RÉGULATION THEORY: ITS ABILITY TO EXPLAIN SECTORAL CHANGE[1]

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Abstract: Régulation theory provides a powerful explanation of the changes which characterise distinctive phases or trajectories of economic growth and the dimensions of capitalist development as well as the forms of crisis that can occur. As a theory of structural change, it has not been made redundant by the increasing complexity of the contemporary world and can be applied to different levels of analysis other than the national or macro. This paper discusses the focus of régulation theory; the key points of difference with neoclassical economics and structural Marxism; its core concepts of the abstract 'regime of accumulation' and the more tangible 'mode of regulation'; and, the analytical framework premised by the theory. The paper then discusses régulation theory's ability to explain the causes and outcomes of change at the sector level - using the example of the Australian electricity sector - concluding that its strengths outweigh any shortcomings.

Introduction

Régulation theory provides a robust explanation of economic change and crisis. It can also be applied to different levels of analysis. Yet it has not received acceptance by mainstream economists possibly because of frequent misunderstanding of the term *régulation* which many equate with a much narrower microeconomic use, a limited number of English translations from a vast range of relevant French publications and it is "quite unreasonable to expect the RA [regulation approach] to dislodge the standard theory when there are many vested interests in the latter's survival" (Jessop, B., 1997a: 521).

This paper explores the ability of *régulation* theory to provide an analytical framework of structural change commencing with a brief discussion of the theory's focus, key differences with neoclassical economics and structural Marxism and its core concepts before proceeding to outline the analytical framework, at macro and sector levels, premised by the theory. Strengths and weaknesses of the theory are examined and the results presented from application of the theory to an analysis of the Australian electricity sector which has undergone a radical restructuring during the last decade. From this analysis, a number of propositions are made about the analytical framework which need testing with further sector-based *régulation* research.

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What does *régulation* theory seek to explain?

The genesis of *régulation* theory lies in the 1970s economic crisis because "there was a need to understand why things no longer worked, a need which first required an understanding of what had previously worked, and why" (Lipietz, A., 1988b: 14) which was not being provided by neo-classical economics or structural Marxism.

A major impetus to the theory's development came with Aglietta's 1976 publication, *Régulation et crises du capitalisme*, which developed "a conceptual structure capable of analyzing the most important transformations of twentieth century capitalism" (Davis, M., 2001: 261). Aglietta developed consumption and production norms to explain why capitalist economies sometimes function well and why, on other occasions, they experience crisis. These norms, he contended, were not fixed and immutable but continually evolving, increasing in complexity over time, showing distinctive features during different periods of capitalism and leading to a crisis when a divergence between them occurred (Barbrook, R., 2001; Boyer, R., 1990; Davis, M., 2001; Jessop, B., 2001b).

The impact of Aglietta's ideas can be seen in the work of his French colleagues such as Lipietz, Boyer, Delorme, André, Mistral, Lordon and Théret (Dunford, M., 1990; Jessop, B., 2001b). Early studies, adopting and developing Aglietta's concepts, focused on forms of crisis whereas subsequent research looked at specific aspects or characteristics of crisis. Throughout the 1980s and 1990s *régulation* theory became more widely known as its leading French proponents initiated a new generation of research and further developed concepts. *Régulation* theory was 'empirically extended' to new research areas, to national economies other than France and the US, to analyses at the micro and meso level and, to different spatial scales.

The focus of *régulation* theory is structural change in capitalist economies because it seeks to explain the qualitative changes that have occurred over the long run, which characterise distinctive phases or trajectories of economic growth and the dimensions of capitalist development as well as the forms of crisis that can occur (Boyer, R., 1988; Dunford, M., 2000; Esser, J. and Hirsch, J., 1989; Jessop, B., 2001a, 2001b; Kotz, D.M., 1990; Mazier, J., 1982; Moulaert, F. and Swyngedouw, E.A., 1989; Noël, A., 1987; Ticknell, A. and Peck, J., 1992). But it is more than a theory of economic crisis (Lipietz, A., 1987a). *Régulation* theory is a theory about change and a theory that has not been made redundant by the increasing complexity of the contemporary world nor is limited in its application to a particular discipline or topic of study. These strengths led Jessop (1997a) to conclude that no other school is, or has been, as influential in as many disciplines or across as many topics of study, the extent of which is exemplified by the following passage:

> Its work includes … Boyer's prolific output on topics ranging from labour markets through inflation and growth dynamics to work on social innovation systems and possible future modes of regulation, and Alain Lipietz's critical

analyses of monetarism, peripheral Fordism, global capitalism, and the prospects for ecologically sound, alternative socialist economic strategies in the face of the current capitalist restructuring. Other members of this school have examined technological change, the labour process, sectoral issues, conventions, spatial reorganization, the nature and forms of state intervention, welfare state restructuring, changing international regimes and state socialism. In addition, students or disciples of the Parisian school have applied its concepts and arguments to an increasing range of economies in different continents and on different scales … The sheer range, mass, and power of such studies have brought the Parisian school wide acclaim and major influence in many disciplines around the world – from its home domain of economics to architecture, urban planning, radical geography, history, educational research, cultural studies, political science, organizational theory, radical international political economy, sociology and feminism. In addition, many analysts use core Parisian concepts … and/or invoke more substantive, but still purportedly regulationist, concepts" (Jessop, B., 2001b: xxv).

Boyer, Aglietta and Lipietz are commonly referred to as the Parisian school and although this school is widely acknowledged as producing possibly the most extensive and influential work on *régulation* theory, Jessop suggests that seven other schools or 'variants' have "developed in parallel with and/or under the influence of the Parisian School" (Jessop, B., 2001c: xxv)[3]. Although a range of differences exist between each school[4], all fall under the umbrella of *régulation* theory because their research focuses on explaining different periods of capitalism, the reasons for crisis, and the changing economic and extra-economic mechanisms of control needed to sustain or secure successive periods of capitalist development (Jessop, B., 1990a).

