

**Australia's Longrun Economic Strategy,  
Performance, and Policy: A Dynamic Perspective**

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**Paper presented at the *Growth & Governance Workshop*,  
in the “*Governing by Looking Back*” Conference,  
Research School of Social Sciences, Australian National University,  
12<sup>th</sup>–14<sup>th</sup> December 2007**

# Australia's Longrun Economic Strategy, Performance, and Policy: A New Dynamic Perspective

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## Abstract

*This essay attempts to quantify and explain the economic performance of Australia from the first European settlement to the present, and beyond. A general dynamic theory – the ‘dynamic-strategy’ theory – has been employed to provide a new interpretation of ‘dynamics Downunder’. It is shown, among other things, that the bold attempt from the 1910s to the 1960s to turn aside from the traditional development policy of exogenously driven natural-resource exploitation in order to embark on an endogenously determined dynamic process, has broken down during the course of the present generation. This was mainly due to a failure of ‘strategic leadership’ on the part of recent Australian governments that have, quite rightly, dismantled the framework of protection, but have failed to replace it with the infrastructure of strategically relevant technological ideas. Once again Australia’s economic prosperity depends heavily on the fluctuating fortunes of the global economy. While in the nineteenth century this took the form of reliance on the prosperity of Britain, today it centres on the continuing growth of Japan and China. This critical problem has been exacerbated by misconceived monetary policies that are damaging the central endogenous dynamic mechanism. What then of the future? It all depends on whether strategic leadership can ever be rediscovered, and a new dynamic economics be adopted.*

**Keywords:** long-run dynamics, dynamic-strategy theory, inflation targeting, strategic leadership, strategic demand.

**JEL codes:** O11, O47, O56.

## I Introduction

Australia has a very longrun history of successful societal dynamics, stretching back some 60,000 years. Elsewhere I have attempted to explain how Aboriginal society was able to remain dynamic and viable for such a vast period of time (Snooks 2006b). Nevertheless, with European settlement, the dynamics of Australian society was transformed. For the first time Australia experienced intense external competition generated by a world undergoing the Industrial Revolution. From 1788 Australian society, like all open societies, became obsessed with wealth and progress, and with recording their material achievement. From that time it was possible to estimate the extent of Australia’s wealth and the pace of its material progress – a task undertaken

by a long line of pioneering Australian statisticians and historical economists, such as W.C. Wentworth (1819 and 1821), Timothy Coghlan (1886–1902), J.T. Sutcliffe (1926), Stanley Carver (1927), F.C. Benham (1928), Colin Clark and J.G. Crawford (1938), Noel Butlin (1962; 1986), Graeme Snooks (1972; 1974; 1994), Gus Sinclair (1988; 1996), and Bryan Haig (2001).

While this local tradition of historical economics is quantitative and analytical, it is not theoretical in nature (Snooks 1993: 139–61; 1994: 259–64). Considerable effort has gone into sketching the longrun patterns of wealth and progress, but no attempt has been made to explain these patterns by employing a realist general dynamic theory. The more economically literate historians have employed the ad hoc tools of orthodox economics, both Keynesian and neoclassical, to relieve the tedium of quantitative description. But, none has been tempted to draw upon the so-called neoclassical growth theory, even though one of its pioneers was the Australian economist Trevor Swan (1956). Perhaps this was fortunate, as deductive neoclassical theory can tell us little about the dynamics of real societies (Snooks 1998b: 25–49).

In this essay an attempt is made to explain Australia's longrun pattern of dynamics by employing a realist general dynamic theory – the 'dynamic-strategy theory'. This theory, which is a product of Australian experience, has been arrived at inductively by the long-term and systematic observation of living systems in both the human and non-human worlds (Snooks 1996; 1997; 1998a; 1998b; 1999; 2000; 2003; 2006). It is a transdisciplinary theory that is gaining recognition throughout the life sciences – see articles in *Complexity* and *Advances in Space Research* (Snooks 2005; 2008).

## **II A new dynamic theory**

To understand the patterns of societal dynamics in the longrun, we require a new dynamic theory. The old theories, unlike the dynamic patterns, tell a story of selective comparative statics. To tell the story of Australia over the past two centuries, we need a truly dynamic theory. For this purpose the dynamic-strategy theory will be briefly outlined by focusing on its central features: the driving force; the dynamic mechanism; strategic demand and strategic confidence; the strategic demand-response mechanism; and strategic leadership in the theoretical Dynamic Society.

### ***The driving force***

The endogenous driving force in the Dynamic Society is the competitive struggle of 'materialist man' to survive and prosper. This is the major outcome of our biologically determined desires – what I call 'strategic desire' – that have been shaped by genetic change over almost 4,000 million years (myrs). In the dynamic-strategy model, as in life, ideas are an effective way of achieving our desires, but they do so in a passive way. In the longrun, as we will see, ideas respond to 'strategic demand'. Two major implications emerge from this reality: altruism is not a prime determinant of human behaviour; and the decision-making process is not dominated by neoclassical rationality. The origin, evolution, and nature of strategic desire and human nature have been explored in considerable depth in my recent book *The Selfcreating Mind* (2006a).

If ideas do not drive society, but merely facilitate the desires of its members, we need to replace the neoclassical rationality model of decision-making with a realist model. Through the inductive method it is possible to derive such a model, which I have called the 'strategic-imitation model' (Snooks 1996: 212–13; 1997: 36–46). In

reality, decision-making is based on the need to economise on nature's scarcest resource – intelligence. Rather than collect vast quantities of information on a large range of alternatives for processing through a mental model of the way the world works, the great majority of decision-makers – whom I call the 'strategic followers' – merely imitate those innovative people ('strategic pioneers') and projects that are conspicuously successful. The only information they require is that necessary to answer the key questions: Who and what is materially successful and why? Hence, the basic information required by decision-makers is the relatively inexpensive 'imitative information', not the prohibitively expensive benefit-cost information. Even the leading decision-makers – the strategic pioneers – do not employ rationalist techniques when seeking new ways of exploiting strategic opportunities. Rather than exhaustively seeking out the best investment projects, they *believe* their investment projects are best. It is the market that adjudicates.

### ***The dynamic mechanism***

The endogenous driving force of strategic desire is a self-starting and self-sustaining force that drives a dynamic mechanism, which has at its centre the 'strategic pursuit' – the pursuit of a dominant dynamic strategy. It is through the strategic pursuit that the objective of survival and prosperity is achieved. This dynamic strategy begins as an individual or family activity which, if successful, is adopted by wider social groups, at first local, then regional, and, finally, national. This takes place through the mechanism of strategic imitation, whereby successful pioneering initiatives are imitated by a growing number of individuals and groups. In this way, a successful dynamic strategy becomes the focus of political policies controlled by ruling strategists, or 'strategic leaders'. The role of 'strategic leadership' is discussed below.

The choice of dynamic strategy – from four possibilities including family-multiplication (procreation *and* migration), conquest, commerce, and technological change – depends on the underlying economic conditions, such as factor endowments and the nature of external competition. It is a choice made by strategists who invest time and resources in alternative dynamic strategies. The important point to realise is that investment in these various strategies is undertaken for the same objective – survival and prosperity – and involves a broadly similar process, which is the strategic pursuit. The main difference is that investment in family-multiplication, conquest, and commerce is undertaken in order to achieve economic growth by gaining control of new *external* resources, while technological change is used to achieve economic growth by effecting greater efficiency in the use of existing *internal* resources. As far as the strategist is concerned – in contrast to the orthodox economist – there is nothing special about technological change. After all, Roman economic growth over a period of 1,000 years was generated knowingly through the systematic pursuit of conquest, not technological change. Technological change, like the other three dynamic strategies, is just an instrument in the more general strategic pursuit. Similarly, within the context of a particular dynamic strategy, strategists attempt to gain a competitive advantage through the adoption of new substrategies which, where successful, generate new 'technological styles'.

