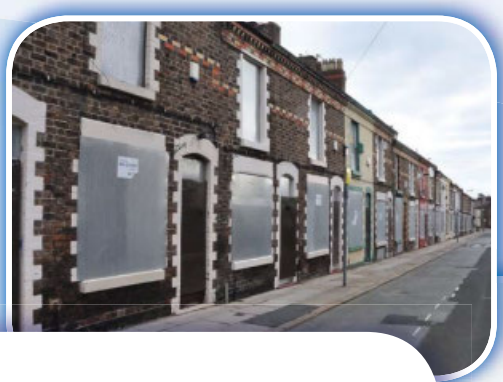
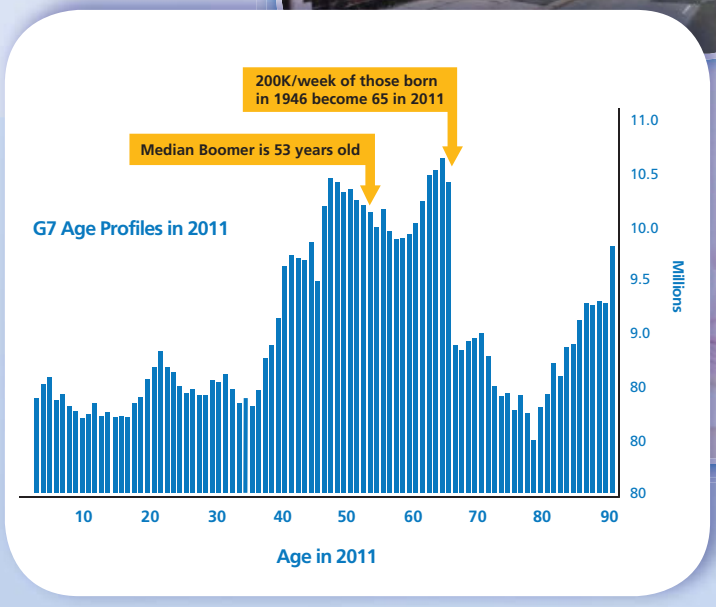
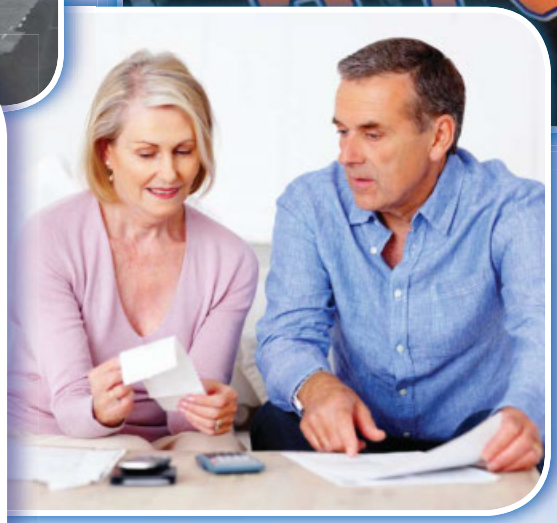
BOOM, GLOOM AND THE NEW NORMAL

How Western baby boomers are changing global demand patterns, again







By Paul Hodges & John Richardson

an ICIS publication

In association with International CEhem
Creative Energy for Important Issues

CONTENTS

Chapter 1
Where we have been 5
Chapter 2
The financial crisis as the key event 19
Chapter 3
Crude oil and the speculators 39
Chapter 4
Where we are headed 53
Chapter 5
The ageing BabyBoomers in the West 65
Chapter 6
Life's only certainty 85
Chapter 7
Lessons from consumer markets 105
Chapter 8
Doing more with less 127
Chapter 9
Maintaining and growing your business 153
Chapter 10
Policy framework for the transition to the New Normal 171
Chapter 11
Road map for success 189
Chapter 12
Call to action 207

Chapter 1

Where we have been

The past 30 years have been a Golden Age for the global economy.

The key feature has been the rise of the Western baby boomers. They were born in 1946–70, and came to dominate the global economy as they moved into their peak consumption period between the ages of 25–54 years old. This is when people typically marry, settle down, and have children. In turn, their need for material goods is at its greatest.

Their domination was achieved via a unique combination of circumstances. Not only were they living in the wealthiest countries ever seen in history. But they also belonged to the world's largest-ever generation in terms of population size. As a result, they had both the wealth, and the numbers, to establish and maintain the consumer trends that have dominated global markets since 1980.

This Golden Age is, however, now coming to an end, as these baby boomers move into the 55+ age group, where people typically consume less as their needs reduce. Instead, we are now moving forward to a new normal, and a world where demand patterns will be quite different.

These western baby boomers have been on a remarkable journey, both for themselves and for the rest of the world. And their journey is not yet over. Now, they are moving beyond their peak consumption years. And, once again, they find themselves in a unique position, with the longest life-expectancy in history now stretching out before them. Almost certainly, they are about to create major changes in world markets as a result.

The key issues can be simply summarised:

- The western baby boomers, who have driven major consumption growth over the past 25 years, are now mainly in their 50s and 60s. They are starting to consume less, and save more as they plan for retirement. This is already leading to lower sales into previously key markets such as autos and housing.
- In turn, this means the emerging economies of Asia, Latin America and Africa can no longer rely on exports to drive their growth. They will instead have to stimulate domes-

tic consumption, particularly in rural areas. And given that emerging economies have much lower GDP/capita, this will dramatically change their demand patterns too.

This change is already well underway. The median baby boomers were born in 1958, and moved into the 25–54 year old age group in 1983. 2013 therefore marks the year when they will move into the 55+ age group. Older baby boomers, those born between 1946–56, have already reached this major milestone in their lives. It is therefore critical that we try to better understand the background to this transition, and where it might lead us over the next 30 years.

THE POST-WAR BABY BOOM IN THE WEST

Few, however, would have forecast this development back in 1945-6, when the troops began to return home at the end of the Second World War. At that point, the economies of both the defeated and victors in Europe, were stretched to breaking point, and their cities were in ruins, as can be seen from the famous photo below of London's St Paul's Cathedral from 1940.

