possible to situate and interpret innovation in the higher education sector through a service sector innovation theoretical framework based on a Neo-Schumpeterian conceptual framework. Therefore, the thesis hypothesis that: ‘Based on an examination of the implications of the philosophical and historical foundations of the concept of innovation, contemporary higher education sector innovation can be meaningfully interpreted through a framework based on service sector innovation theory’; is confirmed.

10.3 Contributions of the research

The thesis identified its research problem as the current lack of a theory of innovation in the higher education sector and investigated potential explanations for this situation. As a result of an examination of the philosophical and historical foundations of the concept of innovation, it was revealed that the lack of a theory of innovation in the higher education sector was due in part to the relatively late commencement (early twentieth century) of the theorising of the concept of innovation itself.

The thesis argued that this was due, in part, to the extended influence of the ‘Platonic paradigm’ which viewed innovation in a negative manner. The longitudinal influence of the ‘Platonic paradigm’ across millennia was traced and it was demonstrated that the first glimmerings of a positive attitude to innovation did not start to appear until the sixteenth century. Even so, the negative attitudes towards the conceptualisation of innovation continued until at least the late nineteenth century. It was demonstrated that a series of philosophical challenges were required to overturn the dominant influence of the Platonic inspired static Enlightenment theories.

The genesis of anti-Platonic philosophy in the forms of Scepticism, Romanticism, Counter-Enlightenment and postmodernism over hundreds of years eventually created enough conceptual space so that theorising of innovation could commence with the theories of Schumpeter in the early twentieth century. The foundation of Schumpeterian theory enabled researchers to use it as a basis to construct further theories examining areas such as innovation in the service sector. However, due to the belated commencement of the theorising of innovation itself, the construction of theories of innovation in the services sector commenced relatively late. Therefore theorising of innovation in the higher education sector was also delayed as a consequence.

The irony of this situation was identified in that, in order for the theorising of innovation in the higher education sector (or the Academy) to take place, the theories of the founder of the Academy, Plato, had to undergo a process of ‘creative destruction’ and be discredited. This ‘creative destruction enabled the theoretical innovations of: theories of innovation; theories of innovation in the services sector; and finally a preliminary investigation into a theory of innovation in the higher education services sector.

As discussed in the previous section, the research conducted in this thesis also contributes to the extension of knowledge in a number of distinct but related areas.

The identification of the lack of a theory of innovation in the higher education sector has located a new area of interest and activity for innovation researchers.

Issues treated within this thesis have established a framework for ongoing investigations in this area.

The thesis has investigated and offered an account based on the philosophical and historical foundations of the concept of innovation and its implications for contemporary higher education as a service sector. This has not been attempted before in such a comprehensive manner. As such, it is an original contribution to the research into conceptual factors shaping historical attitudes towards innovation. It also increases the transparency of theoretical and metaphorical assumptions underlying the construction of theories of innovation and provides an explanation as to the relative late start in attempts to theorise innovation. It also contributed to an understanding of the role of political and philosophical justifications for and against intervention in innovation-related processes.

This research has also contributed towards an understanding of a potential framework for conceptualising innovation in the higher education sector. Following the research of philosophical and historical foundations of the concept of innovation it was argued that a theory of innovation required a theoretical basis which was capable of expressing the dynamic nature of innovation. Neo-Schumpeterian theory was identified as possessing the theoretical heritage which equipped it to deal with these aspects.

The Neo-Schumpeterian framework possessed the advantage of enabling the synthesis of a large variety of ideas into a single conceptual framework. That is, under the rubric of the Fifth Kondratiev techno-economic paradigm theories, diverse economic, political, philosophical, organisational and productive model narratives could be structured and placed within a larger theoretical context. It also enabled the linking of these concepts to Fourth Kondratiev techno-economic paradigm theories that they were displacing. Table 6.2 provided a graphic representation of this synthesis.

The identification of the suitability of Neo-Schumpeterian theories for conceptualising innovation was supplemented by the location of the theories of the Neo-Schumpeterian, Richard Barras. Barras's insights into 'leading' and 'lagging'

services sub-sectors provided the kernel of the methodology to construct and ‘test’ a theory of innovation in the higher education sub-sector. Based on the construction and comparison of two case studies of Barras’ ‘leading’ and ‘lagging’ services sub-sectors, evidence emerged which was suggestive and supportive of the proposition that innovation trends in the lagging sector could be foreshadowed by developments in the ‘leading sector’.

The strategy proposed here also contains the potential to contribute qualitative ‘scenario building’ forecasting techniques⁵⁹⁷ such as ‘horizon scanning’ and ‘trend impact’ analysis.⁵⁹⁸ As it is located within a Neo-Schumpeterian theoretical framework it embraces a broad perspective which has the ability to group diverse change variables into structured, theoretically consistent representations. Additionally, as it has been specifically constructed to target innovation in the higher education sector, it possesses the advantage of being more than a generic ‘horizon scanning’ strategy. It would also contribute to what Drucker has referred to as a ‘systematic innovation’⁵⁹⁹ approach in which knowledge is applied ‘systematically and purposefully’ to produce effective results by providing a theoretical representation of innovation in the higher education services sector which has been empirically tested by case studies.

Utilising Barras’ leading and lagging sub-sector approach, the model can assist higher education strategists by effectively offering a ‘preview’ of potential innovation strategies and directions for the higher education sector. In this sense, it is taking advantage of higher education’s ‘lagging sector’ status. For example, although the ‘leading sector’ has innovative advantage, it also has the expense of high risk, experimental innovative strategies. Analysts have observed that the ‘leading edge’ can easily become the ‘bleeding edge’.

