

New Frontiers: Law Firms in 2020

Part Two

A REPORT BY JOMATI CONSULTANTS LLP, MAY 2011

About this Report

This report is the sequel to 'New Frontiers: Law Firms in 2020 – Part One', which was published in January 2011. It is also the fifth in a series of reports published by Jomati Consultants LLP examining key issues facing the legal market.

The next report, 'New Frontiers: Law Firms in 2020 – Part Three', will continue the examination of future trends that will affect law firms and their clients. It will focus on the investment and financial services industry, including commercial banking, investment banking, funds management, hedge funds, private equity and insurance. It will be published in the Autumn.

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Disclaimer and Thanks

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Introduction

“Commodity – (noun), an article of trade; or, something turned to commercial advantage.”
The American Heritage Dictionary

The economic conditions in the US and Europe that supported the 2002/6 boom are now long gone. We can forget easy credit, rocketing property prices, extreme leverage – at least in the West. Today the ‘smart money’ is pouring into commodities, energy or the growing number of important developing economies. While New York’s and London’s financial centres are just beginning to regain confidence, the rest of the world, far less affected by what the Chinese called ‘the North Atlantic Crisis’, has already moved on. Yet today in 2011, some law firms are still structured around a world view that has expired. Unless this view is updated these firms will stay strategically frozen while rivals evolve.

The firms that re-invent¹ will be the ones that reshape the legal sector over the next decade. Leading the pack will be internationally-minded, creative firms, that pioneer new products and are prepared to invest in new talent, cutting edge practice development or geographical reach. These will pull away from firms who prospered by, one might say, ‘an easy ride’ from a huge property and credit bubble occurring right on the doorstep of Europe and America. Management also faces the prospect of no more easy cost cutting, and the unpleasant revelation that the client push-back that started in 2008/9 is not abating. Now, increasing profits year on year is going to require some serious strategic thinking.

The clients are central to building any strategy. As we noted in the first² of our 2020 reports: your client’s future is your future. In Part One of this report we examined macro-economic issues such as demographic change and how clients, and then in turn law firms, would be affected.

In this second part we focus on: energy, transport, commodities and technology. These are the physical building blocks that make our global economy possible – and over the next decade they will shape your clients like never before. Whether it is new opportunities and challenges driven by soaring fuel and commodity prices, or the huge transport, energy production and infrastructure needs of the world, law firms will have to keep pace with the changing needs of their clients, as they race to keep pace with the wider world.

Firms will also need to decide how the world will evolve in terms of technological development. Will China become a dominant IP-producing economy to challenge the US? Has the time of electric vehicles arrived, or is it still a decade or more away? Such questions matter as they will in turn shape the know-how and capability your law firm will need to offer – and building credible expertise cannot happen overnight.

This report builds on the first report, adding another layer of detail to the macro-economic picture of the world to 2020. We hope this report will stimulate further discussion among management about how the world is changing and what that means for your clients – and in turn your law firm. This is because: the world shapes the client, and the client shapes the firm.

¹ Re-invention does not mean changing the brand or the culture of the firm – but it does mean reconsidering where the firm can most add value, which is something that must always evolve in step with the ‘real world’.

² ‘New Frontiers: Law Firms in 2020 – Part One.’ Published January 2011. Jomati Consultants LLP.

Chapter One: Energy

Power Surge

By 2020 global demand for electricity will have increased by 80% compared to how it stood in 2000 (see table 1). Leading this power surge is China. In ten years a significant part of its 1.3 billion people will be seeking to consume far more energy than most developed countries. They will need this much energy too if they are to be Western-style consumers, which companies in the US and EU so hope they will be. Its needs will even overshadow the famously energy hungry US, becoming the greatest energy user in the world.

India's demands will rise rapidly too, but the 'rest of the world' will have a bigger collective impact overall. Dozens of fast-growing countries, rapidly moving up the developmental ladder, such as Turkey and Vietnam³, need more and more energy. It is a formula that will reshape the world economy by 2020: more people + greater development and GDP + increased use of transport, technology and mains electricity = a huge rise in global energy demand. In turn that demand needs hundreds of billions of dollars in project finance, reams of contracts, thousands of environmental, zoning and construction issues to sort out, and enough legal work to keep many lawyers busy for a lifetime – although it will not automatically go to those sitting in London or New York.

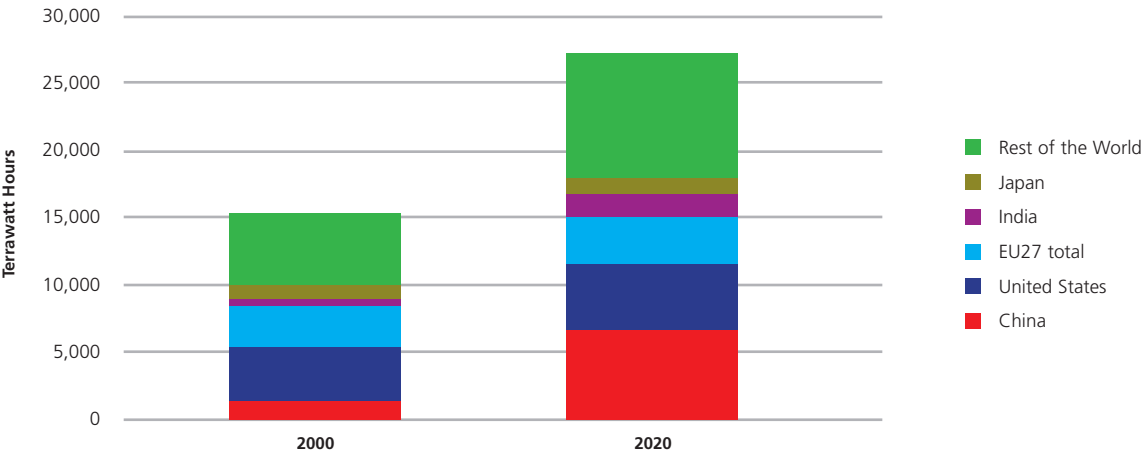


Table 1: World Electricity Requirement in 2000 and 2020. OECD Data⁴.

The table shows that demand in the US and EU also grows, but not so rapidly. This is because these economies are already highly developed – the entire population is already fully 'plugged in'. Also, serious efforts by Western Governments to improve energy efficiency will help to slow energy use. But, the US and EU both require major reinvestment in energy production just to stay on top of current needs; not to mention new investment in new nuclear power stations and renewable energy that will both cut CO² emissions and reduce the need for costly fossil fuels. However, this is complicated by the post-Japanese Fukushima nuclear crisis of March this year. The ensuing knock to confidence in nuclear power may not be huge, but it hurts an industry that had only just seen the emergence of a new generation for whom Chernobyl was just a history lesson and not a living memory⁵. The budget deficit-led reduction in subsidies to renewable energy companies in Europe has also hurt the growth of so-called 'clean energy'.

³ Despite the impact of the 2008/2009 crisis Turkey saw approximately 8% GDP growth in 2010, while Vietnam saw 6.5% GDP growth (Global Finance Data). These countries are both expected to see rapid population growth too by 2020 – see Part One of this report, published in January 2011.

⁴ OECD, 2010.

⁵ BBC 17th March 2011: 'Germany to speed up nuclear energy exit' – in the wake of the incidents at Japan's Fukushima plant. The US and UK are pressing ahead with a new generation of nuclear stations, however the Fukushima crisis will strengthen the arguments of environmental campaigners.

The challenge is made worse by the fact it is not just the number of people that is driving up energy demand – but that each person needs more energy to carry out their lives (see table 2).

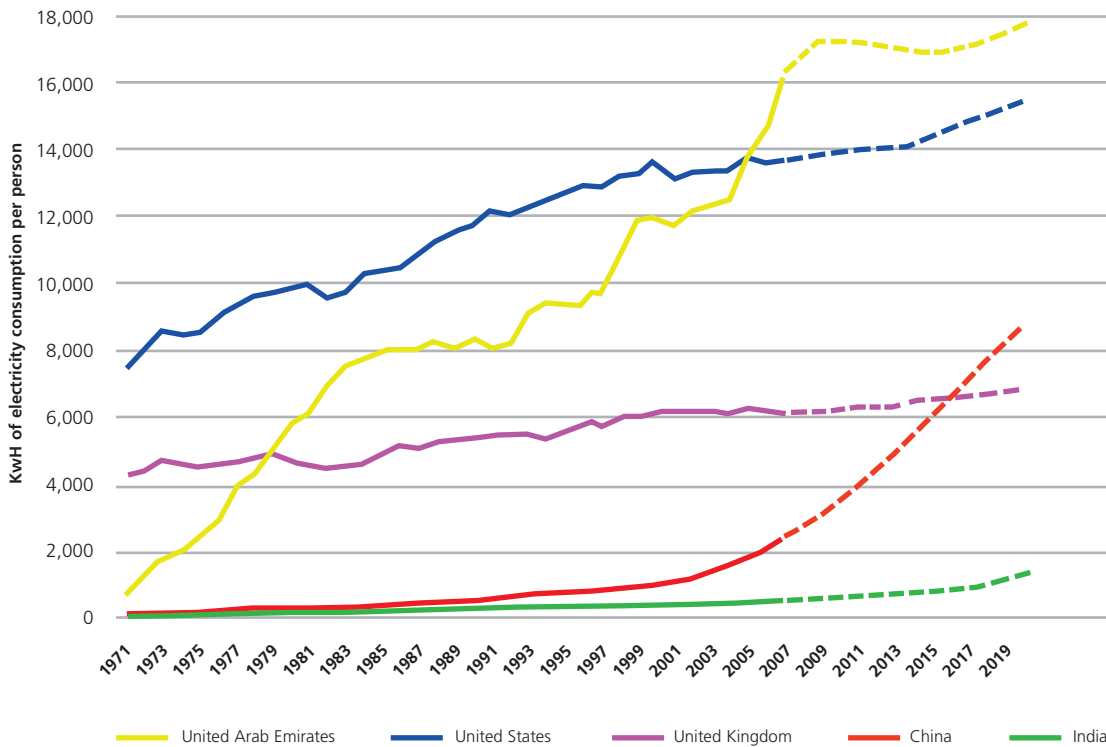


Table 2: Growth in Energy Use Per Capita, plus projection to 2020, World Bank data. Jomati projection to 2020.

As can be seen, energy consumption per capita in even relatively small nations such as the UAE is shooting upward. In the UAE’s case, a massive building boom in the middle of a desert requiring huge amounts of air conditioning, not to mention such extravagant wastes of energy as refrigerated indoor ski slopes in Dubai where the annual average temperature is above 30°C (86°F), have not helped keep energy use down. While in China, even though the denominator population is four times larger than the US, China’s ‘per capita’ use curve is rapidly catching up with its rival. India is perhaps the biggest surprise, but the huge gaps between a relatively small number of middle class Indians and the literally hundreds of millions of people who live in poverty⁶ are clearly indicated by its low energy use despite its size. Although, one might say it is a good thing India and China do not have the same level of energy demand as inflationary pressures on fuel costs would be multiplied.

⁶ Around 20% of the world population, or 1.5bn people, still have no access to electricity. However, this group is slowly reducing as even the poorest countries develop power projects. International Energy Agency’s “World Energy Outlook 2009”.

Future Sources

Ever-tightening environmental regulation will make meeting energy needs by 2020 even more difficult. The world is moving toward further limits on the use of fossil fuels in a bid to reduce CO² emissions⁷ – this is despite the fact that fossil fuels, especially coal resources, will stretch into the future (see table 3) – and so inevitably will be relied upon for a majority of energy supply. This conflict between the need to reduce CO² emissions, while feeding energy needs will lead to complex environmental and perhaps legal problems too. Private and State-backed energy companies will also be prospecting for oil in regions where either climate, technological limits or extreme locations had once kept them out. For example, plans to ‘open up’ the Arctic by Russia and Canada to find oil raise major environmental liability issues.

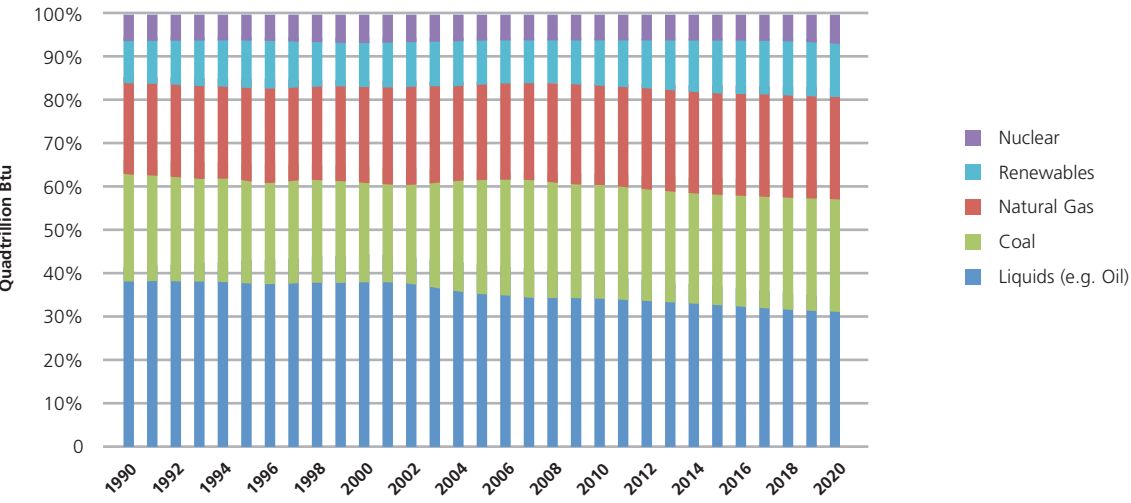


Table 3: Total Marketed Fuels Global proportion 1990 to 2020. US Department of Energy data, including US Government estimates. Note how nuclear remains a small proportion.

In addition Russia is building a fleet of floating nuclear power stations⁸ to power its drilling missions and clearly adds another layer of risk to an already challenging environment. Interestingly, the reason nations such as Russia can now contemplate exploiting the Arctic for fossil fuels is because global warming⁹ has already reduced sea ice to the point where large ships can access deep into the Arctic circle.

The new technologies used in shale gas extraction are also an area filled with legal risk. Possible toxic seepage linked to shale gas extraction in the US¹⁰ has already seen the launch of class actions. But, perhaps the worst example of the need for energy creating huge legal liability came recently in the shape of the BP Gulf of Mexico disaster – whose legal

⁷ Cancun Agreement of 12 December 2010 (United Nations statement): ‘Parties should cooperate in achieving the peaking of global and national greenhouse gas emissions as soon as possible.’ Of course, what this ‘peak’ level should be and how it will be enforced is another matter – but the direction of travel is now clear for all to see. Regardless of climate change scepticism fossil fuels will face more regulatory pressure.

