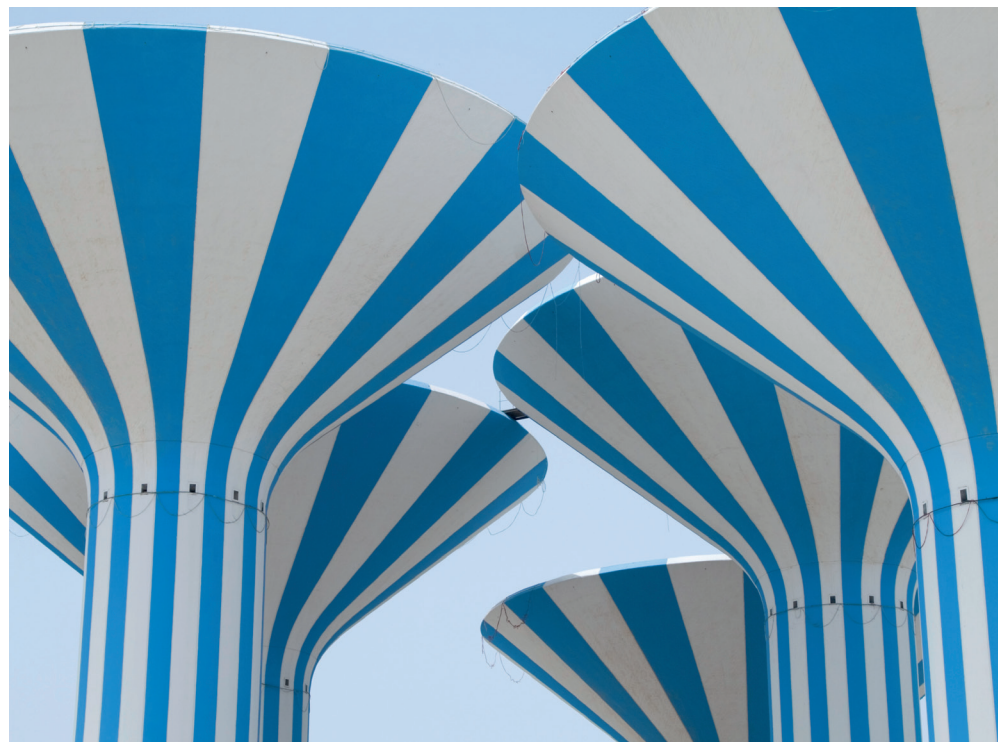


The Work Foundation and the Kuwait Programme on
Development, Governance and Globalisation in the
Gulf States

Kuwait and the Knowledge Economy

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Kristian Coates Ulrichsen



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The Kuwait Programme on Development, Governance and Globalisation in the Gulf States is a ten year multidisciplinary global research programme. It focuses on topics such as globalisation and the repositioning of the Gulf States in the global order, capital flows, and patterns of trade; specific challenges facing carbon and resource-rich economic development; diversification, educational and human capital development into post-oil political economies; and the future of regional security structures in the post-Arab Spring environment.

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the work foundation

Kuwait and the Knowledge Economy

A report prepared for KFAS

Prepared by Ian Brinkley, Kristian Coates-Ulrichsen, Will Hutton, Philippe Schneider



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Executive Summary and Recommendations

Following his lecture at the Kuwait Foundation for the Advancement of Sciences–London School of Economics (KFAS–LSE) biannual seminar in March 2009, KFAS invited Mr Will Hutton to lead a joint LSE–Work Foundation team – supported by a Local Team of Experts (LTE) from KFAS, the Kuwait Institute for Scientific Research (KISR) and Kuwait University (KU) – to investigate how The Work Foundation framework for knowledge-economy development might work in a Kuwaiti context. The plan was to write an initial scoping report and then, if agreement was reached on its analysis and principal recommendations, to proceed to a much more detailed and granular investigation with practical and well-thought-through proposals for implementation.

The focal point for the work was a four-day visit to Kuwait in March 2010 in which Mr Hutton presented his initial thoughts and framework to a specially invited group at KFAS. In addition he and his team had an intense programme of interviews with key representatives from those public and private sector organisations likely to be important in developing Kuwait’s knowledge economy. He and his team have kept in close touch with the LTE throughout the process, including the drafting of this scoping report, and very much welcome and appreciate the energy and feedback from the Kuwaiti side. There has been a growing consensus that the analysis and recommendations offer a very promising avenue for Kuwait to explore, building on both the Four Year Development Plan and the Blair Report. There is an opportunity to be seized.

Introduction

The genesis for this scoping report on Kuwait’s strategic options for developing a more knowledge-based economy was a conference in Kuwait held by KFAS and the LSE in March 2009. Among the varying contributions, the LSE’s Mr Will Hutton (also executive vice-chair of The Work Foundation) gave a lecture arguing that the development of the knowledge economy was the central economic feature of not only developed but developing economies. Employment over the last few decades had shifted increasingly to high-value-added goods and services, now typically occupying 45 per cent of advanced economies’ GDP and rising. This is because of the interaction of the exponential growth of both transformatory and incremental technologies with ever more demanding and sophisticated consumers.

Innovation has thus become increasingly important as a driver of growth, along with rising investment in “intangible” assets with a knowledge character, like research and development (R&D), design, and information and communication technologies (ICTs). Workplaces require engaged and up-skilled workers. As a result of these deep trends the boundaries between traditional manufacturing activity and services are breaking down, and a new “manu-service” sector is emerging in which manufacturing and service functions are being fused. Manufacturers are anxious to preserve market leadership by embedding service capabilities as part of the customer offer in industries as disparate as aero-engines, automobiles and mobile phones. Sixty per cent of US manufacturing firms are now categorised as manu-service companies; interestingly, the figure in China is 1 per cent. This is propelling investment in intangibles across a broad front – not just in design and R&D, but in brand equity, leadership and organisational development. Intangible investment now typically exceeds 9 per cent of GDP in most advanced economies, and exceeds tangible investment in plant and machinery. The lecture and follow-up discussions opened a discussion of the potential relevance of these phenomena for a country like Kuwait, ambitious to break out of the distortions of natural resource-based growth and transition to a knowledge-based economy – and of how this could be done given Kuwait’s size, current industrial structure and economic institutions and, not least, socio-cultural norms.

This is an ideal moment to re-examine these questions, after a number of earlier reports on developing Kuwait’s economy whose recommendations have been implemented only partially – and sometimes not at all. The reports themselves, while strong on strategic direction and statistical content, tended to underplay the specificities of Kuwait’s starting position as a late entrant, along

with the complex challenges of institution and capacity building on a system-wide basis. These are realities that subsequent research and our own approach, stressing the need to create a national innovation ecosystem, more readily acknowledge as key hurdles. However, today's circumstances offer a fresh opportunity. Kuwait has largely weathered the global economic and financial crisis, notwithstanding difficulties with individual banks and some investment companies. Other countries are now facing acute economic pressures. The recession is providing Kuwait with an opportunity to restructure in the light of new knowledge and understanding, in particular of the role of institutions and the interlinking and self-reinforcing nature of reform. While other countries tread water, Kuwait could lay the foundations for future advance. This is the moment to develop a strategy and approach that will offer the country a distinctive means to create Kuwait-specific comparative and competitive advantage, adapting the best not only from other Gulf States but from other countries. Some of what needs to be done is already in train in the Four Year Development Plan. The challenge is to focus and develop still further those strands of policy that would contribute to knowledge-economy development.

The project builds on a multimillion-pound research project by The Work Foundation to understand how the knowledge economy works and what individuals, firms, economies and governments can do better to equip themselves for it. Sponsored by a mix of British companies, the UK government and public organisations, the project is in its fourth year. Having recently entered a second major phase of work, it is one of the largest and most authoritative in the UK, and regularly feeds into the policy of the UK government. KFAS invited The Work Foundation and the LSE – supported by an LTE drawn from Kuwaiti institutions (KISR, KU and KFAS) – to scope how their insights would apply in Kuwait in general terms, before deciding whether to continue with a further and more detailed appraisal. The LSE–Work Foundation team visited Kuwait in March 2010, presented at a special seminar and conducted a number of interviews with key decision makers. This report is the result.

The report recommends that Kuwait develop its knowledge economy more aggressively. The country has a number of important assets on which to build, notably plentiful reserves of capital, abundant availability of petroleum, a sophisticated consumer base, a young population, small size, and strategic location at the heart of a substantial regional market. **We suggest that Kuwait create what we term an innovation ecosystem to support the transition to a knowledge economy, while recognising both that innovation and firm growth are very much trial and error and that there is no single magic bullet that will automatically bring the desired results. Rather we recommend a series of small but self-reinforcing steps that will cumulatively create both the enabling environment and the institutions of the proposed innovation ecosystem, which together will underpin the transition to a knowledge-based economy.**

Analysis and Findings

Building a knowledge economy is a complex and difficult task. We outline the main elements of an innovation ecosystem. This begins with the interlocking role of **publicly supported research generating the original intellectual capital that supports firm formation and entrepreneurship** as the driver of original innovation. However, innovation takes place across a broad front. Innovative firms will also need to be spun out of existing large state-owned enterprises. Small states like Kuwait have to be open to new ideas, the bulk of which necessarily will come from abroad. **Then there is market development and firm creation.** Markets rarely occur spontaneously but are created through regulation, procurement, and early adoption by educated, risk-taking consumers. Regulation and public procurement need to be seen as crucial parts of the ecosystem rather than stand-alone activities. The **financial system** must support firm development and growth. It must be capable of rapidly and flexibly mobilising resource; the most innovative firms have treacherously long start-up phases and lack significant assets that can be used as collateral for loans – a requirement that the ecosystem must solve. **Education** must provide individuals with the necessary combinations of hard and soft skills along with the cultural

disposition to work, learn and take risks. The extent to which entrepreneurship flourishes in any economy or society depends on the facility with which these key institutions interlock in a well-understood way to support risk taking, firm building and market development.

Although the experiences and policy insights of others are important benchmarks, it is necessary to inject a healthy dose of realism when seeking to interpret and apply lessons. The best results occur where all the elements in the ecosystem work together and pull in the same direction, but necessarily this implies coordination and a systemic approach, while at the same respecting the specificities of Kuwait's position, culture and history. Firm development is tumultuous and uncertain, and it needs critical mass along with the establishment of the ecosystem. Without a thorough and nuanced understanding of the context in which specific policies and technologies have arisen as well as the environment into which they are to be introduced, simple transfer is both impossible and in the end inadvisable.

These caveats resonate with particular force in relation to Kuwait. The legacy of four decades of buoyant oil revenues has firmly embedded a notion of citizens' entitlement among Kuwaiti nationals. Aspirations and incentives to invest in human capital at primary, secondary and university levels have been dulled. The pay-offs from simple supply-side interventions – for instance, boosting the provision of finance or improving teacher quality – will not bear nearly as much fruit as they should unless they are complemented by both pressure and demand for them. This implies higher returns on private sector endeavours and activities, and an understanding by officials and politicians of this need. However, the introduction of important structural reforms to boost the private sector, at least until the current Four Year Development Plan, has been hindered by fears that privatisation will amount to no more than insiders squandering and capturing productive national assets. More generally, limited administrative efficiency and a lack of transparency can deter firm creation and the demand for finance. All successful capitalist economies need to migrate from firms simply using private networks to win business and monitor contracts to being able to operate at scale; and scale is only possible if firms can marshal large resources – people, finance and suppliers – through formal and impersonal relationships. The rule of law and trust in official impartiality are thus vital; good governance is a precondition for growth. But reforms aimed at correcting governance failures tend to ignore the fluid, rolling relation between law and its enforcement. Middle-ranking officials, for example, need to own the importance of transparency and good governance. It takes risks to enforce the law. The incentives and reward system within the administration must reflect this truth.

Finally, there is a need to reach a compromise between attracting and adopting existing technologies, modifying them for local contexts and attempting focused original research, including on frontier technology. The risk is that over-ambition to do the original and frontier research will run ahead of the underlying absorptive capacity of the system. A much better strategy is to forge alliances with institutions between which there is greater equivalence of capabilities – for example, between two evenly matched universities. Our report attempts to identify a number of areas and emerging technologies within the grasp of mid-capacity countries that meet these necessary conditions. Kuwait cannot expect to jump to the technological frontier in one leap. Careful investment in the innovation ecosystem will build up absorptive capacity and narrow the gap with what is happening at the frontier of technology – but until this reaches critical mass, results will be disappointing.

As the report makes clear, the twin forces of globalisation and the IT revolution are changing what has been deemed possible, liberating countries like Kuwait from the old rules of production. But at the same time, the playback of responses that served policymakers well in the past is a less reliable guide to catch-up today. As innovation becomes more integrated into a global web of markets and relationships, policy becomes more difficult to design and monitor at the national level alone. Countries, especially small ones with few home-grown capabilities, must be attentive to the diversity of the international landscape of innovation, especially the knowledge that is emerging from lead markets dotted around the world, and must put in place mechanisms – joint ventures,

foreign acquisitions and human capital policies – that link knowledge to local problem-solving needs.

There are strategies that latecomers can pursue and have pursued to compete in local and global markets. We list five broad headings. There are **local optimisers**, who adapt products and production processes to the distinctive tastes and conditions of local markets that are amongst the toughest in the world. There are **natural resource vertical integrators**, who integrate all the segments of the value chain, exploiting their natural resources like oil and gas with a particular emphasis on capturing downstream markets. Other strategies include developing as **low-cost partners** (taking advantage of low wages to enhance relations with high-wage firms and customers in developed countries in order to secure more value-added activity); as **global consolidators** (exploiting late-mover advantages in mid-tech industries by utilising plants with the newest technology or largest scale available, contrasting with Western incumbents that suffer from costly legacy systems); or as **global first movers** (leapfrogging to the global technological frontier through the eclectic use of external knowledge).

Paradoxically, our analysis shows how each strategy leverages advantages that are specific and are often unavailable to more advanced countries and firms. Our preliminary interviews (we provide a full list of interviewees in Appendix B) confirm that the most successful Kuwaiti firms have been operating as natural resource vertical integrators or local optimisers. We suggest that strategy should focus on these two categories, although there may be some scope for success as a global consolidator.

The history of other late economic developers, at least since the Second World War, has underlined the importance of achieving scale in operations, especially in more mature markets, in which the ability to exploit and enhance a given technology is more important than the ability to experiment with radically new alternatives. Small is not necessarily beautiful in the context of catch-up. Moreover, Kuwaiti firm creation is currently very weak, partly due to lack of incentives and partly due to a weak business environment, so it is hard for one start-up to try its luck let alone having a hundred flowers bloom. Policy should therefore follow through on the enabling legislation on privatisation, and in particular identify which parts of the state-owned sector could become local optimisers and natural resource vertical integrators. Further work needs to be undertaken on how the process can gain traction politically via generously priced disposals, employee share-ownership schemes and, to a lesser extent, management buyouts. Rather than institutions being created from scratch, responsibility for policy should be granted to those parts of the bureaucracy that have a proven track record for competence and impartiality.

Recommendations

We conclude with a suite of potential policy initiatives in the short and medium terms, under the varying categories of the national innovation ecosystem: public research and technology transfer, market development and firm creation, finance, education and skills, and openness and governance. **Our aim has been to build up the private sector as quickly as possible through better governance and creating the components of the innovation ecosystem while working gradually towards a new social contract based on engagement, learning and work – an indispensable part of the wider enabling environment.** We see our recommendations as interdependent and cumulative in their impact. Privatisation; public procurement; building up research capacity; introducing educational selection; alliances with overseas institutions of equivalent standing; promoting alliances and joint ventures; greater professionalism in the public bureaucracy; making business start-ups easier; creating prizes and incentives to reward change; and building up Kuwait's capacity in intangible asset creation are all among the areas for reform. To make reform innovative we have also suggested borrowing and adapting a number of initiatives used by other countries, notably Taiwan, Canada and the USA. Kuwait must build up its ecosystem capacity, develop its intangibles and begin to develop manu-service companies as local optimisers

and natural resource vertical integrators – and this will succeed the more as the wider environment enables the necessary cultural change.

There is much to build on within the Four Year Development Plan and from earlier initiatives. The Blair Report has suggested important reforms to governance in Kuwait which we believe are foundations on which the knowledge economy work can build.

To complete our work we need to:

- Analyse closely the Four Year Development Plan, to foreground and integrate knowledge-economy strategy initiatives in order to establish any quick wins and to follow up areas where our analysis was necessarily incomplete.
- Do a proper market analysis of sectors and industries in which Kuwait might have a competitive and comparative advantage. What are the prospects/scenarios for these sectors/industries? What skills and support are they likely to require?
- Map/scan what others are doing in terms of research and knowledge creation, especially in areas that are important to Kuwait. This will allow us to identify opportunities for international cooperation and collaboration with different research centres and fruitful research directions.
- Do a comprehensive gap analysis of each of the conditions that constitute an innovation ecosystem. For example, in the public research component, where does Kuwait enjoy a comparative advantage? How broad or narrow is the knowledge base? To what extent does the knowledge base cover the whole value chain?
- Develop a series of key performance indicators (KPIs) by which progress can be measured, drawing on efforts that evaluate innovation in wider systemic and institutional terms.
- Detail local optimiser and natural resource vertical integration business models so that all those who need to understand them can do so. Examine any areas in which there might be opportunities for a global consolidator strategy. How can Kuwaiti firms avoid the pitfalls associated with mergers and acquisitions (M&As) as they seek to scale up?
- Map Kuwait's current stock of firms operating in intangibles, and open up discussion about the manu-service business model.
- Examine how the take-up of financial flows to enterprise can be improved.
- Offer suggestions for the creation of Kuwaiti selective secondary schools and other educational reforms.
- Scope the possibility of creating a new citizen grant or baby bond as a way of rebasing the social contract on rewarding efforts which raise productive capacity, and moving away from entitlements. Oil revenues in other oil-producing provinces like Alaska have been used to create long-term funds that finance educational bursaries and school and university study, along with a range of investments in public goods and infrastructure that will lift long-run economic investment and performance. Kuwait might want to consider following suit.
- Scope emir's prizes that reward entrepreneurs and innovators who best combine new local business models with overseas ideas.
- Offer a view on sharia-compliant venture capital and finance.

This is an economic and technological roadmap that very much complements the Blair Report's advocacy of governance reform. If implemented it could help sustain and build on the momentum of the Four Year Development Plan and the Blair Report, and give Kuwait and Kuwaitis a sense of direction and pride. However, the process we visualise will not be possible without dedicated support in Kuwait. As part of any next phase of work, we will need to work closely with the LTE to assemble a group of local researchers –economists, statisticians and social scientists – who will help us determine what data exists, collect new data and mount new research. The mapping of the micro-foundations for good policy is an enormous task. We will also aim to deepen our relationships with local companies and organisations, so that analyses and recommendations are truly iterative and have the greatest possible reach, familiarity and credibility.

Although after our visit to Kuwait we are more aware of the challenges, we are also more aware of the opportunities. This is the trajectory on which we believe Kuwait must travel. The next phase of work is to offer a more detailed blueprint.

Section 1

Introduction

Economic change in the 21st century is being driven by three big structural changes that have emerged over the past 30 years and are accelerating in both scope and scale:

- the rise of technology and knowledge-based industries as major generators of value-added, exports and new jobs;
- the shift in business investment priorities from investment in physical assets to knowledge-based intangible assets;
- the growth of an increasingly well-educated and qualified workforce.

The evidence for these changes and the prospects for how they will change in the future are set out in more detail below. However, the form, scope and speed of these changes are always shaped by national circumstances and structures. How the knowledge economy might develop in Kuwait can only be understood in the light of the contemporary situation and realities facing Kuwait.

The knowledge-economy concept does not offer an alternative strategic blueprint. It is a means to an end, a potential tool for helping implement the strategic vision that Kuwait itself has drawn up by offering more options and insights to make that vision a reality than would otherwise be the case.

This report has been drawn up jointly between The Work Foundation and the LSE Kuwait Programme with the active help and support of the KFAS. Under the guidance of KFAS a joint Work Foundation–LSE team visited Kuwait between 13 and 16 March 2010. The team consisted of Mr Will Hutton, executive vice-chair of The Work Foundation; Mr Ian Brinkley, director of the Knowledge Economy Programme at The Work Foundation; Mr Philippe Schneider, associate of The Work Foundation; and Dr Kristian Coates-Ulrichsen, senior research fellow on the Kuwait Programme.

The main purpose of the visit was to give a high-level presentation on the knowledge economy to a selected expert audience and to conduct a series of interviews with expert representatives of relevant Kuwaiti institutions and organisations (see Appendix A for more details on the seminar). The presentation was held on 15 March at the offices of KFAS. The presentation and interviews provided sufficient information gathering and hypothesis testing on the knowledge economy in a Kuwaiti context to allow this interim report to be drawn up. As one of the conclusions of the high-level presentation was that options should be explored for a further phase, we have included some future options should that be decided as appropriate.

The Case for Embracing the Knowledge Economy

There are a number of compelling reasons for Kuwait to embrace the knowledge economy. Kuwait is over-dependent on the fluctuating global price of oil for its revenues. As we show in more detail later, Kuwait is one of the least diversified economies in the Gulf and one of the most volatile in the world. This makes developing a private business sector even harder; it complicates fiscal planning and makes it difficult for policymakers to set out long-term objectives when government revenues are so volatile. Another reason is rapid population growth, which carries fiscal risks as lavish government spending on citizen benefits may require increasingly large budget deficits that become unsustainable in the medium to longer term. Growing awareness of environmental degradation and resource insecurity also provide reasons for Kuwait to invest in human capital and thereby lessen its reliance on hydrocarbons.