As individuals and governments seek to exploit their physical and societal environments, setting in train a mass movement orchestrated through strategic imitation, the dominant dynamic strategy unfolds. Unfolds in the sense that its material opportunities are progressively exploited and, finally, exhausted. And it is this unfolding dynamic strategy (or substrategy) that shapes the expectations of decision-makers. The eventual exhaustion of a dynamic strategy is the outcome of the

‘law of diminishing *strategic* returns’, whereby the revenue and costs of *strategies* rather than factors of production are finally equated (Snooks 1998a: 202–03). The resulting ‘rise and fall’ of dynamic strategies and substrategies traces out a distinctive wave-like pathway (see Figure 4), which provides the dynamic form for this model. This supersedes the arbitrary dynamic forms – the equilibrium growth path and the bifurcated pathways – adopted by supply-side neoclassical, evolutionary, and complexity growth theorists. A meaningful dynamic form cannot be deduced logically from supply-side assumptions about society. It is an existential concept, not an optimising concept.

From historical observation, however, we can derive a general dynamic form that encompasses a series of wave-like surges in economic development and growth that are separated by intervals of stability or retreat. This sequence consists of ‘great waves’ of about 300 years in duration and, within these, ‘long waves’ of about 30–60 years. The great waves are generated by the exploitation and exhaustion of dynamic strategies (for example, the present industrial technological strategy) and the long waves by a series of substrategies (for example, the pioneering phase of the Industrial Revolution in Britain, 1780–1830). We should focus, however, on the underlying dynamic mechanism rather than the precise wave-like pattern, because exogenous shocks continually distort the latter. These wave-like surges should not be thought of as part of a dynamic ‘cycle’, because the intervals between them are not systematically related to the surges of development before and after. Each of these intervals constitutes a hiatus that follows the exhaustion of a dynamic strategy (or substrategy) during which the strategists search desperately for a replacement strategy (or substrategy). The best recent example of such a strategic hiatus is Japan during the 1990s and early 2000s. If the strategists are successful the strategic sequence will continue but, if not, the sequence will terminate and the society will eventually collapse. The latter ultimately occurred in all ancient societies.

### *Strategic demand and strategic confidence*

The unfolding dynamic strategy, driven by the competitive energy of strategic desire (‘materialist man’), plays a central role in the dynamic-strategy model. Not only does it provide the model with a realistic dynamic form, but it gives rise to two new concepts in economics – ‘strategic confidence’ and ‘strategic demand’. These concepts explain not only the dynamics of long-run investment and saving that are left hanging in orthodox comparative-static macroeconomics, but also how ‘dynamic order’ (usually called spontaneous order) is generated. It is the exploration of the demand side of dynamics that makes the dynamic-strategy theory unique in a world of supply-side theories, not only in economics and the other social sciences, but also in biology and physics (Snooks 2008).

Strategic confidence, which rises and falls with the dominant dynamic strategy and its various substrategies, explains the changing investment climate in the Dynamic Society. It provides, for example, a dynamic explanation for Keynes’ ‘state of long-term expectation’. Accordingly it plays a central role in determining the willingness of strategists to invest, because of its influence on the longrun expected rate of return, and in the creation of dynamic order (through encouraging cooperation and an orderly institutional structure). Confidence and expectations rise as the dynamic strategy unfolds, and they decline, stagnate, and may even collapse as it is progressively exhausted. Strategic confidence also binds society together.

Strategic demand – or dynamic demand – also waxes and wanes with the dominant dynamic strategy or substrategy. It comprises the effective demand exercised by decision-makers for a wide range of physical, intellectual, and institutional inputs required in the strategic pursuit. In exploiting expanding strategic opportunities, entrepreneurs need to invest in new infrastructure; to purchase intermediate goods and services; to employ labour skills; to acquire, renovate, or construct the necessary buildings, machinery, and equipment; to engage professional expertise; and to develop new facilitating social rules and organizations. Strategic demand, therefore, is the central active principle in our demand-side model. Naturally the supply responses of population change, capital formation, technological change, and institutional transformation, which are influenced by changes in relative prices, will contribute to the way in which strategic opportunities are exploited; but they do so passively. This concept turns Say's Law – which was accepted explicitly by the classical economists and implicitly by neoclassical economists – on its head: in the Dynamic Society, dynamic demand creates its own supply.

### *The strategic demand-supply response*

With the dynamic-strategy model we can shift focus from comparative-static macroeconomics to longrun dynamics by considering the interaction between strategic demand and the response of the supply-side variables. It is this interaction that causes the dynamic strategy to unfold and, hence, gives rise to the dynamic form of our model, and to the dynamic role played by *strategic* inflation in facilitating the supply response. 'Strategic inflation' is the widespread increase in prices resulting from the pressure of strategic demand on resources, commodities, and ideas. With the introduction of a new dynamic strategy/substrategy, the resulting expansion of strategic demand will lead to an increase in prices of key inputs, but will not generate strategic inflation until the new strategy exerts widespread influence throughout a given society. Economic growth of a traditional and unadventurous (that is, nonstrategic) kind that occurs within the context of known and available resources (such as in Australia during the past decade), may not lead to much inflation at all. But this nonstrategic growth will not last for long. 'Nonstrategic inflation', on the other hand, is the increase of prices resulting from errors in monetary policy and the action of monopolies in either factor or commodity markets at home and abroad.

Herein lie the major differences between strategic theory and orthodox theory. In neoclassical economics the supply side is, by default, treated as the active force in society (supply creates its own demand), which has no place for strategic inflation; while in Keynesian economics the supply-side variables are merely assumed to be given and 'effective demand' is a comparative-static, national-accounting concept. By contrast, in the dynamic-strategy model, strategic demand provides the active force to which the supply-side variables respond according to their supply costs. Strategic inflation, which provides the incentive system in this strategic demand-response mechanism, is a stable, non-accelerating function of economic growth. This theoretical relationship can be (and has been) estimated in the form of the 'growth-inflation curve' over all timeframes – including the very longrun (past 1,000 years), the longrun (past 100 years), and shortrun (1960s–1990s). These growth-inflation curves are estimated and discussed in Snooks (1998b: 151–59). Inflation targeting, where this constrains strategic inflation (as it invariably does), acts as a brake on the unfolding dynamic strategy. To eliminate strategic inflation in the longrun is to eliminate economic growth.

Population, labour supply, capital formation, and technological and institutional ideas all respond to the unfolding dynamic strategy. Changes in these supply-side variables, both in terms of composition and growth rates, are a function of changing strategic opportunities. These variables expand and become more complex as the dominant dynamic strategy is exploited; and they stagnate, decline, and lose purpose, as the dynamic strategy is progressively exhausted and marginal *strategic* returns decline. Rapidly rising and falling prices form the catalyst for these dynamic developments. Naturally, supply-side costs play a role in shaping the strategic response, but this is a passive rather than an active role. Difficulties of supply are met by substitution of other resources and/or by innovation. In this way the supply-side variables are treated endogenously in the dynamic-strategy model. Dynamic demand creates its own supply.

### ***The role of strategic leadership***

Strategic leadership, which is also a response to strategic demand, is essential to the survival and prosperity of human society. It was the primary reason for the emergence of government at the dawn of civilization and for its extension and maintenance ever since. Basically it involves facilitating the objectives of society's dynamic strategists by coordinating their efforts, directly through government directives and incentives, and indirectly through cultural institutions such as religion, ideology, and the arts. In particular the strategic state provides basic infrastructure required by the unfolding dynamic strategy that is beyond the risk threshold and financial resources of individuals and corporations; it negotiates political and commercial deals with other societies; it protects the dynamic strategy at home and abroad; it encourages the emergence of new strategies during recessions/depressions; and it provides basic facilities for education, training, and research required to nourish the long-term health of the prevailing dynamic strategy, whether it be conquest, commerce, or technological change. This is a proactive rather than a passive role, and it is undertaken by the representatives of the strategists for the benefit of the strategists (Snooks 1997: 54–8; 2000: 57–111).