⁸ Russia is now building small floating nuclear power stations to help exploration in the Arctic. Built by Rosatom Nuclear Energy State Corporation, around half a dozen are scheduled for 2015. This opens up all manner of environmental and legal risks, even without issues like oil pollution. The recent joint venture between BP and Russia’s Rosneft is directly connected to exploration of the Arctic – and raises the future possibility of BP facing another ‘Gulf Oil Spill’ scale disaster, this time in the Arctic Circle.

⁹ See Appendix A for more data on global warming.

¹⁰ Reuters, 17 February 2010, ‘Environmental fears over U.S. shale gas drilling,’ primarily due to fears toxic chemicals pumped underground to extract the fuel could lead to watershed contamination.

costs have still not been fully calculated. As an illustration of how great the legal burden has been, in BP's full year financial statement, 1 February 2011, the company needed five of the 38-pages to list the on-going legal issues, law suits and US Government demands for compensation.

Business Impact

- Japanese Nuclear Crisis – The impact on public perception of the Fukushima nuclear crisis cannot be downplayed, especially given Government-backing is needed to co-fund and sponsor most nations' nuclear power plants. A difficult mix of public fear, lower State funds and stronger environmental lobbies means planned future nuclear development may be lower than expected – perhaps with some projects called off, or down-sized.
- Higher Operating Costs - All businesses, especially manufacturing, will feel rising energy costs, from their own needs to the transport of goods. Higher costs could hurt future GDP growth too.
- Birth of New Companies - The development of new technology in solar, wind, tidal, as well as fossil fuel extraction, such as shale gas and oil sands, will see the creation and growth of many new technology-driven energy companies.
- Energy IP – As new technology becomes vital to future energy development IP related to the sector will rise in value. For example, a company that manages to develop a low-cost, super-efficient¹¹ solar cell could be sitting on an IP asset potentially worth billions of dollars in future licensing.
- Project Finance – Funding for the huge global building programme needed to provide sufficient energy will become an increasingly major part of banks' and investment funds' businesses, with many more Public Private Partnerships (PPP) operating in this space. Private initiatives will be especially important for Governments with large deficits, unable to invest sufficient public money.
- Energy Efficiency – With Government and private sector initiatives promoting energy efficiency there will be a range of opportunities for clients offering energy efficient products. There will also be increased national and international, e.g. at EU level, regulation of energy efficiency.
- Energy M&A – As global needs mount and costs of doing business rise, because of more challenging drilling environments or greater needs for new technology, the value of consolidation to gain economies of scale will increase, perhaps as the miners today have consolidated the market. Although, protectionist/competition issues could provide hurdles.
- CO² Emissions – Emission limitations will impact all large businesses. By 2020 one can expect that what are today fairly weak measures to reduce CO² emissions are likely to become more stringent¹², at least in the EU. However, in the US the debate is far from over. Many Republican politicians remain sceptical that global warming¹³ is occurring, suggesting the scientific data is wrong. For global businesses a change of the US Government in 2012 to a Republican President could prove complex, and mean operating in the EU under ever stricter CO² restrictions, while carbon-limiting regulation in the US was repealed or watered down.

¹¹ Even some of the best solar cells are only around 20% efficient, in terms of energy in/electricity out. More advanced systems have gone to 30% and beyond, but are still not mass produced.

¹² Since May 2010 US President Obama has backed the, so-called 'American Power Act', that seeks by 2020 to reduce CO² emissions to just 83% of what they were in 2005. This is clearly a major reduction, especially given the growth of the US economy that will have occurred in another decade. At time of going to press the Bill was still at an early stage and had not yet been passed. Interestingly, as well as perhaps predictably promoting renewable energy, the Bill also seeks to increase nuclear power development in the US – which although seen by some as a risk, especially after the Japanese nuclear power debacle of March 2011, does not contribute as significantly to CO² levels as fossil fuels.

¹³ CNN 22 November 2010, 'GOP ready to fight over global warming.'

- Carbon Trading – CO² trading of ‘carbon credits’ may develop further. In 2010 around 2 billion EU Emission Allowances or ‘EUAs’ were traded¹⁴, selling at around \$20 per EUA – or a market worth around \$40bn. Compared to standard equities, bonds or currencies, this is still a very small market, but by 2020 this may have increased substantially – and not just the EU trading scheme. However, Government policing and promotion of off-setting will remain patchy around the world, with many States dragging their feet even until 2020. Climate sceptics in the US will also not end their lobbying, undermining efforts to build a carbon trading market¹⁵. As with the point above, a Republican President in 2012 could undermine carbon trading in the US.

Law Firm Impact

- Advisers to Nuclear Industry Post-Fukushima – While some legal advisers will see their clients’ nuclear power projects cancelled, others will be engaged in the re-opening of fierce public and regulatory debates about the safety of nuclear power. This will range from giving advice on pro/anti lobby groups, to Governments and regulators, to private sector energy companies and insurance companies.
- Project Finance - The challenge for UK and US law firms is that a large part of energy infrastructure growth will take place away from the West – in Asia, Latin America and developing countries. Will the financing for these projects continue to flow through or originate in London and New York? Some will, but more and more finance will come from Asian banks and investors, as well as Sovereign Wealth Funds in Asia and the Middle East. Finance lawyers in the US and UK seeking to tap this growth may need to look further afield to gain this work.
- Energy Market Consolidation – The cost of exploration will increase and more energy companies will merge or form joint ventures. For example, BP and Russia’s Rosneft proposed joint venture announced in January 2011 to explore the Arctic, or PetroChina’s proposed \$5.4bn investment this year in Canadian energy company Encana’s natural gas assets - the largest-ever Chinese investment in Canada’s energy sector.
- IP Litigation – IP related to energy is likely to be a growth area as technology is pushed further to enable better extraction of fossil fuels and production of renewable energy. This may result in increased litigation over patents and licensing across the energy sector.
- Insurance and Environmental Litigation - Industrial accidents and pollution will increasingly unleash law suits and insurance claims as regulation around the world tightens and energy companies push harder into new territory to extract resources.
- Ownership Rights/Territory Litigation - As nations and their private companies battle to extract oil, gas and coal from disputed territory the frequency of ownership battles will increase. A case in point is the potential legal battle over hoped for undersea oil fields of the Falklands Islands, claimed by the UK and Argentina¹⁶ - but which following the 1982 Falklands War remain very much under the control of the British Government. Future battles over who owns resources uncovered in the Arctic region, or off the coast of Greenland, may also lead to some very significant litigation or arbitrations.

¹⁴ Data: Thomson Reuters. EU Emission Allowances, or EUAs, are the credits that are allocated to the companies covered by the EU Emission Trading Scheme. Each one represents the right to emit one ton of carbon dioxide.

¹⁵ See Appendix A with regard to global warming.

¹⁶ A number of companies have prospected for oil in the Falklands in the last 20 years, but tensions between the UK and Argentina rose in early 2010 when Desire Petroleum appeared to have found oil. In March 2011 Rockhopper Exploration announced (Telegraph 21 March 2011) it had found oil that was commercially viable. Are we heading toward a major legal battle between the UK and Argentina over territorial rights? It is possible. When commercial drilling begins we will know.

Chapter Two: Transport

As with energy, a similar developmental formula applies to transport: more people + greater levels of economic development worldwide + greater trade across borders as developing nations integrate with global trade routes + greater disposable income to spend on fuel and vehicles = greater demands on transport systems. As with energy, add in an increasingly complex regulatory environment and it equates to a significant rise in transport sector challenges and opportunities for clients and law firms by 2020.

Road

There are approximately 950 million cars and light trucks in the world and this number increases by around 50 million every year¹⁷. Adding in large commercial vehicles would greatly increase this number. By 2020 we'll see around a 50% increase in four-wheel passenger vehicles to 1.5 billion – with all the associated infrastructure, fuel, insurance, environmental and regulatory issues that will cause worldwide. We can also expect car production to pick up globally and build steadily to 2020 as more of the developing world moves to four wheels and private transport. Although, as seen below, in the West and Japan, the car industry may have more of a focus on restructuring and cost reduction, while in Asia and Latin America newer automakers will be focused on rapid domestic growth and international expansion.

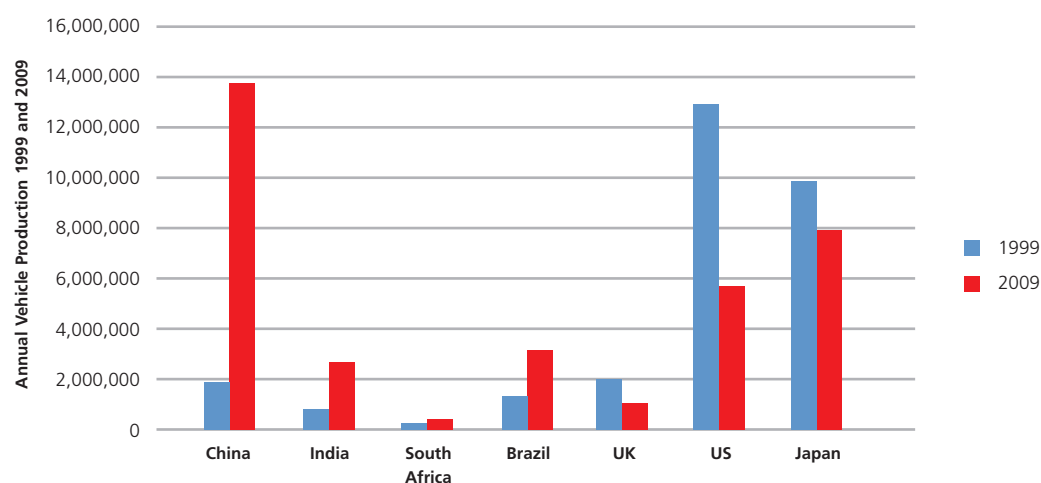


Table 4: Annual car and commercial vehicle production by country in 1999 and 2009¹⁸.

Between 1999 and 2009 China increased domestic car production by 654% - while the UK and US saw production in 2009 drop painfully below what it had been ten years before. In the latter two cases this was partially recession-led – yet, in India, China and Brazil home-grown production lines grew as domestic and regional demand was high, even in the middle of the global crisis.

¹⁷ Global data on car scrappage is not available, but in the US in 2009 according to Thomson Reuters 14m cars and commercial vehicles were scrapped – while only 10m new vehicles were bought. However, many vehicles stay in use for over 10 years and so steadily build up the total despite scrappage. Also, scrappage in 2009 was perhaps high due to US Government 'Cash for Clunkers' scheme.

¹⁸ Data from International Organisation of Motor Vehicle Manufacturers.

There has also been a small, but steady increase in car production in South Africa, but it is still far from reaching its potential. One factor that may help the nation's car industry would be rising salary costs in China. That could trigger the movement of some manufacturers to look for lower cost centres¹⁹. However, a lack of infrastructure in Sub-Saharan Africa makes the region a difficult option for manufacturers. Although by 2020 infrastructure may have improved sufficiently.

Nevertheless, one could ask why does it matter whether a nation has a strong automobile industry or not? The reason is that car makers need a large network of other suppliers and service providers around them to function. A major growth in car-making therefore greatly stimulates the wider industrial sector and drives economic growth. Conversely, as is often noted, when a major car plant closes in Europe or the US – such as in Detroit – it takes with it not just the car makers' jobs, but many of the businesses around it.

But can China's desire to increase vehicle manufacturing mean another 700% increase in production over the next decade? It is possible, but it is more likely that China will not see the same explosion of manufacturing over the next ten years as it did previously where it was starting from a very low base. We will also see other developing countries steadily building market share, meanwhile Western nations will continue to struggle to retain their own share of the global market due to labour costs.

	China	India	South Africa	Brazil	UK	US	Japan	Total
1999	1,829,953	818,193	317,367	1,350,828	1,973,519	13,024,978	9,895,476	29,210,314
2009	13,790,994	2,632,694	373,923	3,182,617	1,090,139	5,708,852	7,934,516	34,713,735
2020 (estimate)	20,000,000	6,000,000	600,000	5,200,000	800,000	6,500,000	6,900,000	39,100,000

Table 5: Growth of vehicle manufacturing by nation²⁰, 1999 and 2000, plus Jomati round number estimates for 2020.

India also has potential to be a major growth market for the transport sector, but as yet has not developed the right models to build global market share. For example, the greatly heralded Tata Nano²¹, known as the 'People's Car' raised hopes that India can build a sustainable car industry, beyond the sales of its relatively successful commercial goods vehicle sector. The main challenge has been pricing. The Nano was first presented in 2008 as likely to sell for \$1,000 – a remarkable price point. However, Jomati checked dealers²² in New Delhi in March 2011 and list prices ranged from \$3,000 for the basic model, to \$4,263 for a better model. This far higher price is partly because of the added costs of raw materials such as steel. After adding in the rising price of petrol, these vehicles are not economical for many tens of millions, if not hundreds of millions, of India's working class²³. Meanwhile, the small, but growing middle class, are earning sufficient to target more expensive, or higher status vehicles. The 'People's Car' is therefore not an easy product to sell in such a polarised economy as India and has not yet become the Indian 21st Century equivalent of the 'Model T Ford' its makers had hoped for. However, in another decade, when social and economic development has spread wealth more widely in the Sub-Continent and the Asia region, the idea behind the Nano may come of age.

¹⁹ Although the costs of production in South Africa may be cheap on paper, the main challenge is insufficient infrastructure, a small home market, and - at present - a lack of strong neighbouring markets to sell into. China can sell huge numbers of vehicles internally, as well as into other developing Asian nations.

²⁰ Data from International Organisation of Automobile Manufacturers.

²¹ In an effort to keep costs down the basic Nano model only has one wing mirror and one windscreen wiper. However, Tata has found that continual rises in material prices have inflated the hoped for price point.

²² <http://tatanano.inservices.tatamotors.com>.

²³ Although often overlooked India's population will eventually overtake that of China. Currently, India has around 1.2 billion people, of which only a fraction would be regarded as 'middle class' from a Western point of view. It is no doubt a huge potential market, with a great future, but has some way to go.

Oil Price Impact

Any discussion of significant car production growth – at least of petrol powered cars – needs to factor in the price of oil. Table 6 shows inflation adjusted oil prices between 1860 and 2020. Its message is a stark one: we have left the era of ‘cheap’ petrol behind – perhaps permanently. A hundred years of relatively low prices have been replaced by extreme volatility, with prices now tending to \$100-plus a barrel, rather than gravitating to the historical average of \$20-\$30 a barrel.