St Paul's Cathedral, London, 1940 (Keystone/Getty Images)

Equally, there was no precedent for a sustained boom in the number of babies being born. At the end of the First World War, births had quickly increased again as the troops returned home. And by 1920-21, they were back to pre-War levels. But from then on, the number of births began a steady decline, no doubt due to the numbers of men who had been lost in the war.

This decline in births continued until the start of the Second World War. Chart 1 shows that in 1921, there were 9.8 million births in what is now called the G7 Group of the wealthiest countries (Canada, France, Germany, Italy, Japan, UK, US). But births then fell to 9.3 million in 1922, and by 1930 only 8.7 million babies were being born. Then, with the onset of the Depression, births fell even further. 1936 saw just 8.3 million babies being born, and numbers stayed depressed until the Second World War broke out in 1939.

This traumatic event seems to have encouraged couples to live for the moment. In 1940, births

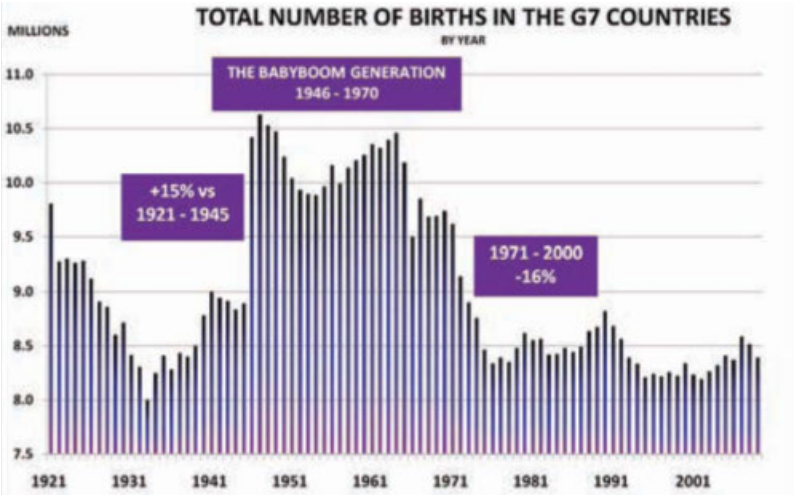


Chart 1: The Rise of the Western Baby boomers

jumped to 8.8 million, returning to the levels seen in the late 1920's, and they stayed there until the war ended. In particular, there was a sharp recovery in the US, where the Depression had hit hard. Only around 2.4 million US babies were born each year during the 1930s. But they jumped 29% to a new all-time high of 3.1 million in 1942, after the country had declared war in 1941.

If history was any guide, the end of the War should also have seen a further temporary increase in the number of G7 babies being born, as the troops returned home. And at first, this seemed to be happening. Across the G7 Group, the number of babies born in 1946 jumped to 10.4 million, and couples continued to make up for lost time between 1947-9. But then, the numbers dropped again, with only 9.9 million G7 babies being born in 1952.

At this point, something quite remarkable began to happen. Visionary economic policy in the US, designed to combat the rise of Soviet communism, provided a massive kick-start to the battered economies of Western Europe. And far from falling back into a new Depression, wealth began to increase and, with it, the number of babies being born.

Overall, between the peak years of 1946–70, the average number of G7 babies being born each year rose 15% by comparison with the previous 1921–45 period. This was equivalent to 33 million extra people, or more than twice the total population of Canada in 1950, the smallest of the G7 members. It would shortly provide the most extraordinary boost to consumption in the West, and in the global economy, as this generation began to grow up.

THE STARTING POINT, 1950

The critical issue, as Chart 2 shows, is that the G7 Group of countries dominated the global economy in 1950. The US was obviously the largest, amounting for over 25% of global wealth. But the other 6 countries together accounted for a similar proportion. So when these countries began, collectively, to have more babies, it made an immediate difference to global consumption and to global demand patterns.

This latter point is particularly important, as we shall see in later chapters when we come to discuss the more recent rise of the emerging economies, particularly the so-called BRIC countries (Brazil,

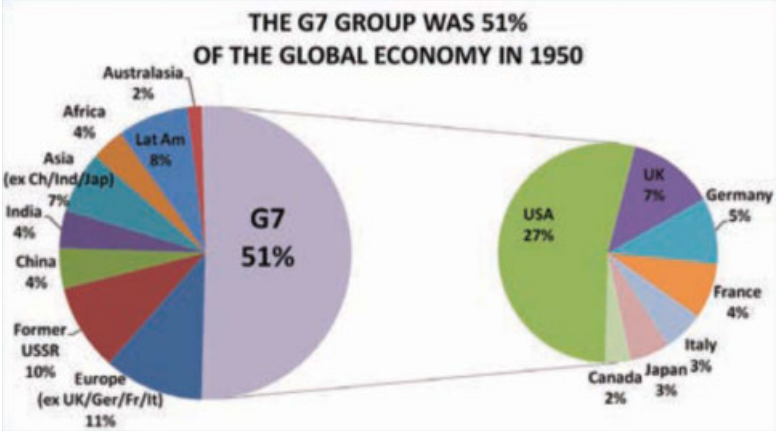


Chart 2: The G7 Group dominated the global economy in 1950

Russia, India and China). People who live on the poverty line have very little discretionary income. They have to spend their money on absolute necessities, such as food and energy.

But the populations within the G7 countries were generally not on the poverty line, and so as their baby boomer generation began to enter employment, discretionary consumption began to surge.

In 1950, as Chart 3 shows, these differences were quite stark. The normal way to measure a country's wealth is to take its Gross Domestic Product (GDP), and divide this by its total population, to provide an average GDP/capita. This is what we have done here. In addition, we express the figure in constant US dollars, based on 1990, so that changes due to inflation are eliminated .