Knowledge-intensive industries benefit from early-mover advantage. Once established, they are very difficult to dislodge. Elsewhere in the Gulf, the pace and scale of investment in the knowledge

economy have been considerable. Developments such as the \$10-billion-endowed King Abdullah University of Science and Technology in Saudi Arabia, the creation of Education City in Qatar and the establishment of NYU Abu Dhabi are all potential game-changers that are reshaping the parameters of knowledge creation in the Gulf. There is, however, genuine scope for a distinctive Kuwaiti model of the knowledge economy to emerge, based on local ownership, alignment with labour market and educational reform, and full integration into national plans.¹ The other Gulf States have prioritised enclave-based agreements with Western institutions that have had only limited diffusion into the wider economy. A distinctive Kuwaiti model of knowledge agglomeration therefore holds great potential if it is geared directly to meeting local objectives as set out in the national vision.²

And last but not least, Kuwait must begin to look beyond the petroleum age regardless of when in the future that faces its final curtain call. This might sound counter-intuitive as the depletion of Kuwait's oil reserves is not imminent. Thus the 2009 *BP Statistical Review of World Energy* estimated a reserves-to-production ratio of 99.6 years, meaning that Kuwaiti reserves are likely to outlast most international competitors'. However, this lack of urgency needs to be tempered by the possibility that depletion and declines in production elsewhere would require Kuwait to bring forward its production and that petroleum could lose its present value as a result of technical progress well ahead of the predicted time of depletion.³ A combination of technological innovation and environmental considerations is accelerating the shift towards post-carbon alternatives. This places the onus on hydrocarbon-dependent states such as Kuwait to take measures to cushion the eventual twilight of petroleum by increasing adaptive capacity and broadening their economic base – as other Gulf States are doing.⁴

As a comparatively high-income developing country, Kuwait does not lack the resources to bring about this economic transition.

Defining the Knowledge Economy

“The knowledge economy” is a term widely used around the world, but hardly ever defined. Judging from world media stories (from the English-speaking press) virtually every nation either thinks it is already a knowledge economy or aspires to be one. Some such as Korea have established a Ministry for the Knowledge Economy. Others such as Ireland have developed an explicit knowledge-economy strategy.

A good working definition was drawn up by the UK Economic and Research Council (ESRC) in 2005: “economic success is increasingly based on the effective utilisation of intangible assets such as knowledge, skills, and innovative potential as the key resource for competitive advantage. The term ‘knowledge economy’ is used to describe this emerging economic structure.”

These definitions capture two important features of the knowledge economy. Firstly, the shift towards a knowledge-based economy affects all sectors – low- and high-tech, knowledge-intensive and less knowledge-intensive, large and small, public and private. Secondly, the knowledge economy is a transition, what some have described as a “soft discontinuity”. It is part of a long-term process going on for decades if not centuries.

¹ Michael Herb (2009) “A Nation of Bureaucrats: Political Participation and Economic Diversification in Kuwait and the United Arab Emirates.” *International Journal of Middle Eastern Studies*, 41.

² Dr Moudi Al-Homoud, Minister of Education, and Dr Yousef Al-Ebraheem, Amiri Diwan, Kuwait and the Knowledge Economy seminar, 15 March 2010.

³ BP (2009) *BP Statistical Review of World Energy, June 2009*, p. 6. www.bp.com/statisticalreview

⁴ Vincent Romani (2009) “The Politics of Higher Education in the Middle East: Problems and Prospects.” *Crown Center for Middle East Studies, Brandeis University, Middle East Brief No. 39*, May.

Table 1.1 Knowledge-based industries defined by the OECD

Market-based knowledge industries	Public-based knowledge industries	Other market-based industries	Other public-based industries
High- to medium-high-tech-based manufacturing High-tech services (telecommunications, computer services, R&D services) Financial services Business services (real estate, advertising, accountancy, legal, technical, consultancy) Cultural and creative industries	Education Health and social work	Low- to medium-low-tech-based manufacturing Distribution, hospitality Transport Other services (dry-cleaning, hairdressing, refuse collection) Recreational and cultural services*	Public administration

Manufacturing classified by R&D intensity; services classified by ICT use and employment of graduates.

*Recreational and cultural industries recognised as knowledge-based by EU but not OECD, and includes libraries and museums.

In our work on the knowledge economy many of the statistics used follow the OECD standard definition of technology- and knowledge-intensive industrial sectors (see Table 1.1). These include R&D-intensive manufacturing and services, and service industries such as business, high tech, financial, education and healthcare that make above average use of ICTs and are large employers of graduate labour.

These industry-based definitions are useful for describing the knowledge economy in a statistical sense, but they also have limitations. As we show below, the nature of a knowledge economy means that conventional industrial boundaries become porous and the conventional distinctions become increasingly blurred. The OECD industry definition can only therefore be an approximation of the scope and scale of a knowledge-based economy.

The potential significance of knowledge-based intangibles such as R&D, copyright, brand equity, design, human and organisational capital has been acknowledged for decades but primarily in an obscure debate on how best to measure the value of firms' assets for accounting purposes. The recognition of the macroeconomic significance of the shift towards intangibles is more recent, and their effective measurement even more so. Table 1.2 shows the standard definitions used by OECD and academic researchers.⁵

⁵ These definitions are also used in the EU-funded Coinvest programme looking at intangible investment across the EU and are likely to form the basis of an internationally agreed set of statistical measures of intangibles in the future.

Table 1.2 Tangible and intangible forms of investment

Tangibles	Intangibles	Examples
Buildings	Computerised information	Software and databases
Plant and machinery	Innovative property	Scientific and non-scientific R&D Mineral exploration, copyright, licence costs New products from the finance industry New architectural and engineering designs
Vehicles	Economic competencies	Brand equity (strategic advertising plus market research) Firm-specification human capital (employer-provided training) Organisational structure (share of management time spent on strategy plus cost of external consultants)

The Drivers

The primary driver is rising demand for high-value-added services and goods from wealthier, more sophisticated, diverse and demanding consumers – either as private individuals or through what citizens now expect from collective provision from public services. As societies become richer and better educated, demand shifts towards high-value-added goods and services and what the UK Treasury⁶ has identified as the “high demand society”. This includes rising demand for education, healthcare and cultural services, and increasingly services related to the environment. Consumers are increasingly demanding not just personalised services, but what some have termed “experiential” services.⁷

In addition, business-to-business activity has seen a huge rise in supporting services through a network of intermediaries – firms and organisations that specialise in high tech, design, advertising, consultancy, training, financial, accountancy, expert labour supply and other services.

The great enablers are powerful and cheap computers and the “general purpose” ICTs coupled with mass higher education. The current phase in the development of the knowledge economies across the world dates from the early 1980s and the rapid dissemination of very cheap and very powerful computers. The role of general purpose technologies is discussed in more detail below.

The accelerator on both the demand and supply side has been globalisation, creating markets of scale and also diversity and facilitating the flow of ideas, concepts, technologies, capital and people. For instance, it took over 90 years for the telegram to spread to 80 per cent of developing countries whereas the diffusion of the mobile phone occurred in only 16 years.⁸ In other words, had eastern Europe, China and India all remained in effect closed economies we would have seen similar changes, but at a slower pace.

⁶ HM Treasury (2006) *Long Term Opportunities and Challenges for the UK: Analysis for the 2007 CSR*. HM Treasury.

⁷ Chris Voss and Leonieke Zomerdijk (2007) “Innovation in Experiential Services – An Empirical View”. In DTI (ed.), *Innovation in Services*. DTI, pp. 97–134.

⁸ World Bank (2008) *Global Economic Prospects: Technology Diffusion in the Developing World*. World Bank.

General Purpose Technologies

“General purpose technologies” (GPTs) have their roots in technology, but can be technologically advanced products, processes (such as lean production) or services. Like electricity, the internal combustion engine or the internet, GPTs have the power to change the organisation and structure of whole economies and not just particular industries. Some definitions identify between eight and ten GPTs in the 20th century compared with up to five in the preceding 150 years.

We can expect many more in the 21st century.⁹ One reason for the speeding up is that innovation stands on the shoulders of the stock of scientific and technological knowledge and that stock is expanding very rapidly across the globe – so rapidly that simply keeping pace with what is genuinely new in the world is a major challenge. Inventions in particular areas can happen very quickly after an initial breakthrough, and can include rediscoveries of processes that could not be developed further at the time because they depended on other discoveries.

The US National Academy of Engineering has identified a series of major engineering challenges, from the practical application of nanotechnology and fusion power, carbon sequestration, health informatics and customised medicines, to cyberspace security and enhanced virtual reality, to personalised learning.¹⁰ Some organisations refer to “enabling technologies” that cut across conventional research boundaries through combined innovations in, say, optical, chemical and biological applications in areas such as healthcare.¹¹ The OECD identifies five new science and technology (S&T) growth areas for the future: health, environment, electronic communications, biotechnology and nanotechnology.¹² These technological challenges and growth areas are summarised in Table 1.3.

Table 1.3 Technological challenges and growth areas in the 2020 knowledge economy

20th-/21st-century GPTs	21st-century great challenges	21st-century new growth areas
<p><i>20th century:</i></p> <p>Internal combustion engine</p> <p>Electricity</p> <p>Motor vehicle</p> <p>Aeroplane</p> <p>Mass production</p> <p>Computer</p> <p>Lean production</p> <p>Internet</p> <p>Biotechnology</p> <p><i>21st century:</i></p> <p>Nanotechnology</p>	<p>Nanotechnologies</p> <p>Energy from fusion</p> <p>Advanced materials</p> <p>Carbon sequestration</p> <p>Managing the nitrogen cycle</p> <p>Water</p> <p>Health informatics</p> <p>Durable customised infrastructure</p> <p>Customised medicine</p> <p>The brain</p> <p>Cyberspace security</p> <p>Enhanced virtual reality</p> <p>Personalised learning</p>	<p>Health</p> <p>Environment</p> <p>Electronic communications</p> <p>Biotechnology</p> <p>Nanotechnology</p>

Sources: Lipsey et al., *Economic Transformations*; US Academy of Engineering, *Grand Challenges*; OECD Science and Technology Indicators 2009.

⁹ Richard Lipsey, Kenneth Carlaw and Clifford Bekar (2005) *Economic Transformations: General Purpose Technologies and Long-Term Economic Growth*. Oxford University Press.

¹⁰ US National Academy of Engineering (2008) *Grand Challenges for Engineering*. National Academy of Sciences.

¹¹ Scottish Technology Group (2009) *Towards a Brighter Future*. Scottish Enterprise.

¹² OECD (2009) *OECD Science, Technology and Industry Scoreboard 2009*. www.oecd.org/sti/scoreboard

Table 1.4 Technological adaptive capacity may restrict the diffusion of future technologies

TECHNOLOGY APPLICATION	MOST OF AFRICA, MIDDLE EAST, OCEANIA	LATIN AMERICA, SOUTH AFRICA, TURKEY, INDONESIA	CHINA, INDIA, RUSSIA, EASTERN EUROPE	INDUSTRIAL COUNTRIES
TECHNOLOGIES LIKELY TO BE MASTERED BY 2020 (✓)				
Cheap Solar Energy	✓	✓	✓	✓
Rural wireless communication	✓	✓	✓	✓
Genetically modified crops	✓	✓	✓	✓
Filters and catalysts	✓	✓	✓	✓
Cheap autonomous housing	✓	✓	✓	✓
Rapid bioassays		✓	✓	✓
Green manufacturing		✓	✓	✓
Ubiquitous RFID tagging		✓	✓	✓
Hybrid vehicles		✓	✓	✓
Targeted drug delivery			✓	✓
Improved diagnostic and surgical techniques			✓	✓
Quantum cryptography			✓	✓
Ubiquitous information access				✓
Tissue engineering				✓
Pervasive sensors				✓
Wearable computers				✓



Source: Silbergliitt et al., *The Global Technology Revolution 2020*.

Blue line indicates that the technology requires increased sophistication.

A recent report by RAND¹³ identifies 56 emerging technologies expected to be feasible and marketable by 2020 and selects the 16 judged to have the greatest technical and commercial promise. It assesses the amount of absorptive capacity a country needs to take advantage of each technology and the likelihood that a panel of countries will do so by 2020, as shown in Table 1.4. The report is necessarily schematic: it does not assess which technologies a country with Kuwait's economic and political structures is in a position to exploit; nor does it factor in the dynamic possibility that weak absorptive capacity can be strengthened by institution-building mechanisms over time. Nonetheless it provides a useful snapshot of the prospects for advancement based on current data and a salutary reminder that countries must retain some realism and cut their technological coat to suit their cloth.

¹³ Richard Silbergliitt, Philip Anton, David Howell, Anny Wong et al. (2006) *The Global Technology Revolution 2020*. RAND.

The Knowledge Economy: The Evidence to Date

Across the OECD, the number of people working in knowledge-intensive and technologically advanced industries grew from 50 million to 150 million between 1970 and 2005. These industries have been the big drivers behind jobs and value added. Figure 1.1 shows changes in the share of value-added across the EU15 and the United States over this period, comparing the knowledge-intensive service industries against more traditional services such as retailing and hospitality and the manufacturing sector.

The biggest contribution has come from the growth of knowledge-intensive business services. Between 1990 and 2005 employment in these industries grew by 67 per cent across the OECD, followed by growth of nearly 40 per cent in public-based health and education services. In contrast, financial services grew very modestly, by less than 8 per cent. High-tech manufacturing saw employment fall. Overall, employment growth in the technological and knowledge-intensive sectors was two and a half times faster than in the rest of the economy over this period (29 per cent compared with 12 per cent).

Intangible Investment

Across all sectors, organisations have invested massively in knowledge-based intangibles. In the business sector, economies such as the USA, UK, France and the Nordics invest as much in intangibles as they do in tangibles. This is shown in Figure 1.2. These figures are for the business sector – they would be even higher if they included the public and other non-market sectors. It is the ability to exploit these intangible assets effectively that is a key feature of successful knowledge economies.

These measures of intangibles are a significant advance on previous estimates, which were confined to total investment in R&D as a share of GDP. The OECD in the past has also produced estimates for investment in knowledge assets based on a composite estimate of spending on R&D, ICT and higher education.¹⁴ One weakness of the measures is that most are still limited to the market sector, so understate investment in intangibles by economies with large public sectors.¹⁵

Knowledge Economy and Industrial Boundaries

The knowledge economy does not respect industrial boundaries, most notably between manufacturing and services. We have coined the phrase “manu-services” to describe the emergence of a new industrial sector where high-value-added services are increasingly integrated with high-value-added manufacturing. Examples include firms such as Rolls Royce, which now makes more profit and value-added from the services that complement its advanced engines, and has set up a specialist services division exploiting its world expertise in manufacturing advanced power supply systems. The most common services offered by manu-service companies in general are design and development services and systems solutions.

Recent research¹⁶ suggests that while up to 60 per cent of US manufacturing firms can be described as manu-services, only 1 per cent of manufacturing firms in China have adopted this

¹⁴ OECD Science and Technology Indicators 2007. The estimates relate to 2004 and have not been updated in the latest STI indicators published in 2009.

¹⁵ A further definitional issue is whether it is public expenditure on higher education that counts or the public sector’s creation of intangible assets such as spending on training the public sector workforce, design, brand equity and so on; or whether it is both after allowing for possible double-counting.

¹⁶ Andy Neely (2009) “The Financial Consequences of Servitization of Manufacturing.” *AIM Research Working Paper*.

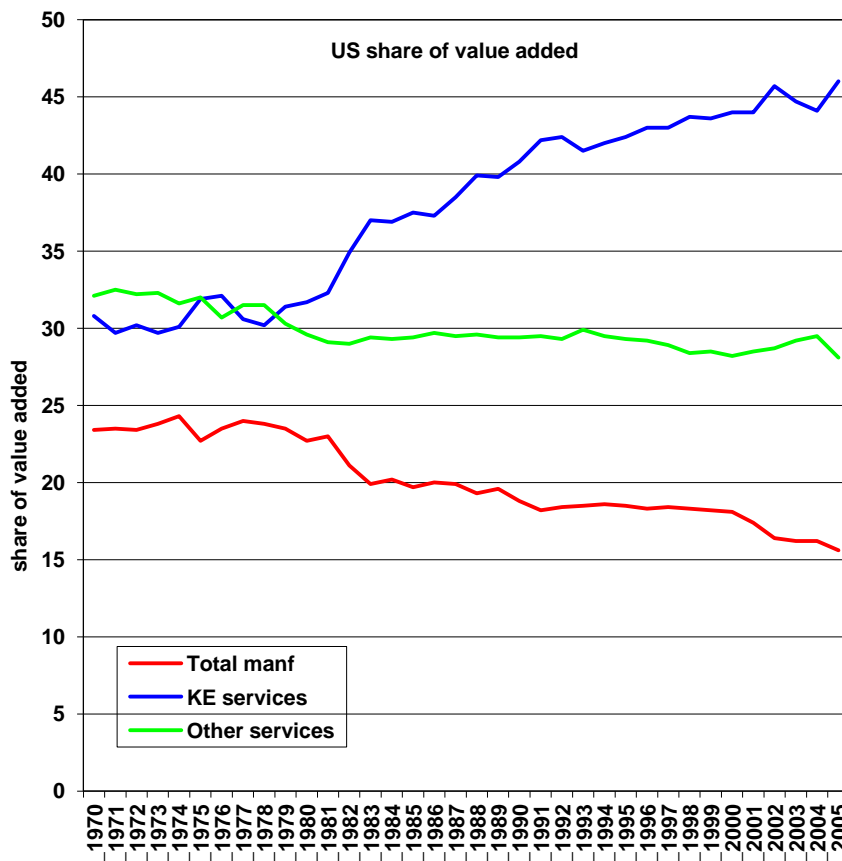
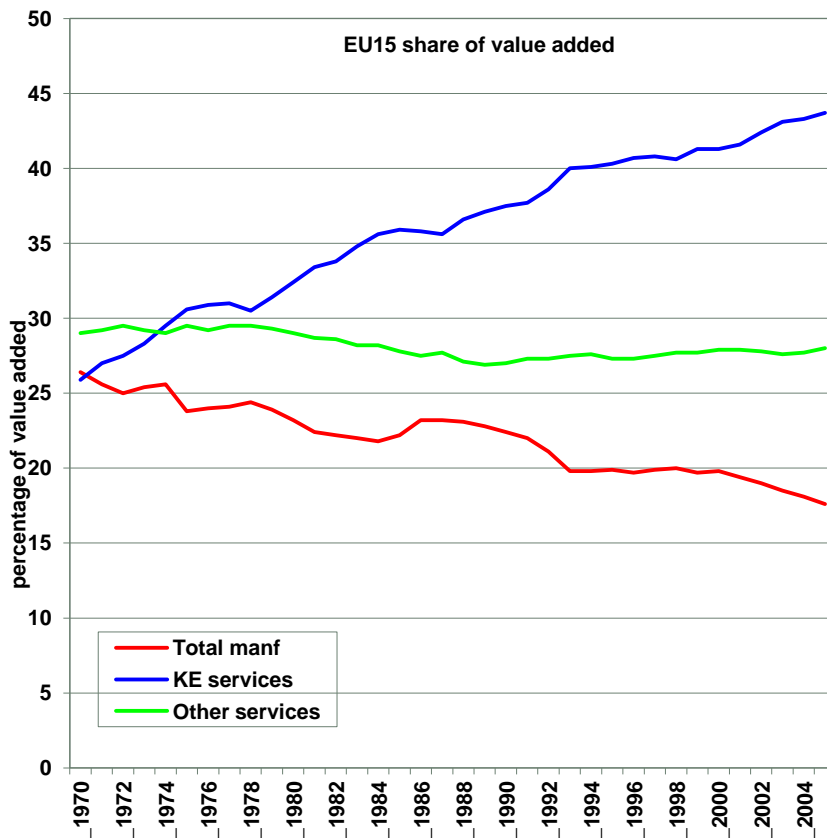


Figure 1.1 Growth of knowledge based service industries in Europe and US 1970-2005

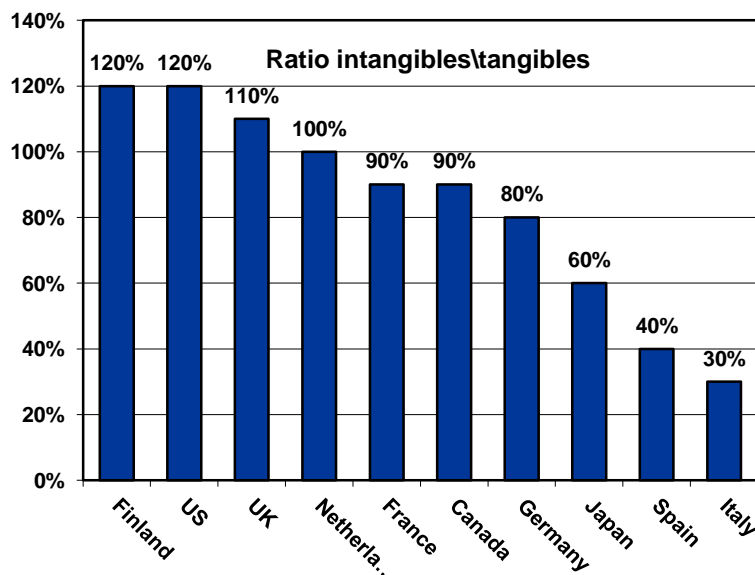
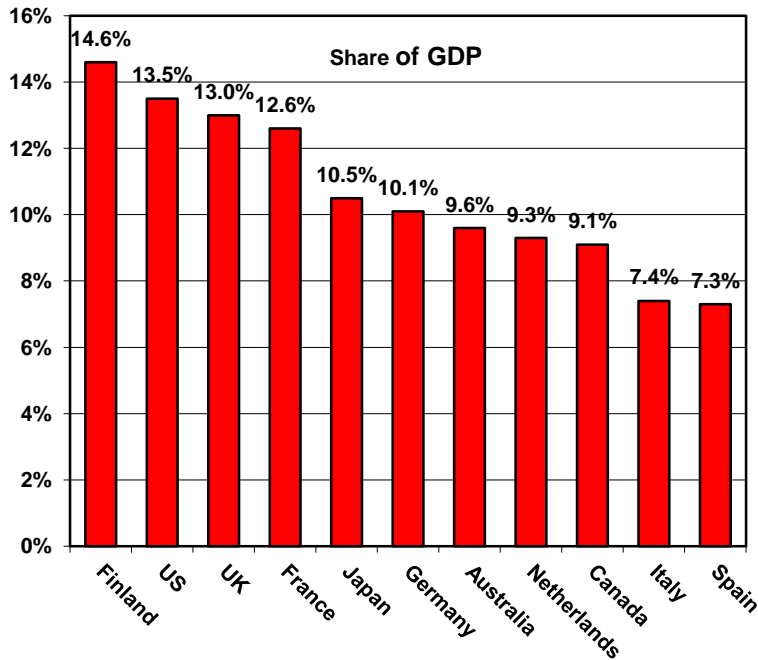


Figure 1.2 Business investment in intangible knowledge-based assets across the OECD

Source: Australian Productivity Council 2009.