It is important to realise that the strategists do not necessarily encompass the entire population of a society. They include only those individuals who invest in the dominant dynamic strategy, either in physical or human-capital terms. The proportion of the population that can be classified as being among the strategists has varied throughout human history, not in a linear but in a circular way (Snooks 1997: chpt 3). In Palaeolithic (hunter-gatherer) society, almost 100 percent of adult members were actively involved in the family-multiplication strategy (for example, Aboriginal Australia). Hence, family and tribal leaders had to take into consideration the aspirations of all adults. By contrast, in Neolithic (agricultural) societies, only a small proportion of the population was actively engaged in the strategic pursuit, while the great majority were nonstrategists, being deprived of their liberty by the ruling elite. The proportion of strategists in the population ranged from less than 1 percent in conquest societies (for example, Anglo-Norman England) to about one-quarter in commerce societies (ancient Greece or medieval Venice). Only in advanced technological societies has the strategist/population ratio once more approached that of hunter/gatherer societies. This was an important social benefit that the original Australians had over the British invaders in 1788.

Curiously the close historical relationship between dynamic strategists and their leaders has, since the 1970s, broken down in the modern world. And with this breakdown of strategic leadership, governments have neglected modern technological

dynamic strategies in favour of military adventurism. Neoliberal economics, which sees no role for strategic leadership in its comparative-static world, has played a major role in this breakdown through its monopoly over economic advice (Snooks 2000: chpts 4 & 5).

## **II Economic performance from the late eighteenth to the early twenty-first centuries**

The new industrial technology from Western Europe transformed dynamics Downunder. It shattered the Aboriginal dynamic equilibrium, laid down a more productive process of economic expansion, and introduced the entirely new process of economic growth. Table 1 and Figures 1 and 2 provide snapshots of the new economic performance of Australia since 1788.

As shown in Figures 1 and 2, the fastest rate of expansion – measured by real Gross Community Income (market plus household income) and GDP – was achieved before 1860, when the vast resources of Australia were being integrated into the British dynamic strategy of industrial technological change. While the economic base was small in the early nineteenth century, the initial difficulties in constructing a new technological dynamic system in an isolated continent like Australia were large, and so this achievement was impressive. This was particularly true between 1830 and 1850 when economic expansion based on wool production was about as rapid as that achieved during the gold rushes of the 1850s. By 1860 Australia's natural resources had been fully utilised using the pioneering labour-intensive technology, and further expansion required a more capital-intensive approach. This fundamental change in dynamic strategy from family multiplication to technological change is dramatically reflected in the 'kink' in the household-formation curve (Figure 3) around 1860. This curve can be thought of as an index of economic expansion, which is the outcome of family multiplication. Australia's economic performance, therefore, can be viewed in terms of what happened before and after the critical year of 1860.

Between 1860 and 1890, development depended on a large inflow of British capital as Australia played the role of raw-material supplier to Britain's industrialisation strategy. During this period, the rate of Australian expansion slowed considerably. And it slowed even more during the 'interdepression' years of 1890 to 1939. This was a period when the new dynamic system was subjected to severe shocks – two major depressions, a major drought, and a world war. Only in the generation (1946 to 1974) after the Second World War – which stimulated the more industrialised Australian economy in a way that the First World War had failed to do – were rates of expansion comparable to those in the second half of the nineteenth century reattained. But, after the mid 1970s, these rates were halved again, and they only recovered modestly between 1990 and 2007.

As economic expansion is closely associated with family formation, it is revealing to outline the longrun interaction between the household and market sectors using my 'Total Income' estimates (Snooks 1994: chpts 7–9). Figure 2 shows the changing relative importance of these two sectors over the past 200 years. Between 1800 and 1861 the household sector grew (10.0 % pa) slightly more rapidly than the market sector (9.8 % pa). From 1861 to 1889 the market (4.7 % pa) and the household (4.6 % pa) increased at similar rates; but between 1889 and 1939 the household (2.2 % pa) forged ahead of the market (1.8 % pa). Once again, between 1946 and 1974 the household sector (5.9 % pa) increased more rapidly than the market sector (4.6 % pa);

and only between 1974 and 1990 did the market (2.8 % pa) completely outstrip the household (1.3 % pa). Clearly the household played a greater role in economic development during periods of high immigration (1800–1860 and 1946–1974) and during extended periods of depression (the 1890s and 1930s).

Traditionally, the long-run analysis of the Australian economy has been cast in terms of a two-sector model – the private and public sectors. But since the estimation of Gross Community Capital Formation (Snooks 1994: chpt 9), it has been possible to recast this in terms of a three-sector model – consisting of the household, private, and public sectors. This new model can, for the first time, demonstrate the changing relationship between economic expansion and economic growth. Since 1860 the dynamic process, as can be seen in Figure 4, has been dominated by these three approximately equal sectors. Over this century-and-a-half, there were three distinct phases of about 40 to 50 years in this sectoral process. The household sector dominated during the second half of the nineteenth century, when population grew at the rapid rate of 3.4 % pa; the public sector took the lead during the retarded development of the inter-depression years, when the rate of population growth more than halved to 1.6 % pa and the private sector was under siege; and the private sector surged ahead during the ‘golden era’ and beyond. As we will see, these changes were driven by the dynamic strategies being pursued, and by the impact of external shocks.

Estimates of economic growth – real GCI per household and real GDP per capita – tell a different story to those of economic expansion. Figure 1 clearly shows that the process of economic development after 1860 (the era of technological strategies) was much more effective in generating economic growth than it was before that watershed year (the era of the family-multiplication strategy). At a more detailed level, Table 1 suggests that over the two centuries following 1800, real GDP per capita increased, on average, at the modest rate of 1.25 % pa. The periods of most rapid and sustained growth were: 1861 to 1889 (1.34 % pa); 1946 to 1974 (2.95 % pa), and 1990 to 2007 (1.95 % pa). It is interesting to discover the length of time it has taken for real GDP per capita to double, and double again, since 1800. The first doubling, by 1875, took 75 years; the second, by 1950, also took 75 years; the third, by 1974, took merely 24 years – only one-third as long as previously; and the fourth, at the current rate of growth (the average for 2002/03 to 2006/07), will not occur until 2016, taking a much less impressive 42 years – 75 percent longer than in the golden era. There are a number of interesting implications here. First, the generation that grew up after the Second World War – the ‘baby-boomers’ – experienced a much faster rate of increase of prosperity than any other generation in Australia’s entire history. Second, while recent governments like to claim that they have presided over a golden era of prosperity, it pales in comparison with the post-World War II years. Not only is the current period of sustained economic growth actually slower, it is only half as long; and even the rate of economic expansion is much slower than this earlier period of development. And as we shall see below, our current prosperity has been expensively purchased. The period of the 1950s, 1960s, and early 1970s, therefore, is the only truly golden era of Australian prosperity, despite the current myth about the past decade created by opportunistic politicians and incorrectly informed media commentators.

These three periods of rapid economic growth stand out against a wider background of slow growth, stagnation, and even negative growth. The period 1800 to 1861 was characterised by slow growth in per capita terms (0.7 % pa), and even negative growth in per *household* terms (minus 0.6 % pa) – and this despite the

resource bonanza (gold) of the 1850s. But, of course, this was the pioneering period of British settlement, when new strategists were struggling to bring Australia's natural resources into a new dynamic system. In contrast, the interdepression years were a great disappointment: 1889 to 1939 was a period of marked instability and very slow growth in per capita terms (0.1 % pa) and even negative growth in per *household* terms (minus 0.2 % pa). While there were small tentative advances from 1904 to 1914 and again from 1920 to 1925, they were followed by marked retreats during the First World War and the Great depression. This poor performance, which is explained below, is also reflected in other time series, such as market and household capital formation (Figure 4), and population growth (Table 1). And finally, the more recent period 1974 to 1990 was also marked by slower growth (1.1 % pa), which was only one-third that of the post-war boom.

