Civilisation 2030: The Near Future for Law Firms

A REPORT BY JOMATI CONSULTANTS LLP, NOVEMBER 2014

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About this Report

This is the thirteenth Jomati report on key issues affecting the legal market.

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Contact Information

Jomati Consultants LLP
3 Amen Lodge, Warwick Lane
London EC4M 7BY
United Kingdom

Principal, Tony Williams. Contact: + 44 (0)207 248 1045, tony.williams@jomati.com

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Data has been sourced from the publications and authorities that published the information. Jomati Consultants would very much like to thank everyone who has participated in interviews for this report.

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Introduction

"The future is already here, it's just not evenly distributed."
William Gibson[1]*, December 4, 2003*

There is always the tendency to believe that 'the future' is very far away when in reality many things that may seem 'futuristic' are already here, but are not recognised. The critical factor is that radical change that will reshape our world, whether demographic, technological or economic, is already active but our perceptions have not caught up with reality. In short the future is already here, we just haven't assimilated its impact into our thinking or behaviour.

For example, the car that you will drive, or may drive you, in 2030 is already being designed, so too is its power source and the intelligent systems that will guide it. Your future employees have recently been born and will soon be migrating to your city. The complex medicines that will likely sustain you in 2030 are also already designed, but they are in the lab waiting for the years of trials to pass before they are let out. Likewise, the megacity markets and the new types of client of the future are also already taking shape, though your firm may not have yet spotted them, while others perhaps have.

As the futurologist William Gibson said, the future is already here, the problem is that not everyone has noticed because it doesn't immediately impinge on our daily lives, or at least we might not think so. And then there are the phenomena that we simply ignore because we would rather not consider them. For example, what will happen when there are not enough young people to pay for the medical care of a vastly larger, older population? Or what does it mean that the majority of the world's 'megacities' are already in the developing world, not the West? And what will it mean when artificial intelligence software that is worthy of the name arrives, a step some may say we are just about to reach?

All of these changes will shape the client base and legal market of the future, which in turn will shape the kind of law firm you will be tomorrow. We can often forget that the global law firms of today were built by demographic, economic and technological forces their partners had no say over. Business law firms are a by-product of commerce and commerce is a by-product of the human condition. Anything that influences this chain, such as the number of people in the world, how long they live, where they live, what conditions they live in and what they are able to do for a living, will in turn shape clients and the law firms that serve them.

This report then is an exploration of three key drivers of change in our society: demographics, urbanisation and the automation of work. We believe this is important to law firms as what may seem like the distant future is really the near future and businesses need to prepare.

1 Attributed to William Gibson, a futurologist and author of several near future novels, in particular 'Neuromancer' of 1984, which explored the future impact of the digital revolution and globalisation.

Chapter One: Demographics

Peak Humanity

We often assume that the human population will keep rising. That we are moving toward 'over-population' has been an accepted idea since the 1970s. However, what many do not realise is that despite there now being 7.2 billion people[2] living on this planet the great proliferation of homo sapiens is coming to an end (see Table one).

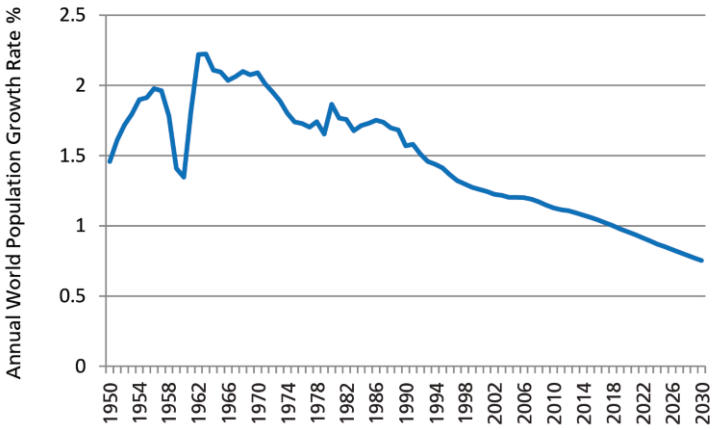

Table One: Annual World Population Growth. Data: US Census Bureau.

By 2030 global population growth will have slowed considerably, down to just 0.75% per annum and will rapidly decline thereafter. Ironically this slowing is due to higher global economic development. 'Peak humanity' could occur as early as 2055[3] and will truly be an historical moment. When we reach 0% population growth[4] humanity will start to shrink after centuries of upward momentum[5]. This slowing has several factors:

- The move from rural communities to cities.
- Rising cost of living, especially property.
- Creation of employment opportunities as opposed to subsistence farming.
- Better health care and contraception.
- Increased use of private and public pensions that reduce the need for the practice of children financially supporting elderly non-working parents.

In short, as a country becomes more secure, more urban and more expensive, families tend to produce fewer children. This in turn has a long term impact on future generations as family trees become narrower. It also tends to be a one way journey. Once a society has geared itself to having between one and two children per family it is very hard economically to return to one that produces three or four children per family even if people wanted that.

2 This is compared to 3.7 bn in 1970 and just 1.6 bn in 1900.
3 The date will depend upon several factors including whether issues such as obesity decrease life expectancy despite medical efforts to increase longevity, thereby speeding up the point where deaths are higher than births.
4 In1963 humanity grew at the fast rate of 2.2%. Today it has fallen to 1.08%.
5 The last great global population declines were following the Black Death in the Middle Ages and after the fall of the Roman Empire in the 6th Century.

The fertility replacement rate for homo sapiens is 2.1 children per mother, which represents two new people to replace the two adults[6] who produced the child and an 'extra 0.1' to account for infant mortality. At 2.1, humanity remains constant in numbers but gets steadily older on average. Once this figure drops to 2 and below humanity is in decline and a lot older on average as there are far less young people. As can be seen in Table Two, the relative decline in the young person's age group is already well on its way. Birth rates all over the planet are slowing and this also equates to a far older global population. There is variation between rich and poor nations, but even in poorer developing nations birth rates are falling.

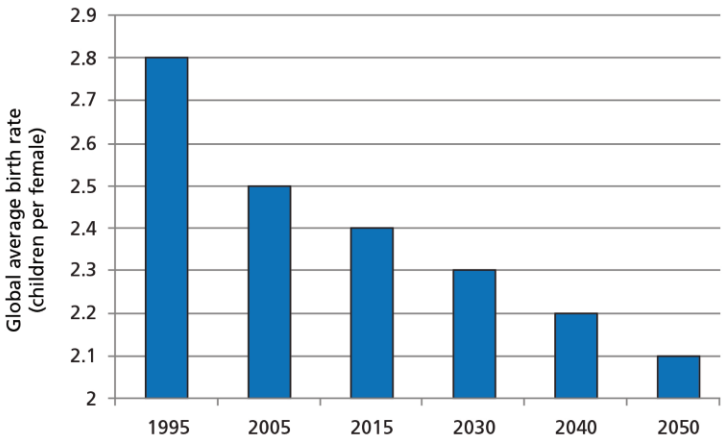

Table Two: The decline of global birth rates. Data: US Census Bureau.

It may seem strange to talk of 'peak humanity' when by 2030 the total population will have continued to rise to 8.3 billion people, reaching more than double the number of humans in 1974. But as we explore below, one of the key reasons for this residual rise in population is that people are living longer and this is of critical importance.

One may also ask: 'How can the global population be growing less quickly when the population in my city seems to be getting larger every day?' There is one key reason for this: immigration[7], which on a global scale is vast. A recent UN analysis[8] stated that even in 2010 there were more than 214 million people living in foreign countries. Given the rising instability in the Middle East, increased freedom of movement of persons within the EU and porous borders around most developed nations one might expect the figure today to be far higher. We won't debate the pros and cons of immigration other than to say it has a profound impact on the demographic health of many countries. Take Japan for example, (see Table Three), a country that has generally prevented large scale immigration. As can be seen, its population has plateaued and will shortly go into decline. By 2030 it will be smaller than it was in 2004, i.e. 26 years earlier. Such demographic shifts could undermine its economy.

6 Of course, modern reproduction methods do not require two adults, at least not in person, but on average and on a global scale this remains the best benchmark to gauge population replacement.
7 Internal migration to major commercial centres is also another reason. However, total world population growth is slowing regardless of the changes to how humanity is distributed over the planet.
8 http://www.unfpa.org/pds/migration.html, though the figure may be higher due to naturalisation.

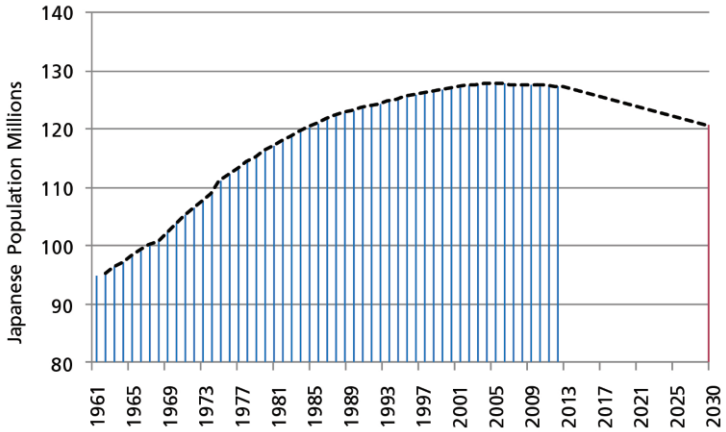

Table Three: The rise and decline of the Japanese population, with 2030 estimate. Data: World Bank and US Census Bureau.

But, population decline is not just a problem for nations that have been highly developed for decades. China is also at great risk of reaching a population plateau (see Table Four).

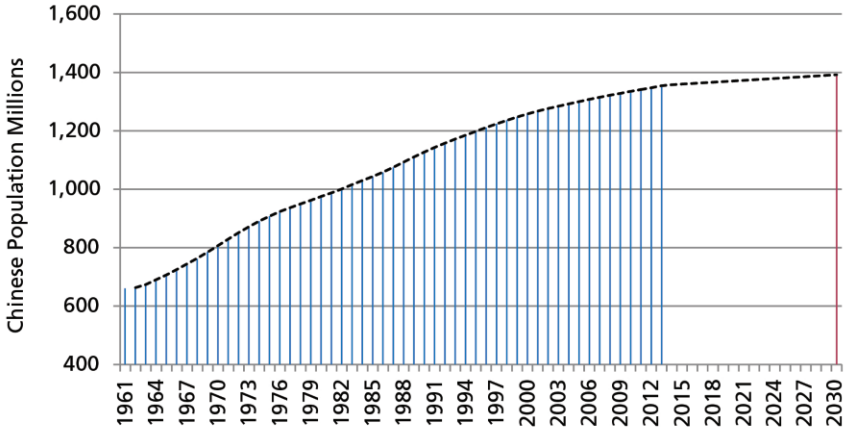

Table Four: The growth and then stagnation of the Chinese population. Data: World Bank and US Census Bureau.

As can be seen, although the total Chinese population very slowly rises from today to 2030, the level of growth is tiny compared to the huge expansion of population from the 1960s to the 1990s. China is unusual in that it created this problem through its own one-child policy. And while China does not prevent immigration the numbers migrating there from abroad, rather than internally from rural areas to the cities, remains minimal.