Unsurprisingly, even in 1950, the US had the highest GDP/capita in the G7 and the world, with an average of nearly $10000. The wealthiest population in the BRICs was Soviet Russia's, with only $3000. In the rest of the G7, the UK and Canada averaged $7000, and France $5000. Even defeated G7 countries such as Germany and Italy were $3500, and only Japan was below Russia at $2000. And apart from Russia, GDP/capita in the BRICs was pitifully small – $1500 in Brazil, and $500 in India and China.

THE BABY BOOMERS BEGIN TO REACH MATURITY, 1970

Now, let us fast forward to 1970. The oldest baby boomers, born in 1946, are 24 years old – just about to enter those peak years for consumption between the ages of 25–54 years. As Chart 4 shows, the G7 still accounts for 50% of the total world economy. The share taken by the US has dropped a bit to 22%, but that of Japan has rocketed to 8% as its 'economic miracle' has begun to develop.

Similarly, as Chart 5 shows, the G7's GDP/capitas have been increasing rapidly, boosted by the number of babies being born. The US is now up to nearly $17000, and the other countries are all in the $10500 - $12500 range. Their populations are starting to be able to afford quite a bit of discretionary expenditure, as they now have spare cash after paying for the essentials. But the BRICs are still lagging far behind. Russia and Brazil have doubled their average income, but only to $6000 and $3000 respectively. India and China are still both below $1000 per head.

THE BABY BOOMERS REACH THEIR PEAK, 2000

Fast forward again, to 2000, and the oldest baby boomer was now 54 years old. The youngest, born in

