

Industrial Rejuvenation

LESSONS FROM INTERNATIONAL AND NATIONAL EXPERIENCE

John Spoehr
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FOUNDATIONS FOR INDUSTRIAL REJUVENATION

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Report prepared for the Stretton Centre

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The Australian Workplace Innovation and Social Research Centre (WISeR) focuses on work and socio-economic change. WISeR is particularly interested in how organisational structure and practices, technology and economic systems, policy and institutions, environment and culture interact to influence the performance of workplaces and the wellbeing of individuals, households and communities.

WISeR also specialises in socio-economic impact assessment including the distributional impacts and human dimensions of change on different population groups and localities. Our research plays a key role in informing policy and strategy development at a national, local and international level.

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1 INTRODUCTION

While Australia and South Australia have been spared the devastating economic and social dislocation that many other OECD countries have experienced since the Global Financial Crisis, we have not been immune to its impacts. Slower economic and employment growth at a national and local level are reminders of this. So too are sectoral pressures playing out in vulnerable sectors like manufacturing where the combination of a high Australian dollar and the rise of low cost mass manufacturing in Asia have undermined the competitiveness of significant manufacturing operations in South Australia and elsewhere. This now includes General Motors Holden which announced in December 2013 that it will close its automotive manufacturing operations in Australia in 2016.

There is now an urgent imperative to develop a sophisticated response to the closure of GMH, one that helps to minimise the negative impacts of the closure on the workforce and supply chains affected. The starting point for this is to identify key lessons from the national and international literature on industrial rejuvenation and the management of major closures. Industrial rejuvenation can be viewed as a multi-faceted strategy that seeks to manage pressures and complex change in response to local, national and global conditions. The difficulties associated with managing change, dislocation and restructuring are magnified during periods of economic crisis when underlying vulnerabilities become more evident and the increased scale and intensity of impacts cause widespread socio-economic hardship.

Over the last thirty years three distinct periods of crisis resulting in large-scale firm closures and layoffs have been experienced. The recessions of the early 1980s and 1990s were marked by very high levels of retrenchment, fuelling high unemployment and long-term unemployment (Spoehr and Shanahan 1994). Unemployment in South Australia peaked at around 12.3 per cent, largely as a consequence of firm closures and mass layoffs.

Great structural changes were unleashed during the 1980s with the deregulation of the banking and financial system and phasing down of industry tariff protection. Since this time Australian industry has faced significant adjustment pressures requiring restructuring and the adoption of innovation and productivity enhancing measures. To influence and manage change, a range of restructuring plans were adopted including the Passenger Motor Vehicle Industry Plan, Metal Plan and Clothing, Textile and Footwear Plan. Each of these plans sought to improve the competitiveness of firms through tripartite planning and processes. Allied labour adjustment packages sought to provide alternative employment pathways for workers displaced through restructuring. During recessions this proved particularly difficult to achieve, resulting in high rates of unemployment for those that were retrenched. During periods of economic growth the costs of adjustment to workers, families and communities is often considerably less.

This report has been prepared during a period in which considerable global economic instability prevails. The GFC has exposed existing vulnerabilities, particularly in relation to mass manufacturing which has been subject to intense competitive pressures from a high Australian dollar and subdued global and domestic demand. The rise of low cost mass manufacturing in Asia adds to this pressure, forcing a fundamental reassessment of manufacturing strategy in Australia. In South Australia this challenge has been taken up by the State Government through the adoption of the *Manufacturing Works* strategy which seeks to support the development of knowledge intensive high value manufacturing, a strategy endorsed in much of the literature as Trippel and Otto (2009) attest.

A cost-reduction response to a severe crisis is not a viable way forward, whereas a search for market niches and an orientation on innovation promises better results. If the firms succeed in enhancing their competences to operate innovatively within their existing markets, and to move to the upstream end of their industries, their accumulated knowledge and skills will be redeployed in a creative way. (Tripl and Otto, 2009, p 1220)

The impacts of downsizing and closures during economic downturns are quantitatively and qualitatively different to those that take place during periods of growth and relatively low unemployment. For example we know that the prevalence of long-term unemployment amongst manufacturing workers is very high as a consequence of firm closures or downsizing during economic downturns. The scale and focus of interventions to manage and minimize the negative impacts of significant change and shocks must be acutely tuned to the economic and labour market conditions that prevail at the time. The following chart provides an illustration of this, indicating the significant differences in economic conditions prevailing at the time of the closure of Mitsubishi in the middle to latter part of last decade, compared to the last few years. Of particular note is the sharp decline in manufacturing employment since the GFC and the steady rise in labor force underutilisation. A more subdued economic outlook for South Australia is expected in 2013-14, creating challenging business and labour market conditions in the year ahead (Budget Paper No. 1, 2013-14).

TABLE 1: SELECTED LABOUR MARKET TRENDS 2004-2013

Year	Unemployment (monthly/April)	Employment (quarterly/May)		Employment growth (quarterly/May)		Underemployment (quarterly/Nov)	
	Unemployment Rate (%)	Total ('000)	Manufacturing ('000)	Total (%)	Manufacturing (%)	Labour force underutilisation rate (%)	Underemployment rate (%)
2004	5.9	719.1	101.4	0.4	9.5	12.9	8.1
2005	5.4	742.0	93.7	3.2	-7.6	12.1	7.7
2006	5.1	754.1	98.4	1.6	5.0	12.5	7.6
2007	5.3	766.6	87.7	1.7	-10.8	11.8	7.3
2008	5	783.4	93.7	2.2	6.8	12.7	7.7
2009	5.7	799.6	80.0	2.1	-14.6	13.4	8.2
2010	5.9	805.3	82.4	0.7	2.9	12.6	7.3
2011	5.6	815.1	81.8	1.2	-0.7	13.4	8.4
2012	5.5	818.4	74.7	0.4	-8.6	13.2	8.1
2013	6	831.4	73.3	1.6	-1.9	na	na

Source: ABS Labour Force Australia (various tables)

In considering the economic impact of GMH in South Australia it is instructive to review a recent assessment of the automotive industry in South Australia prepared by The Allen Consulting Group. It is important to note that the assessment was undertaken using a General Computable Equilibrium Model (CGE) which assumes that shocks like closures will lead to adjustment in wages which in turn will effect demand in other sectors, generating a decline in demand in some and an increase in others. In addition it assumes that capital is flexible and readily deployed to other sectors. These assumptions are problematic as the capital associated with the closure of GMH will not be reinvested in Australia. While significant depletion of capital deployed in one part of the automotive sector might result in a benefit for another producer in Australia, there is a high risk of capital flight from the sector as a whole due to the loss of economies of scale and other factors. Local economic and labour market circumstances will also mediate any outcome, with parts of Northern Adelaide, where GMH is based, experiencing among the highest

unemployment rates in the nation. In summary it is reasonable to expect that the closure of GMH in South Australia would generate substantial, widespread negative impacts, significantly in excess of those estimated using a CGE model.

With these caveats in mind The Allen Consulting Group estimated that the impact of an automotive industry closure in South Australia would be very substantial (2013, p 50-51). They calculated that a shut-down of the automotive sector in South Australia would result in a 1.1 per cent reduction in Gross Regional Product with employment expected to decline by around 1.3 per cent. The loss to 2031 of a shutdown of the entire industry in Australia is calculated to be around \$23 billion in net present value terms. Should economic conditions remain difficult or deteriorate the impacts would be considerably worse.

Using an input-output modelling approach Burgan and Spoehr (2013, p 3) estimate the direct and indirect employment losses associated with the closure of GMH to be around 12,000. The closure is estimated to result in a \$1.1 billion loss to South Australian GSP and \$65 million in lost taxes.

Recognising this, it is vital to examine the potential role that economic and industrial rejuvenation strategies might play in both mitigating and minimising the impacts of the closure and creating the conditions for sustainable development in the years ahead. There are no quick fixes available in circumstances like these, though early intelligent intervention can greatly assist. This might include investments in transitional measures like accelerating the roll out of major infrastructure projects, which can greatly assist with rapid generation of alternative employment in circumstances where short-term demand for skills is subdued. Similarly fast tracking new investments in defence projects would provide certainty to the sector. Medium term growth prospects also exist in horticultural industry development, particularly through value adding in response to growing demand for clean and green food. Sustained growth in education services remains a high priority. In addition the considerable growth currently taking place in the health, aged care and community services sectors is set to continue with allied investments though Disability Care and Consumer Directed Care programs creating additional demand for a wide range of assistive technologies and services. Finally, investments in civic, transportation, communications, health and educational infrastructure can play a key role in boosting short term demand and jobs while adding to medium term productivity growth.

The intention of the report is not to provide an exhaustive review of the extensive literature that exists on rejuvenation but rather a more select examination of that part of the literature which focuses on strategic options available to government in partnership with industry, union and community stakeholders.

The report comprises 5 sections including this introduction.

Section 2 discusses the dimensions of industrial rejuvenation and the related concept of regeneration. The emergence of the regional innovation systems agenda and its relevance as a strategic response to industrial decline and dislocation is reviewed. The emergence of smart specialisation in the European Union is discussed prior to a brief discussion on the relevance to rejuvenation strategies of integrated and inclusive innovation and problem solving processes.

Section 3 reviews notable international case studies of rejuvenation and regeneration.

Section 4 focuses on the impacts of major industrial change, paying particular attention to major industrial dislocations and closures in Australia and Britain. It identifies key lessons arising from scholarly research on strategic responses to closure.

Finally **Section 5** draws out some of the broad strategic implications from the literature for the design of more integrated rejuvenation and regeneration policy and strategy.

2 REJUVENATION AND REGENERATION

While it is not always made explicit in scholarly work and government reports, the literature on industrial rejuvenation has close linkages with that on urban and regional regeneration. There is a shared concern with better understanding and managing crisis and change, reversing economic and industrial decline, fostering innovation and improving competitiveness, generating employment, reducing unemployment and disadvantage and improving urban amenity and community well-being. This suggests the existence of a mutually reinforcing relationship between industrial rejuvenation and urban and regional regeneration, a premise that has significant implications for policy and strategy development.

Industrial rejuvenation involves the transformation of existing industries as well as the development of new and more resilient ones. In broad terms it recognises the need to respond strategically and sometimes in transformational ways to structural and cyclical change that can threaten the viability and sustainability of sectors, harming the well-being of businesses, employees and communities. Innovation is often seen at the core of rejuvenation, necessitating the development of close and robust formal and informal linkages between government, industry, unions and the research community. Agile industry network and clusters situated in a sophisticated regional innovation system are central to this challenge. This section provides some insights from the literature into this, drawing out the important role that policy and institutions, along with innovation and creativity, play in successful rejuvenation.

Urban and regional regeneration on the other hand entails the modernisation and revitalisation of ageing housing stock and physical and social infrastructure, creating healthy, stimulating and vibrant spaces to live, work and invest in. This is commonly regarded as a foundation for improving well-being and productivity, essential to building and sustaining successful industries and economies. During periods of crisis, urban regeneration can play a vital role in boosting domestic demand, creating alternative employment opportunities for those who lose their jobs through downsizing and closure. It also plays a vital role in boosting regional pride and morale. Linking urban and regional regeneration to industrial rejuvenation represents a significant conceptual, policy and practical challenge, which this section will shed some light on.