This could create a huge change in the economic character of China and would appear to be severely damaging to Japan, the second and third largest economies in the world respectively. A static or falling population may create the following impacts:

- Stagnation of the housing market as there would be less demand and little reason to build new houses. House prices could reduce, which in turn would undermine property funds and banks that have invested or lent against property.
- Deflation across the consumer spectrum as flat or declining total consumption affects prices, which could undermine multiple businesses.
- Rising cost of government debt due to likely lower future tax receipts. i.e. higher risk of default on bonds of longer tenure. Though public spending for younger people may be less, as there will be less of them, there will be higher spending on the elderly (see below). There may also be more unemployment by 2030, delivering a double blow to the tax base (see Chapter Three).
- A slowdown in FDI and infrastructure investment, as there is little incentive for foreign money to be locked-up in a declining economy.

The Grey Century

We are also seeing increased longevity amid populations with less young people. This has profound economic consequences. As Table Five shows, age imbalances are growing rapidly.

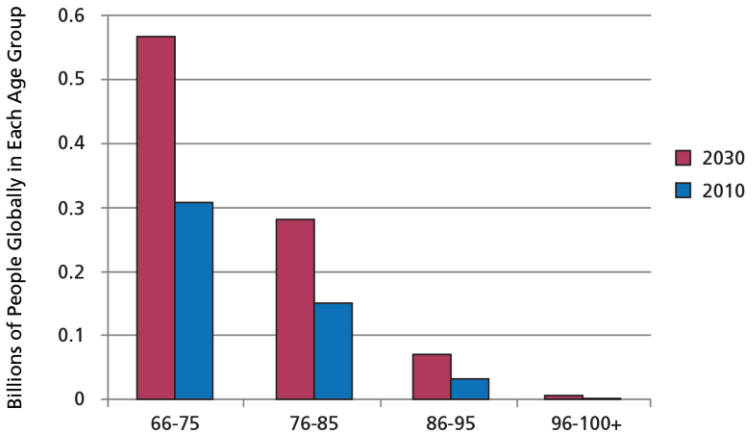

Table Five: Increase in over 65s from 2010 to 2030, by age group. Data: US Census.

In the space of 20 years the number of people aged between 66 and 75 in the world will increase by 45%, rising to a total of 570 million by 2030. Overall, the number of people aged over 65 in the world will total 0.92 billion by 2030. That is nearly one billion people who in most cases will be economically unproductive, though they will be spending whatever income they have and hence contribute via consumption.

One may ask: 'So what? As long as these hundreds of millions of retired people can stay healthy and have pensions of some sort where is the economic risk?' This is a fair point, but the problem is that many people past the age of 65 will neither be healthy, nor will they have sufficient private or public funds to sustain themselves.

For example, 11% of Americans aged over 65 have Alzheimer's disease. Once they reach 85 the incidence of the debilitating brain condition rises to 32%. By 2030 around 8.4 million Americans will suffer from Alzheimer's[9], and this is in a rich country that can, at least at present, afford to provide them with medical care.

Some of those who escape this fate will develop Parkinson's, another disease that attacks the brain and can be lived with for over 20 years, though demands significant care in the later stages. Even if people avoid these challenges, increasing obesity in the general population will lead to diabetes and heart conditions in old age for many, which also demand costly and continuous drug treatment.

Meanwhile, even in a relatively wealthy country such as the UK, for example, around 1 in 7 people have no private pension and no savings. The UK Government is seeking to reduce the impact of this 'no pension time bomb' by making private pension contributions mandatory for employees in large companies. Eventually even the smallest SME will by law need to enrol its staff in a pension scheme. Of course, whether these private pension contributions will be sufficient to meet the cost of living in several decades' time remains to be seen[10], moreover, there will still be many people retiring in 2030 with very little in their pension pots, but likely to live for a considerable time, often in very poor health.

How this grey century will affect humanity will vary from nation to nation. As seen in Table Six below, not all countries face the same aging time frame. The nations with very low per capita GDP remain countries that usually have high death rates among the adult population and hence few people become pensioners.

It might be seen as positive news that India is only expected to have 8.8% of its population aged 65 or over by 2030, especially considering many of these people will not have private pensions nor access to long term funded care other than via their increasingly smaller families. The problem is that because of India's huge population, this relatively small fraction equates to 129 million people, or the populations of the UK and France combined. That is an enormous amount of relatively poor, elderly people that will need to be cared for and will create a massive financial diversion of capital within what will soon be the largest nation on Earth.

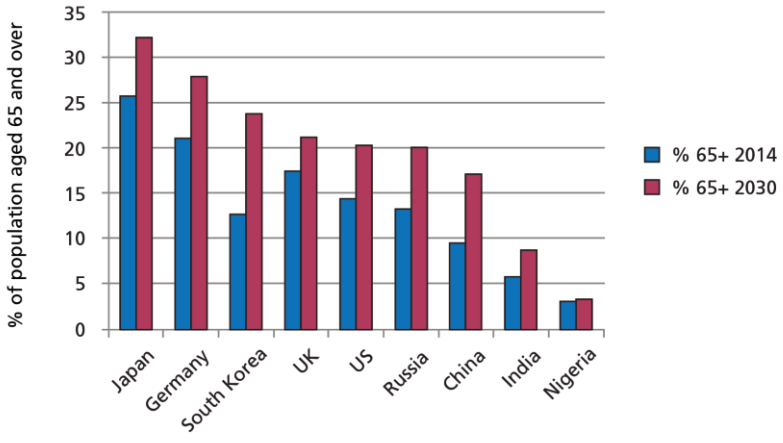

Table Six: Proportion of major countries' population aged 65 and over. Data: US Census.

9 2014 Alzheimer's Disease Facts and Figures, Alzheimer's Association.

10 It was once a rather cynical actuarial 'in joke' in the 1950s and '60s that company pension pots were safe because few people would live past retirement. This was statistically true, as the average life span for an American man in 1960 was only 66.5 years. However, rising life expectancy has now made that view redundant.

Meanwhile in China its 65-plus group in 2030 will be a lot higher, up from 9.6% today to almost double to 17.2%, equating to 240 million retired people. Again, that is a gargantuan quantity of healthcare and pensions, whether public or private, that will need to be provided.

As can be seen in Table Seven, healthcare spending per capita, (combining both public and private medicine), already saw an incredible increase from 2000 to 2010 across the globe. Predicting what it will reach in 2030 is complex, but one cannot imagine anything other than further huge increases in most nations, whether developed or developing.

	Health Spend per Capita (2000)	Health Spend per Capita (2010)	% Increase in a Decade
China	$43	$216	401.6
Nigeria	$17	$80	364.3
India	$20	$52	163.7
United Kingdom	$1,761	$3,489	98.1
United States[11]	$4,790	$8,254	72.3
Japan	$2,834	$4,115	45.2

Table Seven: Growth in per capita healthcare spending (private and public). Data: World Bank, using current US$.

Even Nigeria, which may only be spending $80 per head on healthcare, has more than tripled its spending. China has quadrupled its health expenditure, in part because of far greater wealth, but also because of its changing demographics. Interestingly, Japan, which out of all major economies has the highest proportion of elderly has increased the least, though still by 45% in 10 years. In part this may be because aside from the US, healthcare spending was already far higher than other developed countries and also because the impact of aging had already begun to be felt far earlier.

In conclusion, we have never lived in a world where there were hundreds of millions of people living past the age of retirement. It therefore seems inevitable that the character of the global economy will change as a result. It is often said that this century will be 'the Asian century' due the rise of China and India, but it may be worth adding that it will also be the grey century[12].

Impact on Clients

- Pharmaceutical and healthcare companies will become increasingly valuable, while any IP related to diseases such as Alzheimer's would be 'the Crown Jewels' of any company's patent base.
- Technology companies will increase investment in 'caring robots' (see more later) in order to help advanced nations care for their millions of elderly. This may see the creation of new global companies based on this niche, as well as raising important patent issues.
- Pension funds and life insurance companies will see both huge opportunities to sell pension products in the developing world, but will also be under significant pressure to generate huge profits from their investments in order to provide sufficient pay outs to what will be hundreds of millions of clients by 2030.

11 In the US there is a huge variation between health care use and expenditure depending on whether it is privately funded or not, as well as by the type of insurance plan a person has. This figure is a mean average.

12 By the end of the 'grey century' in 2100 one hopes that many of the illnesses of old age such as Alzheimer's will have been cured, whether by gene therapy or the use of stem cells, and this may well be a real possibility. Of course, no medicine can cure the economic problems caused by having what by then could in some countries be 50% of the population aged over 65, not working and without the capital to support themselves.

- Stock markets will continue to grow in terms of market cap and debt securities will see increasing volumes. As noted above, pensions will need to provide more for more people, this will drive increased investment into shares and bonds.
- Construction companies will increasingly see the value in building not just retirement homes, but 'retirement cities', such as The Villages in Florida, which currently houses over 100,000 retired people. It is now classed as one of America's 'fastest growing cities' and sells over 250 houses every month[13].
- Public sector institutions such as hospitals will need to become increasingly imaginative in how they are funded in order to keep pace with demand for health care services, with almost inevitable greater participation from the private sector.
- Demand for business immigration will continue to grow. Because of lower birth rates more large companies will need to 'import' talent. Though, this may remain a complex political issue.
- Businesses will have an increasingly large and experienced recruitment base of potential candidates aged in their 60s and even 70s. Whether companies will make use of this growing pool of talent remains to be seen, but if they do it will in turn reduce the opportunities for younger people[14]. While, if they don't they are pushing many older, but not necessarily wealthy people in an uncertain financial future.
- Governments, in order to manage the pressure on state pensions and to protect their tax base will increasingly raise the retirement age for state pension benefits and impose further age discrimination legislation to keep the workforce active for longer[15].

Impact On Law Firms

- Increasing opportunities to service what could be seen as a fast growing 'sector group' of corporates that cater for those aged 65 and over.
- Growing need to advise health care and specialist construction companies on the building and financing of hospitals.
- Higher demand from both global and local pension investment businesses, especially in the developing world where until recently investing for a long old age was seen as something very few people did.
- Opportunities to advise governments and public bodies around the world, but especially in developing markets, on financial and regulatory preparation for the demographic changes that are to come.
- Increasing litigation on matters related to age, ranging from provision of health care, application of insurance policies, claims from the elderly against drug makers and retirement homes and age discrimination by employers.
- We may also see some enormous IP battles between pharmaceutical companies over aspects of certain geriatric medicines as they are brought to a growing market, as well as IP related to other 'geriatric-tech'.
- Potential for rethinking their own policies on the aging of partners and the use of ex-partners. That said, at present it does not appear that the average age of equity partners at major law firms is increasing rapidly. If anything some firms are in fact culling 'older' partners to create younger equity partnerships and open up space for new client winning rainmakers who may otherwise leave.

13 Buzzfeed, http://www.buzzfeed.com/likethebreadorthedressing/seven-days-and-nights-in-the-worlds-largest-rowdiest-retirem#458yg1b, 29 Aug 2014.
14 Though, in some countries there will be fewer younger people born. However, (see Chapter Three), because of automation there may be less jobs for people to have no matter what age they are.
15 Of course, whether employers will wish to hire large numbers of elderly workers remains to be seen.

Chapter Two: Birth of the Megacity

Megacity One[16]

As can be seen in Table Eight, the number of megacities with 10 million or more inhabitants has now reached just under 30[17]. And by megacity it is meant the entire urban agglomeration that is nominally called New York or Shanghai, not only the people that live strictly within the central municipal, legally defined boundaries[18]. Together they represent around 530 million people and the majority of them are in the developing world. To CEOs of global companies[19] this half billion people will represent some of the key markets of 2030.