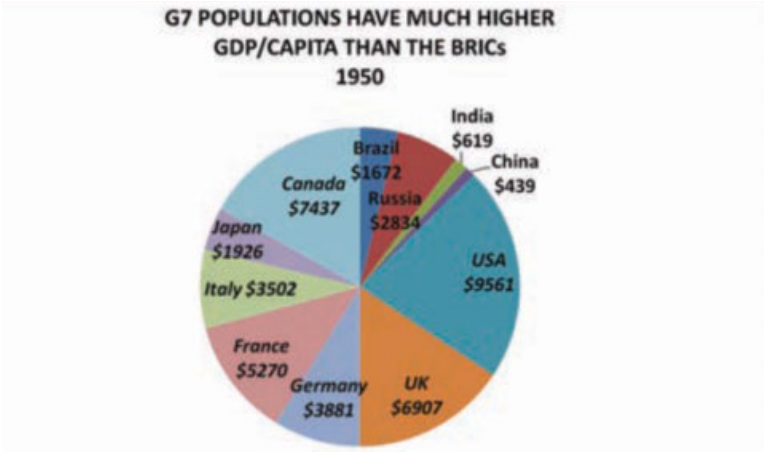


Chart 3: G7 populations in 1950 were much wealthier than those in the BRICS

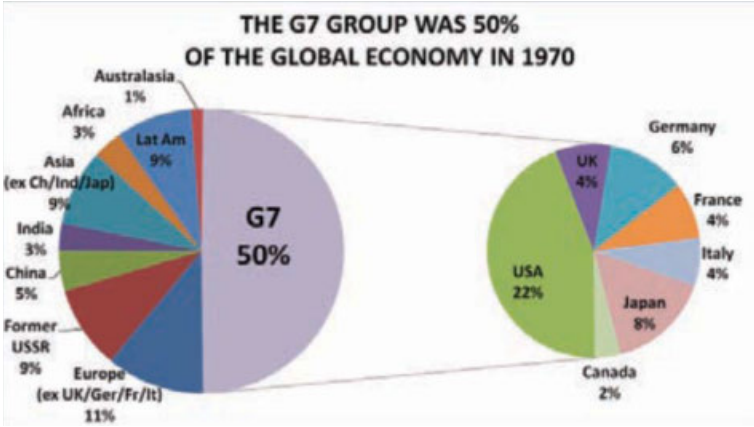


Chart 4: G7 & BRICs share of the economy, and income per head, 1970

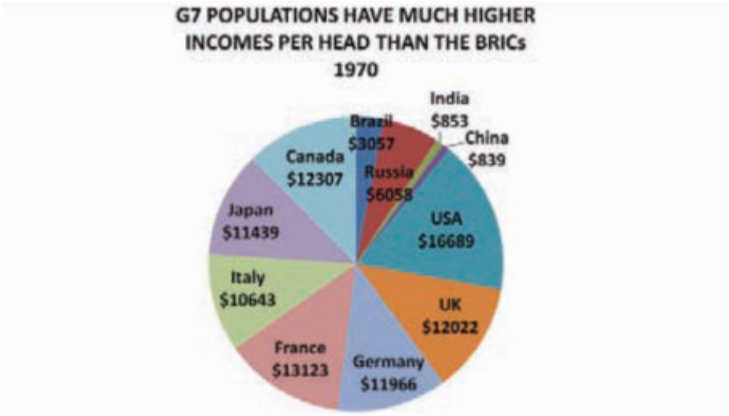


Chart 5: G7 & BRICs share of the economy, and income per head, 1970

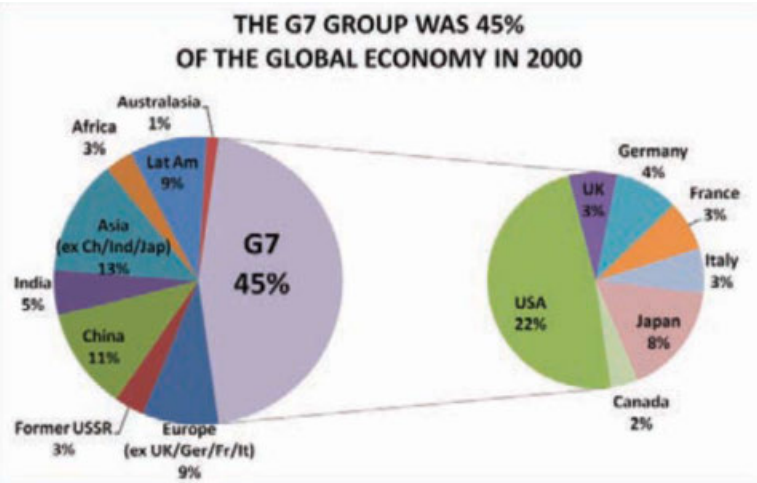


Chart 6: the G7 countries still dominate, and have the highest incomes, 2000

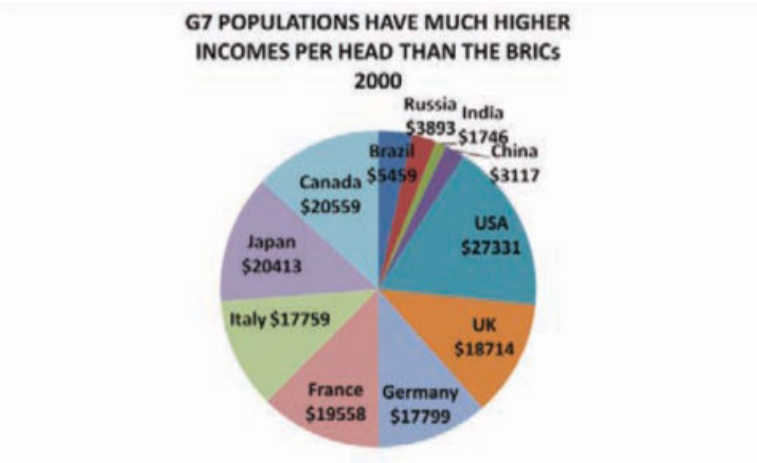


Chart 7: the G7 countries still dominate, and have the highest incomes, 2000

1970, was 30 years old. All of them, in other words, were now in their peak years of consumption. Even those who had delayed having children, due to the arrival of reliable contraception, or who were without children, still had plenty of spare cash to spend on themselves.

The G7, as Chart 6 shows, was still 45% of the global economy. Its economic policies may not have been perfect, but they certainly seemed to have worked pretty well. The US was still nearly a quarter of the total economy. And as Chart 7 illustrates, the G7 Group had extended its lead in terms of GDP/capita. The US was now at $27000 per head, 3 times its 1950 starting point. And the other 6 countries were all in the $17500 - $20500 range, with Japan having grown its GDP/capita ten-fold over the previous 50 years.

Meanwhile, GDP/capita in the BRICs had produced a mixed performance. Russia had barely grown its average, and was actually lower than in 1970 at just $4000, due to the chaos surrounding the break-up of the former Soviet Union. China had produced the best performance, with its average up 5-fold

since 1950, but it was still only $3000. Brazil and India had grown their average GDP/capita 3-fold, to $5500 and $1750 respectively, making Brazil the top performer amongst the BRICs. But even its average didn't allow for much discretionary expenditure, once food and energy costs had been paid.

This highlights one key change since 1970, the emergence of an export-development model in the emerging economies in Asia and Latin America. Consumption in the G7 had begun to increase so dramatically, as the western baby boomers entered the 25–54 age range, that the emerging economies had spotted an opportunity to help satisfy it.

China, in particular, was well on the way by 2000 to becoming the manufacturing capital of the world, as its government focused on export development, rather than domestic consumption as the key source of economic growth. Its share of global GDP had nearly trebled to 11% compared to 1950. Other Asian countries, such as Singapore which had pioneered this model, had also grown their share of the pie to 13%, although India was still dormant with only 5%.

However, 2000 also marked the moment when the first of the baby boomers were about to leave the magic 25–54 age group, when consumption is at its highest. And in parallel, as more and more of them entered the 55+ age group, demand growth clearly began to falter. Western policymakers have done their best to prop it up via the adoption of low interest rates, and the relaxation of lending standards. And this appeared during the mid-2000s to be successful in supporting consumption in key markets such as housing and autos.

But the on-going financial crisis since 2007 has only emphasised that the short-term benefits of such an approach are more than outweighed by the long-term problems that it causes.

THE G7S BABY BOOMERS ARE NOW AGEING

The oldest baby boomers, those born in 1946, transitioned to the 55+ age group in 2001. And now, the median baby boomer born in 1958 is also approaching this milestone. When they reach it, in 2013, the world will have reached a tipping point as far as consumption levels and economic growth. Are we ready for the disruption that this massive change will potentially cause? Are we even fully aware of the issue itself?

So far, the major debate about ageing populations in the West has focused on the problems that this will cause for pension plans. It is already clear that the combination of pay-as-you-go systems and increased life expectancy is a very potent cocktail for public finances. It worked brilliantly when the baby boomers were all in employment, and the elder generation that they were supporting with their taxes was relatively small. But it does not look so attractive for the future.

Chart 8 shows a snapshot for 1900, 1950 and 2000 of average births per year, versus life expectancy, in the larger G7 countries. It highlights the massive changes that have taken place in just 100 years:

- In 1900, these 6 countries (blue group) had life expectancy of under 50 years, and a relatively low number of average births per year. This explains why a pension at age 65 or 70 years old, especially with an upper limit of qualifying income, was seen as affordable.
- In 1950 (green group), life expectancy had moved up sharply to average 65 years, a

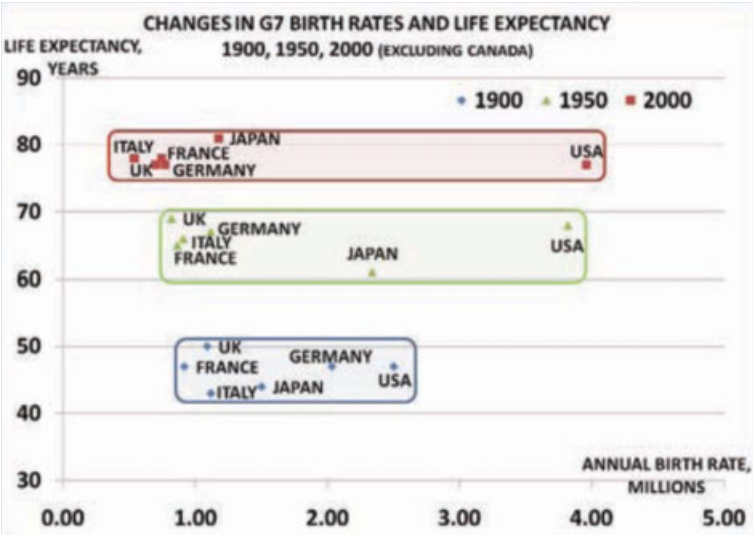


Chart 8: Average life expectancy versus birth rates in the 6 large G7 countries

35% increase. This was due to the success of the chemical industry in producing the first drugs, such as penicillin, and also in improving the overall standard of living. Equally, as we have discussed, a 15% increase in the numbers of babies being born was in the process of taking place.