Concern that narrowly conceived policy responses to economic and financial crisis are largely ignoring innovation objectives has led some scholars to argue for “an innovation solution to the contemporary economic crisis” (Ranga, M. and Etzkowitz 2012, pp. 1429-1437).

2.1 REGIONAL INNOVATION SYSTEMS AND CHANGE

Over the last thirty years Australian manufacturing has been exposed to more intense global competition, particularly as a consequence of trade liberalisation in Australia and the industrialisation of China, India and Thailand which have emerged as major centres for low-cost, high volume manufacturing. Regions with a high dependence on mass-manufacturing in Australia have been profoundly affected by these changes, calling into question the viability of some sectors and demanding major transformation of others, circumstances that have caused some to reflect on the value of Schumpeterian economic analysis.

...the current economic crisis has triggered dual effects: on the one hand, it affected innovation systems both directly, as a result of the economic slump and financial shortages, and indirectly, by aggravating existing systemic weaknesses, in a process of “creative destruction” (Schumpeter 1942). On the other hand, it provides an immense opportunity for correcting such systemic weaknesses, salvaging old industries in parallel with creating new ones and boosting innovation systems, in a concomitant process of “creative reconstruction”. (Ranga, M. and Etzkowicz 2012, p 1433)

A challenge arising from this is to identify the competitive foundations for industrial renewal of old industrial areas (OIAs) and the appropriate roles that government, industry, unions and the wider community might play in establishing and sustaining these in building robust and responsive regional innovation systems and successful industry clusters.

In this context Todtling and Trippel (2004) discuss the renewal of clusters in old industrial regions, focusing on the region of Styria in Austria as an example of an old industrialised area in which a dominant industrial cluster came under threat. They address the question of how clusters might be renewed in regions facing decline and how they adjust to changes in their environment. The authors compare the renewal of the automotive and the metal clusters in the region, concluding that a well-developed regional innovation system, the establishment of new innovation networks and new and more indirect forms of policy are critical to the development of successful new clusters. Moreover they find that:

- Clusters in such regions often face the problems of mature industries such as stagnating demand, high competition and ‘lock in’ to old technology paths.
- The renewal of clusters can be supported by a well-developed Regional Innovation System (RIS).
- Clusters in old industrial regions are often characterised by either fragmentation (few links within the region) or by networks oriented towards the old trajectory.
- The attraction of leading transnational companies may have a positive effect on cluster renewal, if they bring in complementary knowledge to the cluster and if they can be integrated into regional supplier and innovation networks.
- Active policy is needed to overcome the situation of ‘lock in’; market forces alone will not be sufficient to improve the situation. Measures such as the stimulation of networks, the enhancement of ‘systemness’ within clusters, and an upgrading of the regional innovation system are important.

Trippel and Otto (2009, p 1219) apply a regional innovation systems approach to an analysis of the challenges that OIAs face in designing and effectively implementing successful industrial rejuvenation strategies. Focusing on the areas of Styria in Austria and Saarland in Germany, they discuss three types of cluster-based renewal: an innovation-oriented adjustment of mature clusters (incremental change); the emergence of new agglomerations in established industries (diversification); and the rise of knowledge-intensive and high-technology activities (radical change). The study shows that Styria rebuilt its regional innovation system more successfully, enabling the innovation-oriented adjustment of a mature cluster, the rise of a new cluster in an established industry, and

Economics of Agglomeration

Many economists argue that the economic success of cities and regions is closely related to the degree of concentration of economic activity, the sectoral composition of this activity and important contributory factors such as urban amenity, knowledge and skills intensity, social and creative capital and the quality of physical and social infrastructure. Following the path breaking work of Alfred Marshall in the late 19th century, economic geographers and economists have been eager to better understand the drivers of economic concentration – an area of research known as agglomeration economics.

Locations thick with similar economic activity expose firms to pools of skilled labor specialized suppliers and potential inter-firm knowledge spillovers that can provide firms with opportunities for competitive advantage.

Alcacer and Chung 2010, p 26

the emergence of knowledge-intensive activities. The key factors underpinning this success according to Tripl and Otto (ibid, p 1232) were:

- The presence of local firms with strong innovation capabilities;
- The attraction of FDI which established innovation networks with local actors;
- Related diversification processes of steel companies;
- The existence and further strengthening of an excellent knowledge infrastructure;
- A proactive policy approach facilitating innovation linkages and cluster development.

Benefits of Agglomeration

Dense concentrations of economic activity are generally seen as giving rise to increasing returns that may be shared by business units that cluster in space. The analysis shows that virtually all plants reap productivity benefits from being located in places where occupational distribution of workers matches the demand for labour by occupation. ...older firms, whose production processes have been standardized, are better able to exploit advantages of local supplier/buyer networks.

Brown and Rigby 2013

By contrast, in the Saarland, the regional innovation system has been more specialised, resulting in poorer performance with respect to incremental change and diversification and high performance regarding radical change. Tripl and Otto (ibid) argue:

In the Saarland, branch plants attracted by low wages, the region's weak endowment with knowledge providers and supporting institutions and a late and less proactive policy response provided rather unfavourable conditions for the dynamic evolution of the automotive cluster. (Tripl and Otto, 2009, p 1232)

A key conclusion from the study was the need to identify, support and sustain the development of "new clusters to broaden the economic base and to promote related diversification in order to avoid the risk of economic overspecialization" (Tripl and Otto 2009, p 1232). Central to this is a sophisticated and well functioning regional innovation system that enables firms and clusters to overcome problems associated with 'lock in' to old technologies, managerial practices and working arrangements. Regions with sectors that display these characteristics might find part of the solution in building new industries upon the old, argues Treado (2010, p 112).

Regions, like Pittsburgh, that have a strong reputation for expertise in a particular industry or set of industries may find reputation building to be easier than regions that are attempting to build reputation from scratch in a new industry ...or have built strong, competing reputations in other industries.

When Pittsburgh's industrial legacy is viewed narrowly as pertaining to steel production alone, the region seems to serve as an excellent illustration of how path dependence can lead to industrial 'lock-in' and the resulting pitfalls of a destabilising shock. In these models, the ability of the Pittsburgh region to transition from steel production to steel technology represents an escape from path dependence.

...when Pittsburgh's industrial legacy is viewed broadly as pertaining to metallurgical and materials engineering, the presence of the steel technology cluster is more consistent with its legacy.

Reflecting on the experience of the Steel Technology Cluster in Pittsburgh, Treado (2010, p 114) concludes that the "ultimate source of regional resilience" was the expertise of the regional workforce.

More than any other factor, the technical knowledge of local labour seemed to be the key to attracting and retaining the members of the steel technology cluster.

Transforming old industrial areas by moving up the value chain and fully utilising the expertise available locally might be accompanied by a strategy designed to attract FDI. One common expression of this has been the establishment of technology and science parks, which have sought to embed relationships between universities, industry and

government in new common spaces. In a study of evolution and change in industrial clusters, Parker (2009, p 256) notes, “The outstanding success of high-technology clusters has sparked initiatives from governments and other social actors, including universities, to promote the development of regional industrial models that replicate the entrepreneurial and innovation dynamics of successful clusters”. One manifestation of this has been the establishment of technology and science parks like Sophia Antipolis and Hsinchu in Taiwan, which are the subject of a major comparative study by Parker (ibid, p 257). They conclude that:

- *Institutional change involving the transformation of a city/region does not necessarily depend on exogenously induced crisis. It may involve access to new ideas and visions from political entrepreneurs and policy elites.*
- *The provision of resources and physical infrastructure to support regional transformation in an important element in establishing the viability of the new vision for the region.*
- *Institutional systems are not necessarily static in between moments of exogenously induced crisis. They may evolve and change through a reflexive process of strategic learning in which social actors identify problems with the existing institutional base of the city/region and reconfigure institutions to new ends.*
- *The processes of adaptive institutional change involve the strategic learning of social actors and firms who reconfigure institutions to suit their own needs and perspectives regarding the future development of the industrial base.*

2.2 EU SMART SPECIALISATION

The importance of context responsive regional innovation systems is now an overriding consideration for both scholars and policymakers (Martin and Trippl 2013, p 9). This is strongly reflected in the European Union’s *Europe 2020 Strategy*. The emergence of the smart specialisation agenda in Europe represents a new chapter in regional innovation systems policy development and practice. In adopting the *Europe 2020* (sustainable, inclusive and smart growth) *Strategy* the European Union (EU) has placed innovation at the centre of efforts to tackle the economic crisis facing much of Europe. The strategy involves three interlinked priorities:

- Smart growth, based on knowledge and innovation;
- Sustainable growth, promoting a more resource efficient, greener and competitive economy;
- Inclusive growth, fostering a high employment economy delivering economic, social and territorial cohesion.

The EU (2012a, p 7) asserts “Investing more in research, innovation and entrepreneurship is at the heart of Europe 2020 and a crucial part of Europe’s response to the economic crisis”. A cornerstone of the EU approach is the “design of national/regional research and innovation strategies for smart specialisation as a means to harness the potential for smart growth and the knowledge economy...” (ibid).

The rationale for smart specialisation is to focus nations and regions on a “limited number” of economic and industry development priorities that are capable of being competitive in the global economy (ibid, p 11). The EU argues that smart specialization “allows regions to take advantage of scale, scope and spillovers in knowledge production and use, which are important drivers of productivity” (ibid).

Smart Specialisation is about generating unique assets and capabilities based on the region’s distinctive industry structures and knowledge bases.

EU 2012a, p 11

The adoption of smart specialisation is designed to respond to weaknesses evident in past regional innovation strategies including (ibid):

- Lack of an international and trans-regional perspective with the regional innovation and economic systems being considered in isolation from each other;
- Lack of responsiveness to local economic and industrial conditions and insufficient business drivers of R&D;
- Lack of a sound analysis of a region's assets;
- Tendency to pick winners;
- Tendency to copy best performing regions without due consideration of local context.

The pursuit of smart specialization will require different forms of change (ibid, p 12-14). This includes:

- Transition – from an existing sector to a new one based on cooperative institutions and processes (i.e. from fine mechanical and optical engineering to medical technologies);
- Modernisation – technological upgrading of existing industry involving the adoption of Key Enabling Technology (i.e. nanotechnology, biotechnology, photonics);
- Diversification – developing synergies between existing industrial activities and new ones that are more sustainable;
- Radical foundation of a new domain – new technologies making previously low growth activities attractive.

In developing a regional innovation system based on smart specialization the EU have developed a model to guide strategy development in Europe called RIS3. RIS3 comprises four key strategic elements (ibid, p 17):

- (Tough) Choices and Critical mass: limited number of priorities on the basis of own strengths and international specialisation – avoid duplication and fragmentation;
- Competitive Advantage: mobilise talent by matching research, training, development and innovation capacities and businesses needs through an entrepreneurial process;
- Connectivity and Clusters: develop world class clusters and provide arenas for related variety/cross-sector links internally in the region and externally, which drive specialized technological diversification – match what you have with what the rest of the world has;
- Collaborative Leadership: efficient innovation systems as a collective endeavour based on public-private partnership (quadruple helix) – experimental platform to give voice to un-usual suspects.

The EU has set out the following 6-step process for development of RIS3 strategies (ibid, p 18-25).