But, size brings new problems as well as interest from investors and corporates. Will the aging megacities of the West be able to maintain a decent standard of living for their citizens? Will the developing world megacities make the transition to become shining examples of 21st century civilisation, or will they become (and in some cases remain) long term centres of chaos and poverty? It is a daunting prospect when one considers the scale of these cities.

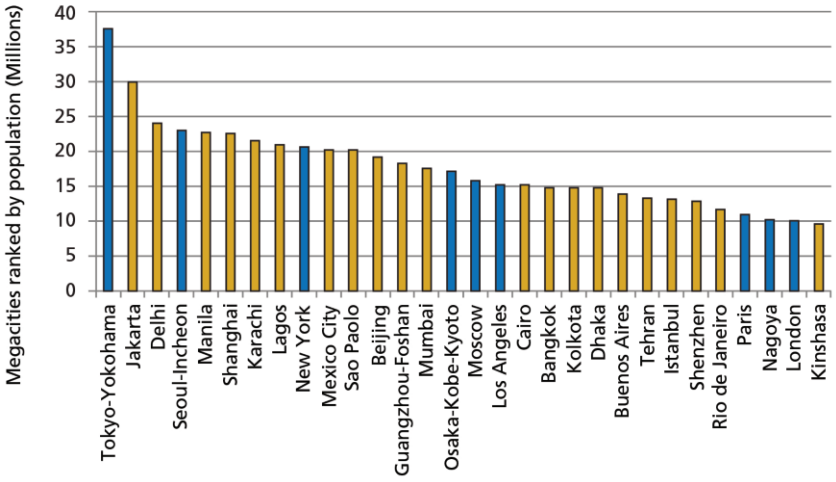

Table Eight: The largest megacities on Earth today, using agglomeration method. Blue shows developed nations, yellow shows developing. Data: Demographia.

London, once the largest city in the world ranks at a lowly 29th position. Paris with its vast suburbs reaches 27th and New York and its even vaster connected East Coast sprawl ranks at 9th place. This suggests that although the West may have 'invented' the modern[20] city its inheritors in the developing world have mostly surpassed Europe and America in terms of size and scale. If one has ever wondered why commodity prices especially for modern building materials are so high then take one glance at this table and the answer is clear. While the West has been digging itself out of the financial crisis over the last seven years, the cities of the developing world have been booming.

16 The term 'mega-city' was first used in 1968 to define a city with a population with over 10 million people, though at that point in history there would have been very few cities in this category.

17 The figure may already be higher than this because many cities do not know how many citizens they have. This is especially the case in developing nations where there is little data as well as rapidly growing, often unauthorised, housing developments such as shanty towns.

18 We are using a definition of megacities that covers contiguous agglomeration, rather than following purely municipal boundaries. This method, used by US academic Wendell Cox's 'Demographia' studies, also utilises satellite imagery to gain a better representation of urban agglomeration.

19 It is interesting to note that while one might automatically consider, for example Apple, to be a 'global company', in reality its share of consumers in the developing world is tiny compared to rival technology companies due to its premium pricing. This of course it a deliberate strategy, but suggests it is fundamentally not a global company in the same way that Microsoft is which seeks major market share in every nation.

20 Although, it was the Babylonians and other 'Near East' cultures of the 1st and 2nd millennia BC that truly invented the first true cities with purpose built markets, central bureaucracies and road networks.

Of course, this does not mean that the West's cities are shrinking, or that the great 'city states' such as Hong Kong are less populated than they used to be. They simply have been surpassed. In the case of Hong Kong and Singapore there is the evident problem that there is simply little more room for a greatly increased population[21]. Hong Kong and Singapore may both respectively have what the World Bank considers as 100% urban populations (see Table Nine), itself something of an historical achievement, but the cities' populations only number 7.2 million and 5.3 million people respectively. They are comparative minnows to the largest megacities.

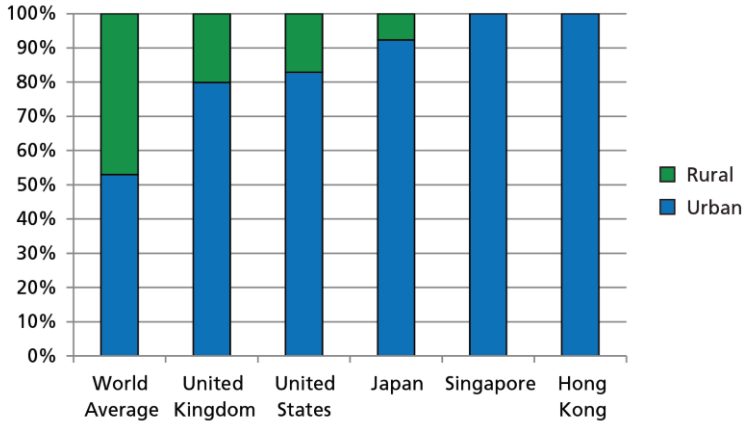

Table Nine: Current rural vs urban population in world and major developed nations. Data: World Bank.

The next question is what will be the population of these nations' megacities in the future? Estimating total population of a country is relatively simple compared to this type of futurology. How can anyone be sure a city will remain an economic magnet for internal migrants? What will be a country's attitudes to foreign migrants and if they are allowed in by the million then where will they choose to live? Will new cities in a country emerge as preferred centres and will the megacities of today possibly fossilise and stall? And perhaps lastly, will war or social breakdown, environmental cataclysm such as tsunami, or a pandemic disease drive a megacity's population away?

However, if we consider that developing nation populations will rise rapidly (in most cases except as noted earlier in China) and that internal migrants will continue to flock to the cities for employment and what they hope is a better standard of living, then we can make some estimates. Take for example Table Ten below, which sets out potential future growth in urbanisation in India, Nigeria and China. As can be seen, China is already a nation with around 55% of all people living in towns and cities, up from only 18% in the early 1960s, i.e. from a level similar to an extremely undeveloped agrarian nation such as Uganda today. That statistic alone shows just how much has changed in China in the last 50 years. By 2030 China's urban population could be approaching 75% if the growth trend from the late 1990s continues. Whether China's great cities will continue to be able to absorb such growth while still improving the general standard of living, remains to be seen. Until now this great internal migration has worked and Chinese urbanisation has been a success story[22]. But by 2030 the Chinese economy may be in a very different position. That said, it seems likely that China's agglomerated megacities, namely Shanghai, Beijing, Guangzhou and Shenzhen will see increased growth.

21 The main way to greatly increase the population, and certainly to reach 'megacity' levels would be to begin a programme of dozens of new residential skyscrapers. That may need to happen one day, but would involve substantial zoning and compulsory purchase disputes.

22 If one ignores the rising pollution, destruction of traditional architecture in the centre of cities, forced relocation of tenants to make way for new developments and out of control growth in road traffic congestion.

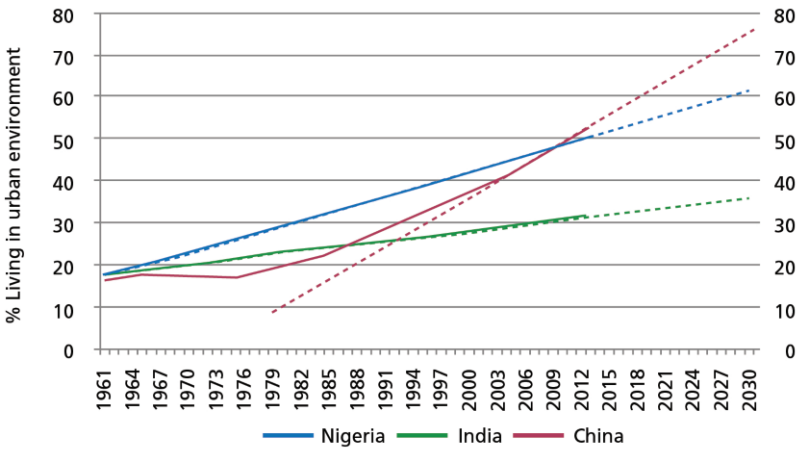

Table Ten: Percentage of population living in urban centres in China, India and Nigeria. Data: World Bank, Jomati projections to 2030.

At the other extreme of the spectrum of countries that have megacities is India, which although soon to become the world's largest nation with four of the world's megacities continues to have one of the lowest levels of urbanisation among major economies. Instead its megacities sit like giant, modern islands in a still largely agrarian population. At present only around 32% of its population is living in cities, with this figure expected to rise to around 36% by 2030, still at a very low level compared to its peers. The figures underline how vast India's rural population still is and we will likely see around 934 million Indians maintaining small scale rural life even in 2030. Undoubtedly some of these millions will migrate to the major cities thereby putting extra strain on Delhi's and Mumbai's creaking infrastructure, but India's story will not be the same as China's.

Megacities or Mega Problems?

While China has managed to create relatively stable megacities, which although heavily polluted do appear to have functioning municipal systems and infrastructure, few other developing nations have been able to do as well. The years up to 2030 will see increased strains on megacities as these poor urban populations continue to expand, just as they did in Europe in the 19th century when agrarian reforms and the industrial revolution reduced the need for farm workers, driving millions from the fields and into the cities looking for employment. The big question is: will these developing world megacities make the transition from widespread poverty by 2030, just as cities like London did in the 19th and early 20th centuries?

After all, out of great poverty sometimes comes a great city. We tend to think of London as a generally wealthy city today[23], but London in Victorian times, then the largest city in the world, was famous for epic levels of poverty, malnutrition, chronic pollution, unsanitary slums and no-go zones at night outside of the relatively small, wealthy Northern and Western suburbs, in fact, not dissimilar to many developing cities today. Throughout the 20th century the wealth imbalance was reduced and public services and transport infrastructure saw massive investment that changed the character of the city. However, London's new role as a global city that serves both a national/domestic population as well as an essentially international financial and corporate network of money and professionals creates new challenges (see later).

That said, not every over-crowded and under-funded city necessarily turns into a modern London or a New York, though perhaps some cities simply need more time. One could ask: do some of the world's megacities have enough

23 At least when compared to other major cities in the UK.

time to rapidly improve before they become unliveable? For example, Nigeria will have an urban population of 60% in 2030, or around 126 million people living in cities; the equivalent of six New Yorks. This is even though two thirds of the population still live on less than $1.25 a day.

Experts argue over the size of Nigeria's major cities, in part because the Government there simply doesn't know how many people live in its cities. But one recent estimate[24] is that 21 million people live in its commercial capital Lagos, making it the largest megacity in Africa and larger than the entire New York/New Jersey urban agglomeration. How does one fund sufficient infrastructure for such massive cities when the majority of citizens can barely contribute? The Chinese model was to re-invest the profits from a large number of State owned, or partially State owned, enterprises into roads, rail networks and modern housing. This built the foundations for other businesses to grow and employ people, which led to rising disposable incomes among the citizens and that in turn helped to fund a wider, more diverse economy and a healthy tax base to support energy plants, sanitation and water supplies. In the case of other developing nations, employment in the megacities is predominantly for very small, owner/manager businesses, often supported by protectionist legislation to prevent larger organisations, especially foreign ones, from entering the market[25]. Wages are low and so consumption is low. In effect this is a transition from an agrarian subsistence economy to an urban subsistence economy. Even if a developing world megacity has one or two extremely large State-backed companies based there, often connected to the oil and gas sector, they usually are insufficient to positively change the economic balance of the city[26].