So in this case, one of the advantages of being a lagging sector consists of being in a position to observe and avoid the expensive mistakes made by the leading sector

⁵⁹⁷ Porter, M., Competitive Strategy: Techniques for Analysing Industries and Competitors, The Free Press, London, 1980, p.234.

⁵⁹⁸ OECD, Knowledge Bank: Futures Thinking, accessed at http://www.oecd.org/document/43/0,3746,en_36702145_36702245_37626859_1_1_1_1.00.html October 10, 2011.

⁵⁹⁹ Drucker, P., Post Capitalist Society, Harper Collins, New York, 1993, p.42.

as they seek to competitively adapt to the new techno-economic paradigm. However, this is premised on the lagging sector actually putting in place strategies to observe and interpret the successful and unsuccessful innovations in the leading sector.

10.4 Implications arising from this research

This thesis demonstrated the subtle influence of philosophical and historical theoretical legacies and metaphors in shaping our understandings of, and attitudes towards, innovation and concepts of innovation. Frameworks of understanding are not stable entities. Language and terminology are also dynamic. The qualitative, narrative methodology utilised in this thesis also implies that this constructed theoretical interpretation is only one of a range of potential theoretical interpretations and, in keeping with the sceptical epistemological stance presented within this thesis, it does not claim to represent an ‘absolute truth’.

Based on an analysis of the philosophical and historical foundations of the concept of innovation, it was argued that a series of intellectual innovations were required prior to it being possible for: firstly, a change in the negative attitudes towards innovation which were largely inspired by the writings of Plato; and, consequently, the conceptualisation of innovation by Schumpeter in the early twentieth century. These transitions were also assisted by the shift from static mechanistic metaphors to dynamic, evolutionary biological metaphors.

The important theoretical ‘creative destruction’ role of sceptical philosophy and its descendent, postmodern philosophy, was elaborated and identified as providing the mechanism for the criticism and delegitimising of earlier Platonic-inspired philosophies which actively discouraged innovation and therefore the conceptualisation of innovation. Theoretical links were demonstrated by tracing the evolution of attitudes to innovation and the philosophies which informed these attitudes.

It was also argued in the thesis that the Neo-Schumpeterian innovation theories drew on the anti-Platonic Counter-Enlightenment tradition and therefore circumscribed the role and scope of rationality in establishing foundations for

knowledge. In philosophical terms, Neo-Schumpeterian innovation theories are sceptical, anti-foundational and non-teleological.

However, Neo-Schumpeterian theory also recognises that each techno-economic paradigm develops logic internal to each paradigm which consists of the pursuit of the most efficient means of the new technology systems and their associated socio-institutional systems interacting: in short, to increase the ‘performativity’ of the system. Neo-Schumpeterian theorists have identified the role of the Neoliberal political model, which privileges competition, innovation and performativity, in guiding the current information and communication technology techno-economic paradigm.

Implications of the philosophical and historical foundations of the concept of innovation were linked to a Neo-Schumpeterian interpretation of contemporary higher education as a service sector based upon the theories of the Neo-Schumpeterian theorist, Richard Barras. Barras provided a theoretical direction for interpreting higher education as a service sector and therefore suggested a case study methodology for testing the hypothesis of ‘leading’ and ‘lagging’ service sectors. The results of the comparative case studies strongly suggested that insights into innovation trends and directions in the higher education sector can be obtained by monitoring innovations in the ‘leading’ financial services sub-sector.

10.5 Recommendations for further research

The present study assumed and argued that an increased understanding of potential innovation trends in the higher education sector is of value.

Contemporary higher education activities are located at the intersection of a range of dynamic forces. These include the growth in the economic importance of the services sector to national and global economies, the transformative power of neoliberal inspired political and economic policies, the rise of a competitive and dynamic global environment which is being transformed by new information and communication technologies, new understandings of theories of knowledge and knowledge production and the increasing value of knowledge and innovation to economic activity.

These are all dynamic processes and provide numerous opportunities for the research direction and methods established in this thesis to be extended. For example, a more comprehensive and continuing monitoring and analysis of innovations in the finance sector would reveal further innovation potentials for ‘lagging’ service sectors such as higher education.

Limitations in this study included the lack of precise timeframes to clearly assess timeline advantages experienced by the ‘leading’ sector. That is, retrospectively, it was difficult to accurately quantify the innovation lead-time factor enjoyed by ‘leading’ sector over the ‘lagging’ sector. In the final analysis, this aspect may not be of the greatest importance to future studies in this area. A level of precision and accuracy as to the exact hour and day of the introduction of technological innovations may not be required. It may be sufficient to merely recognise that monitoring innovations in the ‘leading’ sector may provide valuable insights and directions as to potential innovative applications in the ‘lagging’ sectors such as higher education.

Another limitation consisted in this study only consisting of a preliminary investigation of a potential framework for a theory of innovation in the higher education services sector. One consequence of this was the dominant focus of the case studies on technological innovations. While this approach was useful in demonstrating the utility of the approach, it did not comprehensively examine other areas such as organisational innovations. Although, examples of organisational innovations in the higher education sector were offered throughout the thesis, they were not comprehensively collated. This is a fertile area for future research programs examining potential innovations in the higher education sector.

The decision to decline making value-judgements on the transformation of the higher education sector was a conscious one. The author feels privileged to have been present at this juncture in the Academy to witness and record a historical transition of this magnitude. I leave it to the reader to draw their own conclusions.

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