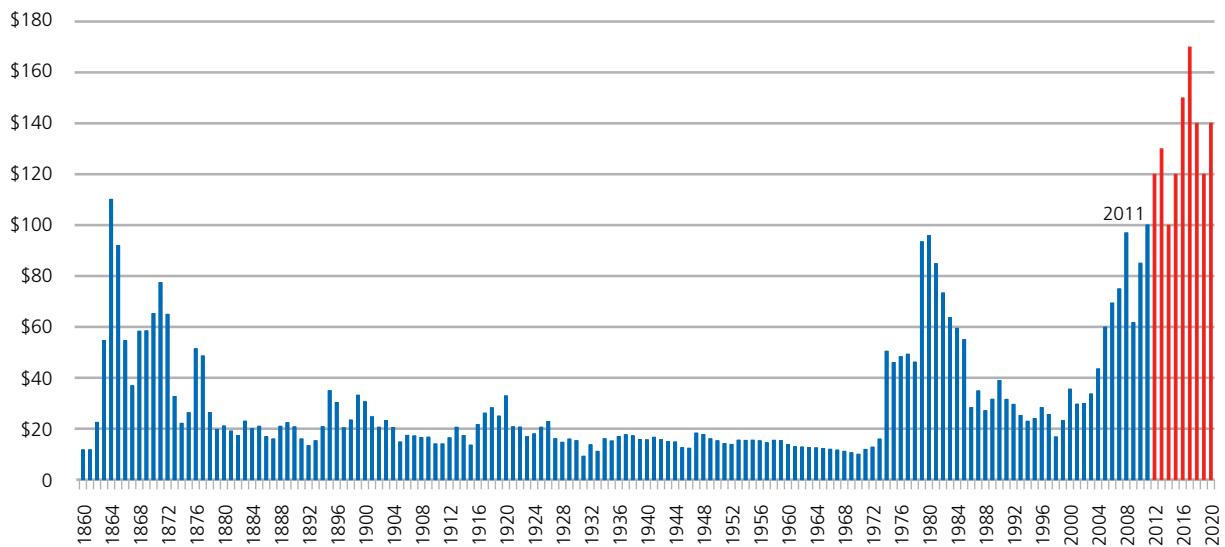


Table 6: Annual Average Price per barrel of crude oil, 1860 to 2010, using 2009 US dollars. (Data from BP). Projections in red to 2020 by Jomati.

As can be seen, an initial spike at the start of serious oil demand in the 1860s is followed by a relative ‘Golden Age’ of low prices from the 1870s to early 1970s as supply continually met demand, thereby stabilising prices. Then, after this 100 year period of relative ‘peace’ oil has swung violently up and down in price, with huge spikes driven by crises in the Middle East in 1973-4 and 1979-1980²⁴, and again today. The 2000s were also marked by a ten year climb to new heights – but this time driven by developing nations. A very brief price crash in 2008/9 has been quickly followed by another spike, driven by protests against undemocratic OPEC regimes²⁵. A situation where oil over \$100 a barrel is the new norm to 2020, rather than a brief spike, seems realistic. If certain scenarios play out, such as a revolt in Saudi Arabia, or war with Iran, then we could see sustained per barrel prices over \$170 (as is factored into table 6).

To put this price change in context consider this: today, crude oil costs as much as when supplies were tiny and just one location in the world, Baku in Azerbaijan, produced 90% of the world’s oil in the 19th Century. That is to say despite oil wells dotted all over the world and the industry accounting for many of the world’s largest companies – growth in demand twinned with supply limitations has pushed prices back to the point when oil was priced as a rare commodity. Such differences in energy costs will have a profound effect on the global economy to 2020.

²⁴ OPEC raised crude oil prices by 70% a barrel, 16 October 1973. The second oil ‘crisis’ came with the Iranian revolution in early 1979 when exports were suspended. Then in 1980 Iraq invaded Iran, which hurt Iraq’s oil production too. This was also a period of sustained weakness in the US and European economies.

²⁵ Of the 12 OPEC members the majority are either undemocratic monarchies/autocracies, such as Saudi Arabia, Qatar, Libya, the UAE, Kuwait or Iran, or are countries that one might politely call ‘democratically challenged’ such as Venezuela and Angola. Nigeria, Ecuador and Algeria are among the most democratically focussed – and even there critics are likely to be dubious. The oil producers of the world are therefore on a perpetual socio-economic fault-line that is unlikely to improve without significant democratic development. However, such development always brings the risk of disrupting oil supplies.

Green Car Impact

The immediate assumption from looking at this data is we are heading toward a transport sector dominated by green cars – or at least vehicles not using petrol. But, a century-old culture of petrol vehicles is not going to vanish overnight, even if manufacturers are making green models. Instead, we suggest there will be a slow build up of demand for green vehicles that will eventually reach the critical ‘breakthrough point’ and then rapidly gain market share. The wider acceptance that oil will not be getting any cheaper will be one factor, others will be countries creating the infrastructure to support green vehicles. Another more basic – but equally essential factor - will be the creation of an electric battery that contains as much energy as a tank of petrol. That breakthrough may come before the end of this decade, but we expect the approach to 2020 to still be dominated by petrol cars.

Despite all the publicity very few of today’s 1.5 billion cars are hybrids, even fewer are pure electric – mainly due to the range limits of current batteries²⁶. One of the few accurate studies of hybrids on the road was by the Dutch Government. The 2009 study found that out of 7.5 million registered passenger cars in the environmentally friendly country, just 23,000 were hybrids, or 0.3% of cars on the road²⁷. And hybrids are still mostly reliant on petrol. Meanwhile, hydrogen fuel cell cars are still effectively at an experimental stage and in tiny numbers on the road.

Another authoritative study was carried in January 2009 by the Boston Consulting Group²⁸. This report predicting that by 2020, if there are steady increases in oil prices, that petrol/electric hybrids in the four main passenger car markets of US, Western Europe, China and Japan will total 20% of market share. Meanwhile, just 3% of all cars sold in 2020 will be all electric. It seems for now that many people are simply going to pay more for their oil-powered personal transport – eating away at household discretionary spending on other areas, such as leisure and household goods. Many people will also put up with growing challenges to their habits for long periods before finally giving up and behaving in a new way. Even with hybrid subsidies worth \$7,500 in the US and £5,000 (\$7,900) in the UK and the Nissan ‘Leaf’ dropping below the US average vehicle price after reductions²⁹, the hybrid and electric market share is very low. Meanwhile, in the developing world \$30,000 cars are still out of reach for most people. Simply put, we are a long way off a green car revolution³⁰.

Rail

Another key transport development is the growth – or one might say renaissance – of rail with the development of high speed trains and track. China is again a leader here. While, in the UK, rail transport is seeing major developments and greater use – with 1.3 billion train journeys in 2010³¹, the highest level since 1928.

Investments in high speed rail links are also increasing in many other parts of the EU – although in the US, rail has a mixed outlook. Aside from a brief surge in passenger use after ‘9/11’ in 2001 due to the avoidance of regional air travel, the number of passenger train carriages in use in the US has been on a downward trend since the 1970s³². But, growing interest in high speed networks could reverse that trend. There is currently one US high speed line from Boston, via New York, to Washington DC, but speeds are still well below ‘bullet trains’ in other nations. Although, California plans to start a high speed project in 2012. In total, ten US rail corridors have been designated for ‘development’ by the

²⁶ Accurate figures for the total number of hybrids in the world are scant, however, estimates suggest there are around 1.6m hybrids in the US.

²⁷ 23 June 2009, www.cbs.nl.

²⁸ BCG Focus, 2009, ‘The Comeback of the Electric Car?’

²⁹ In 2009 the average car price for a new vehicle in the US was \$28,000 – Federal Trade Commission.

³⁰ Another problem is that if 1.5bn vehicles were running on electricity instead of oil – and most electricity will remain generated by fossil fuels at least to 2020 – will CO₂ emissions targets be met?

³¹ BBC News/Association of Train Operating Companies, 31 January 2011.

³² US Department of Transport.

Government, but it is not clear whether all designated routes will receive the necessary funding. The outcome is further complicated by political battles over Government funding, as is currently the case in Florida, where a law suit has been brought against the Republican Governor Rick Scott, over the rejection of \$2.4bn in Federal funding for a high speed rail link in the State³³.

However, as mentioned, it is China that is dominant here, with a plan to ensure all its major cities are linked by high speed rail by 2020³⁴ - or just under 10,000 miles of 350kmh track. The full financing package for the 2020 rail target will reach at least \$300 billion – more than the GDP of Singapore. Initially, China had worked with Siemens, Bombardier and Kawasaki Heavy Industries on train development – but is now manufacturing its own high speed trains, also with a view to exporting them around the world – including to the US. This has been a controversial example of China's building their own³⁵ technology for export. China is also considering building a \$7.6bn rail link across Colombia, linking the Pacific to the Atlantic, in an attempt to create a rail-based substitute to the Panama Canal³⁶. The so-called 'Dry Canal' would cross 220km of land and permit shipping containers to be shuttled from one ocean to another. It would also allow coal produced in Colombia, which is the world's fifth largest³⁷ coal producer, to be transported to China more cheaply. More cynically, one might argue that such a huge investment will also ensure China dominates this vital foreign coal supply. Beyond China, we should also expect rail to develop between other developing nations, in Asia and South America, as trade growth and road costs combine to push up rail freight volumes.

Air

Air travel could see huge growth to 2020, in part because of the increased use of air travel in developing countries – although if crude oil prices keep rising it could make air fuel costs prohibitive unless airlines can reduce costs elsewhere. Equally, many air travellers may accept price rises because of fuel, seeing surcharges as something they have 'to swallow' for the benefit of air travel.

If fuel inflation does not deter air passengers then we can expect China's economic growth and increased wealth to boost regional and global passenger volume. Beijing is already the third busiest airport in the world. The only other Asian airport in the top ten is Tokyo. However, the US still dominates the world in terms of the volume of passengers, with six out of the top ten airports. Equally, China is far behind on the production of its own passenger planes, and America's Boeing and Europe's Airbus continue to dominate the sector.

³³ Reuters, 1 March, 2011. The Florida Department of Transportation had been expected to invite formal bids for the Tampa to Orlando high-speed rail project from companies in Japan, Germany, France, South Korea and China.

³⁴ AFP 28 July 2010.

³⁵ China's welcoming of foreign train makers, followed later by the launch of its own similar high speed rail train has been controversial and led to accusations of IP theft. One high speed train maker that had initially been invited in by China was Kawasaki. It commented in a statement quoted by the Wall Street Journal: "China says she owns exclusive rights to that intellectual property, but Kawasaki and other foreign companies feel otherwise." (WSJ, 17 Nov 2010.) Ironically, China is now using this 'new' technology to pitch for the same rail projects around the world as Japanese and European companies.

³⁶ FT Feb 13, 2011.

³⁷ Ibid

Rank	Airport	Country/Region	Passenger Numbers
1	Atlanta	US	88,032,086
2	London (Heathrow)	EU	66,037,578
3	Beijing	Asia	65,372,012
4	Chicago	US	64,158,343
5	Tokyo	Asia	61,903,656
6	Paris	EU	57,906,866
7	Los Angeles	US	56,520,843
8	Dallas/Fort Worth	US	56,030,457
9	Frankfurt	EU	50,932,840
10	Denver	US	50,167,485

Table 7: Passenger Numbers for World's Top Ten Airports, CIA Factbook 2010 data. (Asian airports highlighted in blue.)

As mentioned, the main threat to growth is excessively high fuel costs, although far greater passenger volumes may help airlines overcome shrinking margins. In one regard, airlines are at a greater disadvantage than the car industry as jet fuel is far harder to replace with alternatives. One might add, there is simply no alternative to the jet engine for large passenger planes. In a world where fossil fuels were impossibly costly, people could still turn to electric cars, the same would not be true of air transport – at least not yet. Although there have been experiments with bio-air fuel blends, they have not been widely taken up. For now, data on long term pricing trends seems to suggest that the cost of flying has not greatly increased. Data for US domestic flights³⁸ between 1995 and 2010 suggests that at least on this small time scale average ticket costs have not increased by more than \$50. When taking inflation into account the difference is negligible. Increasing volumes, better outsourcing of support services, more efficient engines and planes, more intelligent use of advance buying of fuel, sometimes using futures contracts, as well as tough bargaining on employee benefits and salaries, have allowed airlines to keep ticket prices down. However, as said, airlines do not have an alternative to the jet engine, and if there were sustained, spiralling oil prices, this could eventually dissuade less urgent travel. That could in turn send more airlines into bankruptcy, many of which have thin profit margins, are debt laden and have huge aircraft finance costs.

Key issues associated with air travel include:

- States looking to tax airlines and air fuel in order to reduce budget deficits.
- Imposing of environmental restrictions due to airline CO² emissions.
- Limitations on expanding airports in developed countries due to environmental concerns.
- Huge investment needed to rebuild and update old airports and facilities worldwide.
- The effect of a wave of retiring Baby Boomers from 2011 on tourist flights – of course this will only have an impact if sufficient numbers are wealthy enough to enjoy leisure travel.
- The steady increase in the total number of people with sufficient income to fly, and the increase in businesses in developing countries generating business travel needs.

³⁸ US Bureau of Transport Statistics

Shipping

If current global trade trends maintain over the next ten years there could be a 75% increase in seaborne container traffic around the world. Between 1995 and 2008 total shipping container traffic grew at over 8% every year. It is not just the sheer growth that is significant, it is where it is happening. The greatest growth is among developing nations, so much so that the once dominant handler of commercial shipping, the US, is rapidly losing market share. In 1995 US ports had the largest share of container traffic in the world, at around 16.5% by container numbers. By the peak of the previous economic boom in 2008 it had reduced to just under a 10% share of container traffic. The nations that saw the greatest gains were in Asia.

By 2008, just as the financial crisis took full effect, worldwide volume of shipping container traffic had reached 387 million containers – almost three times what it had been just 15 years before. However, a year before in 2007 they had peaked at over 425 million. Straight line projections always come with a health warning, but a simple growth projection from 1995 to 2020 means that by the end of the decade world shipping, in terms of containers, could be 700 million containers per year, and much of that growth will be in Asia. At present 12 of the busiest 20 ports by container traffic are in Asia³⁹. Only one non-Asian port is in the top ten – Rotterdam in the Netherlands: the key port that serves Western continental Europe. By 2020, this picture may have become even more Asia-centric.

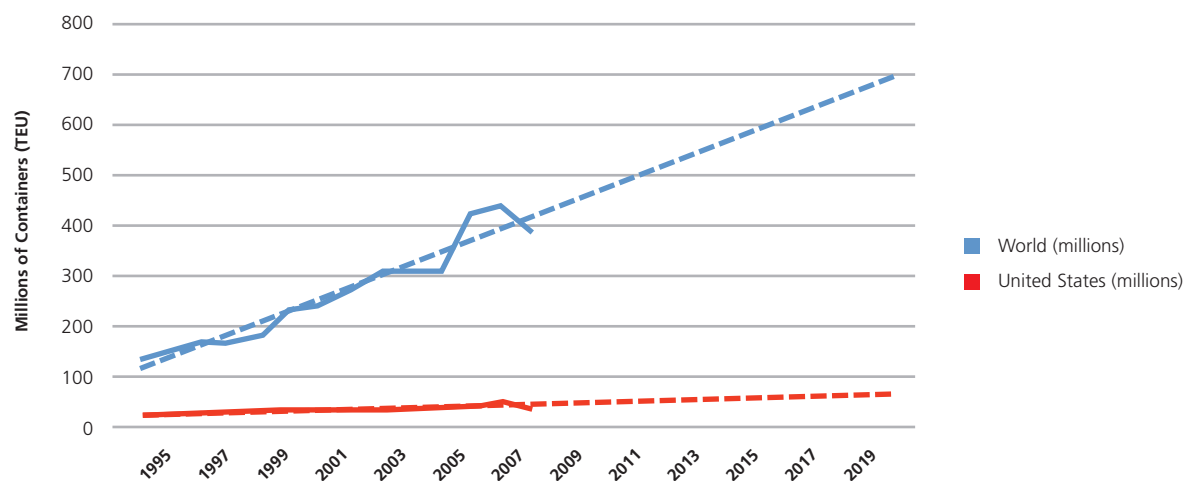


Table 8: World Container Traffic⁴⁰, US Gov Data to 2008, dotted trend lines to 2020 by Jomati.