- By 2000 (red group), life expectancy had increased still further to average nearly 80 years. But the average number of babies being born had declined by 16% between 1971–2000 versus the 1945–70 period.

Will the generation now replacing the baby boomers in the 25–54 year old cohort be able, or willing to shoulder the burdens now being transferred to their shoulders? Will the great benefit of increased life expectancy now become a curse for millions of people, unable to afford what they feel to be a reasonable standard of living?

One source of our current problems is that the short-term 'fixes' used to support demand in the past decade have made long-term 'solutions' more difficult to achieve. They appeared very attractive to politicians focused on the short-term electoral cycle. Equally, in terms of pension age, there has been a collective unwillingness to recognise that we have been living on borrowed time since the 1950s, when increased life expectancy first became a reality.

After all, when the then German Chancellor Bismarck introduced the first state-funded pension scheme in 1889, average life expectancy in the country was only 45 years. And Bismarck set the age for receiving a pension at 65 years, expecting no more than a few percent of the population to ever benefit.

Equally, when the UK followed this lead under Lloyd George in 1908, the age for receiving the pension was set at 70 years, along with a cut-off for benefits for those with incomes above 12 shillings a week (around £40, $65 and €45 in today's money). Policymakers were well aware of the need to ensure it only benefited an affordably small number of people.

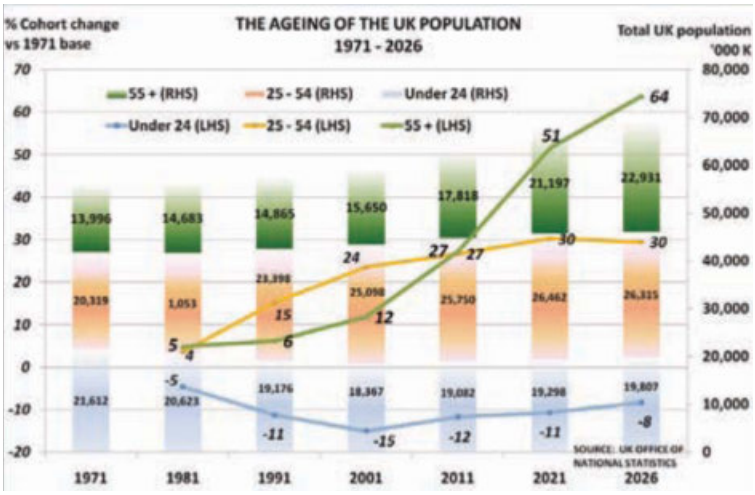


Chart 9: The Ageing of the UK population

However, changing social priorities, accompanied by the growth in size and wealth of the baby boomer generation, allowed G7 politicians to extend the benefits much more widely. And, of course, increasingly baby boomer-dominated electorates chose not to consider how these promises would be afforded once they began to reach retirement age.

Yet the numbers involved are huge. Overall, as we have seen, there was a 15% increase in the average number of births each year in the G7 countries between 1946–70, compared with the preceding 1921–45 period. In the US, there was a massive 48% increase during the peak years of its baby boom between 1946–64, by comparison with 1921–45. And, of course, this overall 15% increase was achieved in spite of declines in Japan, Italy and Germany.

In the UK, for example, as Chart 9 shows, the number of those in the 25–54 cohort grew by 15% between 1970 and 1991 (orange line). And this positive trend continued inexorably, as time passed. By 2001, the number was up 24%. But 2011 sees the moment when growth in the over-55 cohort (green line) starts to overtake that of 25–54 year old cohort.

By 2021, the number of those over 55 in the UK will have risen 51% versus the 1971 numbers, and in 2026 it will have grown 64%. But the number of 25–54 year olds has now stopped rising. Almost by definition, over-55s consume less and save more. And this trend is accentuated by increased life expectancy, as people worry about whether their pension will be sufficient for their needs.

THE KEY ISSUE

The key issue is that western baby boomers, who have driven major consumption growth over the past 25 years, are now mainly in their 50s and 60s. They are starting to consume less, and save more, as they plan for retirement. This is already leading to lower demand in previously booming markets such as autos and housing.

Their need to save more to cover the prospect of a longer retirement is also driving down interest rates, even though policymakers are making desperate efforts to kick-start inflation via their stimulus programmes and efforts at quantitative easing.

In turn, this means the emerging economies of Asia, Latin America and Africa can no longer rely on

exports to drive their growth. They will instead have to stimulate domestic consumption, particularly in rural areas. And given that emerging economies have much lower GDP/capita, this will dramatically change their demand patterns too.

This ageing of the baby boomers has been widely discussed in recent years, but it has only been seen in the narrow (though still important) context of pension funding. And as a result, it has already had an impact on financial markets, where interest rates have fallen to the lowest levels in a generation. In turn, of course, this causes further problems for the baby boomers, as the income from their pension funds reduces.

But its impact on the global economy, and particularly on consumer demand for chemicals, has not yet been as widely understood.

Living much longer should not be seen as a problem, but rather as an opportunity. This requires a major change in mindset as we go through the transition to what we would call a new normal, to emphasise the change from the past 30 years. Equally, social changes such as the introduction of the contraceptive pill, and greater affluence, have led to young people delaying marriage. Whilst life expectancy is continuing to increase as people come to understand the advantages of healthier lifestyles.