The more widespread use of *régulation* theory demonstrates its capacity to explain the changes and variations in different stages of capitalism which other theories can not. It does not proffer an approach of 'one size fits all' but provides a framework which permits variations as well as being able to undertake both historical and contemporary analyses. Moreover, its proponents encourage ongoing development of its concepts and usage.

These attributes illustrate the strengths of *régulation* theory, a point poignantly made by Drache and Glasbeek (1988:2) who posit that "substantial differences in emphasis and direction … do not undermine the coherence of the regulation

[3] In France, two other schools are identifiable, one associated with Destanne de Bernis and the University of Grenoble, and the other, associated with the French Communist Party and Paul Boccaro. Other schools include an Amsterdam group (Overbeek, H. and Van Der Pijl, K., 1993; Van Der Pijl, K., 1993), West German (Esser, J. et al., 1989), Nordic (Mjøset, L., 1987, 1997), the radical American account of social structures of accumulation (Bowles, S. and Gintis, H., 1983; Gordon, D.M., Edwards, R. and Reich, M., 1982; Kotz, D.M., 1990, 1994); and a group of radical geographers (Benko, G. and Dunford, M., 1991; Benko, G. and Lipietz, A., 2002; Collinge, C., 1999; Macleod, G., 1997; Peck, J. and Ticknell, A., 1992; Ticknell, A. et al., 1992)
[4] See Jessop 1990a and 2001c.

school but serve to deepen its grasp of the relations of advanced capitalist society". Boyer and Saillard (2002c: 45) suggest that

> … a theory that is content simply to reiterate its basic concepts and founding insights would soon be condemned to a loss of impetus and relevance. The value of a theory is measured by the quality of the research programme that it produces.

They also detail three powerful reasons for the revision of objectives, methods and concepts – unresolved theoretical issues, empirical invalidation of forecasts and hypotheses, and the very different roles of the state evident with the extension of *régulation* theory to other areas and countries. This argument encapsulates the willingness of *régulationists* to consistently search for improvement in their approach to ensure that the conceptual precision and analytical methods of their "interpretative keys'' (Boyer, R., 2002a: 10) can unlock the increasing complexity of contemporary capitalism rather than become redundant in its ability to explain change.

Some may argue that these 'strengths' are weaknesses, in that the 'spread' across a wide range of research, the refinement of concepts, and heterogeneity within the approach ensure the absence of consistency and homogeneity, the purported strengths of neo-classical economics.

Key points of difference with neo-classical economics and structural Marxism

Neoclassical theory is of an 'ideal' world using deductive methodology based on models against which reality is compared because "*abstraction* is a necessary feature if coming to grips with significant causal *tendencies*" (Lawson, T., 1989: 76, original emphasis). Violation of a neoclassical model means that reality does not accord with the model's assumptions and corrective action is recommended to more closely align reality with the preferred outcomes of the 'ideal' world. This focus of the neoclassical approach, on an abstract world comprising individuals and markets, is the very antithesis of the *régulation* approach for which reality is the starting point, the framework against which the reasons for change are sought. *Régulation* theory does not construct abstract models nor does it draw inferences when reality does not fit a model. Instead, *régulationists* seek to explain the actual changes that occur by analysing reality.

> The Theory of Regulation [sic] responds to the belief, widespread today, that orthodox economics has failed to interpret satisfactorily actual patterns of development, past or contemporary, and that, in particular, its tendency to economic determinism prevents it from taking into account in systematic fashion the powerful ways in which historically developed class relations, institutional forms and more generally, political action have shaped the evolution of capitalist economies (Brenner, R. and Glick, M., 1991: 45).

Régulationists contend that neo-classical economics can not explain the operation of the capitalist economy - and hence, change or crises – because of unrealistic assumptions about equilibrium, markets and rationality.

Neo-classical economics assumes that there is a clearly defined, firmly fixed sphere of economic relations that tends to general equilibrium. *Régulationists* reject the notion that economic reality can be explained by pure exchange relations in 'ideal', perfect markets. Nor do they agree that exchange relations are determined by rational individuals acting solely in response to price. *Régulationists* reject the assumption of rational economic man, *homo economicus*, arguing that economic relations can only be understood through an analysis of their social context because they are always socially embedded and change can be explained by analysing the norms of production and consumption.

Neo-classical economics also assumes that time is irrelevant (purportedly because individuals have perfect knowledge and individual actions can not affect overall market operations) and that development, over time, can be reversed given the market allows a return to previous positions. *Régulationists* argue that such a view ignores the existence of economic, social and political institutions which are not mere "dross signalling various imperfections" (Boyer, R., 2002a: 4) but critical determinants of capitalism's development, dynamic and crisis tendencies, changing over time and thus ensuring that development is path-dependent and not reversible.

Régulationists have also been equally critical of structural Marxism[5] and in particular, its assumptions of the invariance of capitalism, the use of abstract concepts and the Althusserian assumption that structures somehow maintain themselves quasi-automatically (Boyer, R., 2002b; Jessop, B., 1990a, 1997a; Mazier, J., 1982).

Althusser asserted that capitalism's ongoing reproduction was virtually assured once the capitalist mode of production was firmly established. *Régulationists* reject this notion arguing that ongoing capitalist accumulation is ensured because different forms of accumulation evolve from changing conditions creating different combinations of production and consumption norms. Changing institutions and practices are critical, according to the *régulationists,* to understanding the changing conditions of accumulation. Moreover, capitalism is prone to crisis and hence, develops in stages, each stage having its own distinct conjunction of institutions and tendencies to crisis. Structural Marxism, on the other hand, sees capitalism as eternal and unchanging with no differentiation of stages, crises or different forms of institutions.