Business Impact

- Growth Risk To World Economy – As with energy, a failure to develop sufficient transport infrastructure will reduce the rate of globalisation, which is tied to the time needed to conduct international trade, and capability to handle large volumes of imports and exports.
- Two Speed Developing World – While nations such as China invest billions in creating the right infrastructure to fund further social and economic development, other nations, such as India, are lagging behind. Such infrastructure gaps could deter Western investors who rightly see in China ambitions to build comparable Western-level transport systems – if not superior in some cases.

³⁹ American Association of Port Authorities.

⁴⁰ Refers to industry standard '20 foot equivalent unit' containers or 'TEU' loaded or empty passing through the world's ports, and does not include goods that are shipping by other methods, such as liquid oil transported by tanker, or materials stored in ships' holds not in TEUs.

- A New Global Rail Network – A successful roll-out of high speed trains all around the world (perhaps one day linking Western Europe all the way to Beijing with a 350kmh-plus track for heavy goods), will provide added support for further globalisation, speeding the export of goods and opening up new markets, such as within isolated Central Asia.
- Growth of Air and Sea Transport – World will see the volume of global trade reach previously unimagined levels. Huge economies of scale could also reduce shipping costs per unit as total volumes rise.
- Major Development of Transport Infrastructure – Trade volumes will demand greatly increased development of port facilities with improved logistics and container transport centres, as well as larger airports.
- Maintenance – as Western nations can testify, building huge transport projects is one thing, maintaining them and constantly updating them is another. Companies, such as Veolia, which carries out cleaning and maintenance for the private and public sector, could profit from the global market for their support services.

Law Firm Impact

- Finance and project finance – The future financing needs of the transport sector by 2020 will be enormous. In all cases legal advice will be needed both for Government, corporates and the financing banks, while related taxation and insurance issues may also see an uptick. Areas this will cover include:
 - Aircraft finance, not just to match growth needs, but also to support airlines buying new, quieter and fuel efficient planes to replace old models.
 - Airport development finance, which will see greater demand as airports see higher traffic volumes and need more runways and terminals.
 - Port development, with major development of logistics and container transport centres.
 - Finance for High speed rail projects, both for rolling stock, new lines and related station infrastructure.
 - Development of electric charge points in urban areas and at motorway service stations. This may also mean restructuring of local grid systems, if demand grows rapidly.
 - Ship finance, especially for the largest new generation of container ships.
 - Fuel finance may grow, as more companies seek to secure futures contracts on large quantities of fuel, as some airlines currently do today.
- Clean/Green Tech IP Legal Needs – From new electric cars to hydrogen fuel cells, the latest ‘bullet trains’, to new supplemental sail technology for cargo ships, there is an array of IP-related issues at stake that demand legal help – and on a global scale. Some inventions could be far more than just incremental steps too, but rather game-changing technology, for example a solar panel/photovoltaic cell that achieves such high conversion rates could realistically replace the need to be linked to the power grid⁴¹.
- Steady Growth in Environmental Law – As Governments plan to reduce CO² emissions and tighten regulations on waste and toxic materials, or the use of fresh water, the environment will become increasingly a legal minefield for larger companies. Operating in multiple regulatory environments will also be a challenge, especially for those companies importing goods manufactured under different criteria, for example on the levels of toxic chemicals a product may contain.

⁴¹ Currently photovoltaic conversion rates are low and most ‘solar panels’ are not used for direct electrical production but rather for solar heating of water at a household level. We are a long way off a roof-sized panel powering all the electrical needs of a house, but by 2020 this may be achievable. The holders of such technology could conceivably become among the richest IP owners in the world – becoming a huge client for the fortunate law firm that forms links with what would today perhaps be a start-up size business.

- Growth in Zoning and Planning Legal Battles – Demands for housing, for the building of transport and manufacturing infrastructure will create multiple legal issues. At present in developing nations planning law appears to be a minor issue, with poorer residents forcibly removed to make way for development. But, with time and the increasing authority of the rule of law this will change. In the developed world, the need to update airports and train lines will also create legal battles, often with well funded and well organised campaign groups determined to prevent further development.
- Developing Market Challenges – One problem for US and UK law firms seeking to tap transport and infrastructure work in developing nations is the ban on foreign firms offering local legal advice in Brazil, China and India. Some State-backed infrastructure projects will see considerable funding from local banks, rather than international investment banks, and therefore use local law firms to structure the deal. These are not insurmountable challenges, but foreign law firms may need to build closer links with local Governments, national banks and regulators to gain greater access to these markets. Also, many of the largest projects will still be internationally financed and likely to be structured under English or New York law.

Chapter 3: Commodities

The Next Gold Rush?

Commodities began rising rapidly in price in the mid-2000s, driven by globalisation and the growing wealth of developing nations. In 2008 the IMF's non-fuel commodity index peaked at nearly 170 – over 80 points higher than it had been in 2000 (see table 9). The financial crisis created a temporary drop, but by the end of 2010 the IMF commodity index was peaking again, and now heading to 180 points.

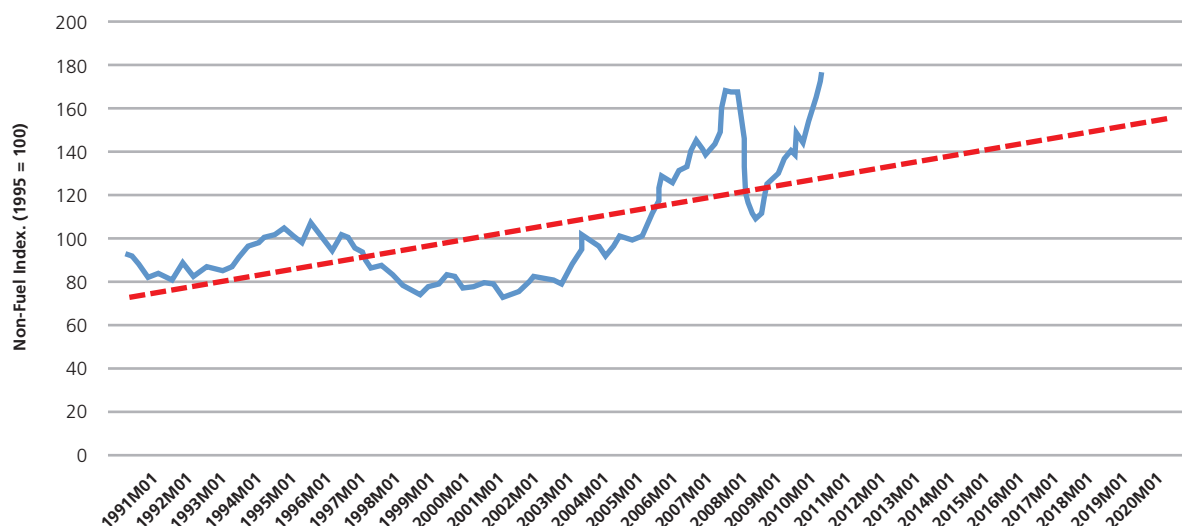


Table 9: IMF Non-Fuel Commodities Index to 2010, Index: 1995 = 100. (Dotted red line shows long term average trend to 2020.)

At present there seem to be a large number of reasons why commodity inflation will continue⁴² over the decade to 2020:

- Continued rapid increase in world population to 2020 – especially in the developing world, leading to increased demand for food and materials.
- Continued climatic change and severe weather events, such as floods and droughts, disrupting arable and animal farming.
- Growing salaries among urban workers in developing nations keep creating inflation – which in turn rises prices in the developed world.
- The number of nations moving to rapid economic development is growing, in turn adding to demand for metals and other resources.
- The cost of mining new deposits of rare metals or other vital commodities may grow as extractive industries exhaust 'easier' fields and need to explore less accessible sites.

Conversely, there may be developments that stymie this commodity price surge⁴³. Potentially, we could see the following occur by 2020:

- A worldwide economic slowdown caused by a BRIC crash - China's and Brazil's real estate sector and other markets could collapse due to over-valuation and excessive credit. That could have a knock on effect on Western investors leading to worldwide slowing in growth.

⁴² Gold reached \$1,503 an ounce 20 April 2010, four years earlier in April 2007 it was around \$650 an ounce.

⁴³ The planned public listing of Glencore International AG in London and Hong Kong (announced April 2011) is an interesting step that could indicate we have reached a short term peak in commodity prices. That is a credible possibility, given the huge recent rises. However, it is also likely that over the longer term commodity prices will remain high due to demand and limited supply.

- Extractive industries may find huge untapped resources⁴⁴ that are accessible and farmers may see huge breakthroughs in yields – this would take the upward momentum out of commodity prices.
- A major return to equity investment and private equity activity toward non-commodity sector corporates - could drive capital flows away from futures and commodities helping to calm commodity prices.

The New Commodities: Land and Water

At the base of the world's economic 'supply chain' are two assets: water and arable land. They are the bottom of the 'food pyramid' – and upon these two foundation stones rest the world economy. We ignore them because in the US and Europe we assume our societies have 'mastered' these areas. But that may change, especially as global warming proceeds. While lack of land and water is possibly a future threat to the West, in other regions such as Asia and the Middle East it is already an issue.

Not enough land and not enough water means insufficient food production, and for any nation that means serious political and economic problems. Rising rice and wheat prices have triggered riots in many countries (see IMF table 10). Food inflation in North Africa and the Middle East is a contributing factor to the civil unrest directed at the regimes there.

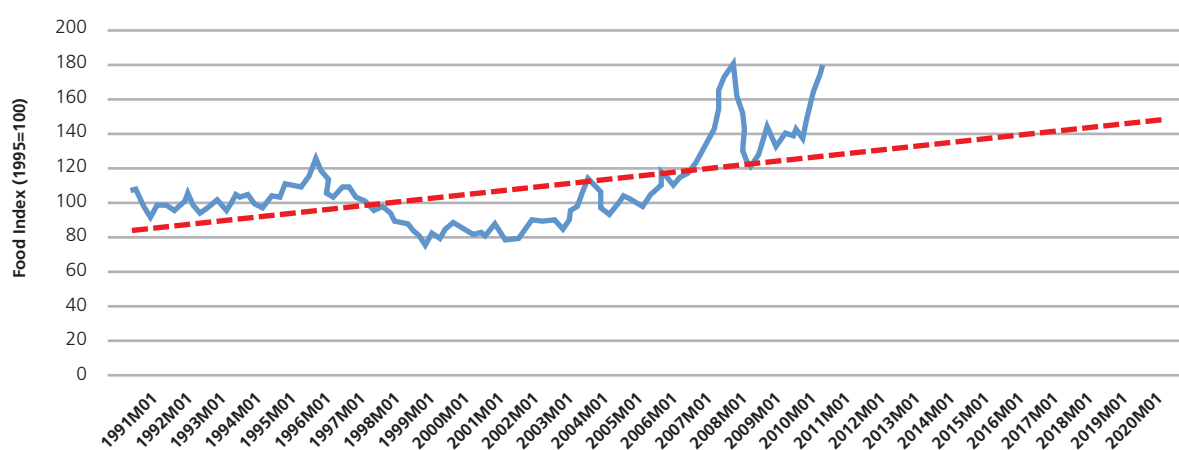


Table 10: IMF Food Index, 1995 = 100. Red dotted line shows long term trend line.

Rising food prices can also force Governments to drop taxes on foodstuffs, or introduce subsidies, which impact public spending on infrastructure. Equally, rising food prices have a serious knock-on effect for those at the lower end of the burgeoning 'world middle class' undermining any income gains they may have had from joining the global economy. This salary erosion undermines one of the key hopes of globalisation: that wider development will create larger markets for products. But, people worried about paying for food will not have money for 'Western' consumer goods. It also makes arable land, and the water needed for it, increasingly valuable.

China, with its huge population and polarised society, is well aware of the incendiary nature of lower harvests due to a lack of water, followed by food price inflation. For example, in February 2011, Chinese Premier, Wen Jiabao, unveiled a 6.7bn yuan (\$1bn) package of measures to divert water, construct emergency wells and improve irrigation. China will also double its commitment over the next ten years on water conservation to 4tn yuan (\$600bn). Huge sums are also being spent on water diversion projects, well digging and desalination plants in other parts of the world.

⁴⁴ Greenland and the Arctic Circle are seen by some as this 'new world' to be tapped and exploited. The retreating ice is making the land and sea bed there 'mining friendly'. How much they will contribute is still unknown – and we are still in the early prospecting phase. Given the time needed to develop drilling in these areas feed-in benefits to commodity prices may not occur – if at all – for some time to come.

Meanwhile, banks and financial advisers are already seeing more ‘interesting’ work in relation to agriculture. Ivolga, a farming conglomerate which controls 1.5m hectares of land across Russia and Kazakhstan, is presently negotiating with Royal Bank of Scotland, which leads its creditors, to restructure a \$300m loan it arranged in 2007. Analysts estimate that if sold the farms could be valued at \$750m-\$1.5bn. This is not the only ‘mega-farm’ in the world. Another example is the one run by El Tejar, an Argentine conglomerate, which has 1.1m hectares. China has been particularly imaginative in its agricultural deals. In one deal China agreed to build a hydropower project in Ghana in return for cocoa beans, rather than cash⁴⁵.

Land’s End

The key challenge to humanity’s demand for arable land is a simple one: it is limited and cannot be increased without huge financial cost, such as desert reclamation, or huge environmental cost, such as clearing the rain forests. Because of population growth there has been a 35% reduction in arable land per person from 1980 to 2007. As populations and urbanisation increases this reduction will accelerate. However, the impact is not equally shared – some fast-growing nations such as India have seen up to a 50% reduction in arable land per person, although China, which has also seen rapid growth has managed to maintain its agricultural base. Less arable land may also mean increased food imports, potentially inflating food prices even further. Another issue is the development of bio-fuels⁴⁶, which also demands good arable land. But growing food for fuel will naturally diminish land for food production, as well as absorbing resources such as water needed for cereal farming. The result is higher food prices. The counter argument is that bio-fuels are a cash crop and that helps farmers. But, wealthier ‘fuel farmers’ may come at the expense of a poorer wider population. As oil prices rise this issue is likely to lead to increasingly heated debate, and possibly future regulation. Whether used for food or fuel, one may regard productive arable land as a commodity that will increase in value to 2020.