All figures are share of market sector GDP. Finland excludes financial sector; US excludes farming. US average of 1998–2000; Germany, France, Italy and Spain are 2004; Japan average of 2000–5; Netherlands and Canada 2005.

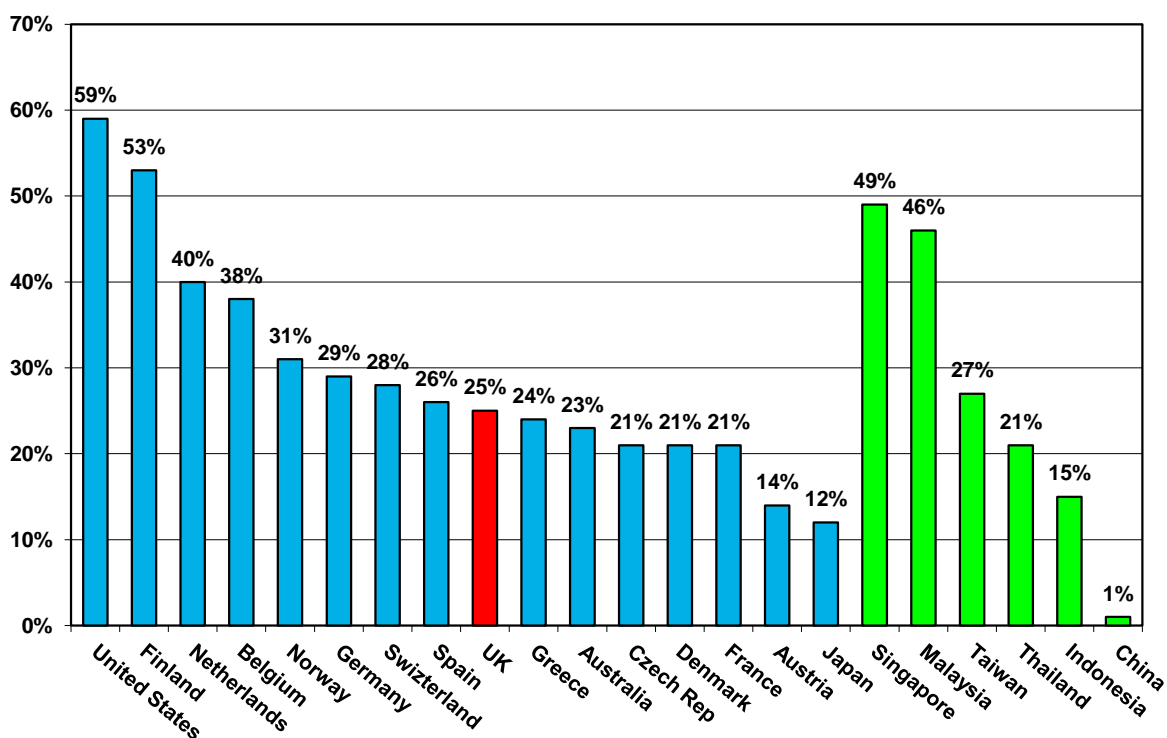


Figure 1.3 Share of manufacturing firms that could be described as “manu services”

Source: Neely, “Financial Consequences of Servitization of Manufacturing”.

The term “manu-services” comes from The Work Foundation knowledge economy programme.

All figures are 2004; UK figure is for Great Britain.

model. The trend is not confined to the OECD. Both Malaysia and Singapore have consciously moved towards manu-services because they recognise that “pure manufacturing” will struggle to compete not just with China but with the next wave of low-wage producers.

Figure 1.3 shows estimates for shares of manu-service companies. These figures understate the importance of manu-service companies as on average they were two and a half times as large as “pure” manufacturing companies. Manu-service models are most common among large firms, but significant shares of smaller manufacturing firms – about a third on average – had also adapted the model.

The evidence from the OECD economies set out above is compelling. Knowledge-based economies have, without exception, expanded their knowledge-intensive service sectors, have invested heavily in knowledge-based intangibles and have expanded the educated share of the workforce.

A key question is how far these lessons are transferable to non-OECD economies. Economic processes are the same in all economies, but the context in which they operate varies significantly. Moreover, even within the OECD, recognition of the importance of the knowledge economy has been comparatively recent. Standing where we are now, we can see what has happened and why, but it was less obvious at the time. OECD economies are still in the process of bringing some of their own policies, structures, institutions and statistical measures into line with economic reality.

A strong private sector is essential, but the relative size and strength of public and private sectors vary considerably. Both the Nordics and North American economies have developed highly

successful knowledge-based economies, but the former have large public sectors and strong welfare states and the latter relatively small public sectors and weaker welfare states.

More important appears to be the relative strength, effectiveness and efficiency of public institutions and their ability to work effectively with the private sector. Knowledge economies are based on the role of business-to-business and consumer-to-business intermediaries. Those that can bridge the private and public sectors effectively in transferring knowledge and driving innovation and technological development in both directions are critical. This is a common finding from both OECD and non-OECD examples.

Many OECD and non-OECD economies have set R&D targets as a share of GDP. However, the growth of the knowledge economy over the past 30 years has been much more strongly associated with increased innovation and technological adaptation than with increased shares of R&D spending.¹⁷ R&D is important, but investment in other equally important knowledge-based intangibles may be even more so.

R&D spending by the private sector is strongly influenced by industrial structure, specialisation and ownership – all features difficult to change. Most OECD economies have switched support towards R&D tax credits, but the evidence on their success in generating additional investment is limited. One problem is that what firms regard as R&D tends to put much more emphasis on development and often includes investment in knowledge-based intangibles other than those in the official definitions.

Policymakers have therefore moved away from targets, which often lack a clear rationale and often fail to take account of the structural constraints, and increasingly focused on improving innovation outcomes rather than inputs.¹⁸ An important feature is the receptiveness and ability to absorb technologies, ideas and practices coming from outside. This may to some extent offset weak domestic investment in R&D – in effect, economies can import some of their intellectual property requirements. The ability to do this has greatly increased as a consequence of globalisation, increased mobility of high-skilled labour, and ICT and other technological advances.

Economies such as Korea, Malaysia, Singapore and Taiwan are making successful transitions towards OECD knowledge-based economies. All these approaches were top down and required a degree of consensus and “buy-in” across civil society and business elites – plans were drawn up and put into action in relatively short time periods with substantial public investment. These economies were able to build on relatively strong private sectors and strong public corporations. They focused heavily on IT-related services and production and, in the case of Malaysia and Singapore, on imported knowledge from multinational linkages. However, their success also depended on identifying national characteristics and features around which they could build success and expertise. These national differences and specifics were as important as the common features.

There are some common features of knowledge-intensive economies, some fairly obvious, such as the steady increases in better-qualified and better-educated workforces, and others less so, such as the importance of a diverse and “high-demand” consumer base. However, OECD knowledge-based economies differ significantly in terms of industrial structure, institutional arrangements and social features. This suggests the same goals can be achieved with different means. This gives non-OECD economies a wide choice of potential routes, but also makes it harder to give a simple

¹⁷ R&D spending across the OECD is no higher as a share of GDP today than it was in 1985.

¹⁸ The clearest example is the EU’s commitment to increasing R&D spending to 3 per cent of GDP, made at the Lisbon Summit in 2000, to be achieved within 10 years. The EU has made no progress towards this target because it had no clear rationale – other than overtaking the USA – and completely failed to take account of industrial structure.

set of guidelines from experience elsewhere as to which route might be best. The national context is very important. The next section reviews previous reports on Kuwait.

Section 2

Previous Reports on Kuwait

We have reviewed some of the previous attempts to set out a strategy for the Kuwait economy, although the team were unable to access some others. Below, we set out some comments in more detail on approaches that have been used in the past.

There are two reasons why these reports have not led to a better outcome for the Kuwait economy. Firstly, there are long-standing economic, social and political obstacles, which we touch on in the body of this report. Secondly, while many of the reports have excellent analyses and sensible recommendations, they also have weaknesses. We identify five common weaknesses below:

- None has really taken a systems approach, ignoring the institutional basis of the knowledge economy. They have tended to understate the uncertainty and difficulty surrounding innovation as a dynamic process, and its corresponding market failures.
- The full significance of globalisation is underplayed in earlier reports. As we argue, inward flows of foreign direct investment (FDI), technology and talent are crucial to the knowledge economy of small latecomers; globalisation has changed what is feasible but also brought new trade-offs.
- The earlier reports do not make clear the distinctive challenges and strategies confronting latecomers. High-profile examples of successful national and regional economies, based on blockbuster licences on university-patented research and technology transfer to small and medium enterprises (SMEs) and start-ups, have become a gold standard and universal blueprint for policymakers but have limited relevance in many settings.¹⁹ Different stages of development will call for different organisational forms, different roles for universities and research, different relations between entrepreneurs and financial markets and different processes of firm selection. As much of this work has emerged only in the last few years, it is hardly surprising that it has not featured in policy discussions. For instance, the five-strategies discussion in the upgrading section in our interim report is based on wholly new work.²⁰
- No report is sufficiently forward-looking in anticipating the rise of GPTs and understanding the implications of emerging technologies for Kuwait.
- Microeconomic assumptions are incorrectly specified, resulting in inappropriate policy recommendations: implicitly the tendency to push a simple model of rationality and motivation beyond its appropriate domain has limited the ability of policymakers to understand a plethora of consumption and investment decisions.²¹

The MIT–Harvard High-Value-Added Strategy

In the early 1990s, a joint report was produced by MIT, Harvard, KU and KISR looking at future challenges for developing the Kuwait economy. The report called for a “high-value-added strategy” based on (i) improving revenues from oil extraction and (ii) building up human capital and expanding the financial sector. The report did not, however, discuss the innovation system in which this could take place, although in fairness policy thinking on innovation and innovation systems was much less advanced than it is today. Without an analysis and understanding of how the innovation ecosystem works, it is hard to implement even the most carefully crafted recommendations. This is as true for Kuwait today as it was then.

¹⁹ Richard Lester (2005) “Universities, Innovation, and the Competitiveness of Local Economies: A Summary Report from the Local Innovation Systems Project – Phase I.” *MIT Industrial Performance Center Working Paper 05-010*.

²⁰ Some of these insights have been formalised in the branch of economics associated with the new growth theory.

²¹ Arguably this critique applies with most force to the Blair analysis.

“State of Kuwait: Energising the Private Sector” Report

In 2001, the World Bank published its "State of Kuwait: Energising the Private Sector", a report that built on and expanded the vision of the 1995 Country Economic Memorandum to diversify and privatise the Kuwaiti economy. One of its major contributions was a comprehensive survey of private sector firms that still today provides an unprecedented snapshot of the condition and character of the private sector. Large parts of section 4 below draw on this evidence.

Amongst the number of recommendations to give the private sector a greater role in the economy, several stand out: adoption of a negative list approach to regulation and the creation of a fully representative task force to assess the appropriateness of major regulations; overhaul and replacement of the Kafala system with more flexible work permits; liberalisation of the banking and financial sector; simplification of commercial laws, especially those relating to procurement, industrial licences and land acquisition; maximising potential gains from globalisation through a more aggressive stance on WTO negotiations and the establishment of an Investment Promotion Bureau; greater involvement of the private sector in downstream oil activities, the appointment of an ICT Czar and the fast-tracking of telecommunications deregulation; and ideas to reframe the social welfare commitments of the Kuwaiti state. While none of these recommendations is particularly novel in isolation, they nonetheless add up to a highly concrete and coherent reform package.

In hindsight, "State of Kuwait: Energising the Private Sector" was ahead of its time, published against a backdrop of record high oil prices and fiscal reserves that possibly suppressed pressures for change and the case for smaller government and privatisation. An accompanying evaluation of how far the government had implemented recommendations made by the IMF in its 1993 report "Options for Fiscal Reform" underscored this trade-off: of the 35 recommendations proposed in 1993 only three had been fully implemented by 2001. A further two had been implemented but introduced with significant concessions, and five had been only partially implemented. The rest had been shelved or deferred for further investigation.

On the other hand, the report was very much *sui generis* and a product of its time: its rather one-sided focus on IT and telecommunications seems rather quaint and quixotic from today's vantage point of an intervening dotcom bubble and a more hard-headed reassessment of the sector's potential and limits. More importantly, other sectors have emerged in that time to give policymakers a wider set of options than could have been imagined a decade ago.

The report also left unanswered a number of important questions: delinking the social allowance from public sector employment was rightly identified as a first-order, if not existential, issue, but apart from fleeting references to a new "Compact with Kuwait" and a brief discussion of the Alaska Permanent Fund, it was not developed. This is where policy innovations such as flexicurity, citizen grants/baby bonds and livelihood insurance could build on the World Bank's insights, forming a "golden triangle" of (i) labour market flexibility, (ii) economic security and (iii) rights and obligations of citizenship.

Similarly, while the report called for privatisation and foreign investment, it did not specify what shape this should take: support for a few large firms or a flotilla of SMEs, encouragement of joint ventures or entirely owned FDI operating in export enclaves. Evidence suggests that these choices are not interchangeable but entail important trade-offs and must fit local conditions (some tentative observations are offered later).

Finally, notwithstanding the number of recommendations offered to improve business competitiveness, some of the assumptions – some obvious, some hidden – upon which its

understanding of legal reform and economic performance were based are problematic: its tendency to reduce regulation to the sum of rules found in statute and treat it like a piece of technology ignores the host environment in which it must be embedded – for instance, whether strategic actors have adequate incentives to enforce and obey regulation.

The World Bank and the Knowledge Economy Index

In 2002, the World Bank Institute produced an overview report on knowledge economies and the Middle East and North Africa (MENA) economies. This outlined some of the features of knowledge-based economies across the OECD and proposed a number of indicators grouped into four pillars (institutions and incentives, human capital investment, innovation systems, and electronic communications) that would allow economies to chart their “KE [knowledge-economy] readiness”. These indices are published annually in an international league table called the Knowledge Economy Index (KEI). However, such measures have disadvantages. They are often a mixture of “hard” and “soft” indicators, some moving frequently and others influenced by the economic cycle. As such, they can move in odd and unpredictable ways. The KEI indicators are useful, but as a basis for analysis and policy guidance they are also limited. By themselves they do not provide enough insight into innovation systems to guide policymakers on the often complicated, interrelated and incremental changes required to develop over time the sort of system needed to build a knowledge-based economy.

The Blair Report

The Blair Report sets out a list of ambitions and desired outcomes – for example, unleashing entrepreneurialism. Its calls for greater capabilities in the prime minister’s office, more professionalisation of the civil service, more accountability and substantial educational reforms are well argued. However, we think there are other economic options for a small latecomer state that could be explored in more detail, and these are set out later in this report. Moreover, a broad strategy report of this nature will not have the detailed understanding of what constitutes a potential knowledge-economy strategy – the processes that underpin an innovation ecosystem and the business models that might be adopted.

Section 3 The Innovation Ecosystem

For the purposes of analytical simplicity, the framework presents innovation as a dynamic and interdependent process whereby researchers and entrepreneurs experiment with different ideas and technologies, and so generate variety. Then follows a selection process signalling to the rest of the system which ones to back. Successful ideas expand, drawing more resources, while unsuccessful ones are forced to exit.²² The process is influenced not only by technical considerations and formal institutions but by shared social norms and value systems – especially those concerning attitudes towards risk, failure, social mobility and entrepreneurship.

To equate innovation with only S&T systems and R&D is mistaken. It overlooks how, at its core, innovation is an economic act in which the capacity to create a new product or service is only worthwhile if there is adequate demand. In fact, research and entrepreneurship operate according to very different cultural and institutional logics – one reason why systems with an undoubted scientific pedigree have fallen short on translating advantages into advanced positions in new industries. Bridging this gap has given rise to so-called “translational infrastructure” – for instance, the Fraunhofer Gesellschaft in Germany, ITRI in Taiwan, ETRI in South Korea and TNO in the Netherlands.²³

Entrepreneurs have been variously held accountable for historic slowdowns if they are too few and great leaps in economic growth if they are in abundance. The extent to which entrepreneurship takes root and flowers in any economy or society depends on the cost and availability of inputs, market size and ease of appropriating the fruits of its success relative to other lucrative if socially less valuable activities, from legal rent-seeking to outright criminal activity.²⁴ It also depends on institutions of good governance: a public administration that plainly aims to serve the public good rather than aggrandise itself, and fosters confidence in the security and predictability of economic interactions.²⁵

On another level, it is the similarities, not the differences, between research and entrepreneurship that stand out. Activity is best marshalled through multiple, small-scale experimentation – a philosophy that is shared by organisations as diverse as Google and the Howard Hughes Medical Institute (**openness**).²⁶ Both tolerate early failure and reward long-term success. But pluralism must be accompanied by disciplining mechanisms that review projects, follow up on successes and recognise failures before they become a drag on the economy, as demonstrated by the baleful, lumbering experience of many national champions around the world. Important here is the role of demand: discriminating consumers – public and private – will not only give innovators an early customer base from which to develop their products but are also more likely to reject poor or substandard ideas (**demand**). In a similar way, competition increases pressures on firms to

²² Eric Beinhocker (2006) *Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*. Harvard Business School Press. Bengt-Ake Lundvall (ed.) (1992) *National Innovation Systems: Towards a Theory of Innovation and Interactive Learning*. Pinter.

²³ John Howells (2006) “Intermediation and the Role of intermediaries in Innovation.” *Research Policy*, 35. Herman Hauser (2010) “The Current and Future Role of Technology and Innovation Centres in the UK.” *Report for Lord Mandelson Secretary of State Department for Business Innovation and Skills*.

²⁴ Kevin Murphy, Andrei Shleifer and Robert Vishny (1991) “The Allocation of Talent: Implications for Growth.” *Quarterly Journal of Economics*, 106(2). Daron Acemolgu (1995) “Reward Structures and the Allocation of Talent.” *European Economic Review*, 39(1).

²⁵ World Bank (2005) *World Development Report: Better Investment Climate for Everyone*. World Bank.

²⁶ Pierre Azoulay, Joshua Graff Zivin and Gustavo Manso (2009) “Incentives and Creativity: Evidence from the Academic Life Sciences.” *NBER Working Paper* No. 15466. See also Raaj Sah and Joseph Stiglitz (1986) “The Architecture of Economic Systems: Hierarchies and Polyarchies.” *American Economic Review*, 76(4).

develop, adapt and adopt better ways of doing things – to stay ahead of, or just keep up with, rivals (**competition**).²⁷

Demand and competition are also important to the extent that they generate the price and quantity information without which successful entrepreneurial hunches cannot be formed. This is why the “right prices” matter as guides to enterprise to change the allocation of resources in productivity-enhancing ways.

By implication, the system must be capable of rapidly and flexibly mobilising resources. In particular, growing firms, especially in high-tech sectors, are hungry users of skills. Technical competence alone is not enough, however. Demand for generic skills – the ability to adapt to and solve new problems – has also increased,²⁸ and at a time when disciplinary walls are tumbling down – in emerging areas from nanotechnology and synthetic biology to business activities such as manu-services – there has never been more need for interdisciplinary thinking.²⁹

Similarly, finance must be fit for purpose, oriented to the fact that many of the most innovative firms have treacherously long start-up phases and lack significant assets that can be used as collateral for loans. A concern for entrepreneurs is that equity markets are too impatient and traditional banks are too cautious, as evidenced by the “Valley of Death” gaps in investment at the seed and early stages.

An important conclusion is that in small economies, positive conditions are unlikely to exist if only domestic institutions and actors are taken into account. We develop this conclusion in more detail in section 4 of this report.

A stylistic representation of an innovation ecosystem is set out in Figure 3.1, developed from the work of the UK’s National Endowment for the Sciences and Arts (NESTA). The figure shows how the functions of an innovation ecosystem – openness, public research, access to finance, competition, demand and skills – relate to each other. This framework could be used to help describe and assess the Kuwaiti innovation ecosystem.

Innovation Does Not Occur Spontaneously

The overall process is, of course, not smooth, effortless or always efficiency-enhancing. Pervasive uncertainty means that most experiments will turn out to be expensive flops. Individuals exploring the unknown may not engage in the search process to establish what is commercially viable, as they hesitate to incur the costs that can also benefit competitors. Instead, the temptation is to free-ride on others’ adventurousness.³⁰ Thus one long-run study estimates that innovators themselves capture only 2.2 per cent of the total value of their innovations, with the balance of the social benefit going to other producers and to consumers of products that use the innovations.³¹ Besides, limited access to information can cause individuals and firms to herd, basing decisions on how other firms are seen to be reacting – a recipe for booms and busts. Traditional supply-side

²⁷ Elias Khalil (1997) “The Red Queen Paradox: A Proper Name for a Popular Game.” *Journal of Institutional and Theoretical Economics*, 153(2)

²⁸ Simon Kirby and Rebecca Riley (2006) “The Returns to General versus Job-Specific Skills: The Role of Information and Communication Technology.” *NIESR Discussion Paper 274*. See also Frank Levy and Richard Murnane (2004) *The New Division of Labor: How Computers Are Creating the Next Job Market*. Princeton University Press.