While a subsistence agrarian community may be poor one could argue it needs little investment to maintain the economic model and permit a sustainable environment. A subsistence urban society however cannot escape the challenges of occupying a man-made environment and therefore needs to 'build in' a multitude of costly amenities as it grows. The larger the city, the larger the bill for building these amenities. For example, London with only 10 million people is currently debating the merits of a $6bn 'super sewer' needed to keep parts of the city's sanitation up to date. Surprisingly for a developed nation like the UK the project has struggled to gain financial backing. In developing nations with far larger cities and a lower starting foundation of amenities[27] to begin with the challenges are magnified. For example, on average only 28% of Nigerians and only 36% of Indians have 'improved sanitation' (see Table Eleven). This is a polite World Bank phrase that simply means human waste is disposed of in a hygienic and organised way.

Population with Improved Sanitation %	
Nigeria	27.8
India	36.0
Pakistan	47.6
World Total	63.6
China	65.3
Russian Federation	70.5
South Africa	74.4
Brazil	81.3

Table Eleven: Percentage of population with improved sanitation (2012), Data: World Bank.

24 http://www.nytimes.com/2012/04/15/world/africa/in-nigeria-a-preview-of-an-overcrowded-planet.html?_r=2&. New York Times, April, 2010.

25 Consider the battle supermarket chains have experienced in India, for example.

26 Such huge natural resource companies based in a sea of small businesses can exacerbate the problem rather than produce any 'trickledown' or systemic benefits. Instead Government and private investment is attracted to the big companies to the exclusion of building a balanced economy. This effect is better known as the Dutch Disease, a term from 'The Economist' referring to the impact of Holland's natural gas discoveries in 1959.

27 Networked power supply, refuse collection, a maintained road network, street lighting and access to emergency services, to name just a few basic amenities.

Part of the population without such facilities are in rural areas, however, in cities where there has been very rapid and unplanned expansion, and not just in Nigeria, 21st century civilisation inadvertently is building the largest open air sewers in history. Moreover, in some cases the nations facing these challenges are not quite as poor as one may think and certainly have the resources to spend if they chose to. For example, it seems absurd to many development professionals that India[28], which has nuclear weapons and a space satellite programme, has more people who own a mobile telephone than have access to a toilet.

This matters because unpleasant cities will not attract either the talent or the investment needed to create a modern, diverse and globally connected megacity that serves far more than the narrow interests of its small urban elite. Great cities do not succeed by the city fathers 'pulling up the ladder' behind them, but rather working hard to enable as many people as possible to join in and share the economic and lifestyle benefits of living in a major city. In sum: cities that fail to be inclusive and sustainable will also fail in the long run as business centres. That in turn makes them far less interesting to global banks, corporates and the law firms that serve them.

Fresh Air and Energy

The future of energy provision is such a massive and controversial subject it merits its own report, but suffice it to say here the massive expansion of populations and urban environments will put a huge strain on the energy reserves of 2030, if not the ability to live in some large cities. Moreover, and continuing the themes above, how much pollution will the citizens of megacities of 2030 have to deal with? Take China for example. The World Health Organisation states that the maximum level of small particles[29] per cubic metre of air should be no higher than 25 micrograms. In February 2014 the small particle level in Beijing was 505 micrograms, or twenty times safe levels[30]. Unsurprisingly China's leaders have now made reducing pollution, especially from fossil fuels, a priority.

But how can this really happen? If a city of 19 million people has perhaps ten million vehicles using its roads, 99% of which run on petrol or diesel, and has factories and millions of homes and offices powered by electricity which is mostly from coal-power, then what hope is there?

The answers are perhaps obvious: electric cars and clean, renewable energy. What is harder is estimating when and if such responses are realistic within the next few decades. Let's briefly consider solar. At present solar power's share of global energy production is tiny, whether via photovoltaic (PV) cells to produce electricity, or solar heating to warm homes. At present just 3.5% of global energy production is via geothermal, solar and wind combined[31] and that is after at least a decade of major public subsidies and considerable marketing efforts.

But, technological advancement could change this picture very quickly. The cost and efficiency of PV solar cells is rapidly improving in terms of price and output. For example solar cells already have a 'socket price' of $0.80 a watt, down from $4 in 2008. Breakthroughs in 3D solar cells recently at MIT and the widespread manufacture of solar panels in China, US and Germany also herald a potential future ground shift. The US-based EIA estimates that in a best case scenario solar could be producing 150 billion KW/hours of electricity in the US by 2030, up from a tiny fraction of that today. However, even with the 'greenest' scenario the world's most advanced, as well as developing, nations are still expected to be heavily reliant on coal and oil by 2030, though this should diminish by 2050.

28 India is perhaps indicative of many developing nations with megacities where a wealthy local person or foreign business traveller can stay at luxury hotels and shop in air-conditioned malls. Yet this is an 'experiential island' in the midst of a wider and far different general reality shared by millions of others.
29 I.e. particles small enough to move through lung membranes into the bloodstream, thereby causing asthma and cancers.
30 http://www.theguardian.com/world/2014/feb/25/china-toxic-air-pollution-nuclear-winter-scientists, The Guardian, Feb 2014.
31 IEA 2014 Outlook.

Much will depend upon two critical factors: adoption of electric vehicles, which will demand far greater supply of electrical energy; and a greater pushback against polluting carbon fuels. Neither of these changes are guaranteed and are intimately combined. A move to greener, electric vehicles would implicitly mean society was both needing more electricity and seeking cleaner energy. At present long distance, superfast-charging electric vehicles (EV), such as the Tesla, are a rich man's pursuit. But several car companies envisage a 'People's EV' at some point in the next five years, if not sooner. And the extra electricity would then need green energy, whether solar, wind or other form, to prevent the EV surge actually creating more pollution.

But, if the transition was successful the impact on developed megacities would be immense. They would be far quieter[32], with far less pollution, though ironically could consume more energy per person than before. For the developing nations that may not be able to afford EVs even in 2030 there is still the hope that high powered PV can be integrated into city architecture and provide cheap, clean power. That would rapidly reduce their pollution and also give an economic boost to poorer citizens who may need energy to operate or launch small businesses to create a more sustainable economy. In this respect investment in the energy of the future could transform the prospects of many millions of people.

As with all considerations of the future there is a tendency to consider a happy, perhaps idealistic outcome, or instead a rather cynical, dark outcome. The truth will likely be somewhere between the two, with some cities by 2030 perhaps banning petrol vehicles and fossil fuels in general from the city limits, while others, whether for ideological or economic reasons will cling to dirty fuels and the internal combustion engine.

What Makes A Great Megacity?

What ensures a megacity becomes, or in Western megacities' case remains[33], a great centre of business and wealth generation? Let us consider a brief[34] history of how New York both came to be a leading city and how it has remained so. New York has benefited from:

- Great geographical assets. Unlike other ports on the Eastern seaboard of America the Dutch traders who founded 'New Amsterdam' in 1626 found that the small town on the Hudson River had excellent deep water access and was only 20 miles from the Atlantic Ocean making it an ideal centre for maritime trade.
- Long term stability. Despite wars of Independence and a Civil War, and even two World Wars, New York remained largely untouched from foreign invasion. Perhaps its greatest ever crisis was in 1664 when the British took over the city from the Dutch West India Company and secured its ownership by giving the Dutch the colony of Suriname.
- Sustained global transport links. New York remained the number one sea port for Europeans to access the American market for decades. Even after the Revolution British traders and shipping companies, which tapped into the wealth of the British Empire, continued to see New York as the 'natural' port to go to in America. It also provided great shipping connections to the Caribbean, which supplied sugar to what for many decades was one of New York's leading manufacturing sectors: sugar refining.

32 Take a visit to a city that is heavily reliant on bicycles, such as Copenhagen and the most striking aspect is just how quiet the centre of the city is without the constant bass sound of combustion engines. EVs would still create road friction noise, (the low rumble one hears near a major road), but would be considerably quieter.

33 For example, London has been an international commercial centre for nearly 2,000 years after its foundation in 43AD by the Roman Empire. Its battle is to remain relevant globally decade after decade.

34 For a fuller description of the evolution of New York, see 'Urban Colossus: Why is New York America's Largest City' by Harvard's Edward L. Glaeser, 2005. Download paper: http://post.economics.harvard.edu/hier/2005papers/2005list.html

- Open and liberal culture. Unlike other early cities in America, New York had never formed a particular religious identity and remained open to immigrants from any nation and any religion. They brought talent, energy and capital to boost the growing city. New York also had an incredible capacity to absorb immigrants in large numbers. For example, between 1903 and 1914 over 12 million people arrived in the city[35], mostly by sea. In 1900 the population was only 2 million. While many of these millions passed through New York and travelled to other parts of America this influx was still the equivalent today of 120 million immigrants[36] arriving at JFK airport in the space of 11 years and not going back, nor collapsing the city's infrastructure in the process.
- Continued evolution of dominant business types. New York was founded on low level commodity trading, namely fur. Then fur was treated to add value for export and a manufacturing economy began to grow. Imported cotton was turned into garments, expanding and widening the manufacturing base. This activity, twinned with increasing port activity generated sufficient capital to grow the first Wall Street banks, which in turn helped fund what became many of America's leading national and then global corporations. These in turn increasingly demanded professional service firms, from lawyers to advertising experts. The economy has continued to upgrade itself to focus on more complex and higher value activity. Will the city keep upgrading itself or rest on its laurels? This remains to be seen, but it is interesting to note how far the banking and trading companies of New York now focus on the use of the latest IT (see more in Chapter Three).

Of course, New York has had difficult periods. The depression of the 1930s shook the city's financial and manufacturing centre almost to complete collapse, but it managed to survive and came back stronger. In 1975 the city came extremely close to bankruptcy, but again overcame the crisis and moved forward. Part of this resilience is no doubt down to the character and determination of New York's leaders over the years. However, that alone is not enough. The West's megacities face fundamental challenges that will become even greater in the years ahead. They face the challenges of:

- Maintaining a sufficiently diverse range of sectors and industries to balance out any decline due to changing economic or technological conditions. Consider for example the rapid decline and then bankruptcy of Detroit after the scaling down of manufacturing there.
- Supplying a growing and affordable housing stock within commuting distance of the main employment centres of the city. Extremely high rents and house prices risk driving talent that does not come from supportive, wealthy backgrounds to consider their options elsewhere. As an example, see Table Twelve that shows the gap between indexed growth in the size of the average UK mortgage needed to buy a property and the far lower growth of wage levels. When one also considers inflation's cumulative impact on salaries, which will reduce spare income available for mortgages especially if wages continue to remain flat, and that London property prices generally rise far faster than elsewhere in the country, then many young people by 2030 may be choosing to take their talent elsewhere. Based on standard trend lines, the gap between wages and average mortgages will have grown from 31 index points in 2013 to a 65 index point gap in 2030. London could price itself out of the national talent pool. In turn, however and as noted below, it may instead seek to attract talent that can afford to live in central London from around the world.

35 Edward L. Glaeser, 2005.

36 By way of comparison, total (legal) immigration to the US that results in residency is around 1 million per year, though these people arrive via dozens of different ports of entry around the US, not just New York.