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[5] *Régulationists* do not totally reject Marxism retaining "an interest in long-term evolution without, however, accepting the grandiose, erroneous dynamic piously admired by Marx's successors" (Boyer, R., 2002b: 17) and some Althusserian ideas about capitalism's mode of production (Jessop, B., 1997a; Lipietz, A., 1987a, 1993).

Régulationists also have argued that "some aspects of Marxist theories of value, distribution and growth … were incompletely specified, over-generic and insufficiently concrete" (Dunford, M., 2000: 143), a view confirmed by the focus of structural Marxism on the abstract concept of modes of production. The focus for *régulationists* has been to delineate the drivers of change to provide more realistic and concrete analyses of capitalism's successive development stages. Similarly, the *régulationists* have treated economic agents not as "passive 'supports' of the relations of production … [examining] the social processes and struggles" (Jessop, B., 1997a: 505) which characterise stages of capitalist development.

In essence, the *régulationists* posit that neo-classical economics and structural Marxism present a very static, inert picture of the capitalist economy. Rejecting this view of capitalism, they contend that a realistic explanation is found by considering the change in, and interaction of, a wide range of economic and non-economic factors evident during different periods of capitalism and its crises.

Core concepts

Régulation theory uses two key concepts developed by the Parisian school namely, 'regime of accumulation' and 'mode of *régulation*'[6]. These core concepts are underpinned by a Marxian view of capitalism where the mode of production is structured around two fundamental conflictual, contradictory and unequal (social) relations: the commodity (monetary) relation and the wage relation (Lipietz, A., 1988a). Accumulation, the process by which capitalism is reproduced and expanded over time, must ensure the maintenance and reproduction of its fundamental social relations otherwise there will be "*ruptures* in the continuous reproduction of social relations" (Aglietta, M., 1979: 19, original emphasis).

[6] Jessop (1990a) suggests that the Parisians provided four key concepts – regime of accumulation, mode of growth, mode of *régulation* and mode of development – although he does acknowledge that use of 'mode of development' is largely confined to Lipietz's work and there is little empirical difference between 'regime of accumulation' and 'mode of growth'. There is little reference throughout the *régulationist* literature to 'mode of growth'. Dunford (1990) also suggests that the legacy of the Parisians was four key concepts although he includes 'industrial paradigm' and 'hegemonic structure' with regime of accumulation and mode of *régulation*. 'Industrial paradigm' is an interesting inclusion given that "few use the notion … [which] plays a much more important role in neo-Schumpeterian models" (Dunford, M., 1990: 306). The other concept put forward by Dunford, 'hegemonic structure', is primarily found in the writings of the German régulationists. The additional concepts put forward by Jessop and Dunford are not generally found throughout the *régulationist* literature.

Regime of accumulation

The maintenance and reproduction of these social relations requires a political and legal order to ensure, amongst other things, monetary regimes, rules of competition, the discipline of markets, effective financial systems, functioning labour markets, and the maintenance of private property rights (Dunford, M., 2000). Moreover, "the notion of social relations points to the regularity and repetitiveness of certain practices" (Lipietz, A., 1988b). This suggests that certain conditions, 'regularities', are essential to ensure the ongoing existence of these social relations. This does not mean that qualitative and quantitative change, within these social relations, does not occur over time. It does mean, however, that certain 'core' elements, the invariant aspects of social relations, are sustained over time while their inherent contradictions are contained partially for a time (Boyer, R., 1988: 70) although their historical form and precise articulation will continually alter over longer periods (Boyer, R., 1990: 37) ensuring the dominance of capitalism. This 'invariant reproduction', 'contradiction containment' and 'historical representation' requires a:

> ... set of regularities that ensure the general and relatively coherent progress of capital accumulation, that is, that allow for the resolution or postponement of the distortions and disequilibria to which the process continually give rise (ibid: 35-36).

This set of regularities defines the *regime of accumulation*, and refers to the distinctive 'regular' social and economic patterns that support and sustain accumulation between structural crises, ensuring its stabilisation over a long period (Boyer, R. and Saillard, Y., 2002b; Lipietz, A., 1986b).

Evidence of these regular social and economic patterns are found in the pattern of productive organisation within firms which defines the relationship of wage-earners to the means of production; the time horizon for decisions about capital formation within which management principles are developed; the distribution of income between wages, profits and taxes which reproduces and reinforces social classes or groups; the volume and composition of effective demand validating the productive capacity trend; and the relationship between capitalist and non-capitalist modes of production (Boyer, R., 1988, 1990, 1991b; Brenner, R. et al., 1991; Moulaert, F. et al., 1989). Moreover, these five areas of regular social and economic patterns essentially define a particular combination of production and consumption (Jessop, B., 1988, 2001b; Lipietz, A., 1986b, 1987b; Ticknell, A. et al., 1992) reproduced over the long term despite conflictual tendencies.

Using this abstract concept, Boyer (1988) and Lipietz (1987b) identified three possible accumulation regimes based on their observation of major patterns of growth from the mid-nineteenth century to the 1970s, each pattern of growth showing a long boom and then a period of decline, stagnation and crisis although the causes of the downswing are different in each case. The accumulation regimes were: extensive accumulation, intensive accumulation *without* mass consumption and intensive accumulation *with* mass consumption[7]. Since the crisis of the 1970s there has been much debate about the current regime of accumulation. Some have suggested the major capitalist economies are undergoing a protracted crisis (Clarke, S., 1988; Gordon, D.M., 1988) while others contend that a new regime of flexible accumulation is already identifiable (Harvey, D., 1989; Schoenberger, E., 1988).