²⁹ Howard Gardner (2007) *Five Minds for the Future*. Harvard Business School Press.

³⁰ Ricardo Hausmann and Dani Rodrik (2002) “Economic Development as Self-Discovery.” *NBER Working Paper No. W8952*.

³¹ William Nordhaus (2004) “Schumpeterian Profits in the American Economy: Theory and Measurement.” *NBER Working Paper No. 10433*.

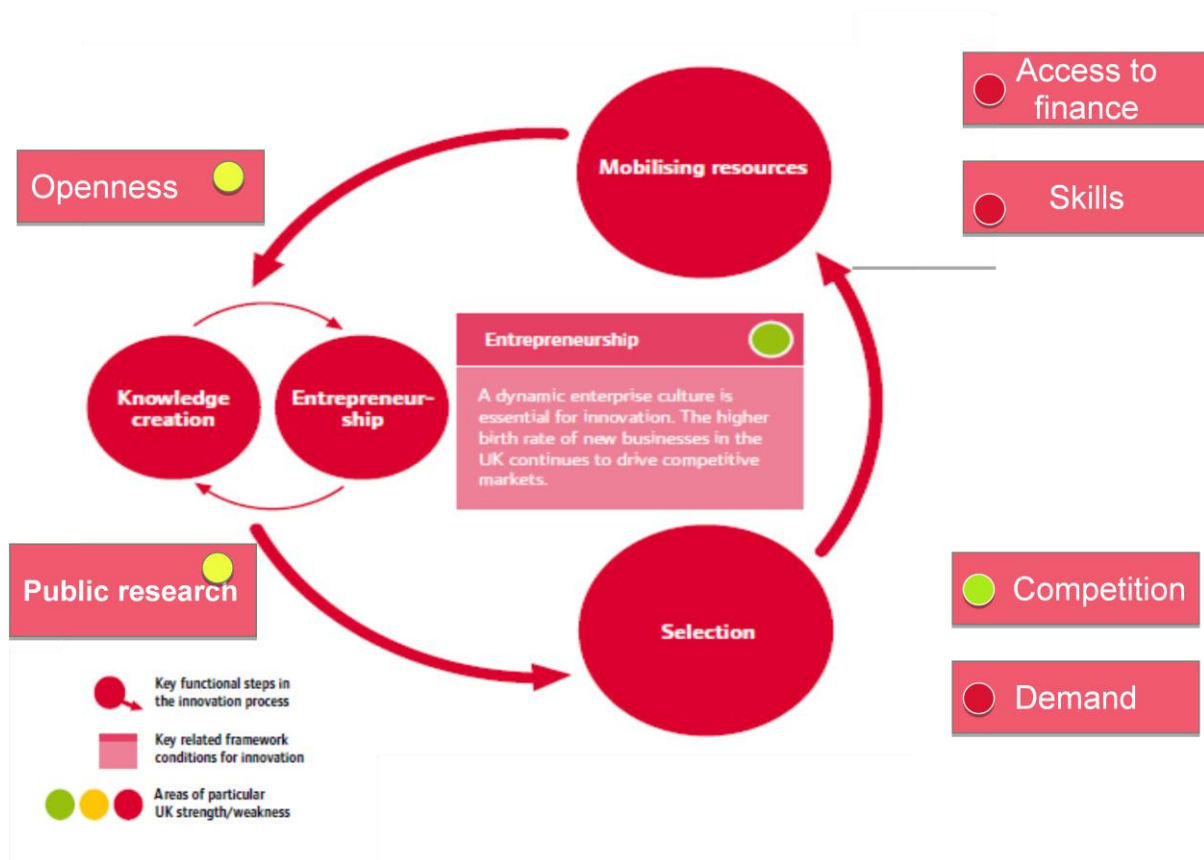


Figure 3.1 The innovation ecosystem

Source: NESTA with an application to the UK

measures (e.g. public subsidies for R&D and temporary granting of monopolies) and the increasingly creative use of demand-side policies (e.g. prizes, public procurement and regulation) may be vital to help overcome market failures. Measures may target not just the carrying out of R&D but also the training of personnel, the introduction of automation and IT, the establishment of brand-name products and energy conservation.³²

Overcoming inertia and built-in resistance to innovation is another challenge. Vested interests have fewer degrees of freedom than start-ups, making it harder for them to accommodate “disruptive” alternatives. Inefficiencies may accumulate insidiously on the back of specialised and asset-specific investments. As incumbents are not typically compensated by those who displace them, their only last resort is to use politics or other means to cling on to their privileges, thereby retarding the march of technological progress.

The Role of Context and Appropriate Institutions

Finally, a bundle of institutional attributes that are appropriate for one setting may have limitations or elements that make them inappropriate for another. This leads to three conclusions.

³² On demand-side measures, see Thomas Kalil (2006) “Prizes for Technological Innovation.” *Hamilton Foundation Discussion Paper 2006-08*. See also Luke Georghiou (2007) “Demanding Innovation: Lead Markets, Public Procurement and Innovation.” *NESTA Provocation 02*.

Firstly, in small economies, positive conditions are unlikely to exist if only domestic institutions and actors are taken into account (see section 4 for a more in-depth discussion). Secondly, different forms of coordination will be necessary depending on whether a technology is in its infancy or maturity, and whether the innovation is radical or incremental. Thirdly, policies for ecosystems that are distant from the technological frontier will look necessarily different from those at the cutting edge. For instance, research in medium-capacity countries will typically focus on applied research or exploratory developments – fields that lie somewhere in between the extremes of pure science on the one hand, and advanced development on the other hand. This will have a number of implications for the character and configuration of the research activity: the “search” behind the research; the objective of the research agent; the expected output; the performance measures by which output is evaluated; the time horizon involved; the techniques employed; the qualifications of the researchers; and the size of the research effort.³³

Another area in which distance to the frontier will lead to differential policies for innovation is competition. On the one hand, firms have little incentive to innovate if they are not stimulated by competition; on the other, too much competition discourages innovation as firms are not able to reap the benefits of their efforts. But whereas firms at the frontier can escape competition by innovating, no such comfort exists for laggard firms. As leapfrogging is difficult – one must learn to walk before one can run – it makes little difference whether they innovate or not, since they will still face competitors that can produce similar goods at similar prices.³⁴ One implication is that competition policy can be more lenient towards oligopolies and some forms of infant industry protection when an economy or sector is catching up (and incumbent firms will invest more when rents are guaranteed) than when the gap has been closed (when powerful incumbents may abuse their position to trample on helpless innovators on whom productivity growth depends), and the real issues pertain to the choice of tariffs or subsidies to support development.

³³ Alice H. Amsden and F. Ted Tschang (2003) “A New Approach to Assessing the Technological Complexity of Different Categories of R&D (with Examples from Singapore).” *Research Policy*, 32.

³⁴ Philippe Aghion, Richard Blundell, Rachel Griffith, Peter Howitt and Susanne Prantl (2006), “The Effects of Entry on Incumbent Innovation and Productivity.” *NBER Working Paper 12027*.

Section 4

An Unfinished Project: The Continuing Need for Diversification

Kuwait must tackle head-on the problems of unproductive entrepreneurship that have become embedded in its political economy over the past four decades. As of 2010, petroleum accounted for nearly half of GDP, 95 per cent of export revenues and 95 per cent of government income.³⁵ These figures are high, even by regional comparison, and reflect in part the slower progress towards economic diversification relative to the other Gulf Cooperation Council (GCC) states. Decisive political action is required to strip away the layers of rent-seeking behaviour and lay the groundwork for the transition to a productive, value-added economic model.³⁶ This will not be an easy task as it requires the reformulation of the contract between state and society. There is, however, growing consensus that the present model of citizen welfare cannot continue in its existing format and that thorough reform is necessary.³⁷ Kuwaiti stakeholders need to reach agreement on what the state should reasonably be expected to do for its citizens, and link it to notions of responsible citizen engagement.

The Political Economy of Unproductive Entrepreneurship in Kuwait

The legacy of four decades of rent redistribution has firmly embedded a notion of citizens' entitlement among Kuwaiti nationals. The challenge facing Kuwaiti stakeholders is how to transform this into a productive culture of citizens' engagement that can support the transition towards a knowledge economy.³⁸ It is complicated by Kuwait's demographic structure, in which an estimated 65 per cent of citizens are under the age of 25. Successive generations of Kuwaitis lack any point of comparison with the pre-oil era and regard the redistribution of wealth as a right, rather than a temporary privilege, of citizenship. This notion of the social contract based on unproductive rent-seeking behaviour is unsustainable.³⁹

A second manifestation of the political economy of rent redistribution is the sharp dichotomy between the public and private sectors and the emergence of dual labour markets. More than 90 per cent of Kuwaiti citizens in the labour force are employed in the public sector, in sharp contrast to the private sector, which consists primarily of expatriate labourers, who also form 84 per cent of the total labour force.⁴⁰ This is slowly changing, as there has been an increase in employment in the private sector in recent years and it is now the primary source of new jobs for Kuwaitis. Legislative reforms have encouraged this trend by subsidising private companies to enable them to match public sector salaries and benefits and encourage nationals to move over. Nevertheless, strategies of subsidisation are open to abuse and do not address head-on the high wage expectations of nationals. Directly or indirectly the public sector remains the "employer of last resort" that absorbs young Kuwaitis lacking the requisite skills and educational qualifications to compete for jobs in the private sector. Relations between the public and private sectors are marked by considerable tension and attitudes of mutual distrust that hinder efforts to create an enabling environment for transformative economic change.⁴¹

Underlying and interlinking these problems is the poor state of education, in terms of qualitative improvement both in standards and in creating sufficient incentives for students to prioritise

³⁵ CIA (2010) *The World Factbook 2010: Kuwait* (accessed 27 March 2010).

³⁶ Dr Adel Al-Wogeyan, Higher Council for Planning, meeting, 16 March 2010.

³⁷ Dr Saad Okasha, Arab Fund for Economic and Social Development, interview, 14 March 2010.

³⁸ Rola Dashti MP, Kuwait and the Knowledge Economy seminar, 15 March 2010.

³⁹ Dr Saad Okasha, Arab Fund for Economic and Social Development, meeting, 14 March 2010.

⁴⁰ Oxford Business Group (2010) *The Report: Kuwait 2010*. Oxford Business Group, p. 9.

⁴¹ Dr Aziz Sultan, Kuwait Engineering Office, meeting, 16 March 2010.

academic achievement.⁴² This spills into attitudes towards work: the World Bank's "State of Kuwait: Energising the Private Sector" survey found a strong duality in employer experiences with Kuwaiti and non-Kuwaiti workers. For instance, only 18.3 per cent of employers found non-Kuwaiti workers to exhibit indifference or an unfavourable work ethic, compared to 39.6 per cent for Kuwaitis. And whereas only 18.6 per cent of employers reported problems related to absenteeism and illness for non-Kuwaitis, the figure rose to 52.2 per cent for Kuwaitis. Not surprisingly, training provision is seen as an uphill battle that is largely not worth the costs.

Kuwait nevertheless differs substantively from classical rentier assumptions of depoliticised societies. Its strong traditions of parliamentary government and participatory politics set Kuwait apart from the other GCC states (Bahrain, which is the closest parallel to Kuwait with a democratically elected lower house, still has an upper house made of royal appointees). This presents both a challenge and an opportunity for Kuwait to forge a distinct pathway of transition. The robust parliamentary system of checks and balances injects high levels of scrutiny and debate into the decision-making process in Kuwait. There is therefore little chance of Kuwait replicating the unsustainable "Dubai" model of development or taking ad hoc decisions that over-reach national capabilities. In addition, the need to secure political consensus imparts a degree of legitimacy and accountability to policymaking lacking in other GCC states, where decisions are more ad hoc and restricted to a small circle of officials.

Set against the beneficial aspects of Kuwait's participatory political system is the succession of political crises since 2006. During the three years to May 2009, the National Assembly was dissolved three times as the parliament and government repeatedly clashed. This necessitated fresh elections in 2008 and 2009 amid an atmosphere of instability. The political infighting caused the delay or cancellation of important structural reforms and of privatisation and development projects. These included a long-awaited law to create an independent regulatory agency in the financial sector, and the promotion of foreign investment and technology in the northern oilfields as part of Project Kuwait. Moreover, parliamentary opposition was instrumental in the cancellation of a \$17.4-billion joint venture between Petrochemical Industries Company of Kuwait and the Dow Chemical Company, as well as a deal with a Japanese–South Korean consortium to construct a fourth oil refinery in Kuwait. Together, these decisions inflicted significant damage on Kuwait's international reputation for ease of doing business, particularly as good governance indicators appear to have stalled over the past decade.⁴³

Internal tensions within Kuwait therefore account for much of the slow progress towards economic diversification in recent years. A number of reports, from the MIT study commissioned by the government in 1988 to the Blair Report, spanning more than 20 years have identified similar challenges and risks, but the gap between the recognition of the problem and the articulation of a feasible solution remains wide. The May 2009 election reflected popular frustration with the political elite and a desire for change that included the historic election of four women to the National Assembly.⁴⁴ Improved relations between the new parliament and the government culminated in the approval of the Four Year Plan by the Assembly in February 2010. The near-unanimous support for the plan provides an opportunity for Kuwaiti policymakers to move ahead with its implementation in a consensual and effective manner. By taking measures to embrace the knowledge economy and reduce its dependence on volatile oil revenues, Kuwaitis can become the masters of their own destiny and shape a more sustainable economic future.

⁴² Dr Moudi Al-Homoud, Minister of Education, Kuwait and the Knowledge Economy seminar, 15 March 2010.

⁴³ Chris Stanton and James Calderwood (2009) "Dow Dispute Dents Kuwait's Image." *National*, 10 January.

⁴⁴ Rola Dashti MP, meeting, 16 March 2010.

Economic Volatility

The vulnerability of Kuwait's economy can be seen in levels of economic volatility. To explore this issue, Koren and Tenreyro decompose volatility into three main components:⁴⁵ the first captures the volatility of sectoral shocks – an economy that is concentrated in sectors such as oil that show high intrinsic volatility will tend to experience higher aggregate volatility; the second captures aggregate country-specific shocks – these are shared by all sectors in an economy, reflecting general conditions such as political and macroeconomic instability; the third captures the relationship or co-variance between sector-specific and country-specific shocks – for example, fiscal or monetary policy shocks in some countries might be associated with shocks to particular sectors, due for instance to inadequate countercyclical monetary or fiscal policy.

Koren and Tenreyro then look at how volatility and its components have evolved in GCC countries from 1970 to 2006. During this period, compared to the global turmoil of the 1970s and in Kuwait's case the troubles of the 1980s and early 1990s, aggregate volatility has abated significantly. Growth rates have also picked up: after two decades of negative growth, for instance, Kuwait experienced an average growth rate of 4.4 per cent in the 1990s and 4.5 per cent between 2000 and 2006, the highest in the region. Part of this stability is attributable to the Great Moderation, with steady growth and low and stable inflation in most of the advanced economies spreading to the GCC, though this may have given way to hubris and a collective blind eye to other dangers such as asset bubbles that have subsequently materialised. But it also reflects a higher degree of sectoral diversification in most GCC economies, though this process is least advanced in Kuwait. Sectoral risk declines quite steeply with the level of development, indicating greater economic and technological diversification and the smaller intrinsic volatility of each sector. Notwithstanding some convergence since, all six GCC countries catch the eye as the biggest outliers, reflecting the towering influence of oil, with levels of risk highest in Kuwait.

The limited diversification and development of the private non-oil sector can be further seen in calculations from the European Central Bank, describing the state of diversification in possible growth areas for GCC countries, namely commodities, manufacturing, finance and tourism.⁴⁶ Again Kuwait seems less diversified than other GCC countries, though the financial sector has grown recently and is one in which Kuwaitis outnumber their expatriate counterparts.

Comparative Advantages and Assets

Notwithstanding this, Kuwait enjoys a number of strengths – some inherited, others instituted – that reduce the risk of crisis even if they do not completely ensure the success of a transition to a knowledge economy. The relevant items on this list of strengths include:

- **Plentiful resources of capital** – the combination of Reserve Funds and private sector offshore investments exceeds \$300 billion. though no official figures are available. A more modest, but still significant amount is held on shore. In tandem, they are taken be a key contributor to the ecosystem's ability to mobilise resources, and the development of capital-intensive industries.

⁴⁵ Miklos Koren and Silvana Tenreyro (2010) "Volatility, Diversification and Development in the Gulf Cooperation Council Countries." LSE Mimeo.

⁴⁶ Michael Sturm, Jan Strasky, Petra Adolf and Dominik Peschel (2008) "The Gulf Cooperation Council Countries: Economic Structures, Recent Developments and Role in the Global Economy." *European Central Bank Occasional Paper Series No. 92*. Note that these sectors are neither knowledge-based nor capture all knowledge-based activity in a given economy, thereby possibly understating levels of knowledge-based diversification.

- **Abundant availability of petroleum** – on the plausible assumption that the cost of energy to local industry is lower than for other locations, energy-intensive industries, from petrochemicals to aluminium and bioelectronics, should benefit. The Independent Petroleum Group, established in the 1970s to develop a downstream petrochemicals sector highlighted this potential; today, many of these sectors are dominated by regional players – for instance, Sabic and Qafco in chemicals and fertilisers.⁴⁷
- **Sophisticated consumer base** – with high disposable incomes, Kuwaitis are sophisticated, early adopters of new technology. Many innovations in online commerce are routinely piloted in Kuwait before being rolled out to other GCC countries.⁴⁸ Demand for advanced products, such as “smart homes” as an estimated 275,000 new housing applications are made over the next 20 years, may provide a lead market for entrepreneurs. The willingness and ability of consumers to adopt new technologies are viewed by some as more important to a country’s prosperity than having a high share of R&D and are invoked to explain, amongst other things, US leadership in IT.⁴⁹
- **Young population** – Kuwait’s population, like that of the Arab world in general, is skewed towards young people. Whereas OECD countries will be confronting the seismic impact and spending needs of a rapidly ageing population, the proportion of working-age Kuwaitis is predicted to rise to 49 per cent of the population by 2030.⁵⁰ Provided appropriate policy choices are made, this implies a larger number of “productive” members of the economy. Preferences for entrepreneurship are systematically found amongst younger people.⁵¹
- **Location** – the country is at the heart of a substantial regional market, which includes major population centres of the GCC countries, southern Iraq, western Iran, northern Saudi Arabia and potentially a wider bridge to west, north and east Africa, eastern Europe and east Asia (the last already accounts for 75 per cent of Kuwaiti exports). Proximity to large markets could provide a very important strategic advantage in negotiating externally and attracting foreign business and technology to locate to Kuwait.⁵²
- **Small country** – Kuwait’s size may make various forms of networking easier while reducing principal–agent problems. Unlike larger and administratively more complex states, Kuwait has theoretically fewer veto points to sabotage or dilute the implementation of policy (although to reach consensus in the National Assembly on policy and law can take a significant amount of time, as the recently approved Privatisation Law shows).

Significant if Scattered Initiatives to Improve the Ecosystem

The government, moreover, has been taking steps to upgrade its S&T system. The 2007 Blue Ribbon Report, with its call for greater and more focused R&D spending under an STI Council as presented to us at the seminar, has provided significant impetus for these efforts, but they are long

⁴⁷ Office of the Chief Economist, Samba Financial Group (2009) “Saudi Petrochemicals Sector: Current Situation & Future Prospects.” *Samba Report Series*, August.

⁴⁸ See Oxford Business Group, *The Report: Kuwait 2010*.

⁴⁹ Amar Bhidé (2008) *The Venturesome Economy: How Innovation Sustains Prosperity in a More Connected World*. Princeton University Press.

⁵⁰ National Bank of Kuwait (2009) “What Will Kuwait’s Population Look Like in 20 Years’ Time?” *GCC Research Note*.

⁵¹ David Blanchflower, Andrew J. Oswald and Alois Stutzer (2001) “Latent Entrepreneurship Across Nations.” *European Economic Review*, 45(4–6).

⁵² UNCTAS (2009) *The World Investment Prospects Survey 2009–2011*. UNCTAS.

overdue.⁵³ KISR's almost exclusive focus on research has enjoyed some notable successes, for instance in fishery and environmental management and the development of reverse osmosis technology; but this is also a source of the ecosystem's greatest weaknesses. With management and business-development skills on the backburner, the system has difficulties in commercialising or sustaining initial success for the long term.

This mismatch between invention and innovation capabilities is not unique to Kuwait, though the scale of upgrading necessary to bring Kuwait into line with not just high-income countries but also developing ones makes it more glaring. R&D expenditure per capita is only around \$46 in Kuwait (under 0.2 per cent of GDP) compared to over \$850 in high-income countries and \$150 across the world. Institutions like KU and the KISR provide the central mass of scientific and technological talent, but this concentration arguably undercuts the ability of industry – notably the Kuwait Petroleum Company (KPC) – to engage with research institutions by limiting its absorptive capacity. Apart from KU, whose primary mission is teaching, KISR is the only institution with serious research capability. While its standing provides focus and leadership, the price has possibly been reduced institutional diversity. This lock-in is not lessened by participation in regional and international networks: from the hesitation or inability to compete for tenders in international markets such as National Institutes of Health (NIH) and National Science Foundation (NSF) programmes in the USA and Japan and the EU's Framework Program 7 to the paucity of non-Kuwaiti researchers and technicians in local institutions, there appears to be an implicit and subtle home bias. This raises the existential question of whether the system will have the capacity to translate any increase in R&D spending – say, to 1 or even 2 per cent of GDP – into enhanced competitiveness and performance.