1. Analysis of the regional context for innovation (regional assets, internal and external linkages and dynamics of entrepreneurial environment).
2. Set up of a sound and inclusive governance structure (industry, government, research and education and civil society).
3. Production of a shared vision about the future of the region.
4. Selection of a limited number of priorities for regional development.
5. Establishment of suitable policy mixes.
6. Integration of monitoring and evaluation mechanisms.

In the context of the Smart Specialisation agenda, Ortega-Argiles (2012) provide an overview of what a range of EU regions are focusing on. While there are some significant variations in focus there are also striking similarities as the following table suggests.

TABLE 2:

Region	Country	Focus
Flanders	Belgium	<ul style="list-style-type: none"> • Strategy built around creation of 6 clusters (transport-logistics; ICT and services in healthcare; new materials, manufacturing and nanotechnology; ICT-enabling services platforms for socio-economic innovation (e-health, e-gov, e-learning); energy and environmentally friendly smart grids). Each area has spearhead initiatives. • New Industrial Policy based on 4 pillars (new sources of productivity in resources, smart infrastructure, clusters and specialization; Factory of the Future; Robust management structures; robust stakeholder based discovery processes).
Navarra	Spain	<ul style="list-style-type: none"> • Moderna Plan defines four types of clusters: basic (auto, electric vehicles and sustainable construction; healthcare services), strategic (renewable energies, agro-food industries), future commitments (biomedicine, medical appliances, services to persons; sustainable tourism, environment and waste; mechatronics, design and creativity, safety) and complementary (business services, education and generation of knowledge).
Lower Austria	Austria	<ul style="list-style-type: none"> • Technopol Program comprises four different technopols (Medical biotechnology; Agro and environmental biotechnology; Modern industrial technologies; Bioenergy, agriculture and food technology). • Clusters include Green building cluster; Food cluster; Logistic cluster; Plastics cluster).
Berlin Brandenburg	Germany	<ul style="list-style-type: none"> • Cluster strategy InnoBB aims to develop future fields of excellence into clusters (Life science; Energy technologies; Transport, mobility and logistics; ICT/New media; Optical technologies).
Lahti	Finland	<ul style="list-style-type: none"> • Environmental technology (Cleantech); design (particularly industrial) and practice based innovation (tools to support innovation) are defined as key strengths.
Silesia	Poland	<ul style="list-style-type: none"> • Medical technologies; Environmental technologies; ICT (modeling and simulation or processes and optoelectronics; Production and processing (metal alloys, polymer and ceramic materials), Transport and transport infrastructure (intelligent systems); Machinery, auto, aerospace and mining (automation, sensors, robots, design); Nanotechnologies.
Limburg	Netherlands	<ul style="list-style-type: none"> • Mapping project identifies 3 key areas of strength: Chemicals and Advanced Materials; Health (life) Sciences; High-tech Systems. • Initiatives include: cross campus strategic co-operation linking universities and businesses; attracting and retaining knowledge workers from all over the world through an International Knowledge Works program.
Emilia Romagna	Italy	<ul style="list-style-type: none"> • Program of activity centered around multiple technopoles and a Regional High Technology Network composed of 34 structures for industrial research and 11 Centres for technology transfer.

Source: Ortega Argiles (2012, pp 11-)

While smart specialisation suggests variation in the sectoral focus of regional innovation and rejuvenation strategies most regions converge around advanced medical technologies, photonics and sensing, cleantech and robotics.

2.3 INTEGRATED AND INCLUSIVE PROBLEM SOLVING

Accompanying the smart specialisation debate and central to the processes involved in industrial rejuvenation has been a related debate about integrated and multi-dimensional innovation and problem solving processes. This is significant because it draws attention to important behavioural and organisational factors underlying innovation, along with long held observations made in the extensive literature on regional economic and industry development emphasising the importance of collective learning, tacit knowledge and institutional thickness (Martin 2003). An important manifestation of the debate has been the Triple Helix Model of innovation and subsequent Quadruple and Quintuple variants – all of which seek to convey the value of integrated and collaborative innovation processes using the intertwined threads characteristic of a helix as a metaphor. The original Triple Helix Model (Etzkowitz and Leydesdorff 2000) aimed to shed light on the potential value

to innovation processes of collaboration between government, industry and universities while the Quadruple Helix (Carrayannis and Campbell 2012) added civil society as a fourth stakeholder. The Quintuple Helix (Carayannis, Barth and Campbell 2012) adds the environment into the innovation equation, embedding innovation in principles of sustainability.

Flowing from this debate, particularly that associated with the Quadruple Helix, has been a range of so-called user-oriented innovation concepts including 'living labs', 'open innovation', and 'social computing' (Arnkil, Jarvensivu, Koski and Piirainen 2010). These seek to engage, to various degrees of intensity, with existing or potential service or product users, with the objective of optimising outcomes for the parties involved. The extent which benefit accrues for different stakeholders is the subject of considerable debate, reflected in the shift in preference from the Triple Helix to the 4 and 5 strand models which engage variously with the wider community either as end users, stakeholders or active participants.

Recent interest in 'co-design', 'design thinking' and 'integrated design' concepts intersect with this debate, sharing a view that multi-disciplinary/multi-stakeholder approaches are necessary to develop innovative solutions to complex problems and challenges (Curley and Salmelin 2013). One of the outstanding examples of this internationally is the Stanford d-school that has created an environment designed to generate productive knowledge rich collaborations.

At any one moment, there are hundreds of projects underway at the d.school involving partners, stakeholders, users and experts. Some are quick introductions that last just an hour or two, others are 10-week class projects and some span years as student teams stick with a project after their class is over.
<http://dschool.stanford.edu/our-point-of-view/>

The emergence of a network of living laboratories based on 'co-design' or 'co-creation' principles is also of significance. Typically living labs involve a combination of the following activities (Pallo 2009):

- Co-creation: bring together technology push and application pull (i.e. crowdsourcing, crowdcasting) into a diversity of views, constraints and knowledge sharing that sustains the ideation of new scenarios, concepts and related artefacts.
- Exploration: engage all stakeholders, especially user communities, at the earlier stage of the co-creation process for discovering emerging scenarios, usages and behaviours through live scenarios in real or virtual environments.
- Experimentation: implement the proper level of technological artefacts to experience live scenarios with a large number of users while collecting data which will be analysed in their context during the evaluation activity.
- Evaluation: assess new ideas and innovative concepts as well as related technological artefacts in real life situations through various

The d.school process

This process – which has been called design thinking – draws on methods from engineering and design and combines them with ideas from the arts, tools from the social sciences and insights from the business world. Students begin in the field, where they develop empathy for the people they design for, uncovering real human needs they want to address. They then iterate to develop an unexpected range of possible solutions, and create rough prototypes to take back out into the field and test with real people.

<http://dschool.stanford.edu>

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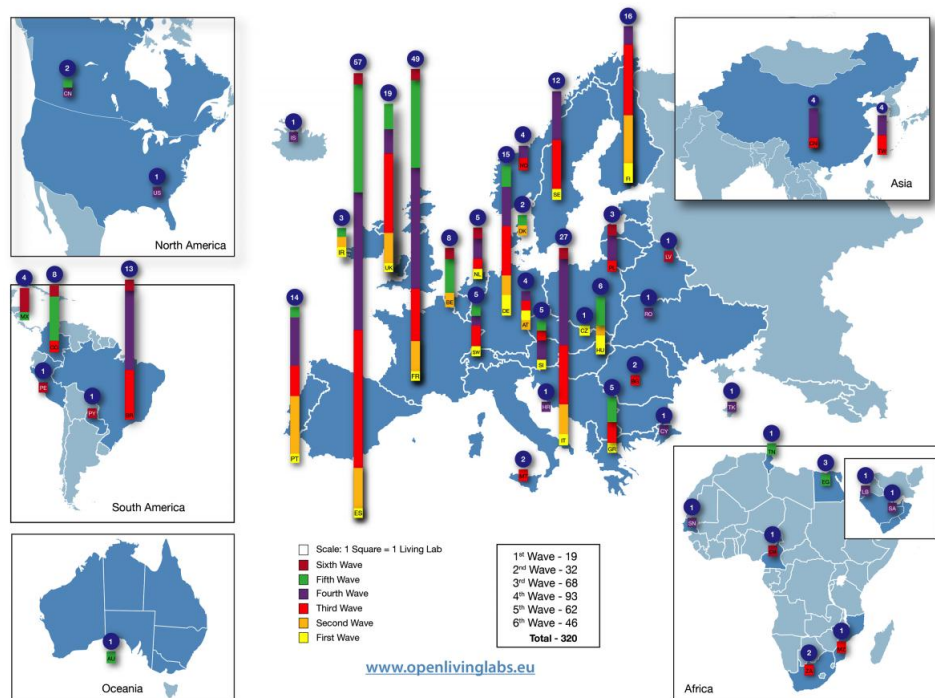
Collaborative Research in the Real World

Living laboratories provide a way to structure research and innovation so that those involved work together more co-operatively and the end result constitutes a better response to the preferences and circumstances of innovation end-users and others affected and to environmental imperatives. Researchers, industry, government and often end-users collaborate on the research and development, testing it out in real world settings.

Salter and White 2013

dimensions such as socio-ergonomic, socio-cognitive and socio-economic aspects; make observations on the potentiality of a viral adoption of new concepts and related technological artefacts through a confrontation with users' value models.

From 19 foundation members in 2006, lab membership of the European Network of Living Laboratories (ENoLL) is over 300. ENoLL members can be found in all continents including Australia as the following maps illustrate.



Source: <http://www.openlivinglabs.eu>

A recent living lab to be established in Australia is the Future Logistics Living Lab located at Australian Technology Park in Sydney (see <http://www.futurelogisticslivinglab.com.au>). One review of the success of living labs by Planitz, Hanlen and Souminen (2010) has concluded that “less than 30 percent were clear successes”.

The European Union has also sought to foster researcher, industry government and community collaborations through the establishment of larger scale Knowledge and Innovation Communities (KICs). These are described by the EU as, “highly integrated, creative and excellence driven partnerships which bring together the fields of education, technology, research, business and entrepreneurship, in order to produce new innovations and new innovative models that inspire others to emulate it” <http://eit.europa.eu/kics/>. The KICs program has funded major initiatives designed to foster collaboration in the areas of ICT, climate and energy.

Over the past five years various purpose built spaces, inspired by initiatives like these have emerged in Australia, including Hub Melbourne, Hub Sydney, The University of Adelaide Hub, Hub Adelaide and various ‘smart work centres’. The Tonsley innovation precinct in Southern Adelaide and the Stretton Centre in Northern Adelaide are larger scale examples of these developments. The latter is a partnership between The University of Adelaide Australian Workplace Innovation and Social Research Centre, the City of Playford, Renewal SA and the Australian Government’s Suburban Jobs Program.

3 REJUVENATION AND REGENERATION IN CITIES AND REGIONS

In the world of urban policy-making, there is a fascination for cities that have managed to turn around their economic fortunes or emerge like a phoenix after crisis. Occasionally, some cities acquire a 'paradigmatic' or 'celebrity' status as they seem to "sum up an era, the place where it all comes together...If Paris was the capital of modernity and Los Angeles of post-modernity, Bilbao and Barcelona in Spain have become meccas for urban regeneration, from industrial cities of a post-authoritarian regime to culturally vibrant magnets of visitors, and all in only a few decades. (Gonzalez, 2011, p 1397)

When we think of regeneration and rejuvenation of cities and regions our minds often turn to the icons of transformative change – Bilbao, Barcelona and Manchester, places often visited by policymakers seeking inspiration. Indeed such is the attraction of these places that some have argued that they have become sites for regeneration tourism - around 5000 professionals visit Bilbao and Barcelona each year to study regeneration (Gonzalez, 2011, pp. 1397-1413). This suggests caution needs to be exercised in reviewing the literature emerging from these places, laden as it can be, with often-immodest messages of success. Thoughtful and critical reflection is urged upon the reader. In the absence of robust evaluation of regeneration and rejuvenation programs, value judgments remain a valuable but imperfect guide to decision making.