Some economic historians have unsuccessfully attempted to revive the status of the period from 1889 to 1939 (McLean and Pincus 1983), particularly in relation to the second half of the nineteenth century. The above figures, even allowing for the argument that Butlin may have overestimated growth from 1861 to 1889 and underestimated it from 1889 to 1939 (Haig 2001), can hardly be used to rehabilitate the interdepression years. This is not to say that the quality of life did not improve during this period. Various indicators of the quality of life, such as mortality, morbidity, and leisure do show a significant improvement, as a result of global changes in medical technology and practices (Snooks 1981; McLean and Pincus 1983; Snooks 1995). It is important, however, to emphasise the fact that the acquisition of material goods and services did not much improve, because it is the command over these that gives human society the resilience to survive and prosper in the longrun. In the past, societies that have failed to achieve 'economic resilience' – failed to compete successfully in the race for economic power – have not prospered, even not survived (Snooks 1996; 1997; 2003). Economic resilience is the prime objective of all societies, while the acquisition of non-material gains is secondary, albeit important. The tragic Australian confrontation of 1788 is merely one local example of this truth.

The contrast between our measures of economic expansion and economic growth are informative. Interestingly, the rapid expansion prior to 1861 (9.9 % pa) was not translated into rapid and sustained economic growth (0.6 % pa). Why? Because this was a period dominated by the construction of a dynamic system that could facilitate the exploitation of Australia's vast reserves of natural resources, rather than a system that could generate economic productivity. While the period 1861 to 1889 experienced a slower rate of expansion (4.8 % pa), it enjoyed a higher rate of growth (1.3 % pa) than the previous half-century. The great achievement of the generation after the Second World War (1946–1974) was, as we have seen, to translate the rapid expansion (5.1 % pa) into much higher rates of economic growth (3.0 % pa). Since then, the Australian dynamic system has been less successful: from 1974 to 1990, expansion was down by a half (2.4 % pa), while growth was down by two-thirds (1.1 % pa); and from 1990 to 2007, expansion recovered to only 63 percent, and growth to only 66 percent, of the 'golden-age' benchmarks.

The growth-rate implications of these estimates are compared in Table 2 with those by Butlin, Haig, and Maddison (who relies on Butlin for 1800–1911, and Haig for 1911 to 1939). Despite Haig's important criticisms and alternative estimates, Butlin's current price estimates stand up reasonably well, because they are the outcome of a masterly historian's craft and intuition. Interestingly, Butlin's current price series are still employed in ABS publications on longrun sectoral change.

Anyway, the comparison in Table 2 shows that, for the analytical sub-periods I have employed, the differences between the alternative estimates of real GDP on the one hand and my real GCI estimates on the other are quite modest and do not affect the interpretation in this essay. The lesson here is that historical national accounts should only be employed for longrun, rather than year-to-year, analysis.

### **III Interpreting the Australian dynamic**

Australian economic performance for the past two centuries should be seen as the outcome of strategic choices made by households in the Total Economy between dynamic equilibrium, economic expansion, and higher levels of household consumption that can be achieved through economic growth. Where governments exist, they do so only to facilitate these choices. Viewed from this perspective, five phases of economic development can be identified for the past two centuries. The first phase, from 1788 to the 1850s, was characterised by economic expansion – the strategy of family-multiplication – as British settlers attempted to utilise Australia’s natural resources by employing the technology of the Industrial Revolution rather than that of the Palaeolithic Revolution (1.9 myrs ago) as had the first Australians. The second phase from the 1850s to the 1890s was more complex, involving the attempt to exploit these natural resources more intensively and to use the surpluses generated thereby to finance economic expansion (household formation) in urban areas at an increasingly higher standard of living. The third phase, from the 1890s to the 1940s, saw a relatively high rate of growth of household formation (higher than population growth) in a period of declining real market income per *household* through protectionist policies, together with some limited opportunities for the more intensive use of natural resources through technological change. The fourth phase from the 1940s to the 1970s – the ‘golden era’ – was characterised by high rates of economic growth as the world economy expanded rapidly (Maddison 2001; 2003), together with the increasing use of surpluses to fund household consumption at the expense of family formation (average family size declined from 4 to 3 people). And the fifth phase, of slower growth since the 1970s is characterised by a return to the dynamic strategy of the late nineteenth century, of dismantling the framework of both protection and government enterprise, and relying upon exogenous demand rather than investing in the infrastructure of a new self-sustaining dynamic. The rest of the essay will focus on these five development phases.

#### *1780s–1850s*

To the European eye, conditioned by an entirely different technology, material living standard, and experience of economic change (which had long include growth as well as expansion), Australian natural resources in 1788 seemed not just underutilised, but even unutilised. They believed that the way to bring these resources into productive use was by the pursuit of the dynamic strategy of family-multiplication within the context of British industrial technology. Hence, the seven decades that followed, constituted a period of very rapid economic expansion, as the number of European households spread throughout that part of the continent that was amenable to the new foreign technology. In the process, Australia was integrated into the western European industrial system through the import of factors of production (capital and labour) and the export of staples (wool and gold) demanded by European industrialisation. By the 1850s a European-dependent dynamic system had completely displaced the long-established Aboriginal system, and the European population had just exceeded the

1788 Aboriginal population of about a million people (Snooks 1994: chpt 6; Butlin 1986: 112–13).

The dynamic of this formative period of European society was the outcome of a process of economic expansion based on an ‘extensive’ use of natural resources, rather than economic growth based on an ‘intensive’ usage. As shown in Table 1, the growth of real income per *household* was actually negative, and it was not until 1861 that it finally turned positive. This was a time of very rapid household multiplication (almost 11 % pa), being twice as rapid as that for the entire two centuries, and greater than that in the second half of the nineteenth century by a factor of 3.7. The remarkable kink in the growth of household formation around 1860 (Figure 3) is a reflection of this change from extensive to intensive resource exploitation. This shift was an outcome of the exhaustion of the substrategy of family-multiplication (reflected in declining marginal *strategic* returns) and its replacement with a new dynamic substrategy. It is not surprising, therefore, to find that the household sector grew more rapidly than the market sector; or that the small emerging market sector (dealing largely in wool) experienced the well-known capitalist pattern of boom (1820s and 1830s) and bust (1840s).

### *1850s–1890s*

The achievement of this period was considerable, involving the large-scale application of a new rural, urban, transport, and communications technology to resources that had already been brought into the European dynamic system. And the colonial governments played a leading strategic role, directly contributing 38 percent of total market capital formation from 1861 to 1889. For the first time in Australian history – a history that stretches back in time for a century of millennia – technological change rather than family multiplication was driving economic development. But, it was technological change generated within the British dynamic system. It was, what I call, the ‘dependent technological substrategy’. Not only did economic expansion (increase in household numbers) proceed fairly rapidly but, for the first time, economic growth (increase in GCI per household) occurred in a rapid and sustained fashion. Indeed, the rate of economic growth achieved in this period was not exceeded until after the Second World War some three generations later.

The dominating feature of the second half of the nineteenth century was the large inflow of population and capital from Europe, largely the UK, which, combined with a new industrial technology, greatly increased the intensity of natural-resource use in Australia. During this period, population, which increased by a factor of eight, fuelled the rapid expansion of Australian cities. Indeed, one of the main achievements of this half-century, was Australia’s ability not only to retain the gold-rush population after the alluvial gold had been worked out, but also to absorb a large annual inflow during the three decades prior to the depression of the 1890s, and to house them at a relatively high and increasing standard. This achievement was based on the ability of the new Australian dynamic process to generate a level of average household income, a distribution of that income, a range of urban employment, a standard of public utilities, and a quality of residential living that made Australia attractive – despite the economic and social costs of global isolation – to a growing number of European families that were shedding the restrictions of traditional economy and society.