A protracted crisis or a new regime of accumulation is not at issue for this paper. The more important point is thus: a regime of accumulation describes a period of relatively stable capitalist development, a period in which patterns of economic and social 'regularities' ensure the reproduction of the fundamental social relations of capitalism, social relations "whose invariant aspects can only be reproduced through continual alterations of their forms and precise articulations" (Boyer, R., 1990: 37). Moreover, these patterns of regularities can be explained by analysing the institutional or structural forms of a particular accumulation regime. This notion of institutional forms leads to the second core concept of *régulation* theory, the mode of *régulation*.

Mode of régulation

There exists "a materialization of the regime of accumulation taking the form of norms, habits, laws, regulating networks and so on" (Lipietz, A., 1986b: 19) which ensures "the compatibility of behaviors in the framework of a regime of accumulation, in conformity with the state of social relations" (Lipietz, A., 1986a: 16). This 'set of rules and collective behaviours' is the *mode of régulation* which, according to Boyer (1990, 1988), supports and steers the accumulation regime by reproducing fundamental social relations through a *conjunction* of institutional forms. In other words, the mode of *régulation* governs, guides, supports and secures an accumulation regime by reducing, containing, mediating, and 'regulating' the inherent conflicts of social relations (Aglietta, M., 1979, 1998; Brenner, R. et al., 1991; Broomhill, R., 2001; Dunford, M., 1990; Jessop, B., 1988, 1990a, 1992a, 2001a; Lipietz, A., 1987b; Ticknell, A. et al., 1992; Ticknell, A. and Peck, J., 1995).

Lipietz warns that "we should not simply assume that the mode of regulation has the 'function' of making the regime of accumulation work" or that it is a standardised inevitable pattern (Lipietz, A., 1986b: 20). Instead, the advent of

[7] These three regimes of accumulation are not readily distinguished throughout the literature with many only referring to the possibility of extensive and intensive accumulation per se (Brenner, R. et al., 1991; De Vroey, M., 1984; Noël, A., 1987; Ticknell, A. et al., 1992). In all these cases, intensive accumulation is used to mean 'intensive accumulation *with* mass consumption' and the period of 'intensive accumulation *without* mass consumption' is commonly referred to as the long transition period between the two world wars. A similar issue arises when one considers the concepts used by Aglietta (1979). His definition of 'extensive accumulation' is equivalent to the Boyer/Lipietz definition of 'intensive accumulation *without* mass consumption' and his definition of 'intensive accumulation' is analogous to the Boyer/Lipietz definition of 'intensive accumulation *with* mass consumption'.

a mode of *régulation* during a particular accumulation regime is a 'chance discovery' (Lipietz, A., 1987b: 15) arising from social and political struggles which means that the mode of *régulation* is only a temporary 'institutional fix' (Peck, J. and Ticknell, A., 1994).

Five institutional (or structural) forms[8] are used by *régulationists* to describe and explain the mode of *régulation* during different regimes of accumulation. These are:

- *monetary and credit relationships* – these relationships define how separate economic units will interact and will be influenced by the development of national and international financial systems;
- *wage-labour nexus* – this characterizes the relationship between capital and labour, management and employees and broadly covers all aspects of work organisation and the standard of living of wage-earners;
- *form of competition* – this institutional form focuses on how relations between firms are organised, how units of accumulation relate to each other;
- *position within the international regime* – the nature of trade, investment, monetary and political arrangements that link firms, national economies and the international system; and
- *forms of the state* - the institutionalized compromise between capital and labour, forms of state intervention, and economic policy.

The dimensions of these institutional forms are not limited to economic factors but encompass social, political, spatial, cultural, organizational, technological and historical factors.

A 'hierarchy' or dominance of particular institutional forms (Boyer, R. et al., 2002b) has been found to characterise different modes of *régulation*[9] in addition to the ongoing metamorphosis of each institutional form. The *competitive* mode of *régulation*, prevalent under extensive accumulation from the mid-nineteenth century until World War 1, has been strongly defined by wages negotiated on an individual basis and subject to market fluctuations, tight monetary controls and a non-interventionist state. The *monopolistic* mode of *régulation*, evident during the period of intensive accumulation since the end of the World War II, has been characterised by collective wage negotiations, strong growth of credit money, oligopolistic forms of competition and different forms of state intervention. As for the current regime of accumulation, "the intensification of monetary constraint and the internalization of competition appear to precede and shape transformations in the wage-labour nexus" (Boyer, R. et al., 2002b: 39).

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[8] Institutional forms may work in one of three ways: as laws, rules and regulations; a compromise or negotiated outcome; or a common value system or representations (Boyer, R., 1990; Boyer, R. et al., 2002b)

[9] Most of the literature refers to two modes of *régulation* although Boyer (1988) does distinguish a third mode which applied during the period when the agricultural sector was dominant and capitalist industry was only just beginning to emerge, *régulation à l'ancienne*.

The combination of an accumulation regime and a mode of *régulation* defines a *mode of development* (Boyer, R., 1990; Brenner, R. et al., 1991). The post World War II period, of intensive accumulation with mass consumption accompanied by a monopoly mode of *régulation*, is commonly referred to as 'Fordism'[10]. Although the debate continues about the mode of development since the 1970s crisis, 'post-Fordism'[11] has become this period's nomenclature.

The mode of *régulation* only contains and controls "within tolerable limits ... [but] cannot prevent all disequilibria" (Destanne De Bernis, G., 1988) because the inherent tensions and contradictions of social relations will never totally disappear. Consequently, crises can occur if these disequilibria are not ameliorated in some way. Different types of crisis have been identified and although there is not general consensus on the names or categorisation of crisis, there is common agreement that the nature of the mode of *régulation* will not ensure stabilisation for an indefinite period leading to a crisis[12].