Recent efforts to reconfigure policy around innovation derived from and encouraging knowledge transfer and openness, and the enthusiasm of institutions such as KISR and the National Offset Company (NOC) in their endeavours, attest that the policy community recognises the scale of the challenge involved. The period has seen the establishment of the National Technology Enterprises Company (NTEC), the Kuwait Small Projects Development Company (KSPDC) and NOC with the purpose of adopting a more arm's-length, private sector approach towards management of these issues.

A central pillar of this strategy has been the overhaul of the FDI regime, whose restrictions and cumbersome nature compare unfavourably with the greater activism of GCC neighbours. In 2008, Kuwait had the dubious distinction of being the lowest recipient of FDI in the GCC, with inflows of only \$58m. This contrasts with Bahrain, Oman, Qatar, Saudi Arabia and the UAE, which received \$1,794m, \$2,928m, \$6,700m, \$38,223m and \$13,700m in FDI respectively.⁵⁴ Further measures such as permitting international arbitration, extending the lifespan of build–operate–transfers (BOTs), improving access to land and moving to one-stop shops may be necessary to encourage greater inflows of FDI where appropriate.

Privatisation, as the main lightning rod for the standoff between government and parliament, has been slow and uneven. Efforts to energise the private sector have resulted in the enactment of Law 7/2008 and the scheduled privatisation of Kuwait Airways (6/2008), while the entry of three domestic and two foreign providers in the telecommunications sector has increased contestability, though the sector continues to lack a regulator. It should be noted that Law 7/2008 is also referred to as the Public-Private-Partnership Law (PPP Law) and/or the BOT/PPP La). The privatisation law was approved by the National Assembly in May 2010.

Finally, the government has signed a number of memoranda of understanding with Singapore, beginning in 2003, which have helped create a central platform of government IT reform, including

⁵³ Kuwait Research Review Panel (2007) *Report of the Kuwait Research Review Panel*, September.

⁵⁴ Mahfouz Tadros (2009) "Foreign Direct Investment (FDI) in GCC Countries: The Case of Kuwait." Mimeo.

the establishment of the Central Agency of Information Technology (CAIT). But again there appears a gap between plans and deeds: the most recent Networked Readiness Index (NRI), compiled by the World Economic Forum and Insead, ranks Kuwait 76th of 133 countries, the lowest in its income class and a deterioration from previous years. Government appears to be the least ready and show the lowest interests towards ICT advances of all sectors, ranked 115th and 81st for readiness and usage respectively.⁵⁵

These issues demand further systematic investigation, which is not possible within the scope of this discussion; however, a few tentative observations are possible.

Lack of Coordination Impedes Efforts to Bring Initiatives Together

Above all, many have expressed the concern that endeavours do not add up to a coherent whole. The hub-and-spoke structure of the Kuwaiti bureaucracy has created steep and segmented hierarchies, with departments and agencies eager to defend their turf in distributive and regulatory terms. There are few mechanisms for coordinating policy and its delivery, making it extremely difficult to manage cross-cutting issues. Cleavages are so pronounced that even institutions such as KISR and KU that are otherwise close kindred, located in the public sector and directed at academic missions, have had problems acting in unison.

The experience of successful latecomers is illuminating. Taiwan and Singapore succeeded in large part because they were able to act in a coordinated manner with a strategic lead being provided by a lead agency – in Taiwan's case, the Council for Economic Planning and Development, and in Singapore's case, the Economic Development Board. These organisations are inevitably close to top officials and politicians. The Finnish Research and Innovation Council, which “addresses major issues relating to developments in science, technology and innovation policy and the human resources they entail, presenting the related proposals and plans to the Government”,⁵⁶ is chaired by the prime minister and has as members five other cabinet ministers, including the Minister of Finance, as well as wide stakeholder representation from the directors general of the Academy of Finland, universities, industry and the labour unions. Finally, as some commentators have pointed out, agencies with broader, cross-sectoral jurisdictions typically enjoy greater autonomy and independence because legislative oversight is more difficult.

Creating a knowledge economy requires self-conscious acts of coordination. For instance, an oft-cited criticism of the public tendering process is that it is biased towards existing technological solutions perceived to be low risk and value for money rather than serving as a catalyst for the adoption of new technology. The constituents of the ecosystem are so interdependent that efforts to support one area, however well designed, are unlikely to materialise unless others are functioning adequately. Actors and institutions implanted in a business environment plagued by the burden of regulatory compliance, a lack of transparency, limited administrative efficiency, diluted implementation and pervasive elements of informality cannot avoid inheriting and reproducing these distortions in their behaviour. It can be seen in the preference of foreign companies for hands-off arrangements instead of equity investments or joint ventures when discharging their offset obligations; it can be seen in the NTEC's shying away from early-stage technologies and transformation into conventional venture capital firms, and the limited demand for both short-term and long-term finance;⁵⁷ it can be seen in the resilience of family-owned conglomerates that

⁵⁵ Soumitra Dutta and Irene Mia (eds) (2010) *The Global Information Technology Report 2009–2010*. World Economic Forum/INSEAD.

⁵⁶ Finnish Government (n.d.) “Research and Innovation Council.”

<http://www.vn.fi/hallitus/tutkimusneuvosto/en.jsp> (accessed 14 September 2011).

⁵⁷ As the World Bank pointed out in a survey to its 2001 report, “the availability of short-term funding was either not applicable or not a problem” for 80 per cent of respondents, and only 15 per cent noted that “it was

internalise transaction costs when formal contracts and external funds are vulnerable to problems of weak governance but provide an unreliable and opaque basis upon which to operate on a larger scale and deal with strangers;⁵⁸ and it can be seen in the ongoing utility of personal contacts (*wasta*) that help make responsive an otherwise indifferent and obstructive bureaucracy.

Weaknesses in Governance and an Enabling Business Environment

The World Bank Worldwide Governance indicators show that Kuwait's position has stalled and even declined over the past decade, partly reflecting the fact that bureaucratic mechanisms can prove remarkably sticky once they are settled upon, whereas some GCC neighbours like Qatar have seen improvements in their capacity.

This picture is also confirmed by the World Bank/IFC's *Doing Business 2010* report.⁵⁹ Overall Kuwait ranked 61st out of 183 economies, though this hid the shrill fact that without impressive performance along a small number of dimensions – employing workers (24th), protecting investors (27th) and above all paying taxes (11th) – performance would have been substantially worse. Particular concerns arose in areas such as enforcing contracts (113th), starting a business (137th) and trading across borders (109th), not least because of Kuwait's small-country status. The fact that Kuwait's performance is so bifurcated with severe bottlenecks sitting alongside oases of good practice needs closer probing.

Nonetheless the preconditions for successful regulatory reform go beyond the apparent scientific patina of indicators. On the one hand, regulatory reform is stillborn without adequate enforcement, but that enforcement requires incentivising low-level bureaucrats for whom minimal effort, bordering on inactivity, is the safest strategic option, since daring to put one's head above the parapet and display any reformist initiative brings only greater risk and responsibility, often with little prospect of reward.⁶⁰ On the other, an embedded culture of informality and arbitrariness, exemplified by the suspicion that institutions and processes are being designed in the interests of insiders, can erode trust and perceptions of regulatory fairness at a political level. Cross-national evidence suggests that low levels of trust go hand in hand with high levels of intervention as a means of coping with and compensating for lack of order. In a vicious cycle, the public favours state control over untrammelled activity by "unneighbourly" entrepreneurs, even when the public knows that government is corrupt and ineffective and that excessive regulation will have a chilling effect on entrepreneurship – and indeed that bureaucratic immobility will only generate further incentives to bend or circumvent the rules.⁶¹

As intimated above, there are enclaves of professionalism within the Kuwaiti system, such as the Central Bank of Kuwait and KIA, that have enabled relatively swift and transparent administration,

a moderate-to-very-severe problem". Likewise 87 per cent of respondents found that "the availability of long-term funding was either not applicable or not a problem, while just under 10 percent said that it was a moderate-to-very-severe problem". In a similar way, KSPDC has not been able to dispense all the funds it has received from the Kuwait Investment Authority (KIA) – some 40 million dinars – due to lack of attractive or credible projects. See Steffen Hertog (2010) "Benchmarking SME Policies in the GCC: A Survey of Challenges and Opportunities." *Research Report for the EU-GCC Chamber Forum Project*.

⁵⁸ Avinash Dixit (2009) "Governance Institutions and Economic Activity." *American Economic Review*, 99(1)

⁵⁹ World Bank/IFC (2010) *Doing Business 2010: Reforming through Difficult Times*. World Bank, IFC and Palgrave Macmillan.

⁶⁰ Steffen Hertog (2010) *Princes, Brokers and Bureaucrats: Oil and the State in Saudi Arabia*. Cornell University Press.

⁶¹ Philippe Aghion, Yann Algan, Pierre Cahuc and Andrei Shleifer (2009) "Regulation and Distrust." *Ecole Polytechnique Centre National de la Recherche Scientifique Cahier No. 2009-22*. These are points that came out of our numerous discussions with the LTE.

even if some of the actual interventions and decisions are criticised.⁶² Administration is generally easier when policy issues can be decoupled and broken down into discrete projects. Again, further investigation is necessary to understand how these “islands of efficiency” emerge and operate in Kuwait and where possible to universalise their lessons.⁶³ Significant resources permit not just the creation and funding of islands of bureaucratic efficiency but also the training and incentivisation of mid- and low-level bureaucrats, whose role tends to be underestimated in regulatory accounts but who are critical to the integrity of regulation.

Finally, mindful that most reforms will touch raw distributional nerves, there is scope for building safeguards into processes such as privatisation and liberalisation. Other countries have innovated to get the necessary buy-in via giveaways and underpricing (which benefit citizens who apply to be shareholders); valuations (which benefit citizens and taxpayers); employee share-ownership schemes (which benefit workers); and to a lesser extent management buyouts (which benefit managers), forestalling the opposition that might otherwise block the creation of a more entrepreneurial culture.⁶⁴ To reinforce the virtuous circle of confidence, these innovations should focus first on “easier” activities that do not entail substantial labour redundancies or adjustments in prices or tariffs and new investments in areas that would otherwise be reserved for the public sector – not least some of the projects outlined in the latest Four Year Plan, such as Harir City and production of electric power and water distillation plants.

Weaknesses in the Education System and the Skills Base

The other weak link is the state of the education system and human capital. However much government spends – and the Kuwaiti government allocates almost 13 per cent of its budget to education – the return on the investment has been disappointing. Although the system has seen improvements in enrolment, they are crude outputs not closely associated with quality. In the rankings of TIMSS 2007, Kuwait was placed near the bottom for mathematics with 354 points, and given 418 points for science, with no students reaching the advanced international benchmark. In the 2006 PIRLS rankings for reading, Kuwait finished third from bottom with 330 points, a considerable distance behind the top regional and global performers. A particular concern is that young men are not interested in education; they cavalierly expect a government job regardless of what or how much they learn. Women have a more certain work ethic but have been frozen out of the labour market for economic and socio-cultural reasons. Traditional pathways for new female workers such as light manufacturing have struggled to find space in an environment dominated by oil production.⁶⁵

Besides the perverse incentives of the social contract, the education system must cope with the strains of educating a young and expanding population – the old dictum that more means worse is an early storm warning to educators and policymakers. Teaching is considered a professional dead-end for top graduates, a stark contrast to the world’s most successful systems – Finland, South Korea and Singapore – which have attracted the best people to become teachers, developed them into effective teachers and intervened when students have fallen behind.⁶⁶ Low entry requirements seal the profession’s Cinderella status: despite the fact that teachers’ salaries are generous in *absolute terms*, what arguably matters more is how well teaching pays *relative* to other occupations, and its opportunity costs in both monetary and non-monetary terms. At any rate

⁶² Interviews.

⁶³ Hertog (2010) *Princes, Brokers and Bureaucrats*, p. 30.

⁶⁴ Nemat Shafik (1996) “Selling Privatization Politically.” *International Journal of the Economics of Business*, 3(3).

⁶⁵ Michael Ross (2008) “Oil, Islam and Women,” *American Political Science Review*, 102(1).

⁶⁶ Steven Rivkin, Eric Hanushek and John Kain (2005) “Teachers, Schools, and Academic Achievement.” *Econometrica* 73(2). See also McKinsey & Company (2008) *How the World’s Best Performing Schools Come Out on Top*. McKinsey.

there is evidence that non-Kuwaiti teachers are poorly remunerated, and it did not go unnoticed in our interviews that the golden period of education, the 1960s, coincided with the substantial participation of Palestinian teachers in the Kuwaiti school system. There is also a concern that education strategies and curricula are not explicitly connected to economic goals or market needs, with muted collaboration between the business sector, labour departments and local community groups such as parent associations. In particular, a tradition of rote-learning and instruction has less and less purchase in a world where raw information is increasingly free and ubiquitous, yet the ability to synthesise, process and draw fruitful abstractions from it is in short supply; at other times, education has been used defensively to protect a fragile sense of identity that can take a highly dialectical form, setting those who embrace modernity against those who do not.⁶⁷

In this regard the growth of private and Western-style universities – the Australian College of Kuwait, the American University of Kuwait and the Gulf University of Science and Technology – is a promising institutional development. At present no more than 10 per cent of Kuwaiti citizens have obtained a university education, but some of these institutions offer a different educational model that emphasises instruction in English and the use of Western curricula, textbooks and academic requirements, often in partnership with foreign universities.⁶⁸ It is too early to evaluate the success or sustainability of these new innovations: reported concerns about quality control may amount to nothing more than teething problems that will resolve themselves over time.⁶⁹

Nonetheless it is possible that the drive to expand higher education is confusing symptoms of underperformance with its underlying causes. A recent finding of what might be loosely called the neuroscientific revolution – the growth of scientific understanding of the brain and mind – has been the renewed attention to the early and adolescent years. Nobel Prize-winner James Heckman likens the learning process to scaffolding: all cognitive, social and emotional competencies are built on a foundation of competencies that are developed earlier, implying that their early mastery makes learning at later ages easier, more motivating and more likely to continue.⁷⁰ One estimate suggests that 50 per cent of the variance in inequality in lifetime earnings is determined by age 18.⁷¹ Hence by the time a student reaches university, the scope for enhancing skills may be limited. Building a workforce prepared for the knowledge economy requires sensitivity to the underlying technology of skills formation – the fact that certain periods are more optimal for learning certain skills than others. It also requires that learning is carefully integrated with its motivational and emotional aspects: education must be something that pulls people in – the Science Club that engages students with an interest in S&T may be a serviceable precedent for imagining other ways in which motivation can be fostered for productive activity.⁷²

Above all, a tighter and more obvious link between effort, aspiration and achievement is required. Schools and colleges can begin this process by rewarding desirable behaviour not just at the top but at all levels – for instance, by fixing the level of starting salaries for public sector jobs to high school grades or providing a citizens' grant for reaching particular educational milestones. Introducing some form of selection and excellence to the education system along the lines of the

⁶⁷ Jean-Eric Aubert and Jean-Louis Reiffers (eds) (2003) *Knowledge Economies in the Middle East and North Africa: Toward New Development Strategies*. World Bank Institute.

⁶⁸ For a discussion of these issues, see Christopher Davidson and Peter Mackenzie Smith (eds) (2008) *Higher Education in the Gulf States: Shaping Economies, Politics and Culture*. SAQI in association with London Middle East Institute.

⁶⁹ The Blair Report cited research from the Kuwait Development Institute.

⁷⁰ James Heckman (2008) "Schools, Skills, and Synapses." *IZA Discussion Paper No. 3515*.

⁷¹ Flavio Cunha and James Heckma (2007) "The Evolution of Inequality: Heterogeneity and Uncertainty in Labor Earnings in the U.S. Economy." *NBER Working Papers, No. 13526*.

⁷² Monique Boekaerts (2010) "The Crucial Role of Motivation and Emotion in Classroom Learning." In CERI (ed.), *The Nature of Learning: Using Research to Inspire Practice*. OECD. See also references in Cisco (2010) "The Learning Society." White Paper.

British grammar school or the German gymnasium is another option. One virtue of low-income inequality, in Kuwait and elsewhere, is the freedom of manoeuvre it affords educators to improve welfare, especially as there is evidence that high-ability students benefit more from having higher-achieving schoolmates and less variation in peer quality than students of lower ability.⁷³ Insofar as the experiences and opportunities of children are broadly similar in equal societies, it is possible to distinguish abilities without violating principles of fairness. By contrast, in societies where the imprint of family investment and differential access to opportunities patterns life-chances, selection can harm not only efficiency but also equity by perpetuating the accidents of birth.

⁷³ Weili Ding and Steven Lehrer (2006) "Do Peers Affect Student Achievement in China's Secondary Schools?" *NBER Working Paper No. W12305*.

Section 5 Common Strategies for Upgrading

How latecomers compete in global markets at a stage in their development where they have basic industrial structures in place but are neither technological leaders with inimitable knowledge assets nor still benefit from low, unskilled wages shines light on the strategic options available to Kuwait. The first observation is that high-tech industries in emerging economies import many important peripherals, parts and components. Imports play a much greater role than they do in advanced economies, even in import-intensive industries such as electronics.⁷⁴ Similarly, internationalisation is a much greater imperative for latecomers. It reflects not the normal cycle of growth and expansion whereby firms project initial advantages outwards but a vital springboard for obtaining totally new advantages.⁷⁵ The case for export promotion agencies charged with gathering foreign market information on consumer preferences, business opportunities, quality and technical requirements is much stronger in this respect.⁷⁶ Very few Kuwait firms seem to have this capability.

These mechanisms are allowing latecomers to push into new areas of economic areas, some of which are knowledge intensive on any account. While the heterogeneity of country endowments and circumstances and the pace of change in the global economy make generalisations difficult, it is possible to identify to a number of generic strategies that are being pursued by latecomer firms. In recent work, Ramamurti and Singh of Northeastern University and the Wharton School show how each leverages advantages that are specific and often unavailable to more advanced countries and firms.⁷⁷ Strategies include:

- **Natural resource vertical integrator:** this strategy is available only to countries endowed with natural resources in which firms engage in cross-border forward integration to secure downstream markets. Contrary to the logic of vertical disintegration in many industries, a premium is placed on the integration of all segments of the value chain from resource extraction right down to processing, petrochemicals, distribution and marketing. Examples include Saudi Aramco of Saudi Arabia, Gazprom, Lukoil and Norilsk of Russia, or Vale of Brazil.
- **Local optimiser:** this strategy turns on adapting products and production processes to the distinctive tastes and conditions of local markets, often supplying consumers in countries with underdeveloped “hard” and “soft” infrastructures. Examples include Haier’s washing machines that are not only smaller and better suited to small loads but can be used to wash vegetables, or Tata Group’s trucks that are famous for their ruggedness in demanding climates and ease of maintenance without need for elaborate after-sales care. Adversity is occasionally turned into a competitive advantage: Zain’s growth has been facilitated by the reluctance of Western executives to enter markets littered with institutional voids and alien to their own; similarly Fasttelco has launched WiMax broadband technology to bridge the connectivity gaps in areas that lack physical infrastructure for broadband services.

⁷⁴ Richard Langlois (1992) “External Economies and Economic Progress: The Case of the Microcomputer Industry.” *Business History Review*, 66(1).

⁷⁵ Yadong Luo and Rosalie L Tung (2007) “International Expansion of Emerging Market Enterprises: A Springboard Perspective.” *Journal of International Business Studies*, 38.

⁷⁶ Daniel Lederman, Marcelo Olarreaga and Lucy Payton (2009) “Export Promotion Agencies Revisited.” *World Bank Policy Research Working Paper 5125*. The World Bank’s “State of Kuwait: Energising the Private Sector” report found that only 14.9 per cent of exporting firms had surveyed foreign markets and 46 per cent had a formal marketing function.

⁷⁷ This section draws heavily on Ravi Ramamurti and Jitendra Singh’s excellent (2009) *Emerging Multinationals in Emerging Economy*. Cambridge University Press.

- **Low-cost partner:** this strategy exploits the low wages of emerging markets to gain a place as supplier-partners in high-wage companies. The arbitrage strategy works less powerfully for high-income emerging economies, though firms from these countries may, in turn, outsource work or import low-wage, skilled and unskilled workers with the hope that maintaining a presence close to customers in developed countries will secure more value-added activity. Examples include Wipro, Infosys, TCS, Dr. Reddy's, WEG and Sabo.
- **Global consolidator:** this strategy aims to build global or regional scale in relatively mid-tech industries such as cement, steel, aluminium, auto parts, personal computers and beverages. Firms exploit late-mover advantages by utilising plants with the newest technology or largest scale available, contrasting with Western incumbents, and are less burdened by uncompetitive labour contracts. Access to cheap credit allows some to make upmarket acquisitions of underperformers in advanced countries. Examples include Tata Steel, Hindalco, South African Breweries, Lenovo, Wanxiang and Cemex.
- **Global first mover:** this strategy seeks to leap to the global technological frontier rather than come up the ranks as a second mover in a mature industry. It requires a strong innovation ecosystem but makes eclectic use of external knowledge. Many latecomer global first movers have come from Israel – compelling proof that small states can develop pioneering technologies. However, Israel's model of development has left it deeply vulnerable; in particular, its single-minded focus on securing advantages on the basis of advanced R&D has constrained its ability to achieve sustained growth. Examples include Check Point, Teva and Embraer.

Our preliminary interviews confirm that the most successful Kuwaiti firms have been operating as natural resource vertical integrators or local optimisers. A problem has been scale. As Kuwait's own experience with cooperatives demonstrates, small firms are not often particularly innovative or dynamic – closer to the antiquated mom-and-pop store than the paradigmatic swashbuckling start-up.