3.1 OLDER INDUSTRIAL REGIONS

The problems faced by industrial regions experiencing long-term decline are complex multi-dimensional ones, rooted in space and time. In reviewing cases of regeneration and rejuvenation we face a long list of cities and regions that have experienced one or a combination of recession, de-industrialisation and major company closures. In a multi-country study Koutský et al (2011) examine issues related to older industrial regions including:

- Manchester (UK)
- Ruhr Area or Saarland (Germany)
- Basque Bilbao and its hinterland (Southern Europe)
- Detroit and environs (USA)
- Manchuria (China)
- Examples of 'new industrial spaces';
- The environs of M4 highway in Great Britain,
- Bavaria (Europe)

These regions are regarded as among the principal 'losers' in the deepening process of globalisation, a consequence of the emergence of 'new' industrial regions in a rapidly changing global political economy. While this change has the potential to overwhelm some cities and regions, the authors, using Manchester as a case study, argue that new development trajectories are possible. Koutský et al (2011) reject fatalistic predictions in their assessment of Manchester, arguing that adaptability and the formation of "new combinations" based on the interconnection of local and global trends can generate specific advantages, which will enable regions facing decline, to once again become competitive.

Manchester faced extremely difficult economic circumstances over the decade to the mid 1980s, resulting in the loss of over 200,000 industrial jobs and an unemployment rate exceeding 20 per cent (ibid, p 170). Responding to these difficult circumstances Manchester became a touchstone for policymakers and researchers interested in regeneration and rejuvenation, particularly the cultural dimensions. It is one of the first cities in the world to industrialise and one of the earliest to experience the effects of de-industrialisation. A revitalised cultural sector is regarded as one of the success stories of the regeneration effort in Manchester, a strategy that would later be emulated by other

regions including Bilbao and Barcelona in Spain. Like Bilbao, Barcelona's emergence from industrial decline involved major investments in cultural infrastructure as well as the attraction of major events like the 1992 Olympics which provided a focal point for regeneration as well as attracting international attention on the city and region. The regeneration efforts of Barcelona were lauded internationally with the award of the Royal Gold Medal for Architecture, a major first for a city design project.

Koutský et al (2011) caution against interpreting the success of one particular region as unambiguously positive (as such processes can lead to internal and external tensions); or as perfectly replicable elsewhere (as this is only replicable in regions with a similar institutional and structural context). Hence this should be interpreted as a useful guide in facilitating the development of new industrial combinations during the process of rejuvenation.

Cities like Glasgow and Manchester in the United Kingdom have been the focus of considerable attention by policymakers and scholars searching for solutions to industrial decline. Glasgow experienced a sharp decline in manufacturing employment during the 1980s. At the beginning of the 1970s manufacturing employment numbered around 306,000, declining to 121,000 by 1991 (Gomez 1998, p 108). While services sector employment grew over the period it was insufficient to fill the employment gap that remained, around 160,000 fewer jobs available in 1991 relative to 1971.

The extent to which regeneration and rejuvenation strategies have been successful in tackling de-industrialisation and chronically high unemployment has been of central concern. Gomez (1998) has argued that despite the image of Glasgow as a city transformed by regeneration, the strategies adopted up until the late 1990s, failed to reverse industrial decline and generate sufficient employment in the services sector to compensate for heavy losses in manufacturing. While the enormity of this challenge is recognized, it is a preoccupation with image reconstruction and the lack of integration of urban regeneration and industrial rejuvenation that appears to be at the heart of the problem as Gomez argues:

The emphasis on fostering service sector growth via image reconstruction, primarily through the promotion of the city centre, has had very limited success in Glasgow. There is no doubt that this strategy has had dividends in respect of the number of visitors to the city. ...it is also undeniable that the image of Glasgow, both within and outside the city, has been radically reconstructed. There is also agreement on the success of these policies in terms of Glasgow's central area physical renaissance. But this seems to refer only to a very constrained and poor idea of urban regeneration. In fact it's clear that the formula used to revitalize the urban area has not been very fortunate as far as employment is concerned.

Furthermore, a wider exercise of revitalization, focusing on potential industrial employment, has been hampered...by the growth of centralized power...and subsequent exclusion of the city as a location for manufacturing inward investment. (Gomez, 1998, p 118)

3.2 BILBAO

Situated in the Basque Country of northern Spain, Bilbao's population reached around 1 million in 2013. The industrial structure of the city was once, dominated by heavy industries, particularly steel, shipyards and machine engineering. A deep economic crisis during the first half the 1980s led to unemployment rising to around 25 per cent and widespread demoralisation (Ploger 2007, Gomez 1998). Over the twenty years to 1995 manufacturing employment declined by half or around 60,000 jobs in Bilbao. By 2005 manufacturing employment had declined from 46 per cent of total employment to just 22 per cent. Service sector employment on the other hand, rose steadily from around 40 per cent to nearly 70 per cent of total employment (Ploger 2007, p 27). By 2009 manufacturing employment comprised just 18 per cent of total employment (Plaza and Harrich 2013, p 8). While much of the employment growth in the post crisis period was in

lower paid and less secure service jobs, Plaza and Harrich (ibid) note a sharp rise in advanced business services from around 10 per cent in 1995 to more than 18 per cent in 2009 (ibid).

Population outflow from the area was dramatic with the City of Bilbao alone losing around 16 per cent of inhabitants over the fifteen years to 1995. Over the following decade more than 11 billion Euro (Aus \$15.6b) in public sector investment was directed towards urban regeneration and industrial rejuvenation projects. On the integration between regeneration and rejuvenation, Arancegui, Querejeta and Montero (2011, p 12) note that:

The diversification strategy of the Basque Government went beyond industry and addresses the regeneration of cities, especially in Bilbao. A prominent sign of this policy was the Guggenheim project, which sought to place the city in a global network of cultural and recreational centres.

Key elements of a regeneration strategy emerged in the late 1980s with the early focus being on major projects before the development of an overarching strategy. A strategic plan was drafted towards the end of the 1980s, “establishing a regulatory framework for regeneration of Bilbao” (Ploger 2007, p 16). In 1991 the ‘Strategic Plan for Revitalisation of Metropolitan Bilbao’ was finalised and a “dedicated agency”, ‘Bilbao Metropoli-30’ (BM30) established to drive the process of regeneration in accordance with the strategy.

BM30 has been described as “a think-tank, lobby organisation and catalyst for investment”, industry led but based on a “partnership model with the public and private sector” (ibid). Four areas of action were identified as priorities for BM30.

- Formation of a knowledge-based high-tech sector
- Inner-city renewal; especially revitalisation
- Environmental intervention; river cleaning, industrial land recycling
- Strengthening of cultural identity through culture-led regeneration

An early initiative was to develop a regeneration Master Plan drawing on the experiences of Barcelona and other areas of Spain with project-led regeneration (i.e. Olympic Games). Additional inspiration came from lessons learnt in Glasgow and Baltimore, cities badly affected by de-industrialisation.

An ambitious vision for regeneration was adopted, seeking to transform Bilbao into “a key node on the European axis”, to “not only guarantee (sic) the ‘survival’ of the city but also establish (sic) the city as a competitive node in an emerging post-industrial urban network” (ibid, p 17). This was embodied in a ‘Territorial Plan’, which sought to focus regional and global attention on Bilbao, recruiting leading architects like Frank Gehry to transform the urban landscape.

Other institutions were established to facilitate development including Bilbao Ria 2000, responsible for regeneration of abandoned industrial land and infrastructure. Bilbao Ria 2000 has been described as pivotal to the regeneration project (ibid). It is a not-for-profit agency involving all tiers of government in the redevelopment of vacant land. While establishment funds for the venture came from central, regional and EU sources, Bilbao Ria 2000 became self-financing through land value enhancement strategies, underpinning major redevelopments throughout the area (ibid, p 18).

Regeneration and rejuvenation was underpinned by detailed work involving leading planners and architects with the initial plan generated by Cesar Pelli who had undertaken similar work in New York City on the Battery Point regeneration project. Public sector investment played a key role in the regeneration in Bilbao with the private sector reluctant to contribute to major civic and transportation projects. Centrepiece projects included the Guggenheim Museum (144 million Euro) and the Euskaduna Conference Centre (72 million Euro) (ibid, p 20). More than 6 billion Euro was invested in transportation infrastructure projects including an extensive metro system and new

metro stations designed by renowned architect, Norman Foster (ibid, p 21). The scale of transport modernisation was astounding, leaving little if any infrastructure untouched by the regeneration and rejuvenation program.

Another major pillar of the Bilbao regeneration program was environmental remediation of contaminated industrial land and waterways. A foundational investment was the development of a new sanitation system costing one billion Euro (ibid, p 22).

Combined the civic and transportation infrastructure projects stimulated significant economic and employment development in the region, growth that was reinforced by wider industrial rejuvenation initiatives underpinned by EU funds over the ten years to 2006 (ibid, p 26). Around 4.5 billion Euro was invested in economic and industry restructuring projects, particularly in the steel and shipbuilding sectors.

REFLECTIONS ON BILBAO

The success of the Bilbao regeneration and rejuvenation strategy is attributed in part to the level of autonomy available to decision makers at the local level in the Basque region, a consequence of democratic reforms (ibid, p 15) that enabled Bilbao to “design tailored policies at the right time”. The Basque region is, notably, the most autonomous region in Spain. The availability of resources to support regeneration and the establishment of specific institutions to drive regeneration were a function of domestic taxation policies and a high level of autonomy, conferring considerable institutional agility.

Cultural tourism has increased markedly since the crisis of the 1980s with the Guggenheim Museum alone attracting 1 million visitors each year (ibid, p 30). Business visitation increased tenfold over the ten years to 2005, attributable to establishment of the conference centre and airport upgrades.

The Bilbao strategy has been criticised for not being sufficiently inclusive of community stakeholders and being too “top down” (ibid, p 35). Others have argued that while civil construction projects were effective in providing much needed employment, longer-term industrial and employment development initiatives have not been particularly successful (Gomez, p 112).

The adoption of strategic planning, while important, has lacked the statutory foundations to overcome inter-institutional complexity and duplication. Bilbao Ria has been viewed by some as privatisation of functions once undertaken by local government, circumventing democratic processes and accountability (Gomez, ibid).

Gomez (ibid, p 113) points to a tendency in regeneration to place style ahead of substance, focusing more on the development of iconic buildings than on sustainable industries and jobs. Plaza and Harrich (2013, pp 8-12) argue however that the Guggenheim Museum in Bilbao has played an important role as part of a wider strategy of attracting investment and boosting “connectivity for the city of Bilbao, providing favourable conditions for improving the region’s competitiveness and attractiveness”. In isolation, a new building can do only so much. As part of a wider strategy of rejuvenation and regeneration it can be inspirational as Guggenheim Bilbao continues to be.