Analytical framework for both macro and sector levels

The mode of *régulation* is a materialisation of the prevailing regime of accumulation, a concrete expression of its regular economic and social patterns, and thus can be analysed by considering the nature of its five institutional forms and their conjunction. Thus, a framework to analyse change at the macro level is immediately apparent.

Although generally regarded as a macroeconomic theory, *régulation* theory has also been applied by a number of researchers to meso-economic analysis focusing upon large sectors of productive activity[13]. The common objective of these studies has been to determine the nature of *régulation* at the sector level and its relationship to overall macro *régulation.*

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[10] Generally speaking, the literature attributes the origin of the term 'Fordism' to the *régulationists*. However, many *régulationists* have acknowledged that the term was first coined and used by Gramsci (Lipietz, A., 1987b).
[11] Harvey suggests that this post-Fordist era comprises 'flexible accumulation' and "a quiet different system of political and social regulation" (Harvey, D., 1989: 145).
[12] Generally, four broad categories of crisis are distinguishable – those not originating within the mode of *régulation,* minor crises within the mode, a major crisis of the mode of *régulation* or accumulation regime, or a crisis of the mode of production e.g. feudalism (Boyer, R., 1988, 1990; De Vroey, M., 1984; Dunford, M., 1990; Lipietz, A., 1987b, 1988b; Mazier, J., 1982; Moulaert, F. et al., 1989)
[13] Sectors have included wine, agriculture, computers and communications, telecommunications, building and public works, and the services sector (Allaire, G. and Mollard, A., 2002; Boyer, R., 1991a; Boyer, R. and Saillard, Y., 2002a; Cooke, P., 1992; Du Tertre, C., 2002; Keeney, M., Lobao, L.M., Curry, J. and Goe, W.R., 1989; Moulaert, F. and Swyngedouw, E.A., 1992; Saillard, Y., 2002).

A sector mode of *régulation* can only be a partial or incomplete mode, not an exact replication of the macro mode of *régulation* and, can be understood only in terms of the overall prevailing *régulation* (Boyer, R., 1990a, 1991a; Du Tertre, C., 2002; Gilly, J.-P. and Pecqueur, B., 2002; Jessop, B., 1990a; Lipietz, A., 1988b; Moulaert, F. et al., 1992; Saillard, Y., 2002). Should sector *régulation* not be identifiable, du Tertre contends "it is nevertheless possible to identify a 'sector dynamic' or an operating economic regime" (2002: 209).

Each sector is regarded as a sphere of productive activity with its own peculiarities or specificity, its own style of governance of which the capital-labour relationship is perhaps the most significant aspect, and factors such as technology, market structure and internationalisation assume differing importance (Boyer, R., 1990, 1991a; du Tertre, C., 2002). Sector differences are attributed by Boyer (1991a) to differing roles played by the state given the national strategic importance the state may accord to each sector, different determinants of economic performance, the extent of sector exposure to internationalisation, the governance of competing and conflictual sector interests, and differing cultural values.

This recognition of sectoral diversity led to the refinement by du Tertre that each sector is distinguishable by its unique 'institutional arrangements', arrangements which reflect but do not fully replicate the institutional forms of the macro mode of *régulation*. Du Tertre sees these sector-based institutional arrangements as reflecting only three institutional forms which comprise macro *régulation*: wage-labour nexus, form of competition, and international position (2002: 204) with the 'density' of institutional arrangements (Gilly, J.-P. et al., 2002) varying between sectors.

The 'gap' between a sector's unique set of institutional arrangements and the macro mode of *régulation* highlights a range of questions posed about the relationship between macro and sector levels: How are 'small' and 'large' sites of *régulation* related? What are the relationships between meso-level analyses and the findings of macroeconomic studies? What are the sub-macro determinants of the transformation of an accumulation regime? How does the macro regime modify the local or sector productive system? (Boyer, R., 1990a, 1991a; Gilly, J.-P. et al., 2002; Jessop, B., 1990a; Saillard, Y., 2002).

Saillard (2002: 184) suggests two alternatives to understand macro-sector relationships. The first option is a 'top-down' approach i.e. sector diversity is subsumed and the macro-sector relationship is the same for all sectors. The alternative is a 'bottom-up' approach starting at the sector level and progressing to consider the nature of its relationship to the macroeconomic[14].

[14] The 'bottom-up' approach is more consistent with the *régulationists* recognition of sector diversity. If each sector has its own specificities and unique sector-based institutional arrangements, then it is difficult to see how each sector could hold the same relationship with the overall mode of *régulation*.

Du Tertre (2002) defines the macro-sector relationship by way of two levels of 'connection': accumulation regime–operating regime, and institutional forms-institutional arrangements. At the macro level is the accumulation regime, at the sector level an economic operating regime. Similarly, at the macro level are institutional forms whereas the sector level has institutional arrangements. He further contends that these macro-sector connections are based on different forms of 'reciprocal impact' i.e. the dynamic of one can influence the dynamic of the other. Thus a sector's dynamic will be determined by its own sector-based aspects (institutional arrangements) *in conjunction with* its place in the accumulation regime.

Boyer (1991a) also points out that sector specificities will rarely cease and thus, exert an ongoing influence on economic adjustments, some sectors being more influential than others. Some sectors may impose their pace on the rest of the economic system with each accumulation regime characterised by the systemic forms of its leading sectors, "the propulsive engines of growth" (Harvey, D., 1989: 132), which may be new sectors of production (Esser, J. et al., 1989; Moulaert, F. et al., 1992). Each accumulation regime has different propulsive sectors providing the 'leading edge', the role models in key areas such as technological innovation, organisational structures and labour processes (Ticknell, A. et al., 1992). Propulsive sectors will also have differing spatial patterns because institutional forms and institutional arrangements, as a concrete expression of society's structure in a given historical period, are spatially formed and reflect – in the case of institutional arrangements – a sector's specificity and operating regime (Benko, G. et al., 2002; Harvey, D., 1989; Ticknell, A. et al., 1992). Consequently, spatial changes are a manifestation of changes to macro institutional forms or sector institutional arrangements with the spatial patterns of industrial location derived from such factors as the organisation of competition and local labour-market conditions (Moulaert, F. et al., 1989).