	<i>Arable land per person (hectares) 1980</i>	<i>Arable land per person (hectares) 2007</i>	<i>1980-2007 Decrease</i>	<i>2020 Projection</i>
Brazil	0.4	0.3	-25%	0.2
China	0.1	0.1	0%	0.075
India	0.2	0.1	-50%	0.075
United Kingdom	0.1	0.1	0%	0.1
United States	0.8	0.6	-25%	0.55

Table 11: Arable land per person (by country) in hectares. World Bank data.

Despite the land drought, crop yields have increased by almost 100% in the last 30 years – in large part to better agricultural methods, greater use of fertilizers, new strains of crops, as well as the introduction of genetically modified (GM) crops to some countries – although in parts of Europe there is still fierce opposition to their use. But, even this incredible agricultural feat cannot seem to slow food inflation as insatiable demand - led by population growth - quickly absorbs any improvements in production. The world’s burgeoning population shows no sign of peaking either, and in 2020 – just nine years away - will be already 10% higher at around 7.7 billion, adding another 800 million mouths to feed⁴⁷.

⁴⁵ Foreign Affairs, 5 January 2010, ‘What the West Can Learn From Chinese Investment in Africa’.

⁴⁶ New York Times, 7 April 2011, ‘Bio-fuels Push Sends Food Prices Soaring.’

⁴⁷ At the same time, increased wealth in many nations means people are eating more, and eating more meat, which also needs several times as much land and water as cereal farming. Testament to this higher consumption is the growing obesity rate in nations such as China – according to WHO data around 20% of people are obese in some Chinese cities.

Water Wars

The division of global water use approximates to: Agriculture 70%, Industry 20%, Domestic use 10%⁴⁸, which indicates just how vital any reduction in water supply is to a nation's ability to feed itself. Yet, water use is predicted to increase by 50 per cent by 2025 in developing countries, and 18 per cent in developed countries⁴⁹. But, fresh water is in short supply⁵⁰ in many parts of the world. Even in the US, strict measures have been introduced to preserve water, such as in California and Florida.

Large scale desalination plants⁵¹ can add to this total – but for most countries it is a question of depending upon rivers, lakes, underground reserves and rain-fed natural water basins. The problem is that over 75% of all countries, 145 in total, share river basins with other countries, and 33 nations have over 95% of their territory within international river basins, i.e. river basins so large and transboundary that multiple nations draw from them. In the 20th century, seven military engagements took place over water resources, while over 300 treaties were signed during the same period to help control water ownership and use⁵². Clearly, with growing populations, growing needs for water for agriculture and industry, combined with global warming, the likelihood of legal battles over water resources, perhaps in order to head off military battles, increases.

To this challenge one can add the infrastructure cost of reservoirs, purification plants, pipes and distribution networks to be built and maintained. Even for developed countries this is a major area of re-investment – the UK has struggled to renew the Victorian water system underneath London's streets.

Business Impact

- Commodity Inflation Reduces Profits - Rapidly rising commodity prices will have a complex impact on businesses⁵³. The increasing cost of raw materials will erode profit margins unless the extra costs can be passed onto the customers. Some businesses, perhaps those with sufficient economies of scale, or those that are very efficient, will be able to manage this 'squeeze'. However, smaller or less efficient businesses, unable to adapt to this inflation may suffer as customers refuse to accept price rises.
- Reinvestment of Extra Revenue – some clients, especially those in the extractive sector⁵⁴, will benefit hugely from this commodity rise, they may in turn seek to plough their revenues into expansion to gain scale so they can further cut production costs.
- Mergers – economies of scale may trigger consolidation and mergers in not just the energy sector, and mining – where it is developed already – but in all areas, including the water sector and farming. For example, today there are some large water companies – but nothing on the scale of the energy companies⁵⁵.
- Infrastructure Investment – as with energy and transport there is considerable room for Government and public/private investment in mining, farming, water and arable land development.

⁴⁸ United Nations data.

⁴⁹ United Nations data.

⁵⁰ Only 1% of all fresh water on the planet is readily accessible. US Geological Survey, 2009.

⁵¹ Libya has for some time been hoping to build a nuclear powered desalination plant. Now, with the revolt, the project looks unlikely to begin for some years.

⁵² UN-Water: Transboundary Waters: Sharing Benefits, Sharing Responsibilities, 2008.

⁵³ Financial Times, 11 Feb 2011, 'Pepsi faces additional input costs of up to \$1.6bn in 2011 – or cost inflation of up to 9.5%.'

⁵⁴ Financial Times, 10 Feb 2011, 'Rio Tinto more than doubled earnings in 2010 from \$6.3bn to \$14bn.'

⁵⁵ Top companies by annual revenue (2010) in Fortune Global 500: World's largest oil company Royal Dutch Shell \$285bn, largest electricity company China State Grid \$184bn, largest water and waste company Veolia \$49bn. However, Veolia is not a 'pure' water company, and a large part of its business is derived from providing cleaning and maintenance services to the municipalities and corporates. It is not until one reaches number 499 with Suez Environmental with revenues of \$17bn that you approach a relatively dedicated water company.

- Technological Development and IP – extractive industries and food producers will continue to develop new technology and related IP as they seek greater productivity, or in the case of mining companies to reach less accessible sources.
- GM Animals and Crops – While linked to the ‘industrial IP’ of the point above, GM foods have a huge public health dimension. Fears over the GM industry may grow as the world becomes more reliant on its products, such as patented cereal strains – perhaps leading to increased regulatory demands.
- Increased Import Needs – the need to import commodities will grow rapidly, with most developed countries already well past the days of self-sufficiency, even in food.
- Use of Futures – companies will increasingly have to find better ways of hedging against rises and fluctuations in commodity prices, this will inevitably mean increased use of the futures markets.

Law Firm Impact

- Futures and Derivatives – As commodities grow in importance, so will futures trading and new futures derivatives, creating interesting capital markets work for those law firms able to help structure new products.
- Land and Water Rights – there will be increasing legal battles around downstream water rights. One can expect the UN and other international bodies to encourage arbitration.
- New Technology and IP – as mentioned above, extractive industries will pioneer new technology to reach and process ever more challenging sources of minerals and metals. Mining companies and innovative industrial design companies providing technology to the extractive sector, will need increasing levels of IP protection.
- GM Litigation – Aside from IP rights, which are complex when it comes to patenting a ‘new’ form of animal or crop, there are competition issues that may grow in importance as GM products spread around the world. Competition issues have already been raised with regard to GM companies selling farmers a ‘total package’ whereby the farmer is locked into using certain proprietary fertilizers and other products once they buy GM seeds.

Chapter Four: New Technology

New technology is a driving force in sustaining economic growth, however we are so used to continual technological development we tend to forget its importance to the wealth of nations. For example, imagine a world where the US economy had only dial-up internet where Europe, Japan and China had high speed broadband. That seems inconceivable. Yet, many nations are in exactly that position – trying to compete in a global economy suffused with continually advancing technological standards, yet barely able to reach the basic standards themselves. Economic growth is an important step for any developing nation, but being unable to communicate or transfer vital business data at the same level as developed nations is a continual challenge.

Global businesses may be affected by this inequality of technological development too. For example, there is no point marketing tablet computers in a country where internet speeds are so slow it takes hours to download a single ‘App’ from iTunes⁵⁶. The technological weakness of some nations therefore not only limits their own development and participation in the global economy, it limits globalisation itself, as it stymies the growth of consumer markets and reduces the revenues global companies could otherwise achieve.

Below is an overview of some key areas of technological development that are helping to shape the global economy.

Medical Developments

Healthcare is heavily dependent upon technology. In turn, medical technology and its advances has an impact on insurance, pensions and public/private investment that goes deep into the heart of the modern economy.

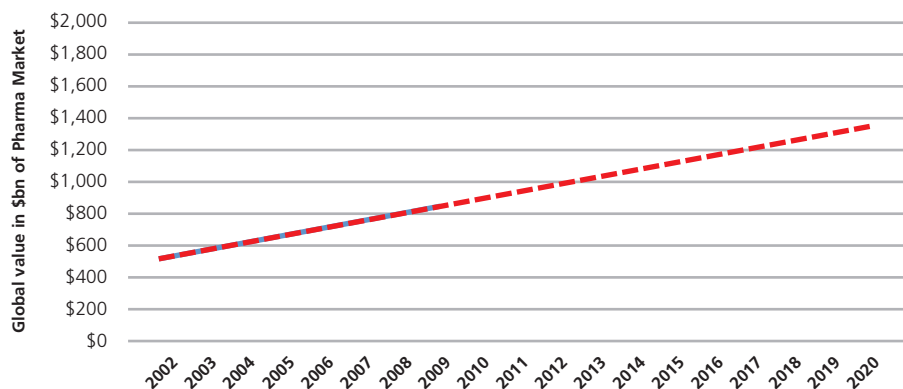


Table 12: Growth in global value of the pharmaceutical market. IMS Health data. Red line shows projection based on growth from 2002-2009.

For example, a breakthrough drug of the importance of penicillin⁵⁷ by 2020, such as one that could cure certain common cancers, would have a massive impact on the world economy. Billions of people would live for far longer, insurance payouts could reduce and revenues for the IP-holding pharmaceutical company, or companies, making such drugs would grow massively. The pensions industry would also be hard hit as people lived for far longer after their retirement, putting huge pressure on pension funds to generate more income. Individuals would also have to contribute more to make pension pots larger. At the same time, in countries with wide scale public healthcare like the UK, the cost burden for the drugs on the National Health Service (NHS) could be immense, possibly leading to legal battles balancing patients’ rights against limits on funding for such drugs⁵⁸.

⁵⁶ However, even some nations with ADSL lines are still seeing such slow speeds it is a hindrance to economic development.

⁵⁷ Such a drug is a long way off – if even possible. Penicillin’s primary ability as an antibiotic was to destroy bacteria and bacterial infections. A drug that could prevent, or reverse, cancerous growths – a situation where the body’s own cells are part of the problem - would involve a far more complex pharmacology.

⁵⁸ Legal battles between patients and the NHS are already a small, but growing trend in the UK.

However, even without so-called 'wonder drugs' the pharmaceutical industry is expected to see massive growth in global revenues. The pharmaceutical industry today is worth around \$850bn in drug sales, by 2020 global pharmaceutical revenues could be near \$1.4 trillion, or a 65% increase in sales over just ten years⁵⁹. China is the main reason for this rise and is expected to become the second largest consumer of pharmaceuticals by 2015, overtaking Japan and second only to the US.

Of the prescribed drugs that sell best globally, a significant proportion are related to illnesses related to long term inactivity, over-eating and eating badly e.g. too much meat, too much fat, too much processed food. These are indicators of a Western diet and increasingly sedentary lifestyle. Western habits are now affecting many millions of people in the developing world as their economies and lifestyles change. For example, at least 30% of the Chinese population are now overweight and 100 million Chinese are diabetic⁶⁰.

A smaller, but also hugely remunerative, group of drugs are related to psychological problems, mainly depression. Although the West has no monopoly on these problems, long term dependency on a pharmaceutical for psychological 'support' certainly is a new development in the developing world. While this may boost the pharmaceutical industry's revenues, it also raises serious issues for the insurance industry and Government spending on healthcare – especially in developing nations. Wider use of drugs also raises the stakes on future international litigation versus drug companies due to unexpected side-effects. There may be increased battles between patent holding pharmaceutical companies and generic drug makers, as the generic producers supply an ever greater demand for important medicines at lower prices.

Another important aspect to medical technology is advances in genetics, which may also have profound legal implications. Today, DNA tests for criminal investigations or paternity are standard and not expensive. However, it is estimated that we will soon have a \$1,000 complete genome sequence⁶¹. Even a decade ago an entire human genome sequencing was estimated to cost around \$10m. Today it has dropped to around \$50,000 – although can still only be carried out in tiny numbers. But, by 2020 – will we all have our entire genome, 'unpacked' and 'itemised' for potential illnesses and conditions attached to our medical records? Will the Government, or public agencies, or companies, such as insurers or otherwise, have access to this information, and if so what will it mean? Letting those with a financial interest in us not being ill know we are very likely to be ill in future is unlikely to be in the favour of the individual. Also, even a genetic indication of predisposition to a certain disease is rarely 100% proof that disease will manifest itself.

These arguments came to a head in the US three years ago and resulted in a piece of legislation that is meant to settle all of these explosive and legally charged issues. The US GINA legislation of 2008 prevents the Government, insurance companies or private employers from using DNA data to withhold healthcare or medical cover. But, that's not the case in every country. In Australia, there are similar rules, although an individual must disclose "any known genetic information" and that "may or may not" affect their chances of getting life insurance⁶². That may seem fair. But, what if, for example you carried out a full genome scan on yourself when you were younger? Technically any 'bad news' would have to be communicated or risk voiding the insurance, as any genetic information collected years ago is still relevant today. As can be seen, this is a legal minefield. However, moving beyond the most developed countries, the situation is more complex as in some developing nations legislation will not have been formed that covers these areas.

⁵⁹ Based upon projection from data by IMS Health Data.

⁶⁰ BBC 21 September 2010: China Battles Obesity in Growing Economy

⁶¹ The challenge with examining DNA is not collecting the genetic material, it is knowing what to look for and how much time and effort the analysis will take. This is why determining paternity is relatively easy as the 'target' genes are known. Trawling through a person's entire genome on the look-out for all known possible links that may impact on developing a disease or condition in the future is a massive project.

⁶² The Australian 'Investment and Financial Services Association', Fact Sheet 23A.

Another important factor is whether GINA, and similar legislation, will stand the test of time. As public healthcare costs rise as rich nations’ populations grow ever older, and in some cases more unhealthy, and as costs mount, it is possible some Governments will be tempted to water down insurance safeguards.

IT

In the US and UK we take broadband and 3G telecoms systems (soon to be 4G)⁶³ for granted. Our personal and working lives are now integrated with this technology. Meanwhile IT directors have been elevated in the space of a decade from backroom support technicians to senior roles who sit at C-level meetings and who make decisions that can make or break a business. Yet, some developing nations are still struggling even to build reliable and widespread dial-up internet services (see table below). Even nations we often regard as highly IT-literate, such as the outsourcing centre India, have very low overall levels of internet penetration. This matters because high levels of data transfer and web-based consumer activity will continue to grow in importance for sustaining economic development⁶⁴.