It was, in other words, based on a new *technological* dynamic process. This interpretation, first presented in the early 1990s (Snooks 1994), came as a shock to those brought up in the tradition of Coghlan (1918), Shann (1930), and Butlin (1964) – a tradition that focuses on changes in the factors of production (capital, labour, and

land) and ignores the role of technological change and, particularly, how it formed the basis of the new Australian dynamic system after 1860 (see Forster 1970; Boehm 1971; Sinclair 1976; McLean and Maddock 1987). In fact, the Australian quantitative tradition has totally ignored the implicit model driving Australian economic development. This was encouraged by the influential but simplistic Harrodian and neoclassical 'growth' models, which focus exclusively on the role of physical investment. In this theoretical environment it is perhaps not surprising that Noel Butlin's magnum opus on Australian economic development in the second half of the nineteenth century is called *Investment* [rather than 'technological change'] in *Australian Economic Development* (1964). Of course, these deductive models are not at all useful for the reconstruction of real-world growth processes, as they are not about long-run economic growth at all, but rather about convergence to, or deviation from, equilibrium. Since this new interpretation of the early 1990s, Gary Magee (2000) has undertaken important work on technological change and economic growth in colonial Australia.

The dynamic-strategy theory also provides a new interpretation of the long boom and bust of the second half of the nineteenth century. Traditionally the fluctuating fortunes of this period have been accounted for in terms of the rise and fall of export prices for Australian staple products (Shann 1930; Boehm 1971). Butlin, following line of enquiry in Coghlan (1918) and adopting the theoretical approach of Schumpeter (1912), analysed this process in terms of a long-term deviation from and convergence to equilibrium, with export prices merely reinforcing this endogenous process. In contrast, the dynamic-strategy theory dispenses with the essentially thermodynamic concept of disturbances around the equilibrium state, in favour of an entirely dynamic concept (of a far from equilibrium type) of long waves of expansion and contraction generated by the exploitation and exhaustion of dynamic strategies (or substrategies) rather than resources. The end of the long boom in the second half of the nineteenth century came with the exhaustion of the 'dependent technological substrategy' – at the stage when the capital-intensive exploitation of Australian land resources was at an end – and the subsequent collapse was the outcome of difficulties in developing a viable, new dynamic substrategy. Export prices complicated this transition process, but did not drive it. It was not a result of over-investment in leading industries and 'structural disequilibrium', as Butlin argues, but of strategic exhaustion – of declining marginal *strategic* returns. Recovery required not a return to Schumpeterian equilibrium, but the development of a new dynamic substrategy that would drive the next wave of prosperity.

### *1890s–1940s*

This phase of Australian development was marked primarily by a relative transfer of resources from the rural to the urban sector owing to government policies of protection and import replacement. From the late 1880s to the late 1930s, the manufacturing sector's share of GDP increased from 11 to 18 percent, the rural sector's share declined from 23 to 20 percent, and services fluctuated around a flat trend of about 30 percent. Of lesser significance was a technologically, and sometimes publicly, led transfer within the rural sector from pastoral to arable farming (Snooks 1974). This was the beginning of what I call the 'paternalistic technological substrategy', which eventually emerged, in the early years of the twentieth century, to

replace the earlier 'dependent technological substrategy'. Until it did, no further longrun growth was possible. The new substrategy was pursued until the early 1970s, with increasingly successful outcomes, until it too experienced diminishing marginal *strategic* returns. It was in this period that Australia's population increased from 3.2 million to 7.6 million, and the number of households, largely urban, increased from 0.6 to 1.9 million (Snooks 1994: 202).

The retarded market development of this period was largely an outcome of a transition between two means of generating economic growth – the traditional reliance on the export of commodities produced from the increasingly intensive exploitation of natural resources, and a government-led shift of attention from natural resource exploitation to urban innovation through tariff protection. The specific reasons for this retarded market development (with the public and household sectors being more resilient) were: first, external demand for primary products did not grow as rapidly or as persistently after the 1890s as it did before, even collapsing in the early 1930s; second, the scale of the Australian economy was not yet great enough for the generation of endogenous self-sustained economic growth in the larger urban areas that would be required to off-set the costs of a major, if relative, shift of resources from high-productivity rural industries to lower-productivity urban industries. Hence, GDP per capita grew more slowly than might otherwise have been expected. These dynamic arguments and consequences were totally overlooked by the simplistic comparative-static and marginal analysis of Brigden (1929) and Samuelson (1939).

Immigration, although still important at times during the inter-depression period (in the 1900s, 1910s, and first half of the 1920s), did not play its former starring role, despite being publicly assisted. Population grew at only half the rate (1.6 % pa) of that (3.4 % pa) in the previous period following the gold rushes. The market economy was unable to provide the opportunities for a continuous and rapid inflow of population during a period in which: sound natural resource margins had been exceeded; foreign trade was no longer an effective engine of growth owing to the precariousness of the world economy; 'protection all round' raised the costs of trade with the rest of the world; and economic expansion was badly punctuated by a series of major wars, depressions, recessions, and droughts (Schedvin 1970; Snooks 1974; Sinclair 1976). And as the market sector was unable to provide opportunities for a much larger population, the feed-back effects from the household economy to the private sector – especially via residential construction – were much less than in the second half of the nineteenth century. Nevertheless, the household sector did expand more rapidly than the private sector owing to its own internal dynamics (family formation) and to its close association with the public sector (particularly assisted immigration and urban infrastructure), and it did act to dampen the effects of severe downturns in private enterprise.

The interdepression period, therefore, was one of less-certain development. A less buoyant, and potentially vulnerable, international economy dampened the driving force in the private sector. By default, the public sector took the leading role in a process of economic change that was lacking in confidence and direction, and that was punctuated by economic and political crises. This developed into the 'paternalistic technological substrategy', whereby the public sector took responsibility for encouraging immigration and, hence, the inflow of capital, through the stimulation of both rural and urban development. This was achieved by the provision of infrastructure, financial grants, subsidies, and tariffs. During the period 1910 to 1939, public capital formation averaged 52 percent of the private and public total. Once again, it was this direct and indirect public activity that the household sector

responded to and, in turn, stimulated. But at the same time, the internal dynamics of the household sector – the decisions to procreate and to change the structure of family organization – created a rate of expansion that defied an uncertain market economy.

### *1940s–1970s*

The remarkable prosperity of this period was built upon the foundations laid during the interdepression years, and it was driven by the same ‘paternalistic technological substrategy’. The difference was that the scale of this strategy reached a level that enabled Australian society to reap the rewards of industrialisation, in the form of an unprecedentedly high rate of growth of real market income per household. While this was in part an outcome of a dramatic recovery of the international economy after the Second World War, which regenerated demand for the products of Australia’s natural resources (wheat, wool, animal products, and minerals), in larger part it was generated by a rapid growth of urban industries, fed on a rich diet of import quotas, tariffs, capital-intensive technology, and, most importantly, increasing returns to scale. Accordingly, manufacturing increased its share of GDP from 18 to 30 percent by the late 1950s and early 1960s (after which it declined to 25 percent by the period’s end as the strategy exhausted itself), the rural sector’s share declined dramatically from 20 to 8 percent, and services’s share rose solidly from 30 to 36 percent. In the early-1970s it seemed that Australia’s future prosperity would depend on urban technological change rather than on natural resource exploitation. But the exhaustion of the import-replacement strategy by the end of this period, meant that a new technological substrategy would have to be developed.

Owing to fundamental changes in the Australian economy during these years, the balance in the use of household income shifted dramatically away from family formation to the consumption of market goods and services. This was associated with the rush of females from the household to the market. In this remarkable transition, the proportion of female household workers who also held market jobs rose from 8.0 percent in 1947 to 36.5 percent in 1990. This was a five-fold increase following a half-century of stagnation in the range of 5 to 7 percent. One implication for the market sector is that, while immigration supplied 1.6 million male workers in this period, the household sector supplied 2.1 million ‘married’ female workers (Snooks 1994: chpts 4 & 5). This was an economic response by households to the unfolding dynamic strategy of industrial technological change not just in Australia but throughout Western society.