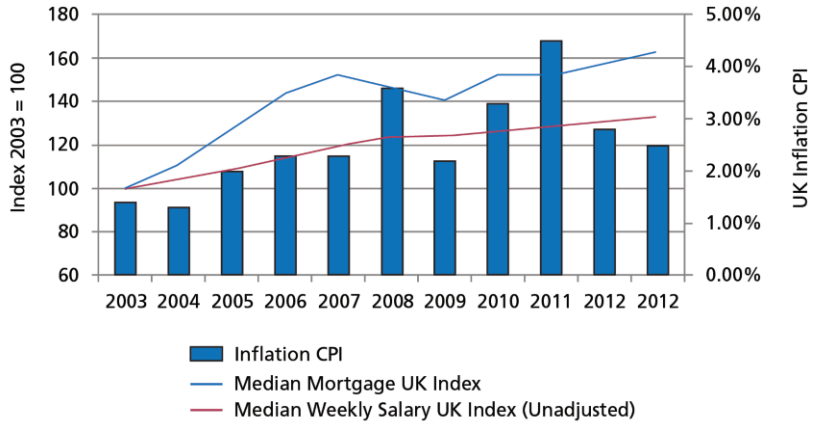

Table Twelve: Median UK mortgages[37] vs median weekly salary, plus inflation. Data: ONS.

- Maintaining world class transport links both to other nations and to the other key cities in the country. As many Western nations appreciate, the problem with first mover advantage in having built some of the world's first modern airports is that they are now too small, too old and are often in the wrong place. But, gaining support from the public and financiers to build a new airport that can cater to international flight demand is a huge task[38] and often is delayed to the point of crisis.

Central to all of the above factors is money, huge amounts of money. Billions of dollars need to keep flowing into the megacities to keep their upward momentum. Though, as we explore below, perhaps it is the case for some megacities that they could still be very successful if they were a lot smaller, or even more successful. They might no longer rate as megacities but they would still be considered 'global cities'.

Megacities vs Global Cities

Readers will have noticed that up to this point a number of famous financial and business centres have been missed out. This is because from the perspective of the megacities they are minnows, at least in terms of sheer size and human scale. Dubai, for example, has just 2.1 million people. Frankfurt's population is even smaller, at around 692,000 people, even if the European Central Bank is based there. While San Francisco, the home of so many tech giants, has just 826,000 people. To better reflect the fact that the most important cities to global business are not always the largest it has for some years now become a trend to develop rankings of 'global cities' using a range of both objective and subjective metrics. Today there are so many of these indexes that it seemed best to provide a selection of five of the most famous (see Table Thirteen).

37 One reason for the upward spike in mortgage levels even though wages were growing more slowly was due to the granting of 100%-plus mortgages, which in turn drove up asking prices, which then drove higher loans. Until, as we all know, this frantic game of credit chasing debt ended in the financial crisis of 2008.

38 The continuing battle over where to build London's replacement for Heathrow rumbles on with the option of building a new airport on a man-made island in the Thames Estuary at a cost of at least $75bn having been dropped. At present experts, the public and business owners remain totally divided on what to do next.

Rank	GlobalCities Index, A.T. Kearney	Global Cities, Knight Frank	Global Cities, Forbes/Accenture	Global Financial Centres, Z/Yen Group	Best Cities, Economist Intelligence Unit
1	New York	London	London	New York	Hong Kong
2	London	New York	New York	London	Amsterdam
3	Paris	Singapore	Paris	Hong Kong	Osaka
4	Tokyo	Hong Kong	Singapore	Singapore	Paris
5	Hong Kong	Geneva	Tokyo	Zurich	Sydney
6	Los Angeles	Shanghai	Hong Kong	Tokyo	Stockholm
7	Chicago	Miami	Dubai	Seoul	Berlin
8	Beijing	Dubai	Beijing / Sydney	Boston	Toronto
9	Singapore	Beijing	NA	Geneva	Munich
10	Washington DC	Paris	Los Angeles / San Francisco / Toronto	San Francisco	Tokyo

Table Thirteen: Five recent rankings of the top ten global cities[39].

The above indexes cover a vast number of metrics. For example, A.T. Kearney's, which is one of the better ones, uses 28 metrics which includes 'business activity, human capital, information exchange, cultural experience, and political engagement'. The Forbes index, among other metrics considers: the amount of foreign direct investment they have attracted; the concentration of corporate HQs; and 'air connectivity' or the ease of travel to other global cities. The most peculiar is the Economist Intelligence Unit's (EIU) 'Best Cities' index, which includes Stockholm and Osaka, in part because these offer a stable environment and offer high 'liveability'. Though, their system places Hong Kong, a chronically overcrowded city in first place. The EIU rankings then place the two dominant global cities in most other rankings, London and New York, in 12th and 16th place respectively. These seem to suggest that rankings that stray away from hard macro data can quickly become lost in excessive subjectivity.

Another factor with all of the rankings is that they are dominated at the top by Western and highly developed cities. This may seem an obvious point, but importance globally is in the eye of the beholder. To a Russian billionaire London may also be highly important, but they may also wish to include Nicosia in Cyprus. Moscow and St Petersburg naturally would be there also for a Russian business leader and they may see great importance in strategically important cities such as Istanbul, as well as major cities within what they might regard as the 'traditional Russian sphere of influence' such as Kiev in Ukraine and Almaty in Kazakhstan. Many Chinese business people focussed on Africa may also believe that Dodoma in Tanzania or Luanda in Angola should be in the top ten.

For what it is worth we shall also venture a view on what will be the 'world cities' of 2030. Table Fourteen sets them out below. Our focus has been primarily on which will be world cities as far as global law firms are concerned, taking into account:

39 Note, Forbes seems to cheat a little bit by putting multiple cities into the same rank. Perhaps this was to ensure they did not offend anyone, especially in North America.

- Level of dominance as a legal jurisdiction in terms of preferred use of legal system for major banks and corporates.
- Where the most important and innovative legal structures are created.
- Where the most internationally important commercial legal cases and arbitrations take place, both in terms of value and legal precedent.
- Where the highest numbers of general counsel of global companies are based.
- Where there is a business culture of paying for high level legal expertise that can support the fee rates of a global commercial law firm.
- Size of the legal market by total value.
- Number of major commercial law firms based in that city.
- Ability to operate there and offer local legal advice (and hire local partners).
- The potential talent pool to provide talent for a global commercial law firm.

Naturally we would also include many of the more mainstream metrics noted above. We have not taken into account more strategic issues such as propensity to take market share or the strength of the local law firms and how this may prevent one's firm from developing there. Such a consideration will depend very much upon the firm's strategic vision and its management's ability to execute that plan regardless of which city is targeted.

Rank	Jomati Global Cities in 2030
1	New York
2	London
3	Paris
4	Frankfurt
5	Singapore
6	Shanghai
7	Hong Kong
8	Tokyo
9	New Delhi
10	Sao Paolo

Table Fourteen: Jomati Top Ten Global Cities, 2030.

Briefly, here are our reasons:

- **New York.** This megacity/global city will remain the largest legal market in the world, as well as one of the most innovative. Its place as the home of investment banking is unlikely to change even by 2030. Other major US cities are also important centres in terms of legal spend, but not necessarily in terms of being a global city.
- **London.** A huge legal market and a global centre for legal advice and disputes. English law will remain essential to many clients as they expand globally. Like New York it will remain a centre of legal excellence and a healthy pool of talent.
- **Paris.** By 2030 France will have likely been through an 'existential' crisis and re-emerged as a far more dynamic commercial nation. Paris's relationship to Francophone nations in Africa will not have diminished and it will remain a home to many global companies and their European HQs.
- **Frankfurt.** It may never be an especially large city, but if one wishes to advise the companies within the largest economy in Europe, which Germany likely still will be, then Frankfurt with its concentration of corporates and banks will remain vital.

- **Singapore.** The growth of its international arbitration centre, especially in Asia-related disputes, will have accelerated. Unlike Hong Kong, which will eventually see judicial independence dissolved under the efforts of Beijing to rein in democracy, Singapore will become the clear legal leader in the region.
- **Shanghai.** By 2030, China will have greatly developed and will have opened its legal market to foreign firms. Though UK and US lawyers will be at a disadvantage compared to huge local firms, the level of client sophistication and the fees they will be willing to pay for global advice will change this city's legal sector profile positively.
- **Hong Kong.** Although its courts will have been hurt by China's overbearing influence by 2030 it will remain a major capital market, especially for the Chinese. It seems unlikely that such a concentration of commercial talent and capital will evaporate by 2030.
- **Tokyo.** One would expect Japan to be either in serious economic crisis by 2030, or will have also had an 'existential' crisis that will trigger radical changes, such as beginning open immigration. Either way, this huge economy and its global companies will need considerable legal support and Tokyo remains Japan's legal centre.
- **New Delhi.** The Indian market will have finally opened to foreign law firms by 2030[40], triggering a legal market revolution and fully opening the largest nation on the planet to global law firms. Delhi, as the nation's capital with the highest courts will likely be the main international legal centre, though it is arguable that Mumbai with its multiple major companies would be a close second option.
- **Sao Paolo.** Brazil in 2014 appears to be in serious economic trouble. However, South America as a whole will only continue to develop and we expect Brazil, after some changes in government, to also open their market by 2030 to global firms to allow mergers and local hires. Global firms will then use Sao Paolo as the centre for all of South America.

Impact on Clients

But what does this all mean for global banks, funds and companies? Some possible impacts:

- For those companies whose shareholders believe a global share of their sector's market is essential then it is inevitable that we will see further investment and the setting up (or expansion) of bases in many of these megacities and global cities[41], both of which will continue to generate a growing middle class.
- Global companies will become far larger than they are even today (some are truly gigantic, for example Walmart which has operations in 27 countries, 11,000 stores and directly employs 2.2 million people with a huge influence over thousands of suppliers globally.) Such truly global 'mega-companies' will grow hand in hand with the megacities.
- The battle for talent could become hotter, especially in the more developed global cities where the cost of living may rise significantly to the point where many young people eschew such cities for other alternatives. This in turn may trigger increased 'import' of foreign talent from other centres in order to keep sufficient staff. The decline in birth rates, as noted in Chapter One, will exacerbate this problem.
- Investment in infrastructure will have to increase, unless megacities are to be left to become inhospitable. Funding could prove a challenge as some impoverished megacities may fail to create a balanced economy with higher levels of productivity that in turn will generate the type of tax base that could pay for such investment.

40 In part because it will need to and also in part because many of the strongest local opponents will have retired from partnership positions in the leading Indian law firms.

41 Some cities will also be doubly good targets as they would be classed as both global cities and megacities, giving a business a market that has huge scale as well as wealth and great global connectivity.

- Increasingly multi-polar companies that have far less commitment to any particular nation. The aim will be to have a top tier position in at least all the 'global cities' and in a number of the developing world megacities. This type of global multi-node business will also be more hedged against economic or environmental crises.
- Separation of world cities from the rest of the national economies in which they are 'housed'. While world cities and the companies within them will trade and communicate with each other, providing high paying jobs for a global elite of technocrats and professionals, the majority of the local population will have very little interaction other than as consumers of these companies' products, nor will the majority be able to take part in what has become a truly transnational segment of the work force.