To this day Bilbao and the wider Basque region remains a source of great interest to policymakers and scholars seeking to better understand factors influencing industrial rejuvenation and urban regeneration. In a review of smart specialisation in the region Arancegui, Querejeta and Montero (2011, p 13-18) note a commitment in the 2010 Science, Technology and Innovation Plan (PCTI 2010) to a science and technology push involving the development of new sectors and enabling technologies, focusing on commitments in a number of areas including biosciences, nanosciences, alternative energies and electronics for intelligent transport. This overarching plan built on earlier strategic initiatives including BioBasque (2003 and updated in 2010) and nanoBasque (2008), extending this work into the energy sector. These strategies selectively extended the engagement of the region into areas where it was judged the region might develop a

competitive advantage. Arancegui, Querejeta and Montero (ibid, p 14) note that “the strategy fostered the lines that matched the most with the Basque system: human health, but with less of a focus on the bio-pharmaceutical chain because [of] the lack of companies in that sector and more of a focus on diagnostic systems and bioengineering”.

To activate the BioBasque strategy the BioBasque agency was established to help drive innovation in the sector, to “influence not only the central part of the bioscience value chain (i.e. the bio-science business group) but also the entire value chain, including suppliers (driving the diversification of the significant machine tool industry towards the production of instruments and equipment for the bio-business sector and research in the field of health) and users (driving diversification in sectors such as agro-food, environment and chemicals) where, although the Basque country does not have high levels of specialisation, there is significant employment and economic activity” (ibid, p 15).

The nanoBasque strategy was accompanied by the establishment of the nanoBasque Agency, both of which were designed to “advance the diversification of all sectors of the Basque economy through the introduction of micro and nanotechnology applications” (ibid), which are regarded as general-purpose technologies or GPTs. Building on a foundation of companies already specialising in nanotechnology, the nanoBasque Agency embarked on a process of mapping existing interest and capabilities in the sector. In reviewing smart specialisation in the Basque region, Arancegui, Querejeta and Montero (ibid) conclude that, “different modes of diversification based on R&D can coexist in a single territory. In each mode, the roles of government and other agents differ according to the entrepreneurial and scientific skills available in the region. When such capabilities exist in the private sector or university environment, the government can take a primary role as facilitator...In other cases where such skills are non-existent or only potential, the role of government is much more active” (ibid, p 17). Key reasons for the success of the Basque approach to smart specialisation is the “high degree of competence of the regional government” and “a large and sustained investment capacity that has been made possible by its unique system of economic agreements...” Arancegui, Querejeta and Montero (ibid) argue that responsiveness of the University sector was a “notable weakness” that requires transformation of universities.

Arancegui, Querejeta and Montero (ibid, p 19) suggest that caution needs to be exercised in arriving at a view about the optimal role for government in smart specialisation, arguing that advocacy of a minimal role for government is likely to prove counterproductive in circumstances where there is underdeveloped or nascent entrepreneurial leadership.

Generally, the role of government is greater when the production base and knowledge in the strategic area of diversification are lower. Even in a relatively advanced region, such as the Basque Country, the pure “entrepreneurial discovery processes” seem to be more an exception than the rule and the regional government’s role can go beyond that of a mere facilitator or catalyst. As noted by Etzkowitz (2003), entrepreneurship need not be restricted to the private sector; it can also be undertaken by the government.

4 IMPACTS OF INDUSTRIAL CHANGE AND SHOCKS

Industrial rejuvenation must be undertaken in an integrated way in order to deal with both the economic and social consequences of industrial dislocation and shocks like the closure of GMH. This section briefly reviews literature on the impacts of major business closures and downscaling in this context. Lessons learnt from a number of national and international case studies of closure are identified.

It is vital when reviewing the impacts of closures and retrenchment to take account of the circumstances in which they take place, as these help to both understand the causes of particular events and the likely magnitude of impacts. Cook et al (2013, p 4) argue:

The immediate causes of closures are due to business decision-making, but the wider context of causes needs to be understood in the light of sectoral, market and technological trends. These trends can include the changing nature and size of demand in markets, over-capacity in supply/provision, cheaper competition from international producers and altering business models including with respect to the processes of innovation. The macroeconomic environment can have a particular bearing on some of these causes. For example, economic downturns can have a noticeable effect on demand, as can exchange rate shifts, which can affect the competitiveness of goods and services. Some of the causes can be tracked and understood over time, which can contribute to foresight of shocks (or potential shocks).

Regions with a high dependency on mass manufacturing have proven to be particularly vulnerable to large-scale downsizing and firm closures over the last 20 years (Spoehr and Shanahan 1994). The timing of downsizing and closures profoundly shapes the experiences of those who are retrenched. During periods of economic decline those experiencing retrenchment are much more likely to become long-term unemployed (unemployed for 12 months or more). During the recessions of the early 1980s and 1990s, retrenchments in South Australia increased sharply from 23,000 in 1988 to 48,000 in 1992 (ibid, p 6). Around one in three of these job losses were concentrated in manufacturing. Retrenchment as a proportion of unemployment in South Australia doubled during the height of the 1990s recession (ibid).

Major business closures and restructuring can have a wide range of direct and indirect impacts (Cook et al 2013), which are mediated in their severity by economic, financial and organisational and personal circumstances. In relation to the workforce, factors such as age, gender, educational qualifications, cultural background and financial circumstances play a key role in shaping outcomes. Six broad categories are used here to review impacts that commonly accompany closures and major downsizing events. These are:

- Economic and employment
- Supplier
- Health and psycho-social
- Population
- Taxation
- Housing

4.1 ECONOMIC AND EMPLOYMENT IMPACTS

Business closures and large-scale downsizing often have significant economic impacts with large-scale closures having the potential to significantly reduce economic output and value added in an economy. The extent to which closures result in net negative economic impacts depends on the existence of compensating factors such as the time available to adjust prior to closure, the quantity and quality of new business or government investment designed to offset impacts and the effectiveness of policy and strategy designed to mitigate negative impacts and generate alternative economic and employment opportunities.

While impacts vary in their severity from case to case, a recent review of the impact of large firm closures undertaken by the Nous Group for the Department of Industry, Innovation, Science, Research and Tertiary Education (Nous 2013, p 10) concludes that:

Workers displaced as part of major firm closures or retrenchments often experience poor labour market outcomes for extended periods of time. These negative effects are not felt uniformly; although some level of hardship is the typical experience, particular groups tend to struggle more than others. The effect of a mass-layoff

extends beyond the individuals who lose their jobs and is felt keenly in communities that are reliant on one or two industries.

Studies of the estimates of the economic impact of closures in South Australia by Spoehr and Morrision (2002) and Spoehr, Wilson and Morrision (2003) illustrate the potential impacts of large-scale business closures on economic output and value added. The closure of the Mitsubishi Lonsdale plant and downsizing of Tonsley Park plant operations was estimated to reduce economic output by around \$370 million at the business itself and have flow on effects in the wider economy of a further \$230 million. In addition the changes were expected to result in the loss of around \$79 million in value added directly from the business and a further \$98 million in value added as a result of flow on effects throughout the wider economy. The negative impacts that ultimately flowed from the closure of Mitsubishi, while significant (see case study in section 4.1), were contained to a large extent by the relatively buoyant economic and labour market conditions that prevailed at the time of closure.

The closure of the Port Stanvac Oil Refinery was estimated to result in the loss of around \$23 million in direct value added from the state economy and a reduction in flow on value added in other sectors of the state economy of around \$50-80 million. Spoehr, Wilson and Morrision (2003) indicate that a significant number of businesses linked contractually to the Mobil Oil Refinery expected negative sales and production impacts. They identify other potential economic impacts including increased demand for Federal and State income support arising from an increase in unemployment.

A wide range of employment impacts can be expected to flow from business closures. The magnitude of these impacts will be mediated by prevailing economic, industry and labour market conditions, the location of the plant and policy responses. Business closures during periods of economic downturn or significant turmoil within an industry sector often generate significant unemployment and long-term unemployment. One consequence of this can be the out-migration of individuals and families from one region to another in the search for work. Closures during periods of strong economic and employment growth will often have fewer negative employment impacts, though this is dependent upon the quality and the suitability of the employment that is available. Harris (1984) has found that the industries and geographic regions in which businesses are generating new jobs can differ markedly from those losing jobs through plant closings and major layoffs. This mismatch in the location of growth and decline can be a source of considerable social and economic distress.

Plant closures can have a wide range of employment related impacts in addition to job loss including difficulty in transferring existing skills to new jobs, a reduction in pay and benefits and increased insecurity of employment (Armstrong et al 2008; Beer et al 2006; Collins and Quark 2006; Tomaney et al 1999, p 408). While it is common for plant closures to lead to higher unemployment and under-employment, a consequence of plant closures can also be the entry of a new business or new investment, which generates employment (Yoder and Staudohar 1985).

Spoehr and Morrision (2004) estimated the potential employment impacts of the closure of the Mitsubishi Motors Limited Lonsdale plant and downsizing of the Tonsley Park Plant in South Australia. They found that the reduction in operations would result in the loss of approximately 1,170 full-time equivalent jobs at Mitsubishi directly and around 1,000 jobs in other sectors of the state economy. Flow-on employment effects were estimated to be greatest in the property and business services, other manufacturing, trade, and other motor vehicles and parts manufacturing sectors. The study notes that the results do not take account of potential offsetting positive impacts flowing from reductions in the scale of Mitsubishi's operations. These include employees gaining alternative employment, income transfers from State and Federal Governments associated with re-training, unemployment and general adjustment assistance that may flow to South Australia if there were a significant reduction in the scale of the automotive industry in the State.

Spoehr, Wilson and Morrison (2003) estimate the likely economic impact on the South Australian economy of the closure of the Mobil Port Stanvac oil refinery. Employment loss was estimated to be approximately 350 full-time equivalent jobs directly and between 450 and 740 jobs lost in other sectors of the state economy. Flow-on effects were estimated to be greatest in the utilities, other manufacturing, business services and transport sector. Large firms with significant contracts with Mobil indicated that they would reduce employee working hours or cut staff. Businesses that were dependent on Mobil for a majority of their turnover indicated that a third of their staff would have to be laid off as a result of the closure. Furthermore, one owner/manager indicated that the closure of Mobil would force him into semi-retirement.

In a study of the impact of the closure of the Geelong based Sterling Clothing Company plant in 1985, Kriegler and Sloan (1986) focus on the significant employment losses flowing from the closure. The majority of employees made redundant were able to secure alternative employment almost immediately. This is likely to have been due to the relatively favorable economic climate prevailing at that time. Most of the employees were able to find work with other clothing firms, reflecting strong demand for machinists in Geelong at the time. The study found that re-employment was related to the timing of undertaking job search. Those who started to look for work either before the announcement of the plant's closure or between the announcement and the actual closure were much more likely to have jobs than those who had not started their job search until after the plant had closed. One-fifth had left the labour force at the time and a further one-fifth were unemployed. Those who had withdrawn from the labour force tended to be older than those who had found new jobs. They were also more likely to be foreign-born, married, and long-standing employees.