A similar transition is underway in the emerging economies caused by the scale of the changes underway in the G7 populations. The New Normal means that there will inevitably be less western demand for goods from the export-oriented economies of Asia. This is already impacting countries such China, which has been extremely successful in building up its role as the manufacturing capital of the world. In turn, this has driven growth in the urban population, and a much higher standard of living.

But even so, China's average GDP/capita is only a tenth of that of the affluent Western countries who currently buy its manufactured goods. Therefore, a slowdown in growth rates for its exports cannot simply lead to a like-for-like replacement with sales into the domestic market. So the transition to the New Normal requires a refocusing on more basic needs, rather than on the small minority at the 'top end' of the population who can afford western goods.

SOURCES

Economic statistics from:

- Angus Maddison, The World Economy, A millennial perspective, Organisation for Economic Co-Operation and Development (OECD) 2001.
- International Monetary Fund
- World Bank

Population data from National Statistics organisations:

- US, Germany, Japan, Italy, France, UK, Canada

1921–2009

G7 births by country

There was a considerable difference, as Chart 10 shows, in the pattern of births in the individual G7 countries.

THE US BOOM IN BIRTHS AFTER 1945

In the US, the number of births fell dramatically during the 1930s, and remained below the post WW1 level until 1945. But then, the economy began powering ahead, as the troops returned and factories switched back to peace-time production from the war effort. With the European and Japanese economies in disarray, there were plenty of opportunities for the US to build up its sales.

Perhaps most critical was the period of the Marshall Aid plan, which ran from 1947–51. This was deliberately designed by the US to rebuild the economic foundations of Western Europe. Its necessity was highlighted during the Berlin Airlift of 1948–9, when the US had effectively to remobilise in order to keep Western Germany, and Western Europe, free from the yoke of Soviet communism.

The success of these efforts enabled the US to put the scars of the Depression behind it. The

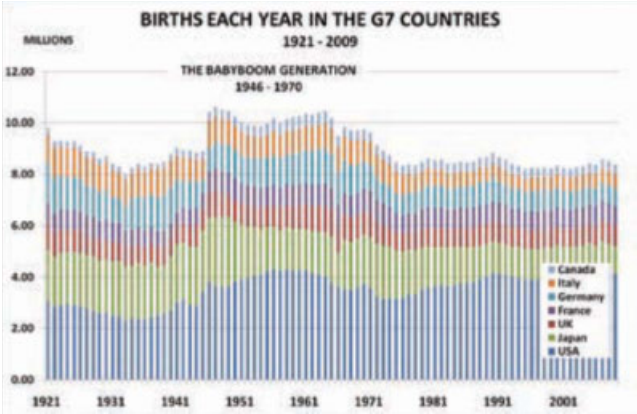


Chart 10: Births each year in the individual G7 countries

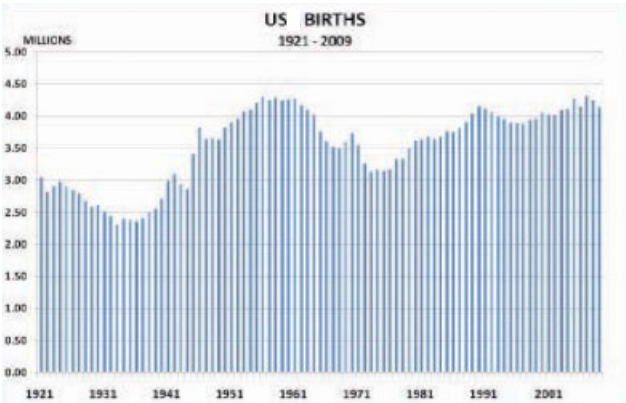


Chart 11: US births 1921 - 2009

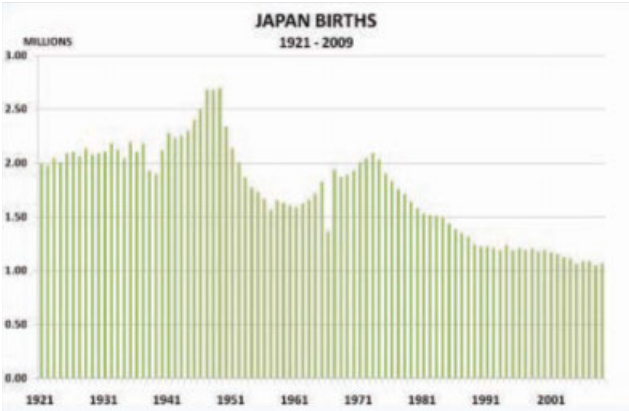


Chart 12: Japan births 1921 - 2009

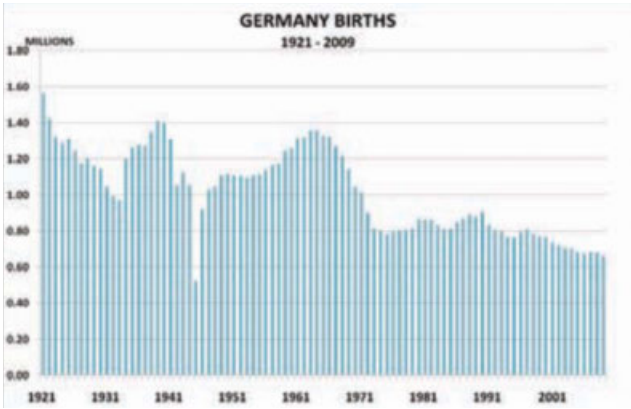


Chart 13: Germany births 1921 - 2009

average number of births each year rose an astonishing 45% during the 1946–70 period compared to the average in 1921–45. The number of births then fell steadily from then until 1976, and although they have since recovered due to greater immigration, the average number of births each year was down 6% between 1971–2000 versus the 1946–70 period.

JAPAN'S BIRTHS HAVE FALLEN SHARPLY

In 1921, Japan was second only to the US in the number of babies being born. That year saw 2 million born, compared to 3 million in the US. But whilst US births then declined during the 1930s, Japan's stayed remarkably steady.

There was then a brief post-War boom in 1947–49. But 1952 proved to be the last year in which 2 million babies would be born. The 1946–70 period actually saw a 9% drop in the average number of births each year, versus 1921–45.