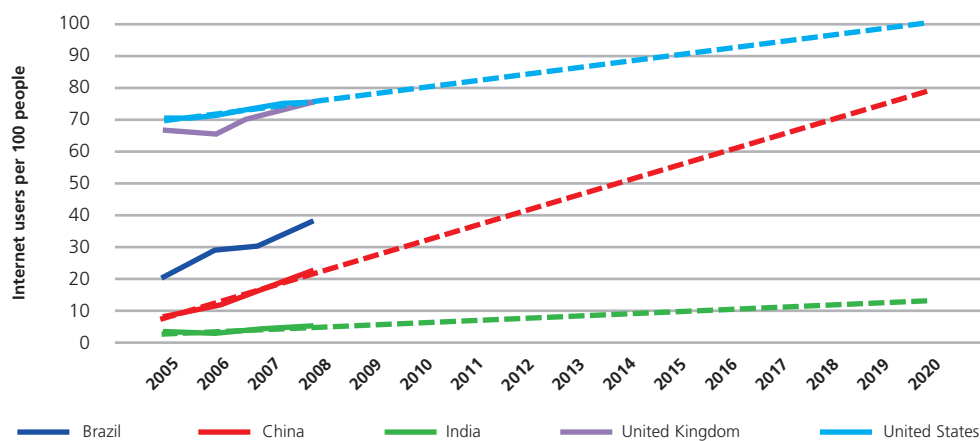


Table 13: Internet Users per 100 people. World Bank Data – includes dial-up and broadband. (Jomati projections to 2020: blue US, red China, green India.)

To be left behind here is far more important than not being able to download a movie, it is a question of whether an individual or company can participate in the global economy as a peer. If sending information or communicating is an issue for a company in a developing nation it is at a huge disadvantage on the world stage. A country that has limited internet capability also cuts itself off from the web-based economy, which is growing exponentially.

The US will reach 90 internet users per 100 people by around 2019. China with a population three times larger, and in its Western regions far less developed, reaching 80 users per 100 by 2020. India, however is far behind. If India followed its current internet user rate only 12% of the population would have an internet connection by 2020. Although, that would still equate to around 130 million people – or twice the UK population. But, this low percentage indicates that a social divide can also replicate itself as a technological divide within a country, limiting the ability of the wider population to develop economically.

⁶³ 4G is the next generation standard of wireless communication. Meanwhile, South Korea is already looking at how to develop a 5G network.

⁶⁴ Dr Martin Hilbert at the University of Southern California has estimated that in 2007 there were 295 exabytes of data in circulation – that’s 295 with 20 zeroes after it. He also found that 94% of all data was digitally stored. Back in 2000, only around 25% of all data was stored digitally. By 2020, we can assume these figures will be far higher, with perhaps 99% of all data held digitally. Telegraph, 11 February 2011.

Frontier Technology

Much as it would be exciting to predict that areas such as robotics and space were going to deliver huge changes to the global economy by 2020, affecting clients and law firms – they probably will not. The technological dreams of the mid-20th Century have ended up producing quite different dominant technologies in the 21st Century: Facebook and Twitter powered by iPhones and Blackberrys. Technology, Media, Telecommunications (TMT) has tapped a market of billions creating a massive revenue stream. Investors and manufacturers found that the greatest profit was to be found in giving people something to communicate with, not rockets and robots.

Yet, go back a few years and you will find the media is filled with 'paleo-futures', or predictions of the future that never come to pass⁶⁵. Many technology predictions are made based purely on what technology can do in the simplest terms, rather than thinking about two key factors:

- The Human Dimension - What use will people really make of this technology and how will they relate to it?
- Profit for Investors - Is there a market for this technology even if such products can be built, and what levels of profit generation will it provide in the long term?

A failure of seeing the human dimension comes with robotics. Despite Japanese efforts, developers have not produced anything significant other than factory-scale mechanical lifters, welders and painters, and the forlorn humanoid robot 'ASIMO' from Honda, which has cost millions, but is almost entirely useless⁶⁶. The main failing is a lack of artificial intelligence or AI, making spontaneous, complex human interaction almost impossible. The problem is humans are unpredictable, for example, we may just ignore a prompt, or reply in an unexpected way. Making machines with a very limited function sync together is a challenge, making an AI-driven machine sync with the infinite possibilities provided by human interaction, is a near impossible challenge. AI simply has not materialised in any advanced form, and may not for many decades to come – if ever⁶⁷.

One technology guru, Google Executive Chairman, Eric Schmidt, sums up⁶⁸ the way technology will develop: "Computers will do things that they do really well, and humans will do what we do really well. People assume that computers will do everything that humans do. Not good. People are different from each other and they are all really different from computers." In short, computers don't make very good analogues of humans. For example, in Japan efforts to introduce 'care' robots to retirement homes have been a failure as, unsurprisingly, people don't want human comfort and emotional support from a machine with a limited set of formulaic responses⁶⁹.

The space industry has received plenty of hype from a small number of entrepreneurs such as Richard Branson. It has also recently been given a boost by the UK Government which has promised to revise legislation so that UK operators of space craft will no longer face unlimited liability for third-party claims or the requirement to have £100m of insurance

⁶⁵ See: www.paleofutures.com, which provides a collection of predicted futures that never happened.

⁶⁶ A fundamental economic problem with robotics is creating a device that successfully mimics a human at a cost lower than the normal human labour cost. Static mechanical lifting is one thing, but handling complex human interactions with social repercussions – such as handling clients at reception - would require a robot of such sophistication it may never be worth the investment, even if it were possible by 2020.

⁶⁷ IBM's 'Watson' a closed AI system that cannot interact, but managed to beat human competitors in the American word-play TV game show 'Jeopardy' in Feb 2011, has been touted as a step forward in AI – going beyond super chess computers like Deep Blue. However, it is very far from being a 'free', socially interactive system and works because its environment is carefully restricted to a language game. Could there be a role here for AI on standard legal document prompting and completion? For sure – certainly by 2020. Will AI replace partners offering clients views on legal issues? Not now, and possibly never.

⁶⁸ Google Executive Chairman, Eric Schmidt, interviewed by the Sunday Telegraph, 5 February 2011.

⁶⁹ Using robots to care for humans also raises some interesting legal issues. What if the robot harms a person they are 'caring' for? Who is to blame? The owner of the robot, the programmer or the manufacturer, or perhaps the Government agency that permitted use of this technology in the healthcare sector?

cover in place for launches and during orbit⁷⁰. This is a positive step, and will help satellite companies. But UK satellite launches will likely remain in the hands of the European Space Agency and launch from locations such as French Guiana.

Aside from the satellite industry and some modest interest from the private sector in providing 'ferries' to the International Space Station after the retirement of the space shuttle fleet, there is little significant activity. Virgin Galactic is soon to offer 'space tourism' – although this is really a \$200,000 zero-G experience at the edge of the atmosphere. It will likely remain a small market. One could add that at least one other company already⁷¹ offers zero-G experiences, at a fraction of the price.

But, beating all competition in the scale of its ambition is US-based Bigelow Aerospace. It is planning to build orbital hotels using 'inflatable modules' that will link together to form a space station open to fee-paying guests. This plan may be misguided, but founder Robert Bigelow is putting up a huge investment - \$500m of his own money with plans to hire another 1,200 employees, in addition to the 200 he currently employs⁷². Are such plans the future, or are they preparing the way for the next Hindenburg-style disaster? The insurance industry will certainly be looking at all these projects with extra thoroughness. The commercial costs may also have been hugely underestimated. The International Space Station, when first planned in 1984 was expected to cost \$8bn in public money. The total cost of building the station, module by module and keeping a crew on-site, is now \$100bn⁷³, and that does not include the next decade of planned operation. That's just over \$6bn a year since its first module was launched in 1994. In comparison, the Large Hadron Collider, the most complex particle accelerator in the world, cost 'only' \$9bn. In short, space tourism is an extremely expensive sector – and its market is therefore tiny – at least to 2020.

Business Impact

- Massive Growth in E-Commerce/Internet Media – Imagine Amazon and eBay with a market of billions, not just the 233 million customer base⁷⁴ eBay currently has. By 2020 such a step is entirely possible. Such a development would have a huge impact on retailers and suppliers⁷⁵. Although more regulated and therefore with higher barriers to new markets, the same factors apply for e-banking and internet-purchased insurance. Revenues for a media company that can get just a few per cent of all internet users globally to subscribe to a news or information service will be huge⁷⁶ - and this is clearly the direction News International with its 'Times' and 'Wall Street Journal' pay walls is heading.

⁷⁰ Telegraph 24 March, 2011.

⁷¹ The 'Zero-G' company in Las Vegas provides a flight in a converted airliner for \$5,000 that replicates the low gravity experience by flying up and down in a 45% parabola to 24,000 feet. Weightlessness lasts up to 30 seconds.

⁷² Nextbigfuture.com, 11 Feb, 2011.

⁷³ Space.com. 1 November, 2010. 'Is the ISS Worth \$100bn?'

⁷⁴ eBay company data. <http://pages.ebay.co.uk/aboutebay/thecompany/companyoverview.html>

⁷⁵ Consider the impact e-commerce has already had on the High Street/Main Street with many book and music chains going bankrupt, while at least in the UK, internet shopping for groceries is rapidly expanding – putting further pressure on smaller chains that cannot compete.

⁷⁶ One could argue that ever since the development of brands like MTV in the 1980s this has always been the ambition of a number of entrepreneurs such as Ted Turner, the founder of CNN, or Michael Bloomberg, the founder of Bloomberg. What is different now, is that rather than being a primarily Western and English language market, the global platform of the internet permits truly global information-based brands – whether this be news, or stock trading, banking, or insurance. It also allows a company to build market share where they may not even have a physical presence other than regulatory approval to sell their services in that country. Clearly, some sectors are more suited to this strategy than others. People may well be able to use internet only banking, but many will continue to want to be able to visit a physical branch.

- Distance Working – Advances in IT have helped remove the few technical barriers to distance working. Distance working permits significant cost savings for employers, reducing overhead costs. Companies could create a structure whereby a small support centre forms a fixed HQ, while most management and major fee-earners/sales people work from home⁷⁷. Some sales and service focussed companies with significant travel demands already work like this – however, there is no reason other businesses that are relatively ‘static’ could not too.
- Digital Information Theft – As more information moves digitally, so will the attempts by competitors, perhaps in foreign countries, to steal that information. Control over business secrets will become ever more important.
- New Producers of Technology – We tend to expect new technology to originate in the US, Japan, parts of the EU, and South Korea and then the list runs out, as if innovation belongs to a handful of the world’s 192 nations. But what happens when developing countries like India, China and Brazil spend sufficient money on R&D to develop high tech products with a global appeal? The wider aspect of this is discussed in the next chapter, however, one thing worth noting is that these nations are already the hosts of cheap manufacturing, and in some cases making very high tech products for others.
- Relocation of R&D Centres – While the rise of Asian nations as R&D developers is a challenge to Western companies, the displacement of R&D centres of US and European companies to Asia⁷⁸ to save money is another trend. Such moves will have a knock-on effect to the service providers that had grown up around that R&D centre, from patent lawyers to technical services offered by third parties. Such a ‘brain drain’ does little to support the West in the coming battle over IP development it will face in the years ahead.
- Globalisation Boosts Pharmaceutical Sector – As more people enter a ‘Western’ lifestyle, so too will they develop diseases associated with modern life. Drug makers will see their market grow ever larger.

Law Firm Impact

- Growing Need for IP Protection – as more nations develop R&D facilities and seek to enter the consumer electronics and TMT sector, the battle to protect IP on a global level will increase. This legal area has been greatly complicated by nations such as China, which is moving from trademark pirating to co-opting foreign companies’ patents, sometimes after a bidding or procurement process where a company’s know-how has been revealed⁷⁹.
- Privacy and Personal Information – As businesses spread abroad via the internet issues related to e-commerce and data retention across borders will grow. Facebook, for example, has continually battled accusations it erodes users’ privacy.
- Web Data Impact on Employment - staff or recruitment candidates may lose out on a job after potential or current employers ‘trawl’ through a person’s web activity. Many people entering the job market already have a large part of their internet interaction visible to employers and Government agencies⁸⁰. As networking sites become more popular the legal position between employee and employer, and possibly clients, will become more complex.
- Distance Selling Issues – as global internet retailers and service providers cross more borders, the complexity of distance selling and legal liability increases.

⁷⁷ The reason many companies operate with an ‘everybody present’ system seems to be based on two things: established custom, and fear that workers at home will be inefficient and unproductive. However, current IT allows a company to see in real time what work staff are conducting and can also measure productivity.

⁷⁸ The Middle East is another possibility, with Qatar investing billions in becoming the leading R&D centre in the region, mainly through funding the Qatar Science & Technology Park. Abu Dhabi is spending \$22bn to build Masdar city, which will specialise in clean tech R&D projects.

⁷⁹ As is alleged to have occurred in relation to China’s development of high speed train technology.

⁸⁰ The way in which people now share huge amounts of personal information in what is ostensibly a public forum is a major change to social/cultural interaction of the past and will continue to create important legal issues. For example, litigation discovery has long been including all company emails, but the ‘vault’ of pertinent data extends far beyond what is said within the confines of company email. For example, tweets between employees regarding a company matter – but in what is essentially an open forum. As a growing number of commentators are now stressing: one should always assume that everything you communicate through the internet may one day be seen by a third party. One can use privacy software, but ultimately your information is passing through a network you can never fully control. One can also never account for subpoenas for internet communications that may come at a later date.

- Legal IT – although not the focus of this report, law firms cannot ignore the future impact on themselves of technology, primarily in relation to predictive document production fusing with knowledge management systems. As the move to unbundle commoditised work from advisory work accelerates, firms will feel under increasing pressure to reduce the costs to the client by developing or buying in software to speed document assembly.
- Genetic Information – (as mentioned above) currently the US GINA law prevents genetic information becoming a health insurance issue, but this is not the same all over the world. As insurance companies globalise they will encounter new regulatory systems they will have to work with, without conflicting with other systems they adhere to. There is also scope for GINA to be amended in the future – opening up an array of legal issues between companies, employers, insurance companies, hospitals and other stake holders.

Chapter Five: Owning the Future

IP-Owning Cultures

It is no coincidence that many of the wealthiest and most developed nations in the world are either now – or historically were – leading IP-owning cultures. Out of 192 countries in the world just a handful have developed the majority of truly valuable IP over the last 300 years⁸¹. These are: the US, which dominated the 20th Century across a multitude of sectors and – so far - still does today; Japan which pioneered consumer electronics and car manufacturing in the latter half of the last century; and of course nations such as Great Britain, France and Germany which from the ‘Enlightenment’ in the 18th Century pioneered the development of new technology (see Appendix B), such as the steam engines and spinning machines that permitted the industrial revolution, while today they still pioneer in areas such as complex engineering, pharmaceuticals and TMT.

Simply put, IP generation is vital to a national economy because it can bring immense wealth and secures income for many years to come. IP forms the core of new companies, in turn creating jobs and in some cases new industries, e.g. desk top computing. Therefore to shun investment, research and development (R&D)⁸² and protection of IP is not only detrimental to entrepreneurs and venture capitalists, it stymies economic development of entire economies. Worse, to let other nations pioneer while your nation simply consumes other people’s good ideas and products leaves an economy in a weak position. It is a position China, which now has considerable expertise in high level manufacturing, is seeking to rapidly move beyond.