Impact on Law Firms

Commercial law firms will naturally be shaped by the behaviours and evolution of the client base. Some impacts may include:

- Far greater global balance in the largest law firms as they seek to follow clients into developing markets and key megacities and global cities around the world. While some global firms already have more than 50% of their revenues and staff based outside the 'home nation', by 2030 this will become standard for nearly all major commercial firms.
- The split between those firms that can service a global client base that may have inhouse legal teams spread throughout the global cities of the world and those that cannot do this, will become ever greater. By 2030 the gap will likely have become so large that the barriers to entry into the global market will have become far too great to overcome.
- The battle for talent will also affect law firms in both the wealthy and the poorer cities. The wealthy cities, as noted, may drive away talent that does not have sufficient funds to survive the relatively low paid early years of a career. The poorer cities will present the problem of there being far fewer people that can operate in a global firm available, but the need for them will be huge. Such professionals will be able to command huge salaries and are likely to be extremely mobile.
- The battle between New York and English law to be the dominant form of business law will continue and increasingly major firms will have breadth and depth in both. While some 'challenger' forms of law such as Chinese may have grown the PRC's lack of judicial independence will restrain its share of the legal market. By 2030, the pace of globalisation and the realisation of the need for considerable English and New York law capability may trigger a series of top tier transatlantic mergers or takeovers.
- Barriers to foreign law firms in developing markets such as China, Brazil and India will have finally fallen by 2030 (if not sooner). The global clients that operate in those nations' largest cities will need international law firms to bring know-how and to help mirror the global network of the clients' business bases in the world's other large commercial centres. The importance of global trade and maintaining international networks will outweigh local, parochial and protective interests.

Chapter Three: The Future of Work

The Robots are Coming

Until very recently, perhaps even as recently as this year, talk of robots in the office seemed rather unlikely despite the hype[42]. Anyone who has owned a 'robo-vacuum' would have been able to testify to their inadequacies. What hope was there for a second industrial revolution when the most popular robots to date could be flummoxed by a shag pile carpet? Robots have so far appeared to be very clumsy, unintelligent, lacking in grasping dexterity, have vision that does not convert to understanding, lack the ability to learn and are seemingly far too 'linear' in their 'thinking' to ever be able to interact with a human unless the human has been trained to interact with the robot in a very specific and supportive way. And the latter point rather defies the point in having a robot.

For example, how would an artificial intelligence (AI) system fitted to a robo-receptionist cope with a client who used irony or made a joke, rather than simply stating in perfect English the name of the person they wanted to meet and the time they were expected? How could the AI make a decision on what to do when, unlike a human, it had insufficient 'life experience' and insufficient mental capacity to decipher and respond correctly[43] to a joke? Would the AI receptionist automatically alert security and have the client thrown off the premises, or just sit there nonplussed until the annoyed client walked off? This may seem an amusing scenario but for the manufacturers of workplace robots it is a challenge as great as putting a man on Mars. And yet they are now getting close to solving this and other key robotics and AI challenges and this changes everything about this growing sector.

It is no longer unrealistic to consider that workplace robots and their AI processing systems could reach the point of general production by 2030. After all, with technology much can happen in 16 years and 'bot' engineers are already close to workable prototypes. As seen, (see Table Fifteen) technology can move quickly after a long experimental incubation.

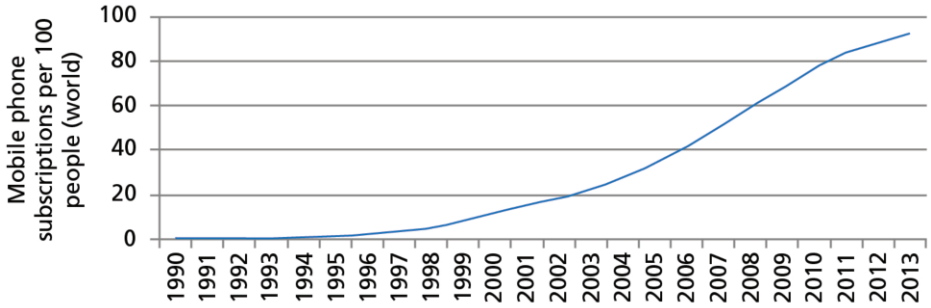

Table Fifteen: Global mobile phone subscriptions per 100 people. Data: World Bank.

Though not an exact analogue 'smart phones' are a useful example of how fast an apparently unimaginably complex and proficient device can become widespread once certain technological thresholds have been reached.

The first Blackberry with email arrived in 1996, though it was still partly modelled on a pager system and sales were limited[44]. By 2000 Blackberry managed to create a dedicated email device and its sales went exponential. By 2007 Apple launched the first iPhone, which provided easy web browsing and access to additional 'apps' for communications

42 We also previously considered robots in a previous report in 2011 and at that point concluded there seemed to be insufficient evidence to believe they would have an impact by 2020, which still seems to be true. However, another ten years is an aeon of time for digital technology.

43 That said, some humans, even highly intelligent ones, can fail to spot irony, which perhaps underlines the problem with creating an artificial intelligence when human intelligence already has many functional flaws.

44 One other reason was that the number of people sending emails was low in 1996. Only 14 million homes were online in the US at this point and many senior managers whose companies would pay for such 'cutting edge' technology as a Blackberry still felt uncomfortable using them. Slow data networks were another reason.

channels such as Twitter, which itself was only born in 2006 and today has 271 million users. In ten years we went from the simplest possible digital communications device to one that replaced and even improved upon the PC, whilst retaining all previous phone features developed up to that point. This wasn't so much sector 'disruption' as total overkill.

Today it is estimated that around 70% of children in the UK have a mobile phone by the age of 12, rising to 90% by the age of 14[45]. The comic image of a family sitting down for dinner and everyone preferring to look at their mobile phone than talk to each other is only funny because it is so true. Perhaps the most surprising aspect of this incredibly rapid change in what is 'normal' is that today it does not seem strange at all. A poor African farmer living in an arid landscape but with a mobile phone used to conduct internet banking using a service such as M-Pesa is not that strange today either. Humans are incredibly good at creating new tools and then integrating them into their lives as if they had always been there.

But, technology does not pause. Apple and other manufacturers such as Google[46], which only launched in 1998, have been investing heavily in voice-based 'personal assistants' such as Siri. They may seem fairly pointless at present and fall short of functional AI, but they are learning (more on AI learning later).

Another example of technology moving at a pace that now seems normal is digital memory. This is a key aspect for robotics as any robot that can move freely and interact with the chaotic environment that is human society will need immense processing power. Up to the late 1990s many computers still relied on 3.5 inch floppy disks and these generally had a memory of 1.44 megabytes or that of an average size PDF document. In 2014 SanDisk released a postage-stamp size memory card[47] with a capacity of 512 gigabytes, or 44,400 times greater in capacity that a floppy disk. A handful of these cards could contain the historical work product of even the largest law firm. This is quite a technological journey in around 15 years[48].

To sum up: after long incubation and experimentation, technology can suddenly race ahead at astonishing speed. We should therefore not underestimate the potential for AI and the physical robots they could be fitted to by 2030.

What Is Different This Time?

One may accept that technology advances rapidly but promises of robots in the past have failed to deliver beyond those used in industrial level manufacturing and even those are limited. In fact the word robot is hardly new. It derives from the 1920 theatre play R.U.R. (Rossum's Universal Robots)[49] about a factory that makes mechanical people. These artificial people are called 'robots', which is derived from the Slavic word robota or in English 'labour'.

However, very recently and nearly 100 years after the word was coined, complex robots are close to becoming a reality and it is certainly probable that at least some will enter service by 2030. The main reason is the development of rudimentary AI 'bots', i.e. software that can act autonomously in digital space and/or work within a mobile machine, in effect creating 'a robot'. One could say this is the classical duality of mind (AI) and body (the mechanical form of the

45 http://www.theguardian.com/technology/2014/may/20/uk-launches-largest-study-of-mobile-phone-effects-on-childrens-brains
46 It seems impossible that Google is only 16 years old. How can something that is as integrated into our lives as knives and forks have only started a few years ago? The answer: because we use it a lot. Use equates to normality. It is also worth noting that Google started as a software company, but is also now a manufacturing company
47 http://www.bbc.co.uk/news/technology-29175093, BBC, Sept 2014.
48 However, society has needed this journey. IBM estimated that in 2012 over 2.5 billion gigabytes of data was generated every day that year. With exponential growth in smart phone data usage and data tracking this will rise much further and faster. http://www.bbc.co.uk/news/business-26383058, BBC, March 2014.
49 By the Czech playwright Karel Capek in 1920.

robot). The difference is that AI can function without a large physical body and can operate within the global data network of the world's data clouds and servers.

Taking this into account, the following recent developments are noteworthy:

Robotics

- One of the first ever robots capable of handling 'unfamiliar objects' was unveiled in the UK, in September 2014. Most robots, no matter how sophisticated in their ability to handle tasks, have needed to be programmed to navigate and manipulate specific objects. The Birmingham University[50] robot 'Boris' opens up huge potential to 'learn on the job' and interact freely.
- Boston Dynamics, at that point probably the world's leading robot designer, was bought by Google in December 2013, its eighth purchase of a robotics company that year[51]. Given Google's $9bn/year R&D budget the potential to drive rapid improvements is very real. One current project is to refine a four-legged partially autonomous 'pack mule' for the US military[52]. Another is a humanoid robot, Atlas, which has shown an impressive ability to move through a complex and random human environment. This is in comparison to the almost comical efforts of Honda's Asimo robot that it unveiled in 2000 to much fanfare but was not sophisticated enough and possibly did the image of robotics more harm than good[53].
- Geriatric robots are already used, albeit with limited success, in Japan. New models are being introduced and one expects more sophisticated 'carer bots' to be used by the general public by 2030. Companies are currently developing robots that will mimic emotional reactions as well as dispense medicine and act as a 'PA' to elderly people with memory problems, such as by giving them prompts and reminders when they are forgetful. This may seem a bit too inhuman but given the predictions in Chapter One it seems there will be a significant need for greater help with a huge retired population[54].
- Drones of many types are already in use from military attack drones to Amazon's 2013 test flight of a medium-size drone that can make deliveries. While not 'robots' that manipulate their direct environment an enormous amount will be learnt through these developments.
- Google's self-driving cars follow the drone theme and are already functional, though still face further tests. Google is understood to be especially interested in developing driverless taxis and delivery vehicles. A number of authorities have already agreed to permit the testing of driverless cars on their roads. The knowledge gained from this project will also be of immense value to other robot types that need to manoeuvre and process huge amounts of information about their speed, direction, position and potential risks around them, while not harming any humans.
- It is also worth considering that 180,000 industrial robots were supplied to a variety of manufacturers around the world in 2013 according to the International Federation of Robotics (IFR). With so many companies already used to using robots when more intelligent machines are available it seems likely they will be integrated quickly into the global economy. The IFR says the watershed moment will be when industrial robots can understand 'natural' human instructions from an untrained operator instead of relying on a professional robotics engineer[55]. That day seems not that far away now. The other major step forward will be adaptive 'modular' capability. I.e. a robot that on Monday sprayed cars can have its spray module replaced by a grasping mechanism module on Tuesday and start fitting wheels instead. Again, this seems increasingly likely to happen.

50 It is perhaps fitting that Boris has been unveiled in Birmingham, UK, a city that was at the heart of the First Industrial Revolution.
51 http://www.bbc.co.uk/news/technology-25395989, BBC, Dec 2013.
52 http://www.youtube.com/watch?v=R7ezXBEBE6U&list=UU7vVhkEfw4nOGp8TyDk7RcQ&index=6 .
53 Honda have persevered with Asimo, which can now run and also greet guests after using facial recognition software, however, videos of 'his' performance in 2014 videos still seem rather choreographed.
54 Though, one could argue that with a rise in robot labour there will be more unemployed and hence more people available to be care givers to the elderly as a form of employment.
55 This is a similar step to what occurred in computing, largely due to Microsoft's ground breaking Windows software of 1985 and Apple's Mac OS of 1984 that allowed anyone to control a computer without the need to code or know programming languages.