Japan's own 'economic miracle' in 1950–75 saw GDP rose 600% to reach $1.2trn. This helped to stimulate a final recovery in the number of births up until the first oil crisis in 1973. But in 1975, they dipped below 2 million for the last time. Overall, the average number of births each year fell 22% in the 1970–2000 period, versus 1946–70, and they are now running at only 1 million.

GERMANY'S SHARP FALLS SINCE THE 1960S

Germany's births peaked at 1.6 million in 1921, and then declined steadily through the economic chaos of the 1920s and the onset of Depression. There was a temporary recovery from 1934 as the country moved towards war, but defeat proved traumatic, and births dropped right back to the 1 million level in 1946, where they remained into the 1950s.

The impact of Marshall Aid enabled the economy to grow 260% in 1950–70, and led to a return of confidence by the late 1950s. But as in the US, 1964 proved to be the peak, and since then there has been a steady decline in the average number of births per year. Overall, they were broadly stable during the 1946–70 period (falling 2% overall), versus 1921–45. But they then fell 29% during the 1971–2000 period. Even German Reunification in 1989 led to only a short-lived upturn in the downward trend, and they have been below 0.7 million since 2005.

ITALY'S BIRTHS SLUMPED AFTER 1970

Italy's births have followed a broadly similar pattern to Germany's since 1921, when over 1.1 million babies were born. It saw a slower decline during the 1930s, then accelerated towards the end of the war. Recovery led to a 'double top' as prosperity returned in the late 1950s and births briefly recaptured the immediate post-war level.

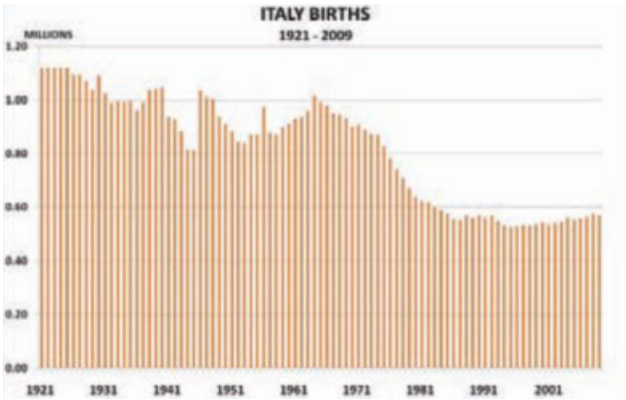


Chart 14: Italy births 1921 - 2009

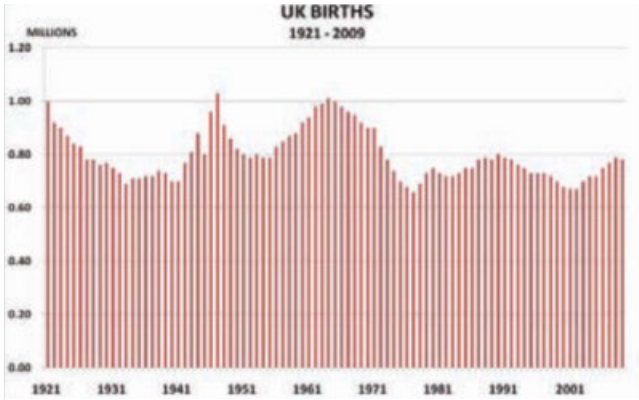


Chart 15: UK births 1921 - 2009

But only 1964 saw more than 1 million babies being born. And overall, the 1946–70 period saw average births down 8% versus 1921–45, a similar decline to Japan's. Since then, Italy has seen the largest average fall of any G7 country, down 31% in the 1971–2000 period, and births are currently below 0.6 million.

UK SAW DELAYED, AND MODEST, POST WW2 RISE IN BIRTHS

The UK also saw the familiar decline after 1921 and through the 1930s. Wartime morale began to turn with the US's arrival on the side of the Allies, and victory led to a brief recovery to 1 million births in 1946–7 as the troops returned.

But a strong recovery in the average number of births then began in the early 1950s, as wartime rationing finally ended. And overall, the 1946–70 period saw a 15% increase in the average number of births versus the 1921–45 period. But as elsewhere in Europe, this was not sustained, and average births fell 17% during the 1971–2000 period, and are currently still below 0.8 million.

FRANCE'S FINANCIAL INCENTIVES REDUCED THE POST-1970 DECLINE IN BIRTHS

France, of course, was badly hit by the carnage of the First World War, with births suffering a steady decline from 1921's 0.8 million level to 0.6 million by 1939, and a further fall to 0.5 million in 1941 as the country was occupied.

Chart 16: France births 1921 - 2009

But uniquely amongst the G7 countries, births then jumped to 0.8 million in 1946, and remained at this level until the early 1970s. This meant France showed a 22% rise in the average number of births between 1946–70, versus the 1921–45 period. Since then, the government's decision to incentivise couples to have more children has clearly had an effect, with the 1971–2000 period showing a relatively modest 9% decline, and births currently holding at the 0.8 million level.

CANADA'S SMALL POPULATION HAS FOLLOWED US TRENDS SINCE 1945

Canada has the smallest population of the G7 Group. It saw a relatively small decline in the number of babies born during the 1920s and

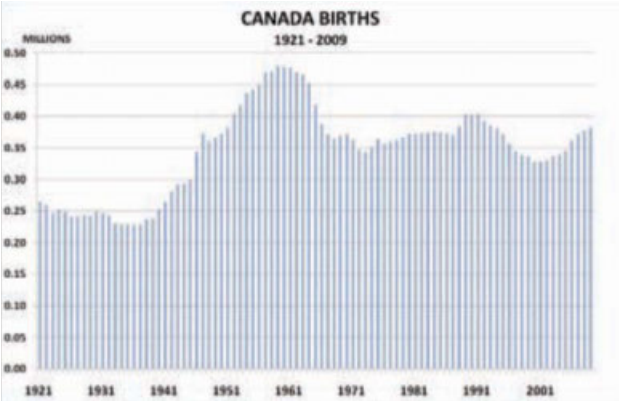


Chart 17: Canada births 1921 - 2009

1930s. It then saw a staggering 65% increase in the average number of births in 1946–70, compared to the 1921–45 period. At their peak in the late 1950's, births had doubled to 0.5 million, compared to the low-point seen in the 1930s.