Size matters because it allows firms to exploit scale economies to compensate for lack of cutting-edge technology or to diversify out of declining sectors. It also matters because first movers in advanced countries will use size to single out potential partners in order to reduce their own risk and monitoring costs. Similarly with regard to foreign vendors, bigger buyers are more likely to receive greater technical assistance and other information.⁷⁸ An emphasis on rapid upgrading explains the emergence of distinctive forms of networking, such as centre–satellite factory systems in Taiwan that aim to strengthen small firms by bringing them into the loop of a large enterprise, with appropriate inducements for both sides. It explains the relaxation of rules on domestic M&As and the popularity of outward FDI: cross-border M&As by firms in latecomer economies ballooned almost 250-fold between 1987 and 2006, from \$400 million (less than 1 per cent of global M&A transactions in 1987) to \$100 billion (almost 9 per cent of global M&A transactions in 2006). Acquisitions of brands or marketing or distribution networks, as manifestations of intangibles, are increasing in popularity.⁷⁹ In Kuwait's case horizontal and vertical expansion is particularly obstructed by land unavailability and to a lesser extent by the absence of capital financing and inadequate feasibility studies.

⁷⁸ Michael Hobday (1995) *Innovation in East Asia: The Challenge to Japan*. Edward Elgar.

⁷⁹ World Bank (2008) *Global Economic Prospects: Technology Diffusion in the Developing World*. World Bank.

“Going It Alone” Is Not an Option: Knowledge Transfer and Openness

The appeal of acquisitions underscores another feature of successful latecomers: firms are prospecting and harnessing global networks of knowledge rather than wasting resources in futile efforts to ape the grand scientific and industrial establishments of the twentieth century.⁸⁰ Consider the success of the Brazilian aerospace company Embraer: as the world’s third or fourth largest aircraft maker and the leader in regional jets, it has reached the aviation industry’s technological frontier, the exception not the rule for latecomers. Established in 1969 for military purposes, it was originally a state-owned enterprise, sponsored by the Aeronautics Ministry. Embraer has grown alongside a regional cluster of supplying firms and technical institutes but with it coordinating the supply chain for components. For all intents and purposes, it is a microcosm of a standard, self-standing innovation system.

Crucial to Embraer’s expansion, however, has been its willingness to bypass local firms and institutions. Beginning with its alliance with Piper (USA) in the late 1970s, Embraer has been ruthlessly pragmatic. Today it buys over 95 per cent of the components from the international aerospace market and only shops domestically for low-tech components. Local value-added amounts to only 38 per cent of turnover. When Embraer was faced with skill shortages in the local aerospace research institute in the early 1990s, it had no reservations about setting up an engineering office in the USA. Embraer was consequently privatised in 1994, with major French aerospace companies taking a 20 per cent equity stake in the company in return for access to advanced technologies. Embraer is a national company innovating in its own right but borrows liberally from an international production system and numerous ecosystems populating it.⁸¹

None of this is easy. The vast amount of knowledge around the world is growing ever vaster and ever more rapidly and requires strong horizon-scanning capabilities. Knowledge is not explicit, and is hard to decouple from where geographically it was generated. To understand the options requires the capacity to immerse key decision makers in the knowledge flows – and to have some control over their creation. All requires a big investment in the local knowledge ecosystem to create the ability to link to the global system.

Some countries have made a virtue of judicious disregard of some standard growth-promoting prescriptions just as others strayed by scrupulous regard for them.⁸² Even a backstop like FDI can sometimes hurt a latecomer’s innovation ecosystem more than it helps. Firms may invest in upgrading local capabilities, but only if experienced labour is available: not surprisingly, the most popular venues for US outward FDI in R&D remain Canada and Europe, and vice versa.⁸³ Even then, investing in such capabilities is hazardous due to labour poaching, and may not be carried out by a private firm, especially a foreign one with high opportunity costs in the form of trained researchers at home. It is more rational to keep the corporate crown jewels under the territorial control of top management and scientists far away from prying eyes. Where FDI takes the form of

⁸⁰ Caroline Wagner (2008) *The New Invisible College: Science for Development*. Brookings Institution.

⁸¹ Whether pianos and cosmetics in Japan (Yamaha and Shiseido), missile systems in Switzerland (Oerlikon), mobile phones in Finland (Nokia) or semiconductors in France and Italy (STMicroelectronics), a growing number of companies that are outside the venerable centres of their industries have broken free of geography and transformed themselves into truly “metanational companies”. Yves Doz, José Santos and Peter Williamson (2001) *From Global to Metanational: How Companies Win in the Knowledge Economy*, Harvard Business School Press, This is not an isolated development or even limited to latecomers.

⁸² Dani Rodrik (2007) *One Economics, Many Recipes: Globalization, Institutions, and Economic Growth*. Princeton University Press.

⁸³ UNCTAD (2005) *World Development Report: Transnational Corporations and the Internationalization of R&D*. UNCTAD. See also Titus Galama and James Hosek (2008) *US Competitiveness in Science and Technology*. Prepared for the Office of the Secretary of Defense. RAND.

entirely foreign-owned firms run in export enclaves, it may crowd out the development of local capabilities, as the goal is to take advantage of lower wages.⁸⁴ Ireland's industrial record – buoyant job creation offset by weak indigenous innovation – testifies to the acute trade-offs and risks inherent in this approach.⁸⁵

Joint ventures, by contrast, have proved a more effective form of FDI, though the temptation to use them to strong-arm knowledge transfer is often difficult to resist. Japanese joint ventures were the cornerstone of Taiwan's phenomenal upgrading in electronics. Local content requirements, meanwhile, encouraged the transfer of know-how not only to joint-venture partners but also to local parts suppliers, providing local firms with opportunities to get closer to the frontier without fear of being crushed or marginalised. Given the requirement to buy locally, the Japanese had an interest in suppliers being as efficient as possible. Israel's Bi-national Industrial Research and Development foundation (BIRD) provides another illustration of the hands-on strengths of joint ventures.⁸⁶ By financing as much as 50 per cent of a project in which one Israeli and one US firm agree to develop a joint product and split the revenues, BIRD offers a low-risk model for collaboration. Part of its success comes from the division of labour between Israeli and US firms: the former focuses on R&D and the latter on marketing and product distribution. To this end, BIRD trains Israeli firms in how to work and collaborate with US firms and provides a matching service, with a database, compiled by visiting thousands of US firms, containing information on potential partners and their technological areas of interest.

The Power of Human Capital Flows

The diaspora and return migrants have proved an extremely important channel of knowledge transfer. In particular, they have absorbed the more tacit and serendipitous aspects of knowledge by literally living and breathing it through experience and practice in the context where it resides. One of the first actions many successful latecomers have taken is to send the home population to advanced countries for training, education and employment – for instance, the number of undergraduates applying to UK universities from GCC countries alone doubled between 2006 and 2009.⁸⁷ Along with their familiarity with local circumstances and their credibility among local actors, return migrants and the diaspora can become “Archimedean levers” for change. The danger is that individuals educated or employed abroad do not return home, resulting in a permanent brain drain: emigration rates of highly educated individuals can exceed 60 per cent in some small countries, and since 1990, the highly educated diaspora of developing countries has doubled in size.⁸⁸ The scale of the problem varies with the opportunity costs: the likelihood that a student will remain in the host country after graduation falls as average per capita income in the home country increases, a finding which has somewhat benign implications for a country as wealthy as Kuwait. A strong sense of citizenship and attachment to the country also help stem the haemorrhaging of domestic talent.⁸⁹ The “reverse brain drain” from OECD economies as scientists, doctors and engineers return to their non-OECD homelands to take advantage of new opportunities is of growing importance.

⁸⁴ Vandra Chandra (ed.) (2006) *Technology, Adaptation and Exports: How Some Developing Countries Got It Right*. World Bank.

⁸⁵ Dan Breznitz (2007) *Innovation and the State: Political Choice and Strategies for Growth in Israel, Taiwan, and Ireland*. Yale University Press.

⁸⁶ An impact study found that 75 per cent of Israeli companies listed on the NASDAQ in 1992 had received assistance from BIRD. See Breznitz, *Innovation and the State*.

⁸⁷ David Turner (2009) “Middle East Applications to Study in UK Rise.” *Financial Times*, 25 May.

⁸⁸ Yevgeny Kuznetsov (2008) “Why Is Diaspora Potential so Elusive? Towards a New Generation of Initiatives to Leverage Countries’ Talent Abroad.” *World Bank Institute Working Paper*.

⁸⁹ This was a recurrent theme of many interviews.

The emergence of a global market for skilled professionals has added a new dimension to these discussions as countries increasingly compete to attract and retain foreign talent. In US universities, foreign-born academics constitute more than 25 per cent of the tenure track faculty, make up approximately 60 per cent of the postdoctoral population, and represent more than 43 per cent of the doctoral degrees awarded in science and engineering. The numbers are even more impressive when one considers the disproportionate contribution of foreign-born researchers to productivity in the university and the wider economy: for instance, 44 per cent of the first authors of US papers in the leading journal *Science* are foreign, while they make up one third of the placements of new PhDs with US firms.⁹⁰ Policy needs to be more closely attuned to the motivation of these individuals and the lifecycle of their careers. Pay matters but as “pilgrims”, in the OECD’s typology, they are motivated by a fuzziier, less tractable stew of incentives: autonomy and creative control, dense peer networks and a physically and culturally conducive environment in which to gather and share ideas.⁹¹

No Knowledge Transfer without Absorptive Capacity

As we showed in section 1, the ability to master particular technologies associated with the knowledge economy over the past decade is likely to vary from region to region within the world economy. How far knowledge flows are converted into technological outputs depends on the quality of human capital, access to finance and the business and macroeconomic environment. One regional study finds that FDI, over and above its contribution to capital formation, generated no technological spillovers for Egypt, Jordan, Morocco, Oman, Saudi Arabia and Tunisia during the period 1980–99.⁹² The main reason is that none of these countries possessed the requisite capacity to absorb and make use of incoming knowledge. Under these circumstances, the use of fiscal concessions, especially broad-based instruments such as tax holidays, can quickly become a costly and ineffective drag on a tight public purse.

The Dangers of Overreliance on External Relations

Obtaining external knowledge requires a degree of commitment and investment in order to be successful. Where third parties are also learning and benefiting from the relationship, they will have an incentive to contribute to it as vigorously as possible: but where relations are approached passively, there will be an increased risk of third-party dependence and drift. Trophy alliances may give latecomers the vicarious confidence that learning is taking place; but it is a false sense of security that can blind them to the need for firsthand learning and the paucity of what in fact they are receiving. In a study of international alliances, McKinsey found that two thirds of alliances between equally matched partners were successful, but where there was a significant imbalance of power almost 60 per cent of alliances failed.⁹³ This raises the paradox that interests might be served better through alliances that are grounded in equality of resources and capabilities, even though they are not a first-best solution. In other words, think Boston University; not necessarily Harvard.

⁹⁰ Paula E. Stephan (2009) “The ‘I’s’ Have It: Immigration and Innovation, the Perspective from Academe.” In Josh Lerner and Scott Stern (eds), *Innovation Policy and the Economy. Volume 10*. University of Chicago Press.

⁹¹ Jagdish Bhagwati and Gordon Hanson (2009) *Skilled Immigration Today: Prospects, Problems, and Policies*. Oxford University Press. OECD (2008) *The Global Competition for Talent: Mobility of the Highly Skilled*. OECD.

⁹² Signe Krogstrup and Linda Matar (2005) “Foreign Direct Investment, Absorptive Capacity and Growth in the Arab World.” *HEI Working Paper No. 02/2005*. See also Ali Sadik and Ali Bolbol (2001) “Capital Flows, FDI, and Technology Spillovers: Evidence from Arab Countries.” *World Development*, 29(12); William Cohen and David Levinthal (1990) “Absorptive Capacity: A New Perspective on Learning and Innovation.” *Administrative Science Quarterly*, 35(1).

⁹³ Cited in Joe Tidd and John Bessant (2010) *Managing Innovation: Integrating Technological, Market and Organizational Change*, 4th edition. John Wiley & Sons.

Section 6 Strategic Options

Kuwait is a small economy that is a latecomer to constructing a knowledge economy – with all that implies. However, the country has significant assets along with institutions and initiatives on which to build. For example, the current Four Year Plan, agreed by parliament, the executive and the emir, is an important advance. But it is also clear that the wider enabling environment in which a knowledge economy flourishes requires major and longer-term reform. We were impressed during our visit by the widespread awareness that much of Kuwait's soft infrastructure, from education to the systems of governance and accountability within both the public and private sector, needs reform. A number of our interviewees and those at the half-day seminar went further, pointing to the entitlement culture that disables the entrepreneurialism which is the precondition for a successful knowledge economy. However, addressing and reforming this enabling environment constitute a major political and cultural challenge.

We have organised our proposals into three categories that are tiered in difficulty. There is an array of immediate win/win initiatives and policy interventions, along with closer analysis of the real business models that Kuwait companies can create, which offer a short-term programme of feasible action. They involve a range of relatively autonomous interventions, some within the Four Year Plan, which do not seriously disturb the existing distribution of economic rent while creating some foundations for knowledge economy development. That is what both makes them and limits the pay-offs. In general, Kuwait's capacity to move faster will depend on joint-venture and general openness for business and ideas; the greater its own absorptive capacity the more it will benefit and the larger the pay-offs – which is why the strategy has to be conceived as cumulative and interdependent. There is more institution building to support the innovation ecosystem and soft infrastructure – and then there is changing the wider enabling culture. Kuwait will need to take a careful, well-thought-through, step-by-step approach to improving the wider enabling environment if it wants to reap the full economic and social rewards of a knowledge economy, each step cumulatively strengthening its innovation ecosystem, the vibrancy of its emergent private business sector and its wider absorptive capacity. It is, after all, whole societies and economies that innovate. This is the challenge – but we are under no illusion about how hard it will be to execute and deliver.

Better Marshalling of Pre-Existing Initiatives and Institutions

The first target is to build up the existing components of Kuwait's innovation ecosystem, as far as possible closing the gaps and making the whole system cohere better. In addition Kuwait must proactively look for opportunities to create viable business models and joint ventures in areas where the country has obvious comparative advantage, notably oil, solar energy, water and marine technologies, smart infrastructure – given the scale and ambition of construction – and meeting the demands of rich consumers. The most viable business models initially are likely to be those that are local optimisers and natural resource vertical integrators, but there is no reason why Kuwait could not emulate the success of countries like Taiwan and Brazil and develop global consolidators. Privatisation, joint ventures and spin-outs from existing state-owned enterprises are strategies that other small latecomers have adopted, and Kuwait is unlikely to be an exception – while simultaneously incubating small high-tech firms and start-ups. Our suspicion is that the prospects for finance over the next five to ten years are likely to be more constrained in the wake of the credit crunch and that it will be hard to overtake centres in the region that have first-mover advantage, especially as education and skills development systems do not meet the requirements of dynamic economies today. However, Kuwait has a strong banking sector that will grow and requires support; but hopes for growth need to be realistically anchored. Economic diversification will lie with other sectors.

More attention needs to be paid to developing the capacity and capabilities in intangibles expecting to develop manu-service companies, although we were unable in the span of our short visit to identify particular candidates or sectors in which candidates might be groomed, or to assess whether there is sufficiently strong “soft” infrastructure to help manu-service companies develop. Nor have we had the capacity to inspect, assess and audit the Four Year Plan to offer detailed suggestions as to what elements potentially conform with a knowledge-economy strategy. However, we believe that there are elements within it that should be grouped and classified as Kuwait’s knowledge-economy strategy. Here are some first thoughts.

a) Potential Short-Term Innovation Ecosystem Actions

Public research and technology transfer

- KISR’s transformation plan, to become a centre of excellence focusing on key sectors (petroleum, water, energy and building, environment and life science) and aiming imaginatively to embed commercialisation of ideas, is strategically right and has wide support within Kuwait. However, ambition needs to be tempered with realism; it is hard for a small latecomer state to build up excellent research competence.
- Government and state-owned enterprise procurement policy needs to support business incubation at KISR, KU and other small and medium-sized companies, and then to privilege them with orders.
- There needs to be further investment in KU’s research capability and its own linkages with the business community, in particular in intangibles – design, non-scientific R&D, advertising and brand equity, and management and leadership. We were not able to visit the university and were unable to form a judgement about its strategy and to what degree, if at all, it might be modified to support the knowledge economy. However, it is certain to have a key role.
- The Canadian Research Chair (CRC) model to attract talented overseas researchers should be looked at. It combines generous monetary awards with assurances that researchers can devote a portion of time to their own intellectual interests. For instance, the CRC provides world leaders in their disciplines with an annual award of \$170,000 for 7 years’ duration (renewable indefinitely); in addition, it provides exceptional young faculty with an annual award of \$85,000 for 5 years’ duration (renewable just once).

Market development and firm creation

- Audit all state-owned enterprises for potential self-standing business spin-offs and privatisation options. This is where a cohort of local optimisers and natural resource vertical integrators are most likely to be found quickly, and these can be grown and supported.
- Work within the GCC to create GCC common standards.
- Set up a new or reformed export promotion agency to support firm internationalisation efforts.
- Create emir’s prizes for research breakthroughs and business excellence, open to international participation. We would like to explore this recommendation more fully in a second phase of work, but the design criteria are critical to the success of the idea. The prizes need to be carefully calibrated to encourage sectors and enterprises that correspond with the plans, and it is vital to have a transparent process for determining the winner to avoid charges of favouritism. There also needs to be a strategy for publicising and celebrating winners;
- Extend the Science Clubs to entrepreneurship clubs. Get school children to develop a taste for the private sector, its challenges and rewards, through internships and mentoring.

Finance

- There is growth in sharia retail banking, and there are opportunities for developing sharia-compliant venture capital, start-up and business development. This should be explored and piloted.

Education and skills

- The Four Year Plan seeks to lift educational attainment. Preconditions for this are an immediate improvement in the incentives for males to enter teaching rather than other occupations, and narrowing the pay gap between Kuwaiti and non-Kuwaiti teachers (with the latter being relatively underpaid). Quickly implementable, this could have an impact within a relatively short period.
- There is a need to step up the programme of Kuwait undergraduates studying overseas.
- University and training courses should be audited for relevance, with a view to phasing out those with uncertain value.
- The programmes and links with overseas universities need to be organised as strategically as possible. There are obvious and important arguments for links with centres of excellence, but Kuwait should also build up its linkages with Western and Asian academic institutions where there is more equivalence of capabilities; austerity programmes and cuts to university budgets in many OECD countries make the moment ripe for such collaborations.
- KPC should consider creating a corporate university to train individuals and help organisational learning as its contribution to the innovation ecosystem. We would need to carry out a full audit and assessment to establish the business case.
- Kuwait apprentice schemes that focus on the key growth sectors should be developed.

Openness and improved governance

- Kuwait needs an even stronger institutional capacity to assess, attract and network inward flows of knowledge. KISR and KFAS are the two principal institutions to do such work and one needs to assume lead responsibility, albeit with active input and participation from other institutions, including KU, the Public Authority for Applied Education and Training (PAAET), private universities, the Kuwait Foreign Investment Bureau (KFIB), NTEC, NOC, CAIT and the Science Club, among others. KISR, KFAS or both need to expand overseas operations as knowledge scouts, working alongside whatever export-promotion capacity Kuwait has developed or intends to develop in key growing markets like India.
- This implies a thought-through strategy on identifying priority countries with which to form alliances and joint ventures – a partnership with Malaysia to introduce sharia-compliant finance to the GCC? With India for exports? With India or Britain for inward investment? This recommendation will require further research and exploration.

b) Medium-Term Options

The following ideas and recommendations need further testing and shaping, and are only some of the potential initiatives, but we suggest them as examples of ways of following through on the more immediate actions.

Public research and technology transfer

- Ensure collaboration across ministries and policy coherence by establishing cross-cutting KPIs, cross-cutting budgetary arrangements and a dedicated government body for the knowledge economy and innovation. To reduce the transaction costs of collaboration,

government should increase standardisation of information and HR systems.

Market development and firm creation

- Create a fast-track process for joint ventures.
- Promote intangibles – creative and cultural industries, in particular design, advertising and architecture; management and leadership; ICT and software skills – and raise R&D levels.
- Overhaul and reform public procurement to stimulate innovation. In our short visit we were unable to come to a view, but in general we noticed a low level of trust of public procurement by business, only moderate professionalism and little understanding of its potential strategic importance. But from intangibles to firm growth, public procurement is a powerful strategic tool, especially in areas that will see considerable government investment in coming years, such as health and housing.

Finance

- Promote share ownership and create other incentives to garner and sustain support for privatisation (now enacted by Law 37 of 2010).
- Emulate the BIRD foundation as a model for establishing joint ventures and providing finance for start-ups. For instance, Kuwait might piggy-back off the strength of Indian entrepreneurs and a large market to help market and commercialise unexploited areas of research, say in environmental management.

Education and skills

- Follow through on the educational reforms in Phase One. In particular, boys' staying-on rate needs to be improved. Offer bonuses for attending and completing secondary school.
- Encourage deeper links between the universities and schools.
- Phase out degrees and diplomas that do not prepare Kuwaitis for the knowledge economy.

Openness and governance

- Encourage more professionalism in the public bureaucracy. There needs to be more transparency about how decisions are arrived at. Introduce better training of lower- and medium-level officials, with bonuses and rewards for enforcing regulation or meeting targets. Kuwait might create "one-stop" shops to help business start-ups and compliance with regulation and official procedures. Learn from the operation of existing centres of official excellence.
- Give legal protection for whistleblowers.
- Follow through the Blair Report recommendations to improve the capability of the prime minister's office.

A New Social Contract for Kuwait

An effective innovation ecosystem requires a different kind of social contact – one where the bias is towards rewarding effort and engagement and moving away from simple entitlements. Here is a suite of possible longer-term initiatives.

- Move towards creating centres of academic excellence in the public sector, borrowing from private schools, as the next phase of educational reform. Pilot grammar schools based on selection.