4.2 HEALTH AND PSYCHO-SOCIAL IMPACTS

Business closures and major restructuring can have a wide range of health and psycho-social impacts. A major review undertaken by an expert European group in 2011 found that negative impacts on the health of workers were evident for workers where retrenchment has been experienced indirectly, that is colleagues were made redundant in their workplace (Koper et al 2013, p 21). Among the key impacts found were:

- Impairment in self-rated health state;
- Increase in certified sickness absence;
- Impaired sleep;
- Impaired 'recuperativeness';
- Increased self-reported stress;
- Cardiovascular impairment and increased rates of related mortality;
- Increased drug addiction;
- Increased number of medical prescriptions/use of psychotropic drugs;
- Increase in smoking and alcohol consumption.

In a study of the closure of General Motors and Ford plants in California in the mid-1980s, Yoder and Staudohar (1985) found that employees and their families experienced high levels of anxiety and stress as a result of the closures. They indicate that poor management of the closure and the lack of job placement support services available to employees generated high levels of anxiety among workers. They report that employees experienced physical and psychological problems that led to a number of suicides. Spoehr and Morrison (2002) indicate that closures resulting in job loss may result in an increase in family stress levels, increase in domestic violence and child abuse and increased drug and alcohol abuse.

Using Mitsubishi Motor Limited in South Australia as a case study, Verity and Jolley (2008) draw attention to potential impacts of closures on sense of community and belonging. They conclude that closure can lead to the loss of close work based friendships and supportive relationships, a problem exacerbated by long-held work based ties in many

manufacturing workplaces. Nearly half of Mitsubishi employees responding to a survey indicated that they had worked at the plant for over 21 years and many others much longer (ibid, p 334). According to Verity and Jolley (ibid, p 337) the, "Loss of repetition of contacts within the organizational setting seems to have impeded the maintenance of relationships that had existed over many years within and outside paid work. In other words the loss of regular contact with co-workers led to the loss of deep work-based "social attachments and intensive and extensive networks that developed over time" (ibid, p 340). They conclude that there is a need for policymakers to pay greater attention to these potential impacts by engaging human service professionals in post-retrenchment support and community development processes.

4.3 COMMUNITY IMPACTS

Business closures can result in the loss of cash and in-kind donations and support to community organisations and programs. Spoehr and Wilson (2003) indicate that the closure of the Mobil Oil Refinery would have a significant impact on local schools and community organizations, which were beneficiaries of \$600,000 in donations from Mobil over a six year period. The loss of corporate financial support from the oil refinery was expected to intensify the pressure on organisations to seek support from alternative sources. Similarly the McDowell Group (2004) found that the closure of the Agrium Kenai Nitrogen plant in Kenya would result in substantial losses to the community. The plant contributed around \$195,000 to 43 non-profit organisations or programs while a further seven organisations received in-kind support. Agrium was active in a wide range of industry and business support organisations.

Large-scale business closures can also result in significant population impacts including the out-migration from a region of people seeking employment elsewhere. The McDowell Group (2004) argue that the loss of an important business might result in both immediate population loss and gradual, long-term population decline.

Significant reductions in economic output, income and demand flowing from business closures are likely to result in a decline in revenue to government with the impact of losses mediated by prevailing economic conditions in the wider economy. This is likely to be most profound where significant out-migration to other regions arises from closures. Any reduction in revenue is likely to increase the tax burdens on residents and businesses that remain and/or result in a reduction in services provided. The McDowell Group (2004, p 2) found that the closure of the Agrium Kenai Nitrogen Plant in Alaska would result in the loss of around \$2 million in industrial property tax and \$0.2 million in residential property tax from Agrium's employees' houses.

Revenue impacts flowing from business closures in the Australian context might include reductions in revenue streams from property tax, payroll tax, local government rates, Goods and Services Tax, business tax and employee income tax.

There are potential housing impacts flowing from large-scale business closures. The McDowell Group (2004) suggests that business closures and layoffs might result in a weakening of the housing market where a closure results in significant unemployment and population outflow. Spoehr, Morrison and Wilson (2003) suggest that closures could result in an increased demand for low cost housing and housing assistance from employees who become unemployed or underemployed.

In summary the literature confirms that the impact of retrenchment and closure is multi-faceted, with social, economic, health and psychological dimensions that can each require attention. This necessitates an integrated, multi-agency response. The challenge as we shall see in the following case studies, is to put this into practice.

5 RESPONDING TO INDUSTRIAL CHANGE AND SHOCKS

Large-scale jobs losses and closures necessitate early intervention to support retrenched workers and their families. In the absence of appropriate support and alternative employment, retrenched workers can face long periods of unemployment and associated social-psychological and health impacts. Mitigating and minimizing the risk of this presents a great challenge to policymakers, particularly when closures are sudden and occur during periods of economic difficulty.

While retrenched workers can become unemployed, they commonly have skills, qualifications and a record of continuous employment prior to retrenchment. They normally also have access to a separation package that can act as a buffer against short-term hardship and enable a reduction in home mortgage or other forms of debt. A problem emerges when the benefits of this are eroded by the inability to find suitable alternative employment or when the security and remuneration of employment is significantly inferior.

The common response to major closures in Australia has been the development of Labour Adjustment Packages (LAPs) funded from financial contributions from government and industry. Australia has a long history of implementing such packages, particularly during recessions when closures are common. LAPs typically include the following elements:

- Counselling
- Career advice
- Resume writing
- Financial assistance for career transition
- Re-training

Importantly most LAPs are accompanied by industry development initiatives designed to support industrial diversification and generate employment in the affected area. Making judgments about the success or otherwise of LAPs can be difficult given the lack of robust longitudinal evaluations of them. Fortunately a number of surveys have been undertaken on the impact of closure on employees over time. There is much that we can learn from these and from reflections on the experience of industrial shocks and closures in Australia and elsewhere. This section reviews a number of relevant case studies detailing the policy response to the event, evidence of outcomes and lessons learnt. The case studies are:

- Mitsubishi (Southern Adelaide)
- MG Rover (Birmingham)
- BlueScope Steel (Illawarra)
- Bridgestone (Northern Adelaide)

5.1 MITSUBISHI

The closure of Mitsubishi in Southern Adelaide in South Australia occurred during a period of economic growth, prior to the sharp decline in manufacturing employment triggered by the Global Financial Crisis. Employment prospects were regarded to be high at the time, particularly given increased investment in mining exploration and the proposed expansion of Olympic Dam, which subsequently did not proceed. In 2004 Mitsubishi announced that it would close the Lonsdale based engine plant and downsize its Tonsley Park assembly plant, affecting around 1200 workers. In 2008 the closure of the Tonsley Park plant followed resulting in around 1700 Mitsubishi workers losing their jobs.

THE RESPONSE

In response to the Lonsdale closure and downsizing at Tonsley Park in 2004 a \$10m Labour Adjustment Program and \$45m Structural Adjustment Fund SA (SAFSA) were established. The Federal Government provided \$45m with balance provided by the South

Australian Government. In addition to the services provided through the LAP, the South Australian Government provided access to financial counseling, résumé preparation and career counseling valued at around \$380,000 (Armstrong et al, p 345). The response to the Mitsubishi closure has been described by some analysts as “rushed...ad hoc and not very effective” (Armstrong et al, p 353), a conclusion that warrants more detailed examination than is possible in the absence of robust evaluation of closure responses and outcomes, which incidentally should be integrated into the implementation of closure response strategies.

OUTCOMES

In a survey of Mitsubishi workers (n 372), Beer et al (2006, p ii) found that a large proportion of those affected by the closure were optimistic about the future, reporting that, “Most respondents...believed they had good prospects for finding employment within the next six months”. A significant deterioration in the quality and security of the employment secured after layoff resulted with Beer et al finding that, while “a significant number had secured employment by the time of Stage 1 interview, ...many of those jobs were casual or short-term contract employment”, the study reports (ibid). The vast majority of Mitsubishi workers experienced a significant deterioration in their income and security post redundancy:

- 225 of 316 respondents (72%) reported earning less than they did after redundancy;
- just 11% reported earning around the same post-redundancy while 15 per cent reported earning more;
- around one third of those in employment had held three or more jobs in the last 12 months.

The vast majority (36 per cent) of respondents found work in manufacturing while around 11 per cent worked in retail, 7 per cent in construction, 6 per cent in health services and just 2 per cent in mining and 2 per cent in defence.

More of those who were retrenched might have found employment if they had been encouraged to undertake retraining. According to Armstrong et al (ibid, p 346) no funds were made available for retraining of Mitsubishi workers despite the existence of skill shortages in a range of areas in South Australia.

Importantly the Mitsubishi impact study revealed that “many...respondents reported that the JobNetwork providers were unable to assist workers in their situation”, a consequence of applying a model designed to support long-term unemployed people, to recently displaced workers (ibid, p v). The key implication of this is the need to develop a tailored program of assistance that is responsive to the client group (ibid, p vi). Some respondents reported that they were not fully informed about the employment service entitlements available to them through JobNetwork providers. This appeared to be a function of inconsistency of knowledge among service providers.

Other effects of the Mitsubishi closure on surveyed employees indicate, as earlier studies have also demonstrated, the need for attention to be paid to a holistic response to downsizing and closures involving a coordinated response from a range of agencies beyond industry, employment and training, including health, community services and housing. The evidence for includes:

- Half of respondents believed that the loss of employment at Mitsubishi affected their social life;
- Higher levels of mental health were reported relative to the population as a whole;
- Housing costs were a source of worry for around 60 of the respondents who sought assistance with their housing. (Beer et al, 2006, p iv).

The \$45m Structural Adjustment Fund SA (SAFSA) offered grants for new business wanting to start up in South Australia and assistance for the expansion of existing operations, with the intention that much of the employment that was generated, be to the benefit of those who were retrenched from Mitsubishi. The extent to which this was the case is difficult to discern. Armstrong et al (1998, p 345) indicate that “While there have been numerous businesses established on the Lonsdale site through SAFSA funding, the government has been forced to admit that the majority of firms who received grants have not achieved their employment targets”. They add that, “...over half of the SAFSA funding went to businesses on the northern side of the city, when virtually all of the displaced workers lived in the southern region”. It should be noted that the closure of Mitsubishi is likely to have had an impact on suppliers located across the greater Adelaide area.

LESSONS

- Attention needs to be paid to dimensions of quality, security and appropriateness in the provision of career advice and placement support.
- Retraining should be offered as a pathway to alternative employment, particularly to avoid people retiring prematurely.
- Mainstream services provided to unemployed people are not likely to translate well for application to closures. Employment and support services should be tailored to meet the needs of the sector and the workers involved.
- A large proportion of manufacturing workers that were retrenched from Mitsubishi went on to work in other areas of manufacturing, indicating that this is a highly preferred outcome. As a consequence industry development funds need to be better targeted to start-ups and expansions in sectors that are likely to generate employment for those directly effected by closure.
- The short and longer term social, health, housing and psychological impacts of retrenchment need to be central to any response to closure. A multi-agency, multi-disciplinary case-work approach is warranted.

5.2 MG ROVER

MG Rover closed its Birmingham plant in July 2005, making 5500 workers redundant and effecting the operations of a range of suppliers. The turnover of the company was equivalent to around 1 per cent of GDP and it generated a flow of revenue to government of around 200m pounds per annum (Bailey and MacNeill 2008, p 112).

Like the Mitsubishi closure, the MG Rover closure took place during a period of relative economic buoyancy, prior to the GFC. The scale of the response was significantly larger but so was the size of the MG Rover workforce.