As an example of the impact of IP, consider table 14, which shows just a tiny fraction of American innovation at the start of the last Century. This early wave of invention became a flood that has not stopped since, creating many global companies in its wake, and contributing hugely to US GDP.

Date	Invention/Key Innovation Event
1901	Gillette Double Edged Safety Razor
1901	Hubert Hoover invents first compact vacuum cleaner
1903	Willis Carrier invents air conditioner
1903	Wright Brothers fly first engine driven airplane
1906	William Kellogg invents Cornflakes
1908	First Model T Ford car sold

Table 14: A small sample of the innovation coming out of America in the early 20th Century⁸³. Note the companies: Gillette, Hoover, Kellogg and Ford.

⁸¹ This may sound extreme, but go through the dominant technologies of the modern world, from engine development to telecommunications to pharmaceuticals, and Japan, Western Europe and the US dominate.

⁸² For example, why isn’t Spain still one of the richest countries in the world? In the 17th Century it was the most powerful nation in Europe and had extensive colonies in the ‘New World’. Britain on the other hand was in a weak position. By the end of the 19th Century Britain was a super power and Spain had been left behind. There are of course numerous geo-political and military reasons for this too – however, one key aspect is that Britain in the 19th century was mass producing products based on UK-patents, or using machines created in the UK to allow that mass production, and then selling those products to the world.

⁸³ The list of all major US inventions from 1900 to 2011 would fill this entire report, so it is hoped this small sample gives a taste of how important continued IP development and ownership is to the world economy – and to the wealth of each nation, and thereby the success of the commercial law firms in that market.

With table 15 one can also see the strong correlation between economic success and patent development, with American, Japanese and Chinese filings rising sharply during periods of major economic growth.

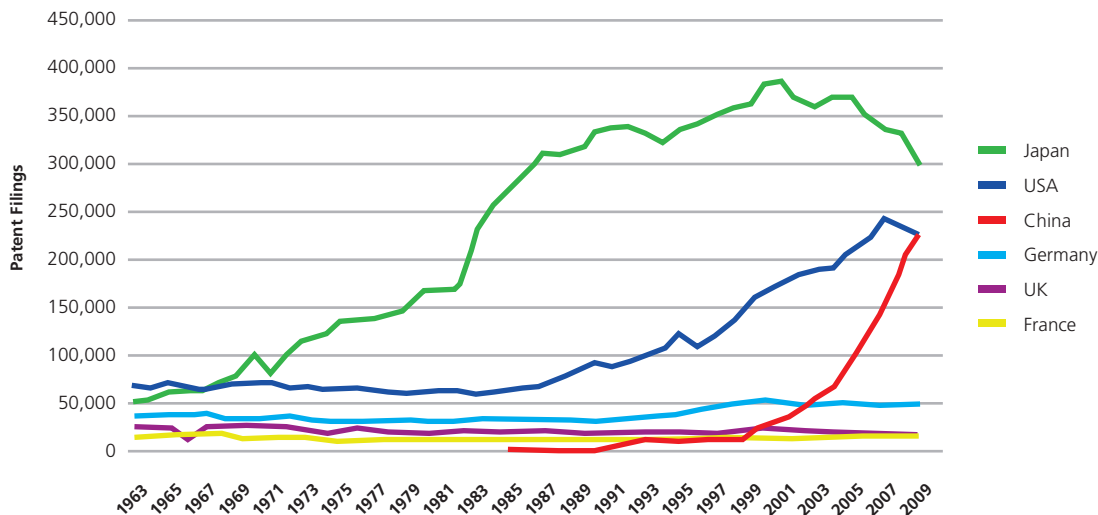


Table 15: Resident only patent filings⁸⁴, 1963 to 2009. Data from World Intellectual Property Organisation. (No data for China before 1985).

American resident patent filings start to rapidly rise after 1980, mirroring the rapid rise in technological development, especially in computing and IT over this period. Japan sees an even more extreme trend: rising up rapidly from the late 1960s until peaking around 2000 and then going into decline. This seems to mirror Japan's wider economic growth and then lethargy. Meanwhile, China, for which there is not even data before 1985, sees the most rapid of all rises – matching the US in 2009 for home grown resident patent filings, but getting there in the space of 25 years.

The UK's position appears to be in slow, but steady decline. This is especially noteworthy as the UK was from 1700 to 1900 a pioneer in many of the technologies that helped found the modern economy, from steam power to early industrialised manufacturing. In comparison, Germany, which has maintained investment in its technology and high quality manufacturing is now relatively far above the UK and France in resident patents. On this latter point many commentators have raised the issue that although the UK is a dominant global financial market, its position in manufacturing has slid dangerously low. This in turn raises the question where will Western European economies be by 2020 if places such as London and Frankfurt lose their importance as global financial centres? Germany may well see its high-level manufacturing sector take up any slack in the economy. In the UK, where R&D development is already under strain and the public sector shrinking, a parallel downgrading of London as a financial centre would be a major blow. Is such a development possible by 2020? Given the continuing rise of Asian financial centres such a possibility should not be ruled out. However, this and other issues related to the financial markets will be examined in Part Three of this report⁸⁵.

Aside from Europe's IP decline, perhaps the most important issue over the next decade will be China's possible ascent to become a pre-eminent IP-generating nation. As table 15 shows, China will soon catch the US up as the leading nation for patent filing. Its education system is charging ahead, with a recent OECD survey finding children in Shanghai

⁸⁴ Patent filings by themselves do not guarantee that a patent holder will be able to sell products or that the companies that own that IP will become a success. However, in broad terms and at least with these nations, the numbers of patents filed does seem to correspond to growth in each country's GDP.

⁸⁵ Part Three of the 'New Frontiers' report, focused on financial services, will be published Autumn 2011.

had reading and maths scores far higher than those in Europe or the US⁸⁶. The publication of scientific papers in China is also showing a powerful move into R&D, while Chinese R&D spending has grown by 20% per year since 1999, now reaching over \$100bn⁸⁷.

	1996	2008
USA	292,513	316,317
China	25,474	184,080

Table 16: Number of papers published in internationally recognised journals, 1996 and 2008. (Data: The Royal Society, the UK's national science academy.)

These are positive steps for China. However, this R&D surge is not without its critics who suggest that publishing papers and scoring highly on maths tests is one thing, but turning this ability into producing wholly original technology the rest of the world wants to buy is something very different. There have also been questions over how worthy many of these Chinese scientific papers are – with accusations of plagiarism, faked results and even ‘ghost writers’ charging professors 300 yuan (\$45) to produce an academic paper⁸⁸. The recent debacle over the alleged appropriation of high speed train technology from foreign companies does not give the world business community confidence either. Equally, one needs to ask whether a society like China, which sometimes seeks to stamp out free thinking⁸⁹, is likely to compete with the unfettered creativity associated with centres of excellence such as Silicon Valley. Even in Japan, a highly conservative society, some companies actively encourage staff to tell superiors about problems in the company's designs and systems. This culture of continual improvement, best displayed at Toyota through the ‘kaizen’ system, has been a critical part of Japan becoming such an inventive IP developer. So can China change? Certainly. Will it change by 2020 and turn this desire to be a respected nation at the forefront of technology into reality? That remains to be seen and very much depends on China's next generation of young people and the ability of the Government to promote creativity.

One other worrying development for the West is that large, innovating companies are closing down not just manufacturing plants and moving them to cheaper locations, but also R&D centres. For example, Pfizer announced in February 2011 it would be closing its pharmaceuticals R&D centre in England which employed 2,400 people and invented Viagra. The closure was driven primarily on the basis of operational costs⁹⁰. The company had four years earlier closed its manufacturing centre at the same site. If this pattern is carried out across Europe and the US, not only will these economies suffer in the short term, the longer term ability to produce technicians and researchers of the right calibre will diminish. Few will want to study for a career that is dying off in their country. At the same time, moving this R&D work to India or China helps them develop talent there, and who may later join competing home-grown companies. To a company that now sees itself as ‘global’ such parochial issues may be of no interest. If a business is operating in 100 countries it may not matter where R&D centres are or what impact this may have locally as its products are its concern and its market is worldwide⁹¹.

⁸⁶ Time Magazine: Jan 31 2011, ‘The Roar of the Tiger Mum’. In the OECD survey Shanghai children scored 556 points for reading and 600 in maths. The US scored 500 in reading and 487 in maths, while UK scored around 480 in reading and maths. Brazil - a fellow BRIC nation - came near the bottom of the table with 400 for reading and only 350 for maths – indicating its economic growth has not yet triggered educational growth of a similar nature, potentially undermining its future.

⁸⁷ BBC News 29 March 2011 and Royal Society Survey.

⁸⁸ San Francisco Chronicle, 11 April 2010.

⁸⁹ The Telegraph 28 March 2011, ‘Peking University to Screen Students for Radical Thoughts’. Although this is primarily about preventing democracy, some argue there is a strong correlation between political freedom and creative freedom, whether in the arts or sciences.

⁹⁰ BBC News, 1 February 2011.

⁹¹ Some of the world's largest companies no longer see setting up R&D centres in India as ‘outsourcing’, rather just cost arbitrage as there is no geographic centre any more from which to outsource. It is simply a case of choosing the cheapest, most efficient jurisdiction within their global network to do the work.

Brand Owners

Ownership of the patent for a new kind of mobile phone is important, but the owners of that patent also need a brand people favour. History is littered with stories of inventors whose good ideas never made any money, often because they did not have the sophisticated corporate backing and marketing expertise to sell them. Conversely, there are many products some would argue were of little practical use, yet conquered the world⁹². History is also marked by stories of smart companies and investors who aggregated quality IP under a well-known, well-capitalised banner – or brand – and made millions for themselves without having invented that IP themselves.

A ‘cool’ brand may not appear to be a solid foundation for judging the success of a product, but consider the added-value a company gains just from having the latest zeitgeist. Take Facebook for example. Facebook’s value in mid January 2011 was \$50bn – although its actual annual revenue for 2010 was just \$2bn – and that from a dangerously erratic income source: web advertising. A 25 times revenues valuation based on web adverts is an incredible achievement for a company just over six years old – but then, few companies personify the term ‘cool brand’ more than Facebook. Although, as MySpace has shown, that status can fade frighteningly quickly⁹³. As can be seen by the data from Superbrands below in table 17, the value of brands can rise and disappear – at least from the top tier – in a space of ten years. For law firm clients who depend on those brands for their revenue this could not be more important.

	Top 100 Brands 2001	Top 100 Brands 2010	% Change	2020 (est.)
United States	62	50	-19%	45
Germany	7	10	43%	8
France	3	8	167%	7
Japan	6	6	0%	6
Switzerland	3	5	67%	3
United Kingdom	5	5	0%	4
Italy	3	3	0%	2
Netherlands	3	3	0%	2
Canada	0	2	NA	2
South Korea	1	2	100%	4
Sweden	3	2	-33%	1
Spain	0	2	NA	2
Finland	1	1	0%	1
Bermuda	1	0	-100%	0
Denmark	1	0	-100%	0
Ireland	1	0	-100%	0
Mexico	0	1	NA	2
India	0	0	NA	2
China	0	0	NA	5
Brazil	0	0	NA	3
Russia	0	0	NA	1

Table 17: Home of top 100 global brands. Data: Superbrands, top 100 Global Brands, 2001, 2010, % change from 2001-2010, followed by a Jomati estimate of number of top 100 brands by nation in 2020.

⁹² Some argue that the first iPad merely combined gaming and content applications available elsewhere and offered little new aside from the hardware packaging. However, its appeal has been globally huge. The Apple brand, its marketing methods, as well as its design, cannot be underestimated in contributing to sales.

⁹³ News Corporation bought MySpace in 2005 for \$580 million. But, it lost 50m users in 2010 (comScore). The rise and fall of AOL also resonates, moving from pioneer, to buying TimeWarner for \$164bn, to being spun off by TimeWarner - in just over a decade. Now AOL is starting another cycle of development, after buying The Huffington Post for \$315m in February 2011.

As can be seen, the US dominates the table. In 2001, 62 of the world's top 100 brands – as judged by SuperBrands were American. This is testament to not just decades of innovation and consumer-focused design, but huge investments in global marketing that make other nations' commitment to brand-building look tiny. Just five global brands were British.

Yet, by 2010, the American stable of top 100 brands had fallen to 50 – still a huge presence in the market – but also a near 20% fall from 2001. Interestingly, the top 100 gainers were not from vibrant Asian economies like China or other BRIC economies – but rather luxury brand companies in Western Europe, especially France and Italy – whose star had risen due to demand from the world's many new millionaires, many of which were from BRIC nations and the Middle East. China appears to be a brand consumer, rather than a global brand builder of its own. Naturally, every nation has local brands that may have huge domestic recognition. But, it is when they graduate to the point of global market recognition they become extremely valuable. We have estimated that by 2020 China, India and Brazil will have created some global brands of their own. Possible Chinese 'super brands' of the future could be: China Mobile, Tsingtao beer, Lenovo – the former computer hardware arm of IBM, or Haier appliances⁹⁴. One could also perhaps add auto company Great Wall Motor – which perhaps unknown to many people in the West is China's largest SUV maker and exports about 50,000 vehicles a year.

The intangible assets of IP and brand value give a strong indicator of the major clients of the future. Therefore it is perhaps unwise to see IP as merely a specialist practice area, but rather one should see it as a practice area that is core to client development, both in the Western and developing world.

⁹⁴ BrandZ report, 'Most Valuable Chinese Brands: Top 50'. To some extent Lenovo and Tsingtao are already known in the West – but they remain far behind other brands in their peer groups. Lenovo is also an unusual brand as it retained a lot of goodwill from its previous association with America's IBM – without that association it is unclear how welcomed the Lenovo brand of computers would be.

Chapter Six: Strategic Guide – Preparing for the Future

Capability Building

Once a firm has decided where growth may take place and where the firm will be able to add value it will have to consider how it will build the capability to match that evolving demand. The main challenge will be building up talent and know-how in an area where costs may not be covered by fee generation – at least not yet. Firms don't want to build too soon, but waiting and believing you can buy in the talent and practice credibility at the last minute when demand is high is a dangerous assumption. Corporates have long accepted they must pay for long term R&D and factor it into their business costs. Law firms are still reticent to do so. The table below therefore considers different tactics for the R&D challenge.