- Consider, as one incentive, making public sector starting salaries conditional on years of attendance at school, building on bonuses.
- Create a Kuwaiti “Permanent Fund”, modelled on the Alaska Permanent Fund, that offers current citizens additional support to acquire assets that are earned by merit or examination – for instance, for students who complete school and/or university or study subjects that are particularly demanded by the knowledge economy.
- Move towards an asset-based welfare system in which, above a certain minimum, income and assets can be earned. Create baby bonds.
- Phase in civil service exams to complete the programme of professionalisation.
- Strengthen the accountability of government to parliament.
- Begin to move towards equivalent wages and conditions in public and private sectors.
- Move toward better systems of corporate governance and accountability for firms. Stock market listing must imply systematic and accurately audited financial statements.

Conclusion

This is an interim report pointing the way to a more diversified knowledge economy that builds on Kuwait’s comparative advantages by creating an innovation ecosystem. To complete our work we need to:

- Analyse closely the Four Year Development Plan to foreground and integrate knowledge-economy strategy initiatives in order to establish any quick wins.
- Follow up areas where our analysis was necessarily incomplete, such as KPC and a corporate university.
- Do a proper market analysis of sectors and industries in which Kuwait might have a competitive advantage. What are the prospects/scenarios for these sectors/industries? What skills and support are they likely to require?
- Map/scan what others are doing in terms of research and knowledge creation, especially in areas that are important to Kuwait. This will allow us to identify opportunities for international cooperation and collaboration with different research centres, and fruitful research directions.
- Do a comprehensive gap analysis of each of the conditions that constitute an innovation ecosystem. For example, in the public research component, where does Kuwait enjoy a comparative advantage? How broad or narrow is the knowledge base? To what extent does the knowledge base cover the whole value chain?
- Develop a series of KPIs by which progress can be measured, drawing on efforts that evaluate innovation in wider systemic and institutional terms.⁹⁴
- Detail local optimiser and natural resource vertical integration business models so that all those who need to understand them can do so. Examine any areas in which there might be opportunities for a global consolidator strategy. How can Kuwaiti firms avoid the pitfalls associated with M&As as they seek to scale up?
- Map Kuwait’s current stock of firms operating in intangibles, and open up discussion about the manu-service business model.
- Examine how the take-up of financial flows to enterprise can be improved.
- Offer suggestions for creation of Kuwaiti selective secondary schools and other educational reforms.
- Scope the possibility of creating a new citizen grant or baby bond.
- Scope emir’s prizes.
- Offer a view on sharia-compliant venture capital and finance.

⁹⁴ One example of KPIs for a national innovation system can be found in European Commission (2003) “European Trend Chart on Innovation.” *2003 European Innovation Scoreboard: Technical Paper No. 5. National Innovation System Indicators*. European Commission.

To this end, we will draw on our existing networks and consult international experts in reference countries and sectors. However, this process will not be possible without dedicated support in Kuwait. As part of any next phase of work, we will need to work closely with the LTE to assemble a group of local researchers – economists, statisticians and social scientists – who will help us determine what data exists, collect new data and mount new research. The mapping of the micro-foundations for good policy is an enormous task. We will also deepen our relationships with local companies and organisations, so that analyses and recommendations are truly iterative and have the greatest possible reach, familiarity and credibility.

Although after our visit to Kuwait we are more aware of the challenges, we are also more aware of the opportunities. This is the trajectory on which we believe Kuwait must travel . The second leg of the report will offer a more detailed blueprint.

Ian Brinkley, Kristian Coates-Ulrichsen, Will Hutton and Philippe Schneider

Appendix A: Summary of the Kuwait and the Knowledge Economy Seminar, KFAS, 15 March 2010

Questions/comments after Will's presentation

Dr Adnan Al-Sultan opened the discussion following Will Hutton's presentation by asking who has been in charge of executing the various strategies thus far. He stated that there is no one unit in charge in Kuwait and that stakeholders are fragmented on multiple levels.

Dr Mahdy Al-Jazzaf stated that many entities within the Executive Branch of the Kuwaiti government need to work together to achieve the transition towards a knowledge based economy. A science, technology and innovation (STI) council had been proposed to ensure that KU, KISR and KFAS coordinate their work. Dr Al-Jazzaf described the Four Year Plan as ambitious and asked if it will achieve a knowledge-economy transition, and, if not, how it may be modified to go in this direction. He added that Kuwait is not a meritocratic system, and that in order for the knowledge economy to take root the economic environment must be an incubator for such skills to rise to the top and allow the entrepreneurial element to flourish.

Dr Naji Al-Mutairi stated that the Kuwaiti dilemma was a question of ascertaining who leads what and in which direction the country should go. He also questioned the relative importance of the role of project managers, as opposed to entrepreneurs.

Second session

Dr Yousef Al-Ebraheem, Amiri Diwan, opened the second session by stating that Kuwait does not have an explicit STI policy as there are currently no guidelines for coordination. There have been uncoordinated attempts in different institutions across both the public and the private sectors.

Dr Al-Ebraheem outlined a number of relevant initiatives that the Kuwaiti government has been working on:

- a) An e-government project that is about 10 years old has developed strategy in coordination and cooperation with the Singaporean government. Its objective is to create a competitive environment among government agencies. Some are now far ahead others, with the Ministry of Interior doing particularly well. However, the programme now has more than one leader and institution – the Council of Ministers as well as the Civil Service Commission.
- b) Education policy aims to make Kuwait a regional centre for education and the development of (non-profit) software, using multimedia, CDs and the internet. This aims to improve the quality of education in schools and is focused on science and ICTs.
- c) The business sector: government institutions, led by KIA, have played a role by establishing two companies – NTEC and KSPDC – to promote technology transfer to small businesses and the private sector, focusing on waste management and the environment.
- d) The private sector: three telecommunications companies have been created – two foreign companies and Zain. However, Kuwait lacks a regulatory agency to monitor and regulate the sector.
- e) The health sector: the Dasman Diabetics Centre is a centre of excellence promoting R&D and technology transfer.
- f) The offset programme uses the transfer of technology as the main component of multipliers.
- g) The Foreign Direct Investment Office aims to attract inward investment and the transfer of technology to Kuwait.

Nevertheless, there is no coordinated effort to bring all of these sectors together. Kuwait needs to focus on addressing the broader issues of job creation, reducing dependence on foreign labour, and the improvement of government services.

Kuwait also faces a number of problems. These include bureaucratic delays and abundance of red tape; lack of a coordinated vision and follow-up policy; frequent change of ministers and service leaders; a weak and outdated legal structure; a perception that spending on IT is a luxury item; and low R&D expenditure. In addition, there is insufficient government start-up capital to encourage new initiatives, as NTEC examines start-up cases from the point of view of commerce and whether they will make a project. There is also a very low level of technological utilisation when investing in IT.

Kuwait therefore needs to find a way to move forward and the new emiri vision makes very clever recommendations. Kuwait should create a task team to regulate and implement policies relating to education, IT and a technology plan.

Dr Al-Ebraheem ended with three recommendations:

- a) Kuwait needs to develop an indicator to measure the level of integration of supply and demand.
- b) The country needs to advance the level of technology used in Kuwait.
- c) It should also develop a report to send to the Council of Higher Planning to develop a strategy with a clear vision and objectives and a roadmap. This must be very specific with a timescale, maybe allowing competition between sectors instead of allowing them all to move forward simultaneously.

Dr Moudi Al-Homoud, Minister of Education, stated that there has been a drive for higher education, but that Kuwait has encountered many challenges to develop the educational system. There have been noble intentions but disappointing end results that have been less than expected. High spending and coverage have not been matched by international results. Students lack incentives to join good schools to pursue an education; consequently Kuwait needs to increase efficiency and competency among students.

In higher education, Kuwait needs to improve the standard of universities (both public and private) and research output, including the insertion of Kuwaitis into world-class universities. This, in common with the other challenges outlined above, needs to be addressed and priorities set as they cannot all be tackled simultaneously. The Four Year Plan therefore sets the following priorities:

- a) Increasing competence in international exams, particularly maths and science, by improving curricula.
- b) Improving the quality of teachers and learning.
- c) Improving technology and education in general.

These are the three major projects and priorities currently ongoing. Kuwait needs to integrate them with the national vision in terms of aligning with private sector and other institutions, as education is the cornerstone of the knowledge economy.

Dr Rola Dashti, Member of the National Assembly, stated that the discussion over the knowledge economy is vital to facing the challenges confronting Kuwait. The country needs to know how to move forward from a notion of citizens' entitlement to one of citizens' engagement. This shift requires a great deal and the knowledge economy is a pillar of it.

Dr Dashti added that human resource development is a big challenge. The quality of education and knowledge creation at the student base is inadequate for a knowledge society. This also has socio-economic implications as the poor standard of many students' education leads to marginalised and unemployable sectors.

There is a lot of aspiration in Kuwait but a lack of a reform agenda for education, particularly now when there is a lot of collaboration between the parliament and the government. Kuwait must consequently change its education model from resources- to results-oriented and needs stronger links with industry. It needs accountability and the measurement of results through indicators.

Economic incentives are also important to the knowledge economy as Kuwait has a bad reputation for doing business, a poor tendering system and a lack of trust in the government.

Reforms must encourage risk taking and the creation of SMEs. This means much more than the mere availability of credit, as tackling corruption, ensuring transparency, quality and the effectiveness of government all need to improve. This is vital to enhancing integrity and preparing laws covering conflicts of interest, asset allocation, corruption and FDI. A comprehensive package is thus needed that relates to integrity and openness. Moreover, intellectual property rights are low on the agenda while the innovation strategy is undeveloped. This needs to cover R&D, think-tanks, non-governmental organisations, consultancies and the creation of knowledge itself.

Dr Dashti ended by arguing that Kuwait is undergoing a period of transformation, and “business as usual” will not suffice. This presents many opportunities to capitalise on as Kuwait moves into this transformation. These include a business-friendly playing field; public governance, transparency and the rule of law; intellectual property legislation; and cooperation between R&D and universities. Underlying all this is the need to think outside the box. The plan of transforming the whole of Kuwait society means that there is much transformation to be done. This entails more than developing the financial sector as it includes the middle class, economic relations, the productive base and capacity building.

Dr Abdullah Al-Sharhan, Australian College of Kuwait, stated that an important law was Law 34 of 2000 allowing the establishment of private universities. This was a regulatory law that introduced a healthy degree of competition and cooperation among universities. It created the Private Universities Council and has been very conducive and helpful in private education. It encouraged Kuwait to internationalise higher education using foreign university partners to enhance the transfer of technology and know-how.

Dr Al-Sharhan described how the Higher Education Ministry utilised the offset programme, for example through the delivery of sophisticated equipment for teaching aviation maintenance and utilising this sophisticated equipment. He called for more support for research in private universities, including funding bodies to specifically support entrepreneurial activities and facilitate the commercialisation of technology. Kuwait also needs more youth clubs, such as the Science Club established in the 1970s, which tapped the hobbies of youth and directed them into scientific studies.

Abdulmajeed Al-Shatti, Commercial Bank of Kuwait, focused on the relationship between the financial sector and the knowledge economy:

- a) The financial sector is a heavy user of IT and banks are major customers of consultancy firms.
- b) The financial sector has led investment in developing the knowledge economy through buying and customising technology, investing in firms either directly or indirectly, and R&D.
- c) The banks are regular contributors to KFAS and Kuwaiti universities and research institutes. This is part of their corporate social responsibility projects, but the levels of venture capital are low.
- d) Banks are a major source of information, both micro and macro.

He identified several trends and future challenges:

- a) The financial industry is very competitive and it will always be a source of innovation.
- b) There is a trend in east Asia towards mobile phone companies investing in banks.

However, there are major challenges to developing the knowledge economy in Kuwait: will financing come from the government or the private sector? Is the government ready to accept failures or lack of tangible results? Is it ready to increase investment in intangibles, particularly after the financial crisis? Where will the data repository reside and who will own it – the customers, the banks or others? The issue of data security is very important.

Dr Adel Asim, NOC, stated that the offset programme depends on the participation of foreign companies. In Kuwait, 35 per cent of the value of contracts fall under the offset programme, which started in 1992 under the Ministry of Finance. However, poor performance led to the government freezing it in 2004 while it determined its performance and capabilities. It consulted the World Bank, which recommended the creation of NOC in 2005, and this began operating in 2006. Dr Asim emphasised its results by stating that under the Ministry of Finance between 1992 and 2004 there was a total of 25 offset programmes, worth KD 741 million. Already, since 2006, 20 projects have been completed, worth KD 1,314 million.

The offset programme has three major objectives: to transfer modern technology to Kuwait; to enhance high-skill jobs for Kuwaiti nationals; and to enhance education. It intersects with several pillars of the knowledge economy:

- a) Through education and informatics, which are the main area of contribution, it intersects with the innovation area.
- b) It supports various economic areas within Kuwait, including training and opportunities, interaction between local entrepreneurs and foreign contractors, in order to facilitate joint business ventures in Kuwait.
- c) It has contributed to offset projects that could become pillars of the knowledge economy, as it has completed 19 education and training projects. It has also supported the private sector and created job opportunities.
- d) It has established a fellowship programme run by the Ministry of Higher Education allowing Kuwaitis to obtain scholarships in higher education in science, engineering and medicine. This programme has sent 250 students abroad since 2003.
- e) The KU Research Park is a current project with a mission to become a resource hub and education centre. Its focus is on science and the creation of a lasting partnership between the government, research institutes and the private sector. There is also a project in maritime management and aviation management (through Boeing at the Australian College of Kuwait).
- f) It has expanded training facilities and training programmes for Kuwaitis.

There are, however, a number of difficulties facing the offset programme:

- a) It has not moved as smoothly as was hoped, facing many obstacles, including licensing, approval, government allocation of land and implementation.
- b) There are sometimes two- to three-year delays for government approval, which discourages foreign contractor participation.
- c) Foreign companies are reluctant to invest in equity and would rather just give money and be finished their offset obligations.

Dr Adnan Al-Sultan argued that importance lies not so much in first-mover advantage as in sustainability, and this is lacking in Kuwait. The MIT–Harvard High-Value-Added Strategy was approved by the Council of Ministers in February 1990, but where is it now? The first study on Kuwait as a financial centre was completed in 1989, but how has the country moved on from this? Kuwait back then also looked to Hong Kong and Singapore as models of development. Therefore the problem is not first mover but how to continue.

Dr Al-Sultan described how NTEC started as a concept in 1998 within KIA. NTEC materialised in 2002, with a long delay between the idea and its execution. He then argued that an innovation ecosystem does exist through KISR, KFAS, KU and KPC, but this is scattered, and NTEC should capitalise on these existing institutions. NTEC has thus far focused on water and the environment, with 32 investments. It has been financially successful and achieved technology transfer. It has also created the Entrepreneurship Centre jointly with MIT, because Kuwait lacked a culture of entrepreneurship. It has a low cost with a budget of \$50,000. It has supported a number of local projects, including two centres within KISR (one in partnership with Microsoft). Hence it has had some successful and positive outcomes.

However, Kuwait needs a clear vision to improve the culture of business and entrepreneurship, stakeholder accountability resting in the emiri office, enforcement to guarantee the implementation of reforms, and a requirement to spend money on necessary improvements.

Dr Mohammad Al-Ramadhan, KPC, stated that intense R&D is ongoing at KPC. This has changed dramatically in recent years as previously a low emphasis had been placed on technology. There is now a new focus on investment in new technology and people, and a plan to create a petroleum centre. The challenge now is to ensure investment in technology to meet KPC objectives. It has worked with NTEC to identify good technologies for investment in by KPC. Nevertheless, Kuwait needs to move from making the initial investment to transferring the technology back to Kuwait. This requires absorptive capacity for new technologies. The question thus is whether Kuwait can take advantage of this investment.

He explained that as oil is the main source of income in Kuwait it is important for KPC to continue to have oil as the primary source of energy. Consequently, KPC created a fund to focus on investment in start-up technologies in North America and Europe, and most investment has been in clean energy funds. Dr Al-Ramadhan ended by stating that KPC is going ahead with plans for an R&D centre in petroleum research and that it has identified an important niche for Kuwaiti opportunities in developing projects as part of the Clean Development Mechanism. Kuwait can also enter the Carbon Trading Scheme and invest in the development of renewable energy such as solar or wind.

Dr Mahdy Al-Jazzaf, KU, summarised the findings of the Blue Ribbon report commissioned in December 2006. These included low investment in publicly funded R&D, absence of a national STI council, lack of R&D focusing systematically on the most significant priorities facing Kuwait, deficiencies in KU and KISR, isolation from global R&D networks, and a commercial and industrial sector not aligned with R&D requirements.

The Blue Ribbon report consequently recommended the following actions:

- a) Significantly increase investment in R&D to 1 per cent of GDP in five years and 2 per cent in ten. It is currently less than 0.1 per cent so this would be a 10-fold increase.
- b) Emphasise petroleum research, renewable energy (especially solar) and water technology, and create centres of excellence in them.
- c) Create a National STI Council as Kuwait needs a higher body to set plans, develop a strategy and monitor implementation of projects.
- d) Reorganise around centres of excellence reflecting national priorities.
- e) KU should strengthen R&D and promote collaboration with other institutions at home and abroad, as well as linkages with industry.

Dr Mansour Ghuloom ended the session by arguing for a clear vision for the future of education, which Kuwait currently lacks. This must cover the meaning and methodology of education. Dr Ghuloom added that Kuwait borrowed the idea of smart schools from Singapore and that he was instrumental in opening one, but that it ran out of funding and therefore had to close.

Appendix B: List of Interviewees

The Work Foundation–LSE team wish to express their gratitude to the following interviewees for making available their time and expertise during the visit to Kuwait:

Mohamed Abueljebain, National Offset Company
Muhammad Al-Hashel, Central Bank of Kuwait
Moudi Al-Homoud, Minister of Education
Ali Al-Mudhaf, Public Authority of Industry
Naja Al-Mutairi, Kuwait Institute for Scientific Research
Yaquob Al-Refaie, Public Authority for Applied Education and Training
Wael Al-Sagar, Businessman
Tarik Al-Sultan, Agility
Adel Al-Wogeyan, Higher Council for Planning
John Baroudi, National Offset Company
Kazem Behbehani, Dasman Centre for Research and Treatment of Diabetes
Mona Bseiso, National Offset Company
Ibrahim Dabdoub, National Bank of Kuwait
Rola Dashti, Member of the National Assembly
Lina Esbeitah, National Offset Company
Mazen Madooh, National Offset Company
Saad Okasha, Arab Fund for Economic and Social Development
Aziz Sultan, Kuwait Engineering Office

Appendix C: Mr Will Hutton's Presentation

The Knowledge Economy: implications and challenges for Kuwait



Professor Will Hutton

Presentation to KFAS Seminar

15th March 2010



Why are we here?



- The Knowledge Economy is 21st century story
- Need to understand in Kuwaiti terms
- Potential tool to operationalise 4 year plan and vision of HH the Emir
- The Work Foundation perspective
- Invitation from KFAS
- Information gathering, hypothesis testing to support a draft interim report.
- Further work may follow....

Outline of Presentation



- Definition of Knowledge Economy
- The evolution and prospects of Knowledge Economy
- The Innovation Eco-system
- Mapping the Kuwaiti context
- Strategies for an emerging small state economy
- Avenues for further exploration

Defining the Knowledge Economy



“Economic success is increasingly based on the effective utilisation of intangible assets such as knowledge, skills, and innovative potential as the key resource of competitive advantage. The term knowledge economy is used to describe this economic structure”

Source: UK Economic and Social Research Council 2005

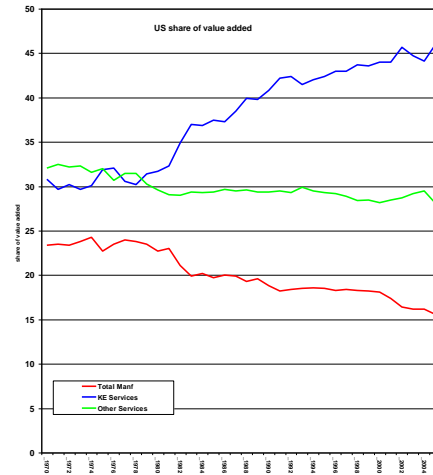
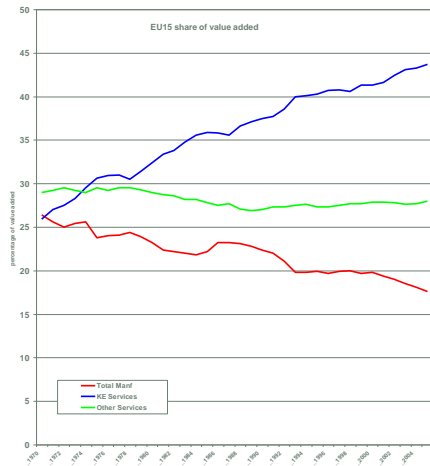
Knowledge based industries defined by the OECD

Note: manufacturing classified by R&D intensity; services classified by ICT use and employment of graduates. Recreational and cultural industries recognised as knowledge based by EU but not OECD, and includes libraries and museums.