The number of babies born then began to fall from the early 1960s, with a smaller peak then seen in the early 1990s. This was followed by a trough that took the number of babies born down to 0.3 million. Overall, the 1971–2000 period saw a 12% decline compared to the baby-boomer period between 1946–71.

Chapter 2

The financial crisis as the key event

The Western financial crisis that began in 2008 was not an unpredictable 'black swan'-type event, but an accident waiting to happen. The cause was policy makers' failure to learn the right lessons from Japan. Three years after the start of the crisis, it seems these lessons have still not been understood.

Japan's baby boomers were mainly born between 1940 and 1952. They had therefore begun to enter the 25–54 age range in 1965 and were all in this range between 1977 and 1994, before the oldest entered the 55+ age range. In turn, this led to an explosion in asset prices during the 1980s. House and stock market values rose to extreme levels, as demand surged.

Equally, once the bubble began to burst, major stimulus programmes had little impact, apart from driving up government debt levels. As more and more baby boomers entered the 55+ age range, interest rates also began to fall, as people worried more about future income.

The US's baby boomers arrived a few years later, mainly between 1946 and 1964. And they took the US economy on the same path, just a decade later. They were all in the 25–54 age range between 1989 and 2000, with the oldest entering the 55+ range in 2001. The US thus saw a similar peak in asset values and similar myopia from policy makers. They chose to ignore the influence of demographics and instead focused on trying to maintain asset values at artificially high levels – even though they knew these could not be sustained.

The trillions of dollars of global stimulus programmes since 2008 have shown that Western policy makers have still failed to learn the right lesson from Japan. It is not a question of trying to return to the 'Golden Age', but of adapting to the new world. And sadly, China seems to have followed the Western path: in its desperation to preserve employment levels as export demand growth slows, it has been busy inflating its own domestic asset bubble in housing.

These stimulus programmes have had a major impact on the chemical industry. They have encouraged major new investment to take place over the past few years, mainly in the Middle East and Asia, driven by governments operating on a social agenda focused on job creation. More capacities

are still being planned, while some financial analysts are suggesting a new 'SuperCycle' may be under way.

Thus, attention has been distracted away from the opportunities that exist to create a new and more robust growth cycle not based on stimulus programmes. This new wave of global growth needs to be based on tackling the key megatrend issues, such as increasing food production and water availability, while reducing carbon footprint and meeting the future needs of the ageing Western baby boomers.

THE HOUSING BUBBLES IN JAPAN AND THE US

The rise of the G7 baby boomers has created several different challenges for policy makers over the past half century. At first, because the increase in birth rates was so unexpected, they were entitled to be confused about what was happening. But since the Second World War, births have normally been reported accurately and on a timely basis. And once babies have been born, the implications in terms of future population trends should be obvious.

So the confusion among policy makers since the 1970s is much less excusable. By 1970, data was readily available to show that a 15% increase had taken place overall in the number of G7 births (and even more in some key countries such as the US). In turn, it should have been possible to develop policies on the assumptions that:

- This increase was already leading to major pressure on schools and education provision, particularly in those countries still recovering from the Second World War.
- Then it would create major pressure on jobs.
- Next, as the boomers moved into the 25–54 age group, they would increase consumption.
- They would also put pressure on housing supply and associated areas.
- Equally, as they moved into their 30s and 40s, they would begin to invest more (via pension schemes and mutual funds, for example), thus putting pressure on stock markets.
- Finally, as they began to retire, they would increase their savings and put downward pressure on interest rates.

All of these things have, of course, now happened – earlier in some countries such as Japan, and later in others, such as the UK, where the baby boom was more extended. Maybe it is too easy with hindsight to say that they should all have been foreseen at the time. Certainly, the constraints of the electoral cycle in the G7 meant that politicians never looked beyond the next three to four years. And their myopia continued even when they were able to look forward comfortably to a likely second-term victory.

But it should not have been a surprise, for example, that unemployment and inflation rose during the 1970s, given the number of G7 babies then jostling for their first jobs and starting to consume global resources on a larger scale than ever before. Nor should it have been a surprise that stock markets began to rise quite sharply in the 1980s, with price-earnings ratios in the US increasing from just 8 in 1982 to a peak of 32 in 2000, as supply fell short of demand.

Of course, housing was in the eye of the storm. All these babies not only wanted to have their own place to live, but also were encouraged by greater affluence to have larger homes and more separate existences. Pre-war families had tended to stay together, for mutual support in hard times. But the boomers couldn't wait to declare their independence by moving out of the parental home as soon as possible.

Equally unsurprisingly, this supply/demand imbalance led prices to increase. Thus, as the boomers grew into their 40s, after 1986, property began to be seen not only as a home, but also as an investment. Indeed, when Western stock markets declined after 2000, many baby boomers came to regard their home as their pension fund. This encouraged them to maintain their spending, even though wages were also stagnating.

Thus, according to the US Federal Reserve, Americans withdrew an average of $564bn a year in mortgage equity between 2001 and 2005, versus just $126bn a year between 1991 and 2000. This amounted to a 6.7% boost to their disposable income, compared with the earlier 2.1%. Equally, the savings rate dropped from 4.7% to just 1.6%. It seemed a magical time, as the overall value of US housing doubled from $10 trillion to nearly $20 trillion between 2000 and 2005.

The awful warning of Japan's experience post-1990 was simply brushed aside, although it was widely known that Japan's baby boomers were ageing ahead of those in the West. Instead, Japan's experience was simply described as the product of failed policies that had led to a 'lost decade' of growth. By contrast, Western policy makers congratulated themselves on how they had learnt to fine-tune the economy to eliminate cycles by creating, as the Bank of England described it, the NICE decade (Non-