MG Rover was a very significant contributor to the regional economy, boosting gross regional production by around 0.5 to 1 per cent and income to government in excess of 200 million pounds annually (Armstrong et al 2008, p 348). Five years prior to the collapse of MG Rover a Task Force was established to provide support to the automotive sector. The report of the Rover Task Force detailed over 58m pounds of initiatives in three interlinked areas, modernization, diversification and regeneration (Bailey and MacNeill 2008, p 112). Related to this was a program of supply chain improvement.

Bailey and MacNeil (ibid, p 113) note:

While the modernization included a number of linked initiatives to improve competitiveness, through increased productivity, the new diversification programme sought to help suppliers diversify away from Rover, and from automotive in general, by encouraging the application of engineering skills to other industries such as medical and nano technologies.

THE RESPONSE

In response to the closure, Rover Task Force – mark 2 was established to manage the response, which was resourced from a 177 million pound assistance package. The Task Force involved a wide range of organisations drawn from industry, government, unions and the NGO sector. The focus of the Task Force was to “...facilitate diversification in the supply chain, support ex MGR workers to find new jobs and provide assistance to the wider community” (Armstrong et al 2008, p 349).

The financial assistance package included the following elements:

- 50m (pounds) for re-training
- 40m in redundancy payments
- 24m loan fund for business growth
- 41.6m to assist suppliers plus a further 7.6m for supplier diversification.

The Task Force put in place a telephone hotline for the workforce, a website, helpline and a central Jobcentre. Travel subsidies were made available for workers having to commute longer distances to work. Of particular note was a 3.4m pound wage replacement scheme assisting around 170 firms, which Bailey and MacNeill (2008, p 114) note, “kept around 3000 workers in place for the critical weeks following the collapse, with 1,329 ‘confirmed’ jobs being saved in this way”. Armstrong et al (ibid) argue “that in contrast to ex-Mitsubishi workers, there has been significant assistance to ex-MGR workers”.

Specialist assistance was offered to MG Rover suppliers for diversification initiatives. In the following section we examine some survey and outcomes data collected to track post-closure experience and outcomes.

OUTCOMES

Armstrong et al (ibid, p 349-50) report the following outcomes from a longitudinal survey (3 waves) undertaken by de Ruyter, Bailey and Bentley (2012) on the impact of the closure.

Six months after the closure:

- More than half of the respondents (n232) were in full-time employment.
- Around one third of respondents were still unemployed.

Twelve months after the closure:

- Around 4000 of those retrenched were in work with around 90 per cent of those in full-time work (compared to around two-thirds of those in the Mitsubishi study earlier).
- 667 were undertaking or waiting for training.
- 398 had received training but were not in work.
- 530 were not working.

The main employing sectors for those retrenched in order of priority were:

- manufacturing
- motor industry
- transport
- engineering
- construction
- local government
- health
- government
- transport
- retail

- security
- financial services

In the final wave of the survey in 2008, de Ruyter, Bailey and Bentley (2012, p 10) found that around “86 per cent of ex MG Rover workers who had become re-employed had ‘permanent’ contracts, while the remainder (14%) employed on a casual basis, or on fixed term contracts, or via agency work”. Significant instability of employment was evident for those whose contracts were for less than 12 months (the statutory period required in order to claim unfair dismissal) (ibid). Around one third of respondents who were employed reported a higher occupational role compared to their role at MG Rover, while one third reported a decline in their occupational status (ibid, p 11).

Around two thirds of respondents reported their annual incomes being significantly lower than their income and MG Rover (ibid, p 11).

LESSONS

A range of policy lessons have been identified by researchers examining the Rover MG experience (de Ruyter, Bailey and Bentley 2012, p 10); Bailey and MacNeill 2008, pp. 115-122). These relate to the areas of employee transitions/support and industrial rejuvenation and diversification.

Employee transitions and support

- Effective policy intervention requires supporting people to enable them to have different options to move within the same sector (and thereby assisting skill reproduction).
- Avoiding sudden closures and slowing down the process of plant closure also enable workers released to pick up jobs arising through ‘replacement demand’ where firms require workers to cover those who have left, retired and so on.
- Government and regional/local agencies need to do more to ensure that employees have the necessary skills to cope as industries change, through high quality, flexible education, training, information and mobility programmes.
- A policy response is needed to tackle growing income inequality. This needs to go beyond a reliance on the National Minimum Wage and consist of genuine measures to provide a “living wage” for individuals.

Industrial rejuvenation and diversification

- Local economic diversification should be supported...supporting modern manufacturing...given both the growth potential of this sector and the need to diversify the economy so as to avoid over-reliance on retail and financial services as drivers of growth.
- Regional development policy needs to foster knowledge intensive competencies through regional ‘collective learning’ which is central to the development of a successful milieu or set of territorial arrangements linked to cluster development.

An evaluation of the impact of a suite of programs implemented in response to the crisis facing Rover and then MG Rover provides useful insights into the value of different interventions (ECOTEC 2008). Prepared for Advantage West

Rover MG Program – employment and economic impact of programs

A suite of programs was put in place by government to help minimize negative impacts from the restructuring and ultimate closure of MG Rover. Fortunately some evidence on the impact of these programs is available. An evaluation of key Rover Task Force 2000 and MG Rover Task Force 2005 programs was undertaken by ECOTEC in 2008. The evaluation estimates that around 620 jobs were created and nearly 12,000 jobs safeguarded over the 2002/3-2007/8 period as a result of the suite of programs (ECOTEC, p 31). The bulk of these were attributable to extension support, innovation, diversification and wage subsidy programs. ECOTEC estimate the Gross Value Added benefit of the jobs created and safeguarded to be around 174 million pounds.

Midlands by ECOTEC the evaluation represents one of the most detailed of its kind available. It reveals that the response to managing the crisis played a critical role in helping to maximize the number of workers re-employed after closure, retain workers in related businesses and create new employment opportunities. Key program strengths and areas for potential improvement identified from the evaluation included (ibid, p 10-11):

- Strong partnership working across the region and recognition of its importance;
- Strong central co-ordination of the process of interventionism;
- A well prepared and efficient interventionist approach;
- Absence of isolationist stances i.e. everyone playing their part;
- Speed of response by all players;
- Pro-active and direct approach and confidence building between agencies and the private business sector;
- Flexibility in delivery and program construction to meet short term specific needs;
- Diversification being recognised as a continuous process;
- Realisation that short term responses can form the basis of long term improvements;
- Awareness of future strategic positioning as a result of the developments associated with the Rover and MG Rover experience.
- Safeguarding of jobs.

Areas identified for potential improvement included:

- A fuller realisation of the actual dependency of businesses beyond claimants
- Avoidance of inconsistency between differing agents in terms of managing programs;
- Greater emphasis on ensuring diversification was being applied into the long-term and across the West Midlands in spite of emergency situations;
- Better identification of outcomes associated with program elements and monitoring;
- Wider UK impacts needed to have been considered and the construction of relationships with other Regional Development Agencies was not so apparent;
- Greater emphasis on the potential leveraging of alternative funds as a result of public sector support to encourage employer engagement;
- Need for examination of multiplier effects as a result of jobs created or safeguarded;
- Need for strong identification of linkage between business outputs and skills development and up-skilling;
- Realisation that more could have been done to wean firms off Rover, or other large firm dependency and greater monitoring through better screening of how reliant the supplier firms actually were.

Rover MG Program - conclusions

“The evidence suggests that on the whole the Rover Task Force and MG Rover Task Force programs were highly successful in mitigating the overall economic impact of the declining fortunes of the automotive sector and its supply chain.

The interventions however, must be taken in the context of a prevailing relatively health labour market, but one where a declining automotive sector was far from conducive to the re-employment of a large number workers back into the sector itself and where the overall trends in this sector did not provide support for employment, investment and growth. The contribution of the Task Force activities in generating and safeguarding jobs and assisting businesses is considered substantial especially in terms of generating and replacing to a degree what would have been lost income and Gross Value Added. The amount of skills training was substantial and contributed in no small part to the retention of experienced workers”.

ECOTEC 2008, p 11

5.3 BLUESCOPE STEEL

BlueScope Steel announced the restructuring of their Australian operations in August 2011, resulting in 1,000 retrenchments (800 from the Port Kembla site). In addition to those directly effected there were around 650 indirect job losses in the Illawarra region (Nous 2013, p 6). Total direct and indirect estimates of jobs losses were estimated to range between 1450 and 2500.

Retrenchment took place two months after the announcement. In the intervening period a 'redundancy swap' arrangement was made available by the company. This enabled some workers whose positions had been made redundant to swap with someone who wished to leave but their position had not been made redundant. One consequence of this is that the redundancy program encouraged older workers to leave - around half of those who were retrenched, retired.

Unemployment in the Illawarra region was significantly higher than the State average, limiting local employment opportunities for those searching for work.

THE RESPONSE

- A taskforce (Illawarra Stakeholder Taskforce) was established to manage the response.
- BlueScope established a Job Centre to provide support to workers – an office providing information and job search advice and support. It also provided a jobs board for local employers. Access to the service was made available prior to redundancy as JSA services were not available till after redundancy arrangements were confirmed. These were confirmed around 12 months after the announcement.
- Establishment of the Illawarra Region Innovation and Investment Fund with contributions from BlueScope, State Government and the Australian Government – a \$30m fund (Australian Government - \$20m; NSW Government - \$5m; BlueScope Steel - \$5m over three years to June 2014) providing grants for employment generation linked to industrial diversification and sustainable jobs.
- Establishment of the BlueScope Labour Adjustment Program delivered by DEEWR – a \$10m allocation for career support and transition services.
- A website/information sessions detailing entitlements was made available to workers.
- A Jobs Market was held to link local employers with BlueScope employees.

OUTCOMES

- Estimated that 50 per cent of retrenched workers retired immediately.
- Of those eligible for Job Services Australia support services, 338 were placed in jobs by the end of October 2012.
- No data available on the quality of jobs or turnover in jobs after retrenchment.
- Quality of the vacancy data available to inform job search was questioned by some.
- Innovation and Investment Fund claims outcomes of around 900 FTE. Concerns were reported about slow pace of allocating grants; no requirement for the program to directly benefit BlueScope workers; lack of support for SMEs relative to larger enterprises.

LESSONS

- Delivery of programs regarded as effective but largely as a consequence of informal linkages rather than effective formal institutional arrangements.
- The contribution of Local Employment Co-ordinator regarded as central to successes.

- Job Centre provided a central point for contact prior to formalisation of redundancy.
- Jobs Market viewed as broadening range of employment options available.
- Lack of support to map skills and identify training needs.
- Need to combine training with on the job experiences to increase employability.
- Need for more guidance about what jobs are in demand beyond vacancy lists.
- Focus on supply does not of itself solve the problem of lack of available and appropriate employment.
- Support to BlueScope suppliers regarded as inadequate, particularly given the large presence of these in the area. Need to provide assistance for diversification.

5.4 BRIDGESTONE

Bridgestone Australia was a major tyre manufacturing factory based in Northern Adelaide in South Australia. In October 2009 it announced that it would close its Salisbury plant leading to the retrenchment of 600 workers. This followed earlier automotive industry plant closures, notably Mitsubishi in 2004 and 2008.