The method of sector analysis, proposed by Boyer using Bartoli and Boulet's study of the French wine sector (Saillard, Y., 2002), requires four elements to be identified: (1) a sector's social and historical origins, its collective actors and spatial implications; (2) the institutional arrangements that both define the sector and enable it to function; (3) the sector's place in the accumulation regime and macroeconomic interdependences; and (4) the drivers or points which cause reciprocal transformations of the sector and the overall economic system. This method has been used in the majority of sector studies based on the theory of *régulation*[15].

[15] One exception has been the US agriculture study by Kenney et al (1989) which suggests that sector change can be understood through an analysis of three factors: a sector's place in the accumulation regime, the impacts on the sector of external economic processes such as new technology and markets, and the role of the state in changing the sector.

Thus, to understand structural change within a sector requires, amongst other things, two analyses - one, an analysis of the nature of the five macro institutional forms and two, an analysis of the sector's institutional arrangements which reflect each of the institutional forms. A sector's institutional arrangements not only produce outcomes, being the tangible expression of structural change for each institutional form at the sector level, but also delineate the sector's mode of *régulation.*

Strengths and weaknesses to explain the causes, and outcomes, of change at the macro and sector levels

To understand the conjunction of the mode of *régulation's* five institutional forms first requires an analysis of each which, in itself, can be somewhat problematic. The nature of each institutional form has not received the same degree of discussion as the more abstract concepts of the accumulation regime or the mode of *régulation*. We do know that they embody laws, regulations, norms, habits, compromises and common value systems. However, in most cases, references to the five institutional forms have been cursory and vague with little description or details of the nature and concrete expression of each. In a few instances, details of one are provided as an example although invariably the example presented is the wage-labour nexus (e.g. Dunford, M., 1990). Boyer (1988, 1990) is one exception as would be expected given his prolific contribution to the development, extension and application of *régulation* theory although his descriptions do contain a reasonably high level of abstraction. To use the analytical framework consequently requires the researcher to pay close attention to her interpretations and descriptions of the concrete, tangible manifestation of each of the five macro institutional forms.

Analysis of each institutional form also requires boundaries to be drawn between each which can be somewhat artificial and arbitrary. This in itself can be problematic given the varying degrees of inextricability between the different institutional forms. This is exemplified by the strong interrelationships of the wage-labour nexus, monetary regime and form of the state with the form of competition, given their direct impacts on profitability conditions. A form of competition is defined by its profitability dynamics which reflect its structural characteristics and other influences. Hence, analysis of this institutional form requires consideration of all factors which impact on profitability conditions including those exogenous to its structural characteristics[16].

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[16] For example, the 'wage-labour nexus' impacts on profitability conditions through direct and social wages not only as a cost but also as a critical determinant of consumption and thus, effective demand. The 'monetary regime' can impact on profitability conditions through the cost of available money forms which it administers. The 'form of the state' strongly influences wage determination processes and the 'monetary regime' and hence, profitability conditions. In addition, the 'form of competition' can be

These definitional and boundary issues are not unsurmountable but need to be resolved before the researcher can proceed towards meaningful and credible macro and/or sector analyses.

A further issue which the researcher must resolve concerns the number of institutional forms and thus, sector institutional arrangements to be analysed. Du Tertre, a leading 'sector *régulationist*', has based his studies on the establishment of sector institutional arrangements for only three macro institutional forms. The literature contains no explanation or discussion as to why the other two institutional forms – form of the state and monetary regime - are excluded from, or not relevant to, the analysis. Boyer's sector analysis method (Saillard, Y., 2002) makes no mention of limiting the analysis to three institutional forms. An assessment of a sector against all five institutional forms enables clear conclusions to be made about the institutional arrangements which define the sector, ensure its functioning and explain its mode of *régulation.* To limit the framework of a sector analysis presupposes its conclusions.

None of these issues, however, diminish the strengths of *régulation* theory which lie in its ability:

- to explain change by analysing reality not abstract models;
- to undertake an analysis not limited to economic factors but able to take into account a wide range of influences upon change. The range of factors which can be considered using *régulation* theory include social, technological, historical, political, environmental, spatial, cultural and organisational as well as the economic;
- for the analysis to incorporate both quantitative and qualitative dimensions (Boyer, R., 1990: 61); and
- equally importantly, it does not adopt parameters or concepts applicable only at the macro level (e.g. the national output measure of Gross Domestic Product) to explain patterns of change at the sector level. A sector-based *régulation* analysis explains change through the use of qualitative and quantitative measures directly relevant to, and assessable at, the sector level.

The Australian electricity sector

The 1990s delivered a decade of structural change, with astonishing rapidity, to electricity sectors around the world. The Australian electricity sector has been part of this world-wide phenomenon. Former government businesses have been broken up into multiple companies, some have been sold, a 'national' electricity market has been created, transnational corporations

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influenced by specific actions of the state designed to shape and change its structural characteristics through economic policy and other specific actions.

(TNCs) now feature strongly and the majority of consumers can choose their electricity supplier. This transformation has been driven not only by sector-specific regulatory change and the creation of a national market but also by concurrent changes such as a shift to workplace bargaining over wages and working conditions, an almost 10-year program promoting national competition, the rapid growth of financial markets and new money forms, Australia's increasing global integration, the adoption of new organisational structures and technology, and a multitude of other factors. Australia's electricity restructuring has been hailed as a 'role model' by the Organisation for Economic Cooperation and Development (OECD, 2005) and the International Energy Agency (IEA, 2005), a benchmark against which other countries should assess and measure their own progress. It is, however, an area of Australian public policy for which there has been little analysis of the outcomes generated, or beneficiaries, from the restructuring.