Software 'Bots' and AI

- An AI system allegedly passed the Turing Test[56] for the first time in June 2014. The Turing Test, a special interview system designed to filter out autonomous, conversational software from real people has normally been able to prove what is human and what is not. A computer program called 'Eugene Goostman', which was simulating a 13-year-old Ukrainian boy, managed to convince the test it was a real boy. However, several AI experts have criticised the particular experiment and claimed it was too easy for 'Eugene'. Perhaps the most significant point is that scientists are now arguing about which program is the most convincing rather than whether a program could be convincing.
- IPSoft launched Amelia in September 2014, an AI 'avatar' that is designed to use applied knowledge, i.e. it thinks around a question to provide the best answer as opposed to seeking a direct A to B type response. As IPSoft says: 'Understanding words is not enough. You must understand the context.' Amelia can also conduct simple sequential steps for a user to carry out tasks especially those that involve interaction with another digital interface. For example, it could browse the internet for you, find an insurance policy that fitted your needs on a comparison site, fill in the forms and then make a payment for you. Interestingly, if it does not know how to do something it will contact a nominated human to ask for an answer, relay the answer and then memorise the data for next time. In short, it learns by using the best source of knowledge about the world there is: humans.
- Robots' AI systems were given their own cloud-based web system last year that will potentially allow all robots to share data, store information and generally learn from each other as well as communicate to any other system on the web. The system called RoboEarth is funded by the EU. The idea is that rather than have each robot carry around with it the sum total of robot knowledge, RoboEarth holds it for them and they are permanently connected to it, allowing them to draw 'insights' from it whenever they need. For example, a robot learns to load a dishwasher and uploads its 'experience'. Another robot in a different location is asked to do the same task and downloads the guidance it needs to perform the task. It in turn adds its feedback to the communal knowledge like a law firm perpetually adding to is precedent and KM library. It still faces many challenges, not the least promulgating a universal language for AI and robotics that will make such a cloud system viable. But, it is a big step.
- Associated Press, one of the largest news agencies in the world, announced this July that eventually the majority of its corporate earnings stories would be written by an AI system designed for them by a US company, Automated Insights. The program it uses is called Wordsmith and 'spots patterns and trends in raw data and then describes those findings in natural language, just like a human would'. It can also devour gigabytes of numerical data and other information and produce a written report, for example a report to a Fortune 500 CEO on economic trends in China. Meanwhile, the Los Angeles Times has launched 'Quakebot' that rapidly turns information about local earthquakes into news stories. A cynic might say the publisher chose this type of story for its AI experiment to stave off opposition from threatened journalists. Overall, it seems these systems could rapidly be improved to produce news, financial reports and market research papers at incredible speeds. They could also be used to produce legal documents. For example, due diligence and litigation discovery software is already highly developed, but more on the legal sector below.
- Wikipedia, which has made an impressive attempt to make digitally available the sum total of human knowledge, or at least provide the links to it, employs over 1,800 bots to scour the site's nearly 44 million pages in order to edit content and leave messages for those whose pages have been edited. The bots do this independently. Similar technology could be utilised, perhaps along with Wordsmith (see above) to produce and improve legal documents.
- 'Algo trading', including High Frequency Trading (HFT), is now well established in at least the major Western stock markets. Ironically it appears to have performed so well that a number of HFT houses have now closed as an increasingly competitive market filled with other HFT houses has reduced profits[57]. However this is proof of the success rather than the failure of algorithms' ability to integrate with financial trading even if the focus up to now has been on speed trading.

56 A Turing Test is successfully passed if a computer is mistaken for a human more than 30% of the time during a series of five-minute keyboard conversations.

57 http://www.businessweek.com/articles/2013-06-06/how-the-robots-lost-high-frequency-tradings-rise-and-fall#p3, Businessweek, June 2013.

The next big challenge will be to bring all of these elements together. As can be seen, many different companies are developing the requisite technology to build something far more compelling. Part of this process may be the consolidation of a number of technology companies to bring together the necessary skills and IP. Google's purchase of Boston Dynamics is an example of such M&A.

Putting Robots to Work

Let us say that by 2030 both the 'mind' and the 'body', i.e. AI and robotic functions are sufficiently advanced to be put to general use. Where would be the most likely places to see their impact, at least outside of factories? Areas first affected may include:

- **Taxis, buses, trains/metro trains and goods vehicles.** Trains, taxis, buses, goods vehicles on at least major routes/wide roads, e.g. from an airport or seaport to other major transport centres/logistics areas seems likely. Automated trains at airports already exist, so the jump should not be massive. In these cases the 'robot' would be integrated into the vehicle. They could also be used in road cleaning and cleaning of pavements/public areas. Snow ploughs could also be automated in this way.
- **Transport planes.** Planes already use autopilot and airborne military drones have also been successful. One would imagine that robotically controlled aviation could also be used for goods transport, though human transportation may need to wait, at least until public opinion was satisfied on safety.
- **Construction robots.** These seem likely, especially in large scale and dangerous projects such as building a dam, oil rig or skyscraper. Such robots do not need to have human shape or proportions, but would be designed to conduct several jobs and work in unison with a team of other types of robot.
- **Mining.** As with construction, their use would be most useful for conditions that were dangerous for humans. Such robots could work with 'dumb' mining machines or with semi-intelligent drills and other machines to create a networked mining 'mechanism' (indeed such vehicles are already used in some vast Australian iron ore facilities).
- **Office clerking robots.** From photocopying to delivering the internal physical mail/files to preparing rooms for a meeting, clerking robots could do all necessary tasks to keep a large office running smoothly.
- **Consumer marketing/sales/call centres AI bots.** Many sales systems already depend on 'robocalls' and automated systems, once AI is sufficiently robust to deal with the many random conversational situations humans will generate there would be little need for humans to be involved in areas such as telephone sales and help centres. That said, some argue that automation will in fact increase the value of human interaction, at least in areas such as sales where 'consumer experience' is key. Perhaps we will see a split, with low value commerce becoming fully automated and higher value retail setting itself apart by the use of empathetic and attentive humans.
- **Process level 'knowledge bots'.** These would be AI bots that would cover any systems-based work that involved processing written information. From low level journalism, to data management, to due diligence in the banking, audit and legal sector, many jobs could be replaced by AI bots.
- **Trading and market analysis bots.** As noted above, algobots already exist though they are relatively limited. In the future there is no reason why more intelligent bots cannot conduct wide reaching research and analysis, taking in libraries worth of data and also execute trades in a range of securities not just based on speed but on greater insight. They would also prove useful in financial projections for businesses in general, reducing the need for financial experts. They would also make many actuaries redundant as this is a highly data-dependent job.

Some may argue that this may sound impressive, but won't robots and AI systems cost too much to ever be put to use in this way? That is a serious concern. But, as recent developments in IT have proven, if a company can produce a compelling product that meets a major need then sufficient units will be sold to rapidly bring down production costs. As each year passes the costs will drop and the products will also see small, but useful upgrades in part to ensure people keep buying new models. If, for example, the first intelligent robot models are introduced in 2030, by 2045 they would likely be many times more advanced and far cheaper.

Overall Impact on Industry

Without a doubt if the possible future outlined above comes into effect then its impact will be huge. Let us consider low level knowledge economy work, such as that carried out by a very junior lawyer. In a top UK or US law firm the salary for a lawyer who perhaps is only doing file/data checking, collation, data linking and document improvement is around $100,000-plus. Some of the larger firms will hire 100 of these every year, creating a cost of $10m per annum. Let us say the first intelligent AI bots that are smart enough to work independently in a leading law firm cost $500,000 per annum in licensing costs, a price that would rapidly fall as competition increased in the AI sector. Even at this price they would be worth the cost as they can work 24 hours a day, 7 days a week with no downtime, thereby eclipsing the chargable hours of the most workaholic lawyers.

Because of the expected huge advances in processing capability by 2030 just a handful of bots would be able to work on multiple numbers of matters in parallel. They would also never stop working and would be instantly accessible to anyone in the firm over the entire planet (or at least wherever there was an internet connection). Moreover, as they worked they would learn, thereby becoming more efficient as they progressed. Eventually each bot would be able to do the work of a dozen low level associates. They would not get tired. They would not seek advancement. They would not ask for pay rises.

Process legal work would rapidly descend in cost. And therein is another side to this story and that is clients might refuse to pay more than they believed the work had cost the firm to produce (a subject that is hot right now and will be even hotter as AI arrives). To sustain margins a law firm would have to show added value elsewhere, such as in high level advisory work, effectively using the AI as a production tool that enabled them to retain the loyalty and major work of clients. Ironically, clients would look to law firms not for their AI capability because such high tech production methods would quickly become standard. Clients would instead greatly value the human input of the firm's top partners, especially those that could empathise with the client's needs and show real understanding and human insight into their problems. Of course, a firm that decided not to use AI would appear to be massively expensive to a client, rather as a luxury boutique that made hand woven rugs would be many times more expensive than a department store that sold machine-made rugs of a similar quality.

Accountants could also be badly affected. An audit of even the largest company on the planet could be carried out in hours as long as the data was digitised, which by 2030 it certainly will be. The only barrier would be the processing speed of the 'audit bots'. Again, the major accounting firms would see their process margins crushed. Instead they would have to focus on high value consulting and expert advisory work. Audit could even be given away for free as a loss leader. Initially they may oppose the idea of AI, but smaller competitors wielding this technology and threatening to steal clients with offers of efficiency will force their hand.

Compliance managers at banks, insurance companies and corporates may also be extinct. What would be the purpose of employing a human when a bot can simultaneously be in every database of every office, of every employee, crunching every action and every email, then checking it against the company's protocols and compliance rules in a few minutes? The answer is: very little. In short if a decision depends on a reference 'to the rules', then an AI bot can do it.

What AI bots will be weak at is making decisions that are based on human factors, such as a strategic choice that people feel enthused by, or deciding on a merger based on whether they like and can work with the other party. Managers, especially those with an elevated capacity for empathy and imagination, as well as strategic and creative thinking, will become ever more valuable and sought after. Those managers who 'do things by the book' face an uncertain future, as surely they can be replaced? Or to paraphrase Erich Schmidt[58], the CEO of Google: 'Humans will still do what humans are good at and AI will do what AI is good at.'

While professional service firms may be looking at the end of their current, and often inefficient, models, other types of business that actively seek to be more efficient and time saving would become vastly more profitable. Manufacturers, transport and construction companies which have operated on tiny margins would be able to massively increase production and once they had amortised the robot/AI costs their profit margins would rise. Retailers which had employed in some cases thousands of call centre staff all over the planet to meet global time zones would be able to simply use a single AI centre that would handle nearly every call. Again, profit margins would rise or conversely product prices will fall.

Socio-Economic Impact

This fundamental change in human civilisation poses some major problems. If robots become the main means of production then whoever owns the robots will control the lion's share of future wealth generation. Rather as the first Industrial Revolution put power in the hands of those who could afford to own or fund the creation of factories the Second Industrial Revolution will concentrate power and wealth in the hands of those with sufficient capital to build and develop robots and AI bots.

But what happens when inevitably there is less demand for labour? For some nations, especially those with rapidly reducing birth rates this could, at least on face value, actually be an answer. Countries that previously could not find enough people to work would no longer have that problem, e.g. Japan.