Fundamental technological change, involving the substitution of capital for labour on a large scale, began in the recovery from the Great Depression, accelerated during the Second World War, and finally spread widely throughout the economy of the ‘golden era’. This was associated with changing relative factor prices of capital and labour, and to changing patterns of consumer demand (Snooks 1994: chpt 5). Because of these fundamental changes in the dynamic system, developed countries, including Australia, generated a wider range of market occupations that suited the physical capabilities and technical training of female household workers. And, as a result of this outward shift in the demand for female labour, the relative wage rate of females to males increased by 69 percent (from 0.55 to 0.93) between the late 1930s (or, indeed, 1920s) and the 1970s. This major shift of market demand for female labour – the first since the Industrial Revolution – enabled women to escape from the low-level wage trap that resulted not from widespread social discrimination but from the restricted range of employment categories in which females could, *at that time*, effectively compete with males. As I have shown elsewhere, it is possible

econometrically to explain 98 percent of the increase in female participation in this period by reference solely to economic forces (Snooks 1994: 85–88).

This period also saw the emergence of the private market economy as the leading sector for the first time in Australian history. While the unusual buoyancy of the global economy was important, even more so were the fundamental technological and structural changes taking place in the private sector owing to the successful ‘paternalistic technological substrategy’. While the public sector was content to play a less direct role in this new economic climate, it was still substantially involved in the development process through its protectionist and immigration policies. And it experimented with badly timed ‘Keynesian’ countercyclical policies (Cornish 1993). But by the early 1970s this strategy had finally run its course – the possibilities for import replacement had been exhausted and marginal *strategic* returns were falling significantly.

### *1970s–2000s*

This latest development phase began with a move to replace the exhausted ‘paternalistic technological substrategy’ with a more market-oriented one. It was recognised that, in this new economic climate, the dismantlement of the old framework of protection was essential, in order to promote greater efficiency and international competitiveness. This was the beginning of a wider effort to implement so-called ‘microeconomic reform’ in the commodity and factor markets. The hope was that the private sector would respond by developing new technologically based industries that could compete globally. In this way Australia would be able to replicate the high rates of economic growth and prosperity of the ‘golden era’. What they overlooked was the need for governments to invest heavily in the infrastructure of technological ideas and human skills, consequently the gap between private and public capital formation widened rapidly (Figure 4). The actual outcome, therefore, was not anticipated by policy makers or their economic advisers: namely, manufacturing’s share of GDP plummeted from 25 to 11 percent (back to the levels of the early 1900s), the rural sector’s share continued to decline from 8 to 4 percent, services increased strongly from 36 to 50 percent, and mining (reflecting the return to a dependency on staple exports) increased from 3 to 6 percent (back to the levels of the 1910s).

This government-led movement, supported by key business leaders, was based on the static supply-side approach of neoclassical economics, rather than on a more realist demand-side dynamic approach. It was an approach that neglected both the pragmatic development role that Australian governments had always played, and the essential role of strategic leadership for government outlined earlier in the dynamic-strategy model. According to this orthodox approach, it is enough to implement ‘microeconomic reform’ by dismantling the old forms of regulation and protection and by selling off all remaining government businesses, because neoclassical economists tell us that the private sector will respond to the global challenge. Instead of being a first step in developing a new dynamic strategy, it was to be the only step. Instead of doing what governments of all successful societies (including Australia’s) in the past have done – providing strategic leadership by investing in the infrastructure of new dynamic substrategies – recent Australian governments have used taxes together with receipts from asset sales to fund military adventures and extravagant election campaigns. Recent Australian governments, like recent governments in much of the Western world, have lost sight of the essential role of strategic leadership, for reasons discussed elsewhere (Snooks 2000: 81–88).

Wiser governments in Australia would certainly have dismantled the framework of the exhausted ‘paternalistic technological substrategy’, sold off the old strategic businesses (in transport, communications, and utilities), *but in addition* – and this is the key point – *they also would have used the sales receipts to invest in the infrastructure of science, technology, education, and work skills*. An important current example is the solar energy industry. Despite the fact that Australia has long been – and continues to be (eg ANU’s ‘solar silver cells’) – a world leader in developing solar technology, other countries have invested in this Australian technology and are reaping the strategic returns. Owing to a persistent and perverse lack of interest by the Australian government in supporting a local solar-energy industry, this country has missed out on massive strategic returns. Government support of projects of this type from the 1970s would have provided the strategic leadership required to develop a new dynamic substrategy based on cutting-edge technologies in which Australia has a comparative advantage. It would have given rise to a new, endogenously driven dynamic system. Instead, Australia has regressed to relying upon exogenous demand for our natural resources, particularly from China, to drive the Australian economy. Instead of pursuing an independent technological strategy that would have resulted in a viable endogenous dynamic system, Australia is relying on global demand for its natural resources to generate economic growth. *This is a regression to the ‘dependent dynamic substrategy’ of the nineteenth century*, which has resulted in uneven regional outcomes, with the resource-rich states, such as Western Australia and Queensland, growing rapidly and the other states falling behind. Essentially, there has been a failure of strategic leadership in Australia, particularly over the past decade, in favour of military adventurism. While the present government has given last-minute support to some alternative energy initiatives, it has the appearance of being a desperate attempt to retain government, rather than to the rediscovery of the vital role of strategic leadership. Hence, unless there is a major change in attitude to leadership, the response of Australian governments to the current energy problem is likely to be piece-meal, inadequate, and ephemeral. Since making this point earlier (Snooks 2000; 2006), the ALP under Kevin Rudd has announced new policy initiatives about future investment in the infrastructure of technological change. Now that he is Australian Prime Minister, it will be interesting to discover whether these policies are effectively implemented.

Compounding this strategic failure, Australia’s internal dynamic mechanism has been damaged by misconceived policies that target strategic inflation. This has reinforced the desire, and the need, to rely upon an exogenous driving force. When discussing the dynamic-strategy theory earlier, it was argued that *strategic* inflation is central to the operation of the strategic demand-response mechanism. This has been demonstrated empirically via the ‘growth-inflation curve’ for leading societies (Snooks 1998b: 141–59). Any persistent and long-term attempt to constrain the economy in order to keep *strategic* inflation within narrowly defined limits will distort this mechanism and, thereby, disrupt the endogenous dynamic system leading to economic stagnation and, even, downturn. During the early 1990s the Australian Treasurer Paul Keating told the electorate that this was ‘the recession we had to have’, because it was a necessary part of the process of ‘slaying the dragon of inflation’. This tilting at dragons by any would-be Don Quixote seriously endangers the longrun growth process. Nonstrategic inflation, however, is a different matter.

Since the early 1990s, when it was widely argued that total inflation should be kept close to zero, there has been some indirect and pragmatic recognition of the dynamic-strategy type of argument: the total inflation target was increased to 3 % pa; then it was said to apply ‘over the course of the cycle’; and, more recently, it was

applied not to total inflation but to ‘underlying’ inflation. While recently there has been a pragmatic recognition of the economic damage that inflation targeting can do, the orthodox theory that should underlie this (unheralded) change of policy – indeed the dynamic theory that should underlie the concept of inflation-targeting itself – is non-existent. The truth is that inflation targeting is largely a theory-free, ad hoc policy. And in pursuing it, the Reserve Bank is merely whistling in the dark.