Using the analytical framework provided by the theory of *régulation*, an analysis of the Australian electricity sector was undertaken to determine the outcomes, and beneficiaries, from its restructuring. A brief summary of the results is presented below. The most significant outcomes were found to be:

Global integration: The electricity sector forms part of Australia's increasing global integration and dependence through foreign ownership by major energy TNCs across all electricity operations[17], international trading agreements removing barriers to offshore investment in electricity, the sector's increasing use of global financial markets to finance debt, the fusion of privately-owned electricity companies into global networks of business operations, the use of interlocking directorships between Australian companies and TNC parent companies, and significant contributions to the profits of offshore owners. And, as noted above, Australia has been nominated as a 'benchmark country' for best practices in electricity restructuring (IEA, 2005b: 41);

Debt and derivatives: There has been a marked upward shift in long-term debt dependence, much greater than for Australian companies generally, as government-owned electricity companies have borrowed to fund substantial repayments of equity to their owners and private companies to fund the acquisition of Australian electricity interests. New investment in generation capacity or transmission and distribution networks by these companies has been marginal and could not have caused such a surge in debt levels. At the same time, the use of derivatives has exploded particularly for managing trading risks with companies holding electricity derivative contracts well in excess of the value of their equity;

[17] In terms of Australia's national electricity market, I estimate that foreign ownership in 2005 accounted for around 25 per cent of installed generation capacity, a third of transmission networks, and 30 per cent of services to distribution customers.

An 'uncompetitive' market: The majority of the national electricity market's (NEM) structural characteristics are contrary to a competitive market, wholesale prices have shown high levels of volatility and can be manipulated by large generation companies, the sector is increasingly oligopolistic with a much more concentrated market structure because of consolidation and re-integration between companies, end-use prices are falling for business consumers whilst substantial real increases have been incurred by residential consumers, and insufficient investment in new generation capacity is occurring to meet future demand forecasts;

Labour: Although direct and indirect wage determination processes of the macro institutional form are closely mirrored in the electricity sector, a number of differences are evident. The sector's use of part-time jobs, employment of women and individual employment contracts are less than half national figures. Substantial productivity gains occurred after a sizeable downsizing and for nearly ten years, the sector's productivity eclipsed that of the total Australian market sector. In more recent years, the sector's productivity growth has turned negative preceding a national productivity downturn. Real wage growth for the electricity sector outstripped productivity growth by more than 2 to 1 but as both have become negative, the fall in real wages has been far less. Nationally the changes in real wages and productivity have been virtually identical. Electricity sector wages have also remained notably higher than other sectors throughout the period of restructuring, being second only to the mining sector, and as the rest of the Australian workforce are experiencing longer hours of work without overtime payment, the electricity sector's actual and paid working hours remain closely matched. These outcomes for the electricity sector, it is contended, directly reflect the high level of sector trade union membership which has been more than twice the national rate since restructuring commenced[18]. This level of representation has translated into stronger bargaining outcomes for labour displayed by higher relative wage levels, increases to real wages in excess of productivity growth, and fewer individual contracts to set wages and working conditions;

The state: The electricity sector has performed a central role to the hegemony of Australian neo-liberalism being earmarked by the state for competition and becoming the 'reform' flagship for a 10-year program promoting national competition. The sector's restructuring contained key tenets underpinning the neo-liberalism paradigm: privatisation of government assets, breaking-up of government monopolies into a number of competing buyers and sellers, the creation of a national market, market price determining the outcome for buyers and sellers as well as a regulatory regime and ongoing regulatory changes to ensure the 'effective' functioning of the market. Moreover, the state

[18] Trade union membership has fallen across the workforce to 22 per cent. Union membership within the electricity sector has been consistently the highest of all sectors in Australia and well above national levels although the proportion has fallen from a peak of 68 per cent in 1995 to a current level of just under 50 per cent.

has actively pursued economic policies and actions resulting in decentralised wage determination processes, reductions in the social wage, market-determined interest rates, the creation of new money forms, increasing global integration and dependence, all of which have exerted direct influences on the electricity sector. Australian electricity restructuring has also considerably strengthened the state's regulatory arm as well as providing a relatively significant source of annual revenue for state government owners.

The analysis also showed the clear winners from the restructuring of Australian electricity to be the owners of capital. The state has also gained. Labour, as consumers and workers, has experienced significant disadvantage and faces some bleak prospects despite earlier real wage gains at the expense of jobs.

Financial capital (i.e. the owners of interest-bearing credit such as banks and other financial institutions) has benefited through much higher levels of debt exposure and the increased use of offshore financial markets to access debt finance. Fictitious capital (i.e. financial speculation) has benefited from the explosion in the use of derivatives and the creation of the new electricity derivatives market. Industrial capital (i.e. owners of investment in production) has benefited from the privatisation of electricity assets, an increasing concentration in market structure, a reduction in wholesale price volatility, the increasing re-integration of companies, a real reduction in electricity prices for the majority of business consumers, and the opportunity for larger generation companies to 'game' the market for considerable financial gain.

The state has also been a winner because its 'restructuring model' has received international endorsement blunting domestic opposition. Key tenets of neo-liberalism have framed the restructuring, reinforced its hegemony and provided the state with a 'blueprint' for other sectoral changes to further entrench neo-liberalism. The state's regulatory arm has been strengthened and state governments have tapped into a substantial source of revenue.