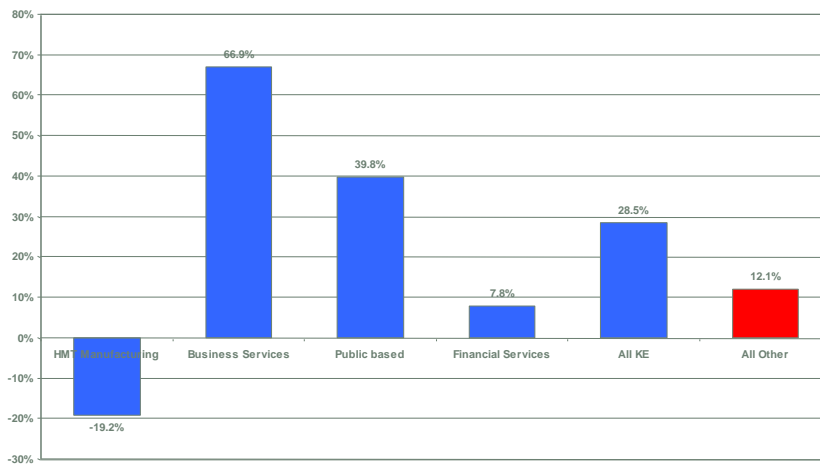


Market based Knowledge industries	Public based knowledge industries	Other market based industries	Other public based industries
<ul style="list-style-type: none"> • High to medium high tech based manufacturing • High tech services (telecommunications, computer services, R&D services) • Financial services • Business services (real estate, advertising, accountancy, legal, technical, consultancy) • Cultural and creative industries 	<ul style="list-style-type: none"> • Education • Health and social work 	<ul style="list-style-type: none"> • Low to medium low tech based manufacturing • Distribution, hospitality • Transport • Other services (dry-cleaning, hairdressing, refuse collection) • Recreational and cultural services* 	<ul style="list-style-type: none"> • Public administration

Growth of knowledge based service industries in Europe and US 1970-2005

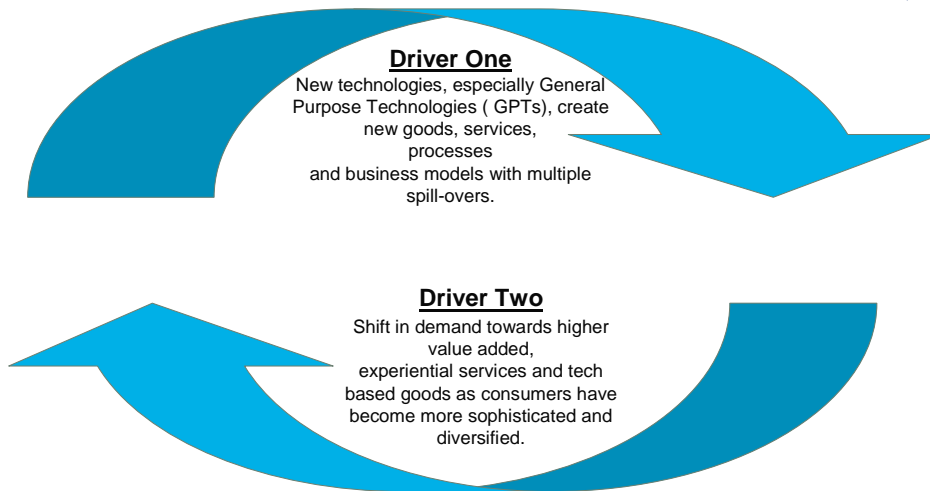


Employment growth across the OECD 1990-2005



Key drivers of the knowledge economy

Growing as proportion of GDP in all western & advanced Asian economies



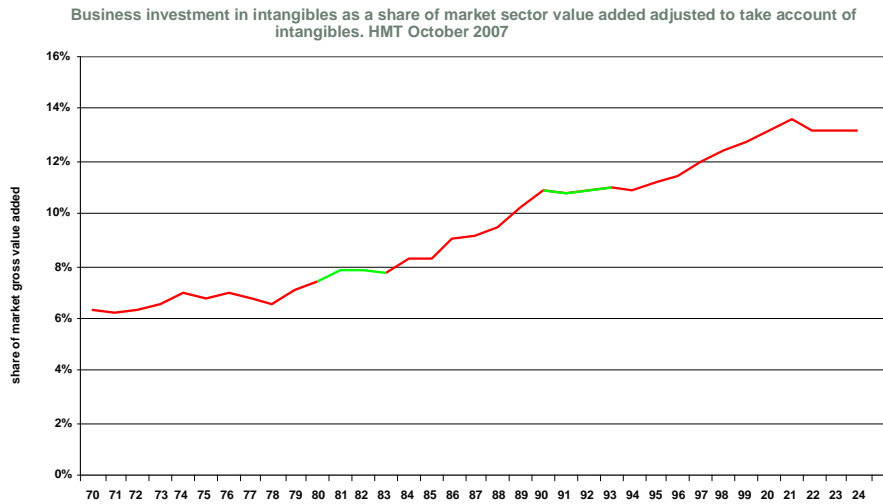
Intangibles and tangible forms of investment



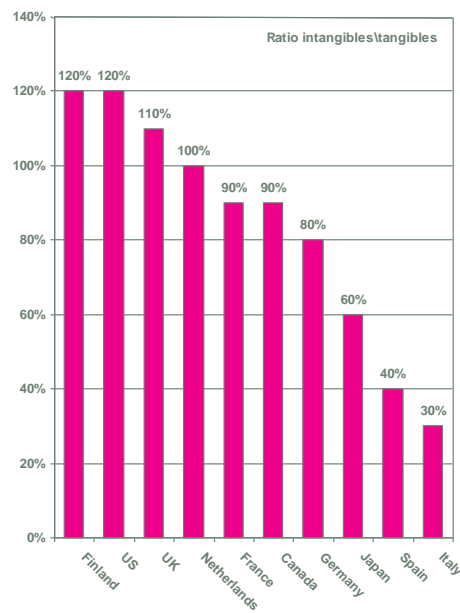
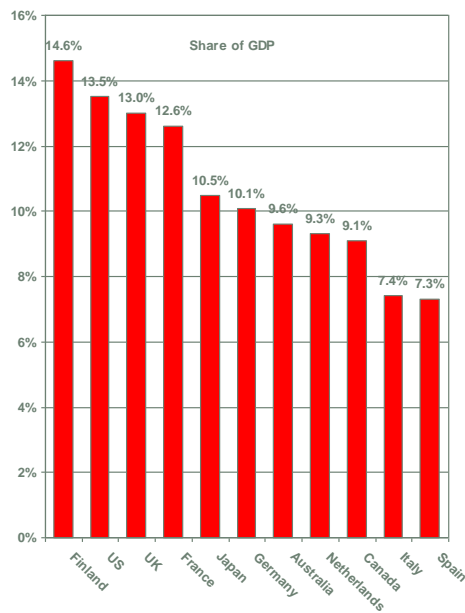
Tangibles	Intangibles	
Buildings	Computerised information	Software and databases*
Plant and machinery	Innovative property	Scientific and non-scientific R&D Mineral exploration, copyright, licence costs* New products from the finance industry New architectural and engineering designs
Vehicles	Economic competencies	Brand equity (strategic advertising plus market research) Firm specific human capital (employer provided training) Organisational structure (share of management time spent on strategy plus cost of external consultants)

The rise and rise of “intangibles” – proof positive of the emergent Knowledge Economy

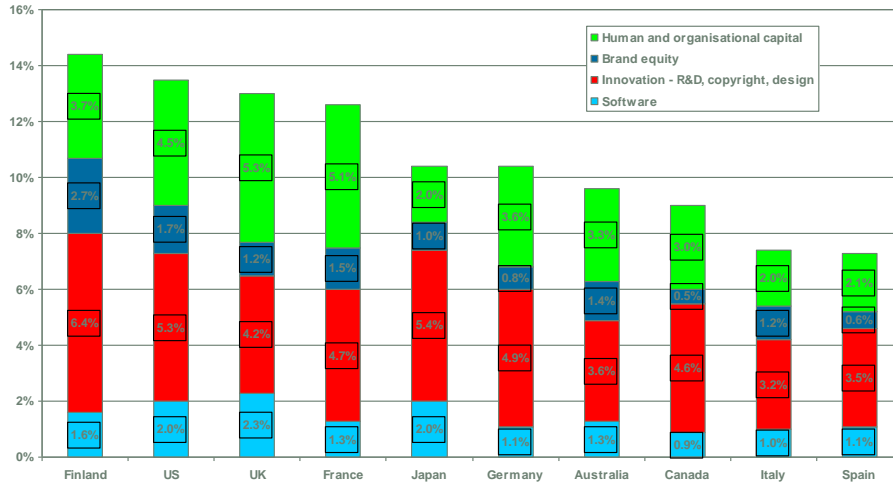
Intangibles investment share 1970-2004



Business investment in intangible knowledge based assets across the OECD



What sort of intangibles does business invest in?



A short history of general purpose technologies (GPTs)...



- 9000 BC – 1400AD**
Seven GPTs
domestication of animals & plants; wheel; smelting of ore; writing; use of bronze; iron & steel; creation of water wheel
- 1400 – 1750**
Two GPTs
three masted sailing ship and printing
- 1750 - 1900**
Five GPTs
steam engine; factory system; railway; iron steamship; communications
- 1900– 2000**
Nine GPTs
internal combustion engine; electricity; motor vehicle; airplane; mass production; computer; lean production; internet; biotechnology

Twenty-first century prospects? Grand challenges for engineering



- Nanotechnologies
- Energy from fusion
- Advanced materials
- Carbon sequestration
- Manage the nitrogen cycle
- Water
- Health informatics
- Durable customised infrastructure
- Customised medicine
- The brain
- Cyberspace security
- Enhance virtual reality
- Personalised learning

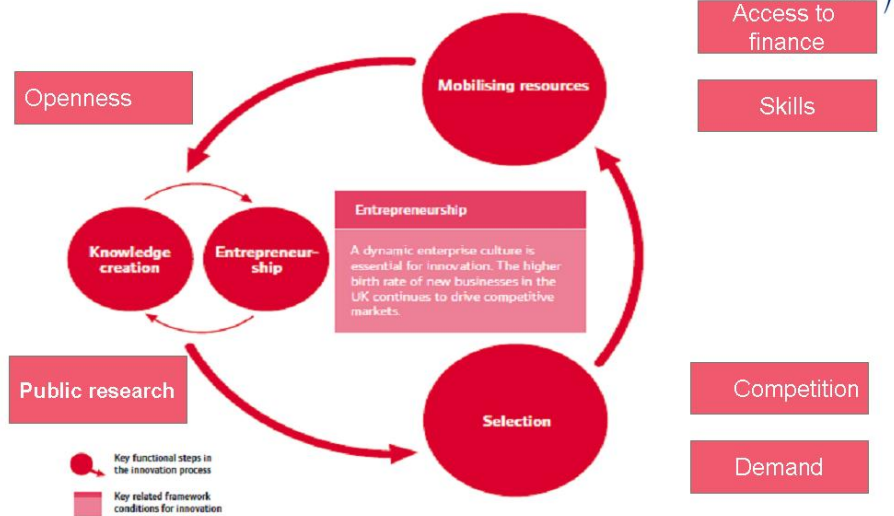


Why exponential growth of innovation



- Knowledge is a public good that constantly expands with each individual contribution to the pool of common knowledge from which others draw
- Multiple combinations of ideas ceaselessly growing
- As a result much invention and innovation happens simultaneously
- Research scientists report that their research anticipated by other teams

The Innovation Ecosystem



A national innovation eco-system to support productive entrepreneurship



- Openness
- Public Research
- Entrepreneurship
- Competition
- Private and public demand
- Access to Finance
- Skills

An innovation eco-system (continued)



- A small economy innovation ecosystem must be more open
- Small economy innovation ecosystems necessary both for indigenous entrepreneurship and capacity to absorb FDI and foreign technologies. The superabundance of knowledge hard to manage in terms of focus and management.
- Productive entrepreneurship really hard to generate. Entrepreneurs chase profit wherever it can be found. They will seek rents, tax breaks and monopoly licenses. Why good governance, openness, proper property rights so important.



Challenges for Kuwait

The big case for embracing the knowledge economy



- The twilight of petroleum - what happens when China slows?
- Fiscal risks as spending doubles in four years compounded by long run demographic change
- Environmental reckoning – resource insecurity
- Knowledge intensive industries have early mover advantage – very difficult to dislodge
- Mastery of one's destiny

Political economy of unproductive entrepreneurship

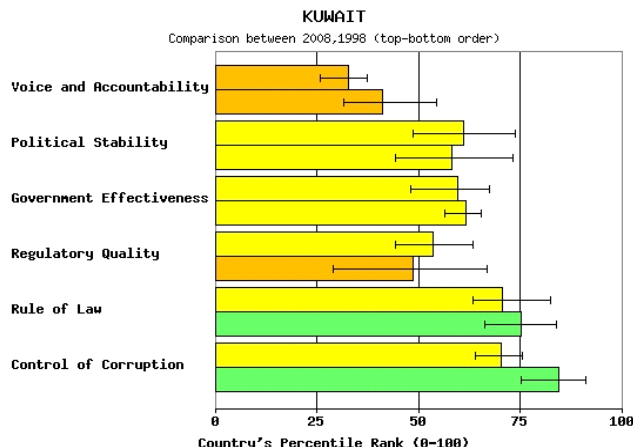


- Kuwait a rentier state – widespread influence of rent-seeking behaviour and policy on productive mentalities
- Patterns of state employment and lavish distribution of oil wealth have fostered culture of low productivity
- Insider/outsider markets (labour and product)
- Kuwait developing reputation as 'bad place to do business'

The political economy of Kuwait



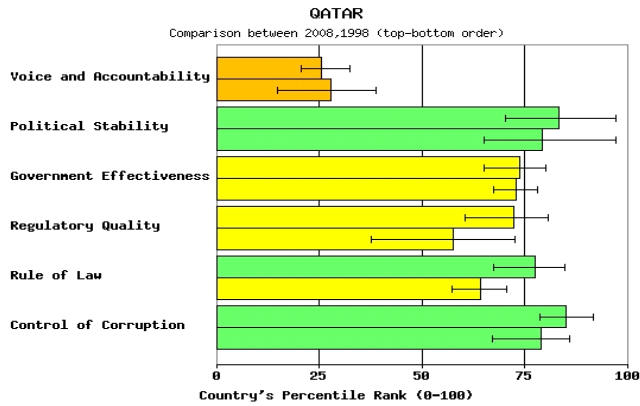
- Strong tradition of consultative govt and participatory politics in Kuwait
- Benefits – system of checks and balances – little chance of replicating ‘Dubai model’ and over-reaching
- Some institutions work well (eg. independence and professionalism of Central Bank)
- But – repeated political crises since 2006 and slow progress with structural reforms and privatisation projects
- Good governance appears to have stalled in the past decade – key to ease of doing business. Others trending better on some key indicators



Source: Kaufmann D., A. Kraay, and M. Mastruzzi 2009: Governance Matters VIII: Governance Indicators for 1996-2008
Note: The governance indicators presented here aggregate the views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organizations, and international organizations. The WGI do not reflect the official views of the World Bank, its Executive Directors, or the countries they represent. The WGI are not used by the World Bank Group to allocate resources.

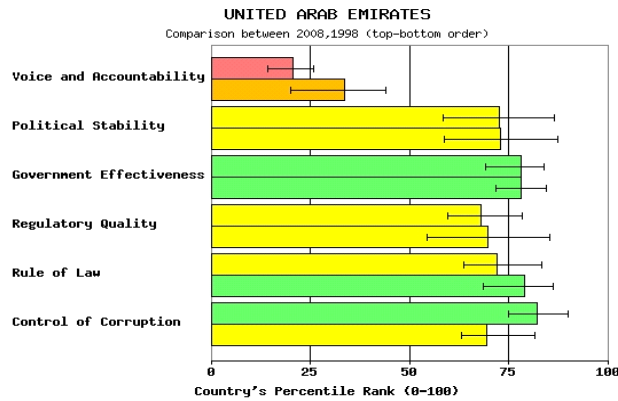
Kuwait and the Knowledge Economy

A report prepared for KFAS



Source: Kaufmann D., A. Kraay, and M. Mastruzzi 2009: Governance Matters VIII: Governance Indicators For 1996-2008

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An audit of Kuwait's innovation eco-system: Assets



- Healthy oil revenues – can be used to develop capital-intensive industries
- Energy prices to local industry necessarily lower
- Favourable geographic position
- Fewer transaction costs as a small state; in theory can mobilise resources, small number of players and monitor compliance with policy
- Embryonic elements in eco-system eg “transformed”KISR

Audit ...



- Young population – youth bulge (50% of population under 20) and % of working age Kuwaitis predicted to rise to 48.9 % of population
- Rich, sophisticated consumers – hungry adopters of new technology
- Investment in and commitment to education, even if returns are disappointing
- Political will at the very top
- Low inequality and strong sense of citizenship

An audit of Kuwait's innovation eco-system: weaknesses



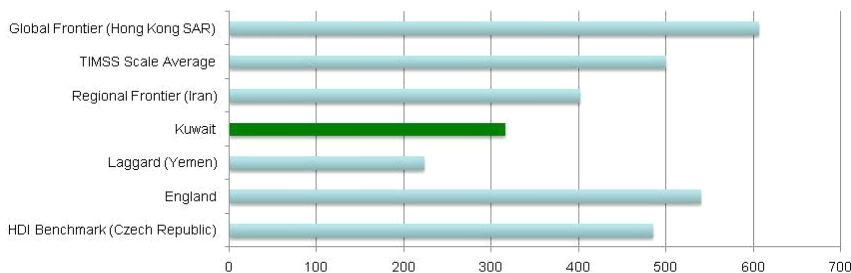
- Entrepreneurship – 2 new businesses per 1000 inhabitants. The lack of intermediate organisations: trade associations and professional societies
- Accountability and governance structures of private companies (family businesses, co-operatives)?
- Research – 0.17 per cent of GDP. Universities focused on teaching.
- How good is capacity to horizon scan and articulate new demand?
- Public procurement? Can knowledge transfer be sustained through offsets? Transparency of tenders?

Challenges continued...

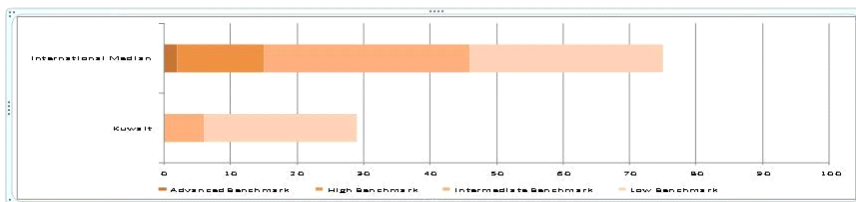


- Finance – time horizons, hurdle rates, appetite for risk, appropriate for firms over life cycle?
- Skills – education scores between 50-60 per cent top performers and 60-70 per cent of international median.
- Gender gap – girls outperform boys by international criteria
- Technical skills and 21st century skills indifferently embedded in the curriculum. But reform likely to be contested
- Is the teaching profession sufficiently respected and rewarded? A recent survey of GCC wages found that among the 16 industries surveyed, education ranked 14th
- Can markets be developed with such small domestic market?

**TIMSS 2007 Distribution of Maths Achievement at 8th grade
(Average Scale Score/Max 800)**



**Percentages of Students Reaching the TIMSS 2007 International Benchmarks
of Maths Achievement at 8th grade**



Small state knowledge transfer strategies



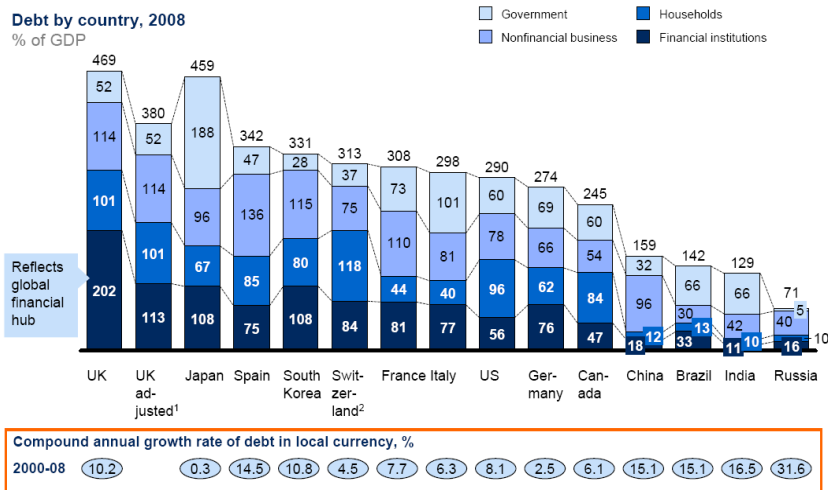
- Imports of capital goods/purchase of foreign companies are particularly effective, as they entail greater control over the tacit elements of technology.
- Transfers through FDI are tricky.
- Movement of highly skilled personnel is another important channel. Knowledge workers tend to be attracted by less tangible factors.
- Proximity to large and growing markets and effective transport links can offset some of the disadvantages of being small.

Strategies for firms without real knowledge assets in emerging economies



- Natural-resource vertical integrators
- Local optimisers
- Low cost partner
- The global consolidator strategy
- Global first mover

Finance – a viable area but not too far



1 The UK financial sector was adjusted to reflect its position as a financial hub. See the technical appendix for details.
2 Data for Switzerland represent year-end 2007.

SOURCE: Haver Analytics; McKinsey Global Institute

Strategic Options



- Precondition for medium and long term success is education, notably of boys. Must start early rather than view universities as finishing schools
- Reconcile excellence with equality
- Rewards and incentives need to be aligned to discretionary effort
- Reformulate social contract eg the American Alaska Permanent Fund or European flexi-security. Universal citizen grants conditional on graduation
- Identify partners that need you as much as you need them; think Boston University as much as Harvard and MIT. Opportunities as universities in the OECD face spending cuts and freezes

Strategic Options continued



- Me too strategies – financial entrepot, tourism – are limited because give no first mover advantage. Instead the question should be: how do they serve knowledge economy?
- Firm strategies should be “natural resource vertical integrators” (Energy, solar and waste must be areas) or “local optimisers”.
- Knowledge economies are about a wide range of intangibles – not just S&T and R&D; what about design, architecture, advertising etc?
- “Manu-services” and Islamic finance

Strategic options continued..



- Focus should be GCC, Africa and India – less Asia, Iran and Iraq
- Innovation is uncertain: policy must involve the support of failed entrepreneurial projects, as a necessary part of fostering the successful
- In terms of eco-system the best short term source of IP is overseas; acquiring branding and marketing know-how is particularly important
- Soft infrastructure needs urgent attention – can professionalism of Central Bank be extended? A more competitive civil service? e-government?

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