In addition, there are important practical problems with this type of monetary policy. First, the focus on ‘underlying’ inflation amounts to targeting *strategic* rather than *nonstrategic* inflation – the reverse of what is required to maximise longrun growth; second, it will adversely affect the essential work of small innovators – the ‘strategic pioneers’ – who have limited access to development funds; third, as monetary policy can only be applied at the national level, it has amplified deflationary effects on any region experiencing a downturn while other regions are booming; fourth, it will exacerbate the effects of drought in rural areas; and finally, it generates equity problems through its impact on home mortgages, particularly when household debt is at historically high levels, as at present. These problems, which are exacerbated by the Reserve Bank’s irrational fixation with inflation, have not been sufficient to prevent the re-emergence of the spectre of the ‘dragon slayer’ in the dying days of the Howard/Costello regime. And there are indications that it will be a permanent guest of the new Rudd/Swan era. Of course, a distinction must be made between strategic and nonstrategic inflation, and the latter (which may well emerge in the near future from an irresponsible bout of election spending) must be kept under control. The point to note here is that a systematic study of the past shows that no viable strategic society has ever been endangered by strategic inflation (Snooks 1997; 1998b; 2000). Indeed, the loss of strategic leadership and the ideology of inflation-targeting have been responsible for Australia’s less impressive economic performance over the past few decades than that achieved during the ‘golden age’ of the 1950s and 1960s.

#### **IV What of the future?**

The economic performance of Australia over the past two centuries has been dominated by the exploitation of natural resources. Initially this was achieved through the dynamic strategy of family-multiplication, which was pursued for the first three generations of European settlement using a new technology generated during the course of the Industrial Revolution. During the second half of the nineteenth century Australia employed an even more capital-intensive technology to exploit its natural resources, largely in response to exogenous demand. Following Federation, an endogenously driven dynamic system based in urban areas finally emerged, as the result of government paternalism, and continued until its exhaustion in the early 1970s. Since then the paternalistic system has been dismantled and Australia has reverted to exogenously driven natural-resource exploitation once more.

The traditional path being blindly followed by the present generation was chosen in preference to the more imaginative one of developing an endogenously driven technological strategy. To achieve the latter it would be necessary to invest heavily both in ideas-related infrastructure and in human capital, and to abandon the theory-free policy of inflation targeting that merely damages the strategic demand-response mechanism of an endogenously driven dynamic system. Such a system will be essential in the future when China ceases to grow rapidly, when Australia exhausts its mineral resources, or when climate change challenges the traditional sources of export-driven growth.

What of the future? That should be seen as an outcome of the general dynamic system that has been identified as determining the past, rather than of extrapolated historical patterns. Assuming no unforeseen crisis overtakes us in the next generation, as overtook Aboriginal society totally unexpectedly in January 1788 (see Snooks 2006b), there are a few responses that can be made to this question by applying the dynamic-strategy model to Australian experience. It seems clear that Australia's economic performance over the next generation will depend upon three key matters: the first depends on the growth trajectories of Japan, China, and India; the second on the impact of climatic change; and the third on whether Australian governments can rediscover the essential role of strategic leadership. Australia can do nothing to ensure the continued rapid growth of the global economy or to effect any change in climate, but it can ensure that we reduce our exposure to any adverse changes in these influences. This can be done, as I have suggested, by abandoning the damaging policy of inflation targeting, and by developing a technologically based, endogenously driven dynamic system. Such an innovative dynamic system would provide the flexibility to adapt to all forms of sudden global change. If Australia is able to achieve this, the next generation will experience rapid and sustained growth and prosperity; if not, the economic and political outcome could be much like it was during the retarded interdepression period.

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**Table 1: Australian Growth Rates (constant prices), 1800 to 2007  
(% pa)**

|                  | GDP  | GDP per capita | GCI  | GCI per capita | GCI per h/hold | Population | Households |
|------------------|------|----------------|------|----------------|----------------|------------|------------|
| <b>1800–2007</b> | 5.42 | 1.25           | na   | na             | na             | 4.11       | na         |
| <b>1800–1990</b> | 5.55 | 1.18           | 5.47 | 1.10           | 0.43           | 4.33       | 5.02       |
| <b>1861–1990</b> | 3.50 | 1.39           | 3.40 | 1.33           | 0.93           | 2.08       | 2.44       |
| <b>1946–1990</b> | 4.19 | 2.32           | 3.98 | 2.24           | 1.43           | 1.82       | 2.52       |
| <b>1946–2007</b> | 3.99 | 2.26           | na   | na             | na             | 1.69       | na         |
| <b>1800–1861</b> | 9.89 | 0.70           | 9.87 | 0.61           | –0.63          | 9.13       | 10.56      |
| <b>1861–1889</b> | 4.76 | 1.34           | 4.60 | 1.24           | 1.73           | 3.38       | 2.84       |
| <b>1889–1939</b> | 1.75 | 0.11           | 1.99 | 0.30           | –0.24          | 1.64       | 2.24       |
| <b>1939–1946</b> | 5.06 | 4.14           | 3.50 | 2.62           | 2.44           | 0.89       | 0.90       |
| <b>1946–1974</b> | 5.08 | 2.95           | 4.81 | 2.94           | 2.07           | 2.07       | 2.69       |
| <b>1974–1990</b> | 2.44 | 1.12           | 2.34 | 0.93           | 0.26           | 1.38       | 2.08       |
| <b>1990–2007</b> | 3.22 | 1.95           | na   | na             | na             | 1.25       | na         |
| <b>1974–2007</b> | 2.91 | 1.58           | na   | na             | na             | 1.31       | na         |

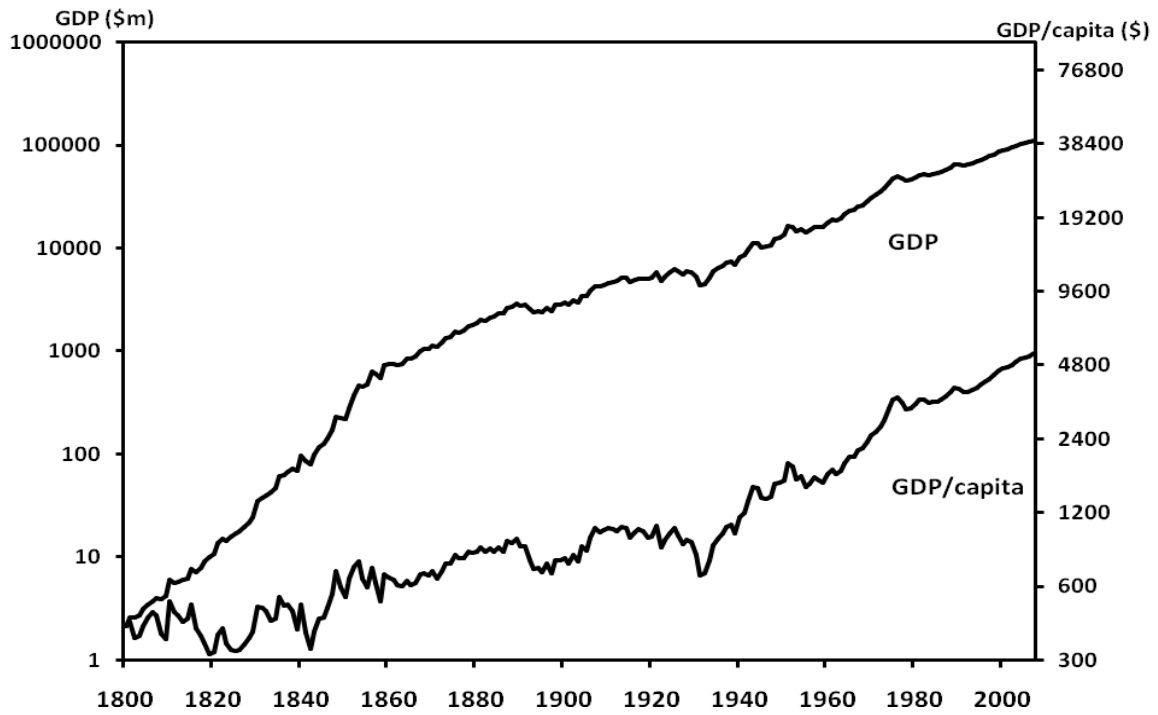
*Note:* GCI = Gross Community Income = market (private + public) + household income. See Snooks (1994) for definitions and detailed estimates.

*Sources:* 1800–1990: Snooks (1994: 24); 1990–2007: calculated from *Australian National Accounts* (ABS).