Tactic	Pros	Cons
Hire-in expert teams once the client demand is clearly visible.	Allows deferment of investment until later. Don't move until 'a sure thing'. ⁹⁵	You can 'miss the boat'. You can appear as an 'also ran' or pretender without real credibility in the area. Who says top teams already established in other firms will want to join you?
Form alliance/association with expert boutique with a view to takeover if needed in future.	Low cost and low risk, but can learn some key lessons as relationship develops. If new area fails to grow no great expense lost.	Lack of integration sends a message to your clients. Who says they'll join you when you finally want them?
Secondment of lawyers to clients in emerging practice areas/sectors.	Gain close relationship and trust with, potentially, major clients of the future. Learn about client's needs from the inside.	Risk of lawyer going inhouse to client permanently when company grows. Cost of secondment to a client that may never become significant.
Train up from associate level.	Builds internal expertise from ground up. Foundation for greater growth. Shows clients real commitment.	Potentially risky if new sector never delivers 'interesting' work. Risk trained-up lawyers will later leave – wasting all that investment. Worse: they leave for direct rival.
External Experts.	Experts can educate a small group of lawyers, who once up to speed, can spread know-how of key issues to all when needed.	Needs buy-in and receptiveness of partners to work. Also needs someone in the 'know how' group the firm listens to.

Table 18: Pros and Cons of different tactics for capability building.

⁹⁵ 'Better late than never', is not always true. An example of this would be the move into Silicon Valley of white shoe New York firms, who after first ignoring internet companies, changed their minds and opened California offices in 1999 and 2000, just as the dot.com boom peaked – and then crashed. The same could be said for top UK firms who first stayed distant from hedge funds, especially from activist hedge funds that might annoy their publicly listed clients, then chased after them as their success grew only to suddenly see many funds collapse in the financial crisis of 2008/9.

There are a number of other key areas law firms need to consider when planning for future changes in the market:

Research & Development (R&D) – Law is an exacting profession and it is often hard enough to stay up to date with legal developments and changes in the market – without also planning ahead for the capability and knowledge you may need in the future. R&D can often seem irrelevant when times are good and practice groups are working flat-out. But this ignores two key things: when this practice may run out/run down, leaving you exposed; and new areas perhaps just outside your current focus that nonetheless would be highly profitable if you took time to build market share there. Having continual R&D, whether maintained internally or via continued external engagements, is therefore a vital support in not overbuilding a practice that may soon falter, or waiting too long before acting in new areas.

Client Overconfidence – Listening to clients may not always be in a firm's best interest when it comes to planning ahead. We still believe clients are the centre of any strategy, but clients will also always appear confident about the future of their products⁹⁶. Second guessing a client is not easy though, especially when there is a growing flow of work. Following the boom/bust crises of your clients is ultimately a matter for your firm and the kind of culture you wish to keep. But, carrying out objective intelligence on the future prospects of certain work streams may not be a bad idea. At least that way management can draw up contingency plans for when the practice dries up, or sees demand shift to a different part of the world.

Targeting Start-Ups - If a start-up looks likely to become a major company but cannot be profitable on fees for some time, what can be done? One strategy is stay in close contact, perhaps going in to give free, or discounted, advice in the hope of building trust and contacts. Building good personal rapport with the founder and original patent/idea holder will be vital – as in a start-up without a corporate structure founders will still 'call the shots'. Partners who are capable of giving tailored business and legal advice should be encouraged to do so, building a 'trust stake' in the business, which later can be transformed into a more conventional lawyer/client relationship. Naturally, there will be a strict limit to these 'loss-leader' efforts, perhaps just a handful each year firm-wide. But with careful vetting, just as a private equity fund might do before approaching a target, a law firm could develop major future clients without alienating them early on with high fees. This approach may have relatively low cost of sales compared to trying to pitch to a company that is already a global brand name and requires thousands of dollars' worth of time to join a beauty parade.

Corporate Social Responsibility/Branding – Today, telling the world you represent a major oil company is still likely to win you praise from the business press. But, by 2020 that may have changed, just as working for 'big tobacco' became something few law firms publicised by the 2000s. Will law firms find themselves trying to play-down 'carbon-culture' clients in the future? It's a hard call. Given the level of doubt in some quarters over global warming, supporting green companies could be a PR issue too. But, if more BP/Gulf of Mexico disasters occur – as well they might as we dig deeper and enter previously pristine environments like the Arctic – the potential for the contagion of reputational damage grows. Also, among certain audiences there is kudos for supporting renewable energy clients – although firms need to stay away from 'green-washing'⁹⁷. The key problem law firms face is that the public, media and regulators are increasingly seeing lawyers as 'facilitators' of their clients, not just detached and impartial legal advisers. Testament to this is the growing frequency with which pressure groups target the offices of law firms because of certain clients. Also there are increased efforts of regulators to target law firms for the advisory work they have carried out for clients, such as in relation to tax shelters.

⁹⁶ Lawyers working on mortgage derivatives for investment banks, would no doubt have been told the future looked bright, happily encouraging you to build up teams that can handle more and more of this work. Until of course that work dries up and you are left with a huge cost over-run and the need for painful staff lay-offs.

⁹⁷ 'Green-washing': Where a business makes what appear to be significant environmental steps, yet which under analysis shows little real change in how the business works. BP's marketing campaign saying 'BP' stood for 'Beyond Petrol' is a case in point. For a time environmentalists did believe they were witnessing a true shift in the company, until reality prevailed. Now the company is met with fierce cynicism by green groups.

Long Term Future Winners and Losers – Although beyond the 2020 time horizon of this report it is worth considering that over the next 30 years certain industries will have significantly changed in importance to the world economy, as table 19 shows. For example, in the US and Western Europe tobacco is clearly not a growth client – even though still seeing growth in Asia. But, as public health awareness improves in China and other developing markets, tobacco sales will start to decline there too. There are also numerous industries that will grow in the future, which we have documented in previous chapters. In between these are sectors, or technology focus areas, where it is not clear which way things will go, for example, hydrogen-powered vehicles.

Long Term Winners	Could Go Either Way	Long Term Losers
Electric vehicles	Hydrogen Vehicles	Petrol Vehicles
Solar and Wind Power	Coal ⁹⁸	Oil and Gas Industry ⁹⁹
Pharmaceuticals and Genetics	Nuclear	Tobacco
Container Shipping	Public-funded Health Care	
High Speed Rail		
Water Management		
Agriculture/Bio Fuels		
Rare Earths/Metals		
TMT/Internet		

Table 19: The Long Term View: global winners and losers by a selection of sectors/client groups over the next 30 years.

Does tobacco’s and oil’s long term future decline mean law firms should start down-sizing their practices in these areas? The answer is: not yet, and probably not until after 2020 either. As these sectors reach critical growth barriers they may require even more legal support than before. Equally, and as examined in Chapter Two, many new technologies that will lead to new global companies are still in their infancy. For example, electric vehicles are not about to replace all petrol cars – but may in the longer term.

Such long timescales may feel beyond the scope of law firms, and yet the future challenges and opportunities clients in the above industries face are rooted in decisions that CEOs will need to make right now. Understanding the long term significance of decisions that could be monumentally important is necessary if law firms are to give the best advice to their clients.

⁹⁸ Coal has been placed as ‘either way’ because with new emission-reducing coal power stations, combined with huge reserves of coal, we may still be using this fossil fuel many decades into the future. The same cannot be said with confidence about oil and gas, which will become scarce. Nuclear also could have a major future, but incidents such as that in Fukushima raise concerns about long term public support for the technology.

⁹⁹ Over the next 10 years oil and gas clients may see greater revenues than ever before. But, their decline is likely in the decades after 2020, if other technologies produce cheaper and greener sources of alternative energy.

Conclusion

Knowledge of what the future will bring is one thing, knowing what to do with it is another matter. We would argue that as more legal work becomes commoditized and outsourced, and as clients become increasingly demanding about what they will pay premium rates for, offering more than well-drafted, legally watertight contracts is going to become more important. Clients increasingly want not just law from external advisers, but law set in a wider business context – and that includes future changes to their sector.

If one doubts that clients will turn to lawyers for more than straight legal knowledge then consider who the US Treasury and top investment banks turned to for help as Lehman Brothers went to the wall: lawyers such as Rodgin Cohen, former chairman of Sullivan & Cromwell. They called him not just for his legal advice – if they wanted banking statutes they could have checked online – what they wanted was an adviser with real insight into the entire banking system in the US. That knowledge was fused with and interwoven with legal knowledge, but if it had only been straight legal facts he could deliver, his help would never have been that valuable. This is of course an extreme example, impending ‘financial Armageddon’ on Wall Street is not a regular occurrence. But the basic principle is the same: clients always respect a lawyer who can see how the bigger picture fits together.

Those lawyers who prefer the process of commercial law to what the real purpose of the profession is, namely protecting your client’s interests, may therefore not be suited to the equity partnerships of the future. Valuable legal input is not about process – legally correct contracts and excellent service are a hygiene issue when you pay \$750-plus an hour. Valuable legal input comes when the lawyer sees the client’s problem in the round, in context to the shifting markets and possible future regulatory and economic environment their business may be moving into.

The other aspect to the use of market knowledge is how law firms use it to steer their own destinies. The most extraordinary aspect of the financial crisis is not that few, if any firms, saw it coming, but that so few have changed since. Law firms have downsized, they have de-equitized partners, but many haven’t changed their strategy, their global outlook, or their business model. It is as if with the cuts made and profits stabilised the collective question from the partnership is: ‘Can we get back to normal now?’

From our research we would suggest the normal of the 2000s will not be the same as the normal of the 2010s. Whether this be addressing the new kinds of growth in the BRICs and many other developing nations, or helping clients with a possibly emerging energy and commodities crisis, or having sufficient capability in Asia as the world becomes increasingly multi-polar, the challenges facing many US and UK law firms will be different. Certainly, many aspects of ‘bread and butter’ domestic corporate and real estate work will come back with time. But, they may come back with lower levels of profitability. Also, ‘waiting it out’ may mean missing huge areas of potential growth in revenues and profits as the world moves on.

No prediction of the future can be 100% certain, but we hope this report will help management in its strategic thinking. The fundamentals of business stay the same, but the shape they take keeps changing. Taking the management time to consider how your clients and the world they operate in are reshaping could prove to be an invaluable step as we head to 2020.

Appendices

Appendix A: Global Warming

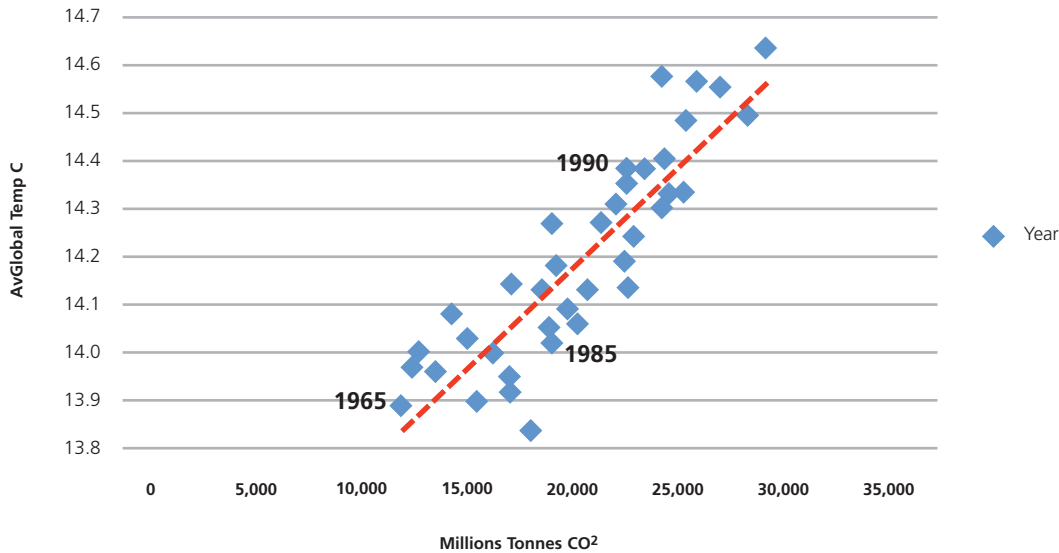


Table 20: CO₂ levels vs Average Global Temperature, since 1965. CO₂ data from British Petroleum (BP), Temperature data, Columbia University. (The carbon emissions above reflect only those through consumption of oil, gas and coal.)

Although there is still plenty of valid discussion over how much man-made CO₂ emissions contribute to global warming, there do seem to be two facts at work here: that global annual mean temperatures, although fluctuating, are overall on the increase; and that man-made CO₂ emissions are increasing. We are not scientists, and can only consider the data that respected sources provide, however, there is clearly an argument to suggest CO₂ is increasing world temperature. When the two data streams are plotted against each other one arrives at table 20, showing a correlation suggesting that higher CO₂ = higher world average temperature. This seems to be a view that is increasingly accepted around the world, despite pockets of serious scepticism. Such views have to be factored into any activities a major corporation carries out as emissions will increasingly attract regulatory attention.

Appendix B: Key Inventions from 1700 to 1900.

Date and Invention		Country
1709:	Iron smelting using coke: Abraham Darby I	UK
1712:	Steam piston engine: Thomas Newcomen	UK
1714:	Mercury thermometer: Daniel Gabriel Fahrenheit	Germany
1764:	Spinning jenny: James Hargreaves/Thomas Highs	UK
1785:	Power loom: Edmund Cartwright	UK
1798:	Vaccination: Edward Jenner	UK
1801:	Jacquard loom: Joseph Marie Jacquard	France
1803:	Morphine: Friedrich W. A. Serturner	Germany
1816:	Miner's safety lamp: Humphry Davy	UK
1821:	Electric motor: Michael Faraday	UK
1822:	Photography: Joseph Nicéphore Niépce	France
1823:	Electromagnet: William Sturgeon	UK
1824:	Portland cement: William Aspdin	UK
1826:	Internal combustion engine: Samuel Morey	USA
1829:	Steam locomotive: Robert Stephenson	UK
1831:	Electrical generator: Michael Faraday	UK
1834:	Combine harvester: Hiram Moore	USA
1835:	Revolver: Samuel Colt	USA
1839:	Vulcanization of rubber: Charles Goodyear	USA
1840:	Artificial fertilizer: Justus von Liebig	Germany
1856:	Celluloid: Alexander Parkes	UK
1858:	Undersea telegraph cable: Charles Wheatstone	UK
1859:	Oil drill: Edwin L. Drake	USA
1859:	Lead acid battery: Gaston Plante	France
1861:	Siemens regenerative furnace: Carl Wilhelm Siemens	Germany
1862:	Pasteurization: Louis Pasteur, Claude Bernard	France
1876:	Telephone: Alexander Graham Bell	USA
1877:	Phonograph: Thomas Edison	USA
1879:	Long-lasting, incandescent light bulb: Thomas Edison	USA
1881:	Carbon arc welding: Auguste de Méritens	France
1885:	Automobile patent granted (internal combustion engine powered): Karl Benz, first automobile put into production	Germany
1885:	Internal combustion motorcycle: Gottlieb Daimler and Wilhelm Maybach	Germany
1888:	Kodak hand camera: George Eastman	USA
1895:	X-ray : Wilhelm Conrad Röntgen	Germany
1895:	Diesel engine: Rudolf Diesel	Germany

Table 21: Major inventions from 1700. (Various sources, Wikipedia.)

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