This rather convenient solution is not quite as neat in real life. The countries with some of the lowest birth rates also are the richest. In the West this has led to rapidly increasing immigration and a rise (at least in the short to medium term) in overall population. But, many of these people will not have jobs. Unemployment would rise just at the point when the demographic mix means governments need as much tax revenue as possible to pay for their millions of retired citizens.

58 The original quote was: 'I've come to a view that humans will continue to do what we do well and that computers will continue to do what they do very well and the two will coexist, but in different spaces.'

Moreover, where will the tax revenue come from if the employed ranks are shrinking? Governments would be forced to increase taxes on the large corporations and service businesses that employed robots and AI bots. In turn these companies might seek to relocate their HQs and domicile abroad to avoid that burden, whilst keeping operations in those countries.

The knock-on effects around the planet would be significant. What would be the point in coming to the West if there were no jobs? What would be the point in investing in highly developed nations if the population had a declining income due to lack of work and therefore could not consume? Ironically, would robotised nations see declines in GDP because they had effectively undermined the basis of traditional economics, i.e. that work produces wealth for all, as all (except the unemployed) must work. Now 'work' would mostly create wealth for a tiny group of people who 'owned the ability to work', i.e. employ robots, which would not earn as individuals, but rather be property. It is conceivable that a factory owner could literally 'own' 100% of all their company's economic activity as there would be no distribution of wages.

And finally, what will everyone else do with their time? There is a limit to how much television people can watch. Would there be mass emigration from the developed world to what remained of the developing world, where at least there would be demand for skilled white collar workers from the West? Or would we see a type of 'Luddite' revolt, with populations rising up to demand some form of meaningful and remunerative labour? Or would instead the many millions of unemployed develop a new form of economy based again on labour, but perhaps focussed on barter or communal goods? It is hard to know. We have never before been in a situation where the majority didn't work[59] for a paid living, at least not since the Dark Ages when indentured serfdom and subsistence farming were the norm.

Impact on Clients

Some of the predictions above consider not just 2030 but the longer term outlook for an automated economy. But, if we were to limit ourselves to relatively modest changes that would occur within the next 16 years we may see:

- The beginning of automated/robo vehicles. Surprisingly this may have little impact on car companies as they would simply move their production to making such models. But it would introduce some interesting regulatory and legal issues.
- Knowledge bots by 2030, at least at a basic level, do indeed seem to be realistic. As noted, this will have an impact on clients' demand for information-based process work. It would also have an impact on banks and likely see them greatly shrink their staff. Investment banking for example may start to see ever smaller senior ranks.
- The rise in importance of those companies that develop and manufacture bots and robots. At present Google clearly has a lead and perhaps would move from a 'search' and mobile phone company to a primarily robotics and AI company.
- All major companies would in general see greater increases in productivity and increases in annual profits, though, initial expenditure in robotics and AI would tend to mean the larger, cash rich companies will be able to exploit these changes more easily.
- The importance of IT security would rise to extremely high levels. Companies would face not just losing information but see AI bots go awry if hacked.

59 One could say that Ancient Greece, such as Athens, had a similar system via the use of slave labour. But the analogy is not quite fitting as even among the citizens who were free there was great variety in employment and levels of wealth, from workmen to traders to oligarchs. Moreover, they did not have vast unemployment.

Impact on Law Firms

The following points are based on the premise that law firms adopt and respond to new technology. However, some may not and this is discussed below. But, many will accept they have no choice but to change.

- Knowledge bots, as noted above, can be expected to be available by 2030 that would be able to carry out many of the tasks given to paralegals and junior associates. After many years of amassing 'big data' in the shape of vast stores of knowledge management (KM) files, precedents and templates, knowledge bots would be able to put all of this material to work rather than just acting as a retrieval system as most KM software is today.
- Partners would begin to embrace technology more widely. It is perhaps an overlooked factor that a reason for the slowness in the use of advanced IT is that many people in law firms do not feel passionate about it, and perhaps even fear its impact on their value as a professional. However, the managing partners of 2030 are in their mid-30s today. Their approach to, and acceptance of, technology will be very different.
- Alternative business structure law firms, in the UK and other markets, will no doubt embrace this type of technology as it will greatly suit the type of matters they handle. With their external investors able to provide significant capital they will invest in the latest AI when it becomes available and use it to rapidly increase the volume of matters. This increased efficiency will not harm their model, but rather make the shareholders in their narrow equity model extremely wealthy.
- The number of secretaries will drop even further. Today many firms are finding they do not need so many PAs due to improved technology. By 2030 this will have been taken to a much more advanced level, with perhaps specialised legal assistant versions of Siri and Amelia (see above) able to do many 'secretarial' tasks from arranging meetings to booking flights.
- The number of associates that firms need to hire will be greatly reduced, at least if the intention is to use junior lawyers for billable work rather than primarily to educate and train them ready to become business winners. Firms will struggle to overcome this gap in the usual career paths of their lawyers. I.e. firms need to hire young lawyers to become the next client winners, but they will be far less profitable at the start of their careers when knowledge bots take over most work up to 3 PQE.
- And as noted above, partners who have empathy, creativity and imagination, and who can really win a client's loyalty, as well as add value over and above any AI system will become immensely valuable. Such partners will ensure law firms keep their clients and hence will be worth remunerating very well. After all, if AI becomes commonplace then what will be the differentiating factors between the major firms? Most likely it will be the quality of its human staff and the relationships with clients that they can build and maintain. AI systems will be smart, but humans will still long for a real person to go to lunch with or discuss a deal with.

In conclusion, the economic model of law firms is heading for a structural revolution, some might say a structural collapse. We may have heard a lot about 'New Law' and alternative business structures, but the impact of AI will make such developments pale in comparison.

Market Shakeout

Some very small, specialist advisory firms that never had significant leverage in the first place will perhaps be the only law firms not affected by the changes. Firms that had a very tightly held equity and generally focussed on process matters will also not change radically, they would simply scale down their staff levels as AI capabilities rose and benefit accordingly.

The firms that will be most affected would be the very large, high value commercial firms whose associates expect to be given interesting work and many of whom aspire to the status and wealth that equity partnership affords. These fee earners are also incredibly profitable as they clock up the hours on matters the partners have brought in.

To enable the firms of the future to keep up profits they would need to massively increase the volume of matters they handled, as the leverage model will have been turned on its head. Rather as investment banks merged together to gain scale so will law firms need to follow the same strategy. It is possible that the generation of young associates joining firms this year are among the last who will become partners in 'traditional' commercial firms. Thereafter it will be a very different world, perhaps by 2030, but certainly in the decades afterward.

Conclusion

So what have we learnt about the near future? First and foremost is that many of the causes of future change are present today. Will this future be a better place, for people in general and for law firms? At face value one could argue it looks dystopian: huge, poorly funded megacities, filled up with aging poor people and struggling young people who will try to support a huge tax burden even though there are few jobs for them.

But then, there is another way of looking at this. Cities have always been in a state of flux, London for example was a nightmare for many of its inhabitants in the early Victorian era[60], but in the 20th century became a desirable global city. There is no reason why the future will be permanently dark for the megacities of tomorrow. They can change, adapt and improve.

Old age does not have to equal poverty and senility. Medical advances move apace and efforts to improve pension provisions are already in place. Robotics and automation do not necessarily mean the end of democratic capitalism, but rather free people to do new, productive things with their time. Very few of the jobs conducted by people in London or Manhattan would have been imaginable to someone in 1900, or at least not the way those jobs are carried out today. We cannot know for sure what new professions and what new jobs may exist for people by 2030, nor if society will adapt to a new form of labour market economics that enables a significant part of the population to 'work' but not in the way we do today, i.e. by providing labour to a company.

One might say everything is to play for, for people, for nations and their cities, and for companies and the professionals who serve them. The only certain thing is that there will be significant change to our societies by 2030. And will law firms benefit from this? That in part depends on what one considers the main beneficiaries of a law firm? If there is considerable automation in the law and clients continue to push for disaggregation and efficient IT-driven processes, which seems inevitable, then law firm models will change primarily by concentrating ownership into fewer hands. This will benefit the few equity partners or shareholders who remain.

Law firms will also certainly be more global. Neither companies nor their advisers can ignore the rise of the global cities and megacities as they are where the markets for their products and services are, or are where the head offices and decision-making will take place.

And demographics? One can expect lawyers in cultures where retirement is later, such as the US, to see partners continuing for even longer. Though, in the UK this is not so certain and we may instead see partners living long enough to genuinely have significant second careers that could persist over several decades. Though of course the number of partners in the future may be far less. What we may see is more senior associates leaving the law because they cannot become partner and then developing a second career instead.

Ultimately, whatever happens in the future of law firms, new technology will be key to steering organisational structure, production systems and staffing, just as it has been with financial services.

60 If you doubt this then read the works of Charles Dickens.

Take banking for example. As Lloyd Blankfein, CEO of arguably the most innovative bank on the planet said this year: 'Goldman Sachs is a technology firm.' And this is not just hubris, over 25% of the firm's staff are working directly in IT and its chief technology officer is considered on a par with any of the investment bank's top partners. Perhaps by 2030 60% of its staff will be working in IT. Though one could wonder how many staff it will even employ by that point, as how many humans will it need? Will law firms soon travel down the same road? It seems quite possible.

We have not got all the answers, but we hope this report has provided some interesting questions for law firms all over the world to ask themselves and with which to start a conversation with their clients. After all, what could be more important than thinking about one's future, especially when that future is a lot nearer than one may think?

Appendices:

Appendix A: The World's Megacities by Urban Area Population.

Rank	Country	Urban Area	Population
1	Japan	Tokyo-Yokohama	37,555,000
2	Indonesia	Jakarta	29,959,000
3	India	Delhi	24,134,000
4	South Korea	Seoul-Incheon	22,992,000
5	Philippines	Manila	22,710,000
6	China	Shanghai	22,650,000
7	Pakistan	Karachi	21,585,000
8	Nigeria	Lagos	21,000,000
9	US	New York	20,661,000
10	Mexico	Mexico City	20,300,000
11	Brazil	Sao Paolo	20,273,000
12	China	Beijing	19,277,000
13	China	Guangzhou-Foshan	18,316,000
14	India	Mumbai	17,672,000
15	Japan	Osaka-Kobe-Kyoto	17,234,000
16	Russia	Moscow	15,885,000
17	US	Los Angeles	15,250,000
18	Egypt	Cairo	15,206,000
19	Thailand	Bangkok	14,910,000
20	India	Kolkota	14,896,000
21	Bangladesh	Dhaka	14,816,000
22	Argentina	Buenos Aires	13,913,000
23	Iran	Tehran	13,429,000
24	Turkey	Istanbul	13,187,000
25	China	Shenzhen	12,860,000
26	Brazil	Rio de Janeiro	11,723,000
27	France	Paris	10,975,000
28	Japan	Nagoya	10,238,000
29	UK	London	10,149,000
30	Congo, Dem Rep.	Kinshasa	9,735,000
Total:			**533,490,000**

KEY:

North America and Europe;
South America;
Asia and Middle East;
Africa.

Data: Demographia. (Note: the population figures are based on the agglomeration method and do not conform to strict municipal boundaries). [Note: technically Kinshasa is not a 'megacity' yet, though very soon will be.]

Jomati Consultants LLP
3 Amen Lodge
Warwick Lane
London
EC4M 7BY

Tel: +44 (0) 20 7248 1045

www.jomati.com

jomati
consultants LLP