**Table 2: Rates of Australian Economic Expansion, 1861 to 1939 –  
Alternative Estimates (% pa)**

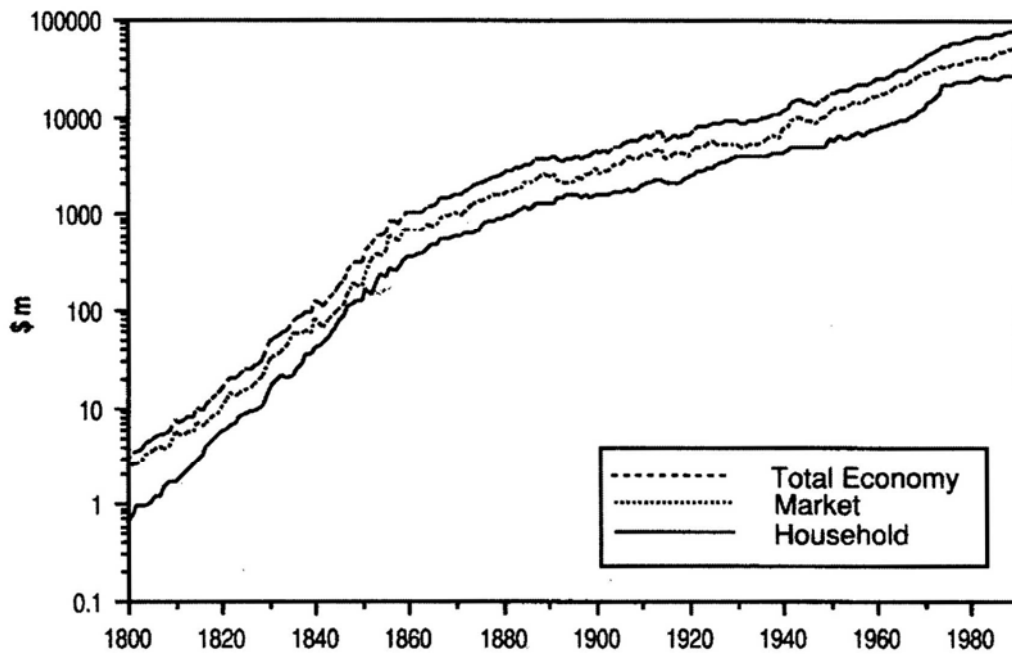
|                  | Real GDP         |                |                    | Real GCI         |
|------------------|------------------|----------------|--------------------|------------------|
|                  | Butlin<br>(1962) | Haig<br>(2001) | Maddison<br>(2003) | Snooks<br>(1994) |
| <b>1861–1939</b> | 2.9              | 2.9            | 3.0                | 3.0              |
| <b>1861–1889</b> | 4.9              | 4.1            | 4.8                | 4.6              |
| <b>1889–1939</b> | 1.8              | 2.2            | 2.1                | 2.0              |

*Notes:* Maddison adopts Butlin’s current price estimates for 1861–1911, and Haig’s quantity-based estimates for 1911–1939. Snooks’ real GCI is based on his detailed estimates of household income plus Butlin’s current price estimates of market income (minus any household items). Both Maddison and Snooks use alternative price series when deflating Butlin’s current price estimates.



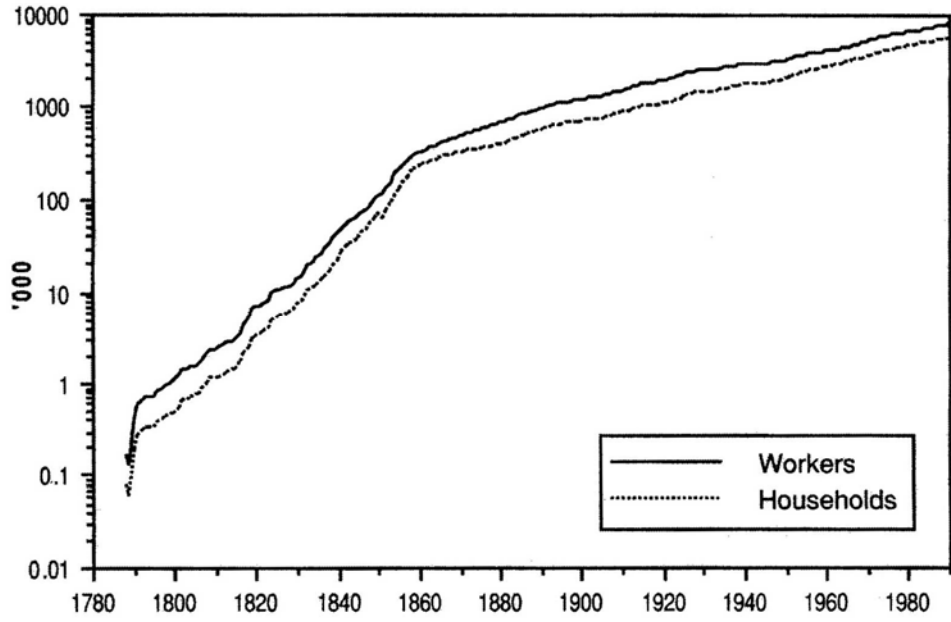
**Figure 1: Australian GDP and GDP per capita (1966/67 prices), 1800 – 2007**

*Sources: 1800–1990: Snooks (1994: Table 7.9, pp. 180–81); 1990–2007: ABS*



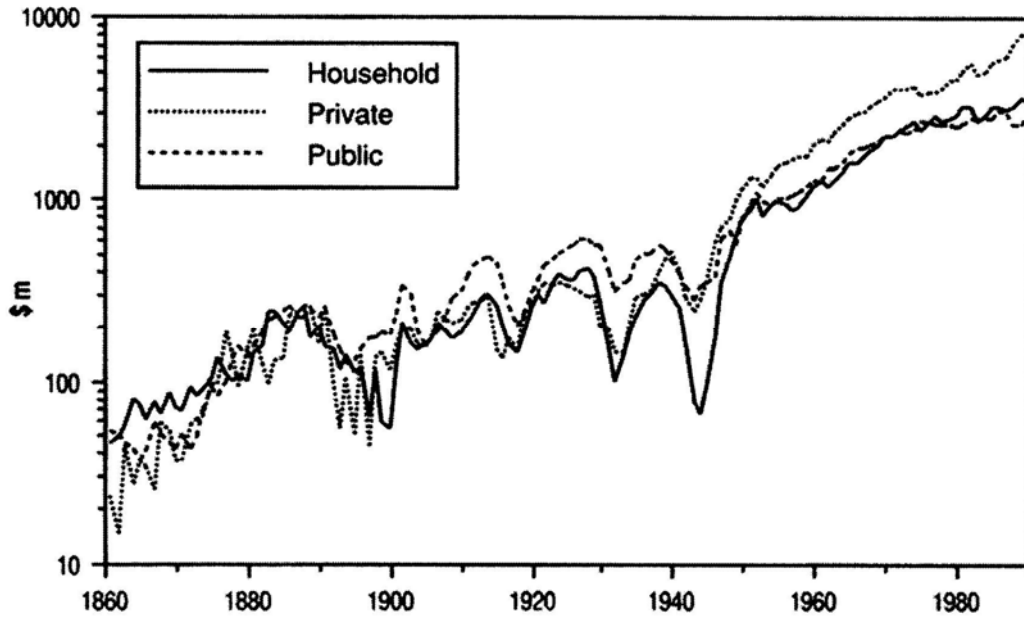
**Figure 2: Australian Gross Community Income (GCI) by sector (1966/67 prices), 1800 – 1990**

*Source: Snooks (1994: 22)*



**Figure 3: Index of Economic Expansion: Australian Households, 1800 – 1990**

*Source: Snooks (1994: 55)*



**Figure 4: Australian Total Capital Formation by Sector (1966/67 prices), 1800 – 1990**

*Source: Snooks (1994: 55)*