Finally, labour, as workers and consumers, have been the losers because residential consumers have experienced significant upward real price increases, future shortfalls in generation capacity are most likely to impact on residential consumers through higher prices and loss of supply, the prospect of real wage increases is remote and increasing inequality across the sector is a strong possibility. As decentralised bargaining, from workplace to workplace, becomes more prevalent across Australia, there is a greater likelihood of inequality in working conditions and rates of pay. Labour may dissipate these prospects, within the electricity sector, if it can maintain its high level of union membership and the unions have adequate resources to co-ordinate their negotiations from company to company. However, greater use of individual contracts to employ electricity workers will severely limit the unions' ability to reduce increasing inequality across the sector's workforce.

Australia has been hailed as a 'model' electricity sector but the so-called competitive market, the model's centrepiece, fails to achieve its own fundamental objective. Nevertheless, it very successfully asserts the prerogatives of capital over labour. Capital's prerogatives have been also clearly affirmed by the other drivers of Australian electricity's transformation namely, wage determination processes, competition policy, financial markets, ownership changes and Australia's international relationships. Furthermore, the state has been unambiguously instrumental in ensuring this paramountcy.

These results would not have been found, nor conclusions drawn, using, for example, an analytical framework based on neo-classical economics which would have limited the analysis to economic factors and focused on the operation of the national electricity market, compared to a model of perfect competition, to the exclusion of all other influences on the Australian electricity sector's transformation.

The need for further sector-based *régulation* research

This analysis of the Australian electricity sector's transformation not only shows outcomes and beneficiaries but also generates a number of propositions about the application of *régulation* theory to sector-based research.

First, all five institutional forms comprising Australia's mode of *régulation* are evident in the operation and characteristics of the Australian electricity sector. The extent of their sector 'presence' – in terms of outcomes similar to the macro level and the nature of institutional arrangements - varies but is generally strong. The Australian state has played an extremely active role in shaping all macro institutional forms, during the period considered, as well as the institutional arrangements which comprise the electricity sector's mode of *régulation*. Lordon (2002: 132) is of the view that the state relates to the mode of *régulation* in two ways – it works *within* the mode by supplementing and reinforcing the other institutional forms and it acts *on* the overall mode. The same is equally evident for the Australian electricity sector's mode of *régulation.* Is this indicative of the strategic importance accorded to a sector by the state as suggested by Boyer? Are these interrelationships between a sector and the state indicative of those between the state and leading sectors? What is the difference between state-sector interrelationships of 'leading' and 'non-leading' sectors? Answers to these questions are not evident without further sector-based research.

Second, unique institutional arrangements can be found within the Australian electricity sector for all five institutional forms of the macro mode of *régulation*. Just like their macro counterparts and the accumulation regime, these institutional arrangements support and steer the electricity sector's operating regime by 'regulating' capitalism's inherently conflictual social relations present within the sector. The electricity sector's mode of *régulation* is epitomised by the following:

- competition - an increasingly oligolopistic electricity sector supported by an increasingly complex regulatory regime;
- monetary regime - prudential regulation of electricity companies operating within national market to prevent collapses and an electricity derivatives market to reduce the exposure of NEM participants to price volatility;
- the state – a proactive and market-enhancing regulatory regime accompanied by active participation through ownership of electricity assets;
- international position – the Australian electricity sector as an OECD role model for energy liberalisation; and
- wage-labour nexus – significantly higher relative wage levels; real wage growth exceeding productivity; little difference between paid and actual hours worked; much lower levels of job 'casualisation', employment of women, use of individual employment contracts; high preponderance of workplace agreements and the highest levels of trade union membership.

Du Tertre (2002) suggests that a sector has institutional arrangements reflecting only three macro institutional forms (wage-labour nexus, competition, and international position). Yet analysis of the Australian electricity sector found institutional arrangements reflecting all five macro institutional forms. Does this mean that sectoral modes of *régulation* do not consistently comprise the same 'mix' of institutional arrangements? The *régulationist* literature does not refer to this possibility. In any event, should a sector analysis presuppose the existence of all or only some reflections of macro institutional forms?

Third, the nature of the Australian electricity sector's 'international' institutional arrangement differs considerably from du Tertre's notion of rules and regulations of an international regime. It also differs from all other aspects identified as being composite parts of the Australian electricity sector's mode of *régulation* in that it derives directly from Australia's international position, its relationship with the OECD. One of the arrangements which coalesce to comprise Australia's international position is also the genesis of the 'international' institutional arrangement for the electricity sector. All other aspects of the sector's mode of *régulation* are distinctive arrangements, specifically 'designed' for the Australian electricity sector, but strongly reflecting a particular macro institutional form. This finding strongly reinforces the notion that the nature of each institutional form, and its sector reflection, can vary considerably and it is not so much the composition but the nature which determines the extent of *régulation.*

Fourth, the institutional arrangements reflecting the macro form of competition - in the Australian electricity sector's mode of *régulation* - was found to be very dominant. A hierarchy of institutional forms has been found for the macro mode of *régulation*. Does a hierarchy of institutional arrangements apply at the sector level? The literature is also silent on this point.

None of these propositions or questions weaken the strengths of *régulation* theory but highlight the need for further sector-based research to explore these possibilities and deepen our understanding of *régulation* theory. The shortcomings of *régulation* theory, referred to earlier, do not outweigh the value which its core concepts provide to a theory of structural change and in particular, the analytical framework provided by the mode of *régulation.* The five institutional forms of the mode of *régulation*, both individually and in combination, provide a very powerful framework to analyse the outcomes of structural change – at the macro and sector levels - through a wide lens of contributory factors which go well beyond the economic. Furthermore, sector-based *régulation* research has the "ability to provide a detailed account of real changes in various productive activities" through a frame of reference which is empathetic to restructuring and reorganisation at the sector level (Du Tertre, C., 2002: 209).

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