THE RESPONSE

A 'Beyond Bridgestone' steering committee was established to manage the response to the closure. The committee was supported by five working groups. Nous (2013, p 28) note that "the involvement of so many players from different layers of government confused the process for workers who would have benefited from a single information source or co-ordinator". A Local Employment Co-ordinator worked with a separate working group, which was linked to the steering committee.

A range of institutions provided services funded by the Automotive Industry Structural Adjustment Program while additional support was provided through the Productivity Places Program for training. Retrenched workers were provided access to Stream 3 Job Services Australia intensive support services.

OUTCOMES

- While 438 Bridgestone workers were reported to have found jobs, the relative quality and security of these jobs are not known.
- Job search assistance provided by JSAs was reported as valuable by some.
- Concerns were expressed that the reward structure in place for JSAs led them to streaming people into short-term jobs rather more secure longer term arrangements.
- The take up of PPP places was low.
- Access to Recognition of Prior Learning assessment was accessed by 404 workers with 267 gaining qualifications through this process.

LESSONS

- The governance arrangements were regarded as inappropriate and cumbersome by some. Lack of communication between the working groups and the Steering Committee was a limitation, though early inertia was overcome to a large extent through the constructive role played by the Local Employment Co-ordinator.
- Recognition of Prior Learning played a key role in successful transitions for a large proportion of workers.
- JSAs may be too focused on short-term outcomes driven by the incentive structures in place. This may generate job placements that are unsuitable or unsustainable.

- Lack of data about the experiences of workers interactions with services makes it difficult to evaluate the effectiveness of specific services.

5.5 RESPONDING TO SHOCKS

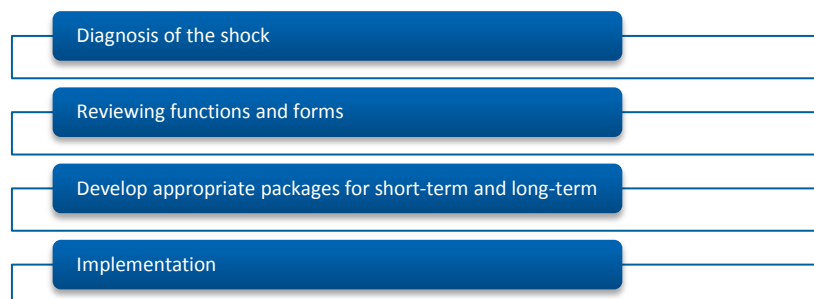
A recent report on lessons from past economic shocks commissioned by the British Government, Cook et al (2013, p 51-60) provides a useful summary of potential interventions/responses to help inform future action. These are summarised below by domain (Business, Supply Chain, People and Place).

Domain	Intervention/response	Commentary on what worked/learning
Business	Support package to influence decision making	In the case of General Motors' decision to stay at Ellesmere Port, government was able to draw on a package of interventions around the business and its supply chains (e.g. Grant for Business Investment, Advanced Manufacturing Supply Chain Initiative) and its workforce (e.g. National Apprenticeship Service). This was also facilitated by workforce concessions to help improve plant efficiency.
Business	Selective Financial Assistance	Harris and Trainor (2007) found that receipt of Selective Financial Assistance (SFA) by manufacturing firms in Northern Ireland reduced the probability of plant closure by 15%-24%. The results showed that the overall net effect on employment change was an increase of around 19,600 jobs in plants that had received SFA compared with a loss of 33,200 jobs in eligible but non-assisted plants.
Business & supply chains	Business support	Albeit based mainly on self-reported benefits, RDA evaluation evidence found that the largest benefits (relative to costs) were in the area of business support (PricewaterhouseCoopers, 2009).
Supply chains	Support to modernise and diversify	Mitigating actions were successful in helping suppliers to Rover to diversify between the Rover Task Force in 2000 and the MG Rover Task Force in 2005, and then thereafter (ECOTEC, 2008). This was a tailored support package.
People	Combining employer-led redundancy support with Jobcentre Plus and Rapid Response Service	The quick and coordinated response following the closure of RTA in Northumberland meant that 78% of redundant workers were in new employment, engaged in start-up/self-employed enterprise, in training, or retired within several months of closure. The sustainability of outcomes was unknown at the time of the work.
People	Coordination and 'flexicurity'	The coordination between employers, employees and public authorities has been identified as key in Finland in providing financial security to redundant workers in between jobs (European Commission, 2008). This incentivises partners to help secure positive destinations for workers quickly. In Austria, outplacement services are jointly-funded by employers, surviving workers and redundant workers (European Commission, 2010) – this requires a strong public employment service and a cooperative ethos and culture.
People	Employer pools and coordination	In various countries in Europe, employer pools are used to identify opportunities in other employers locally – e.g. in Sweden and Germany (European Commission, 2010)
People	Retraining	A key part of the response to MG Rover's closure was having: <ul style="list-style-type: none"> • discretionary support so that workers could take part in retraining for alternative careers • flexibilities that could be used to bend rules (e.g. retaining benefits even though workers were in short-term full-time training). <p>90% of ex-MG Rover workers were in employment three years after the closure and 60% had undertaken some form of retraining/education (Bailey et al., 2012).</p>

Domain	Intervention/response	Commentary on what worked/learning
Place	Long-term restructuring	Pringle <i>et al.</i> (2011) identify a number of issues in supporting place-based growth, including having long-term stability in institutions, developing new areas of growth in related activities, and the importance of strong research centres and human capital that reinforces development. This emphasizes holistic place-based responses over a long period of time that take advantage of local strengths. E.g. in Germany (in the Ruhr and Munich for example), there have been targeted investments in strategic transport, and assets such as science parks and educational establishments alongside other support.
Place	Long-term restructuring	In Gothenburg, long-term response to closure of the shipyards has taken 25+ years. It has combined investment in educational establishments, with development of related clusters around information technologies where synergies have been found to other sectors, e.g. automotive. The process benefited from long-term stability in institutions, and a private sector ethos of borrowing at commercial rates to fund regeneration (Cadell, 2008).
Place	Investing in technology assets	In the West Midlands, longer-term transformation of the economy was implemented through regional strategy and regional programs around clusters and High Technology Corridors. The High Technology Corridors program was seen as effective in developing technology assets and was combined with specialist support to businesses, e.g. through proof of concept funding and innovation networks (SQW, 2008).
Place	Developing sites	The future development of sites and premises requires some coordination between public authorities and private developers/owners. In some cases, developers may 'sit on' sites, hoping values will increase. A desirable outcome is for sites/premises to be used appropriately in the context of local economic strengths, which may require taking a long-term view and may mean seeking higher value uses. For example, the current approach at Discovery Park (formerly Pfizer) seems to combine technology uses with other employment creation that may be appropriate to the local labour market.

THE BRITISH FRAMEWORK FOR MANAGING ECONOMIC SHOCKS

A key outcome of the research commissioned by the British Department for Business, Innovation and Skills on economic shocks has been the development of a framework for how to understand and respond appropriately to them (Cook et al, 2013, p 61-92). The broad contents of the framework are summarised below. It comprises four domains and accompanying guidance to assist with responding to and managing shocks.



DIAGNOSIS OF THE SHOCK

Key elements in this domain are:

- Determine whether or not there is (or there might be) a case for intervention in any or all of the domains.
- Identify the critical issues and potential needs for each of the four domains.
- Identify the market and other failure arguments that might provide a case for public sector intervention.

Key outputs for this stage should be assessment and diagnosis of the shock.

REVIEWING FUNCTIONS AND FORMS

Key elements in this domain are:

- What mainstream services already exist that businesses or individuals could be signposted to, and/or that place/communities could benefit from.
- What existing initiatives and services can be leveraged and/or deployed in response to the shock.
- What additional bespoke actions might be required to cover any needs that remain unmet by mainstream or existing services, and how self-standing might these be into the future.

DEVELOPING APPROPRIATE PACKAGES

Key elements in this domain are:

- Testing strategic fit, so as to ensure that the response action works..
- Options assessment to consider the pros, cons, possible costs and benefits and risk associated with different actions; key to this is to review critically past evaluation learning.
- Discussion with key agencies delivering relevant services about capacity and capability to deliver at higher scale and/or around eligibility criteria.
- Identification of possible funding sources to deliver actions, including within partners, private sector, national and other sources – and discussion about scope to relax any eligibility criteria or other constraints on funding.
- Planning to set out all relevant actions, lead parties taking responsibility for actions and reporting arrangements.

IMPLEMENTATION

Key elements in this domain are:

- Review and refinement of actions.
- Monitoring and evaluation of the event and interventions.

6 FOUNDATIONS FOR REJUVENATION AND REGENERATION

This final section of the report distils some broad strategic implications flowing from the various strands of literature reviewed here. Taken together they might be regarded as some of the foundations for successful rejuvenation and regeneration.

6.1 STRATEGIC IMPLICATIONS

As we have discovered, rejuvenation and regeneration can be regarded as mutually reinforcing concepts. When intelligently integrated they have the potential to significantly improve the social and economic prospects and wellbeing of areas experiencing industrial decline, closures and a legacy of underinvestment in social and physical infrastructure.

INTEGRATED PLANNING AND EXECUTION

- integration of economic, industry, workforce, social and urban policy and program agendas;
- ensuring responsiveness to place, economic, political, historical and cultural needs and circumstances;
- agile and responsive collaboration and governance processes and structures.

FACILITATIVE AND CATALYTIC LEADERSHIP AND INSTITUTIONS

- developing high quality leaders and diffusing leadership;
- authentic engagement, trust building and collaboration;
- effective communication of vision, strategic responses and progress;
- new trans-disciplinary institutional spaces for design thinking, problem solving and action.

EARLY IMPACT ASSESSMENT AND RESPONSE MANAGEMENT

- early assessment of the full range of potential impacts of disinvestments and closures to provide an evidence base prior to them occurring;
- economic, workforce and social modelling of potential and actual impacts;
- scenario planning of alternative responses to large scale retrenchments with particular attention to short and medium term demand side solutions;
- ensuring that the social and economic costs of industry adjustment are mitigated or minimised for workers, families and communities through early intensive assistance appropriate support or pathways to appropriate employment made available to all those affected by restructuring, retrenchment or closure.

TRANSFORMATIVE KNOWLEDGE INTENSIVE, HIGH VALUE ECONOMIC AND INDUSTRY DEVELOPMENT PATHWAYS THAT BUILD ON EXISTING STRENGTHS AND ADD NEW ONES

- building and sustaining a robust regional innovation system;
- developing viable pathways for transitioning from mass production to knowledge intensive, high value goods and services;
- transforming existing industries and enterprises to make them more resilient in the face of domestic and global pressures;
- fostering and supporting the growth of new and more resilient firms/sectors to respond to the decline of others;
- investing in high performance workplace systems;
- facilitating and sustaining robust and outward looking industry clusters and networks;
- fostering and investing in a culture of creativity and innovation sustained by design thinking processes and institutions.

MODERNISING PHYSICAL AND SOCIAL INFRASTRUCTURE AND IMPROVING WELL-BEING

- identifying early infrastructure development priorities that help to boost employment in the short term and productivity over the medium term;
- improving the quality of civic amenity as a foundation for improving morale, well-being, population/workforce attraction and retention;
- modernising housing and transport infrastructure to improve well-being and reduce travel to work times.

LEARNING FROM EXPERIENCE

- Ongoing monitoring, evaluation and adjustment as appropriate of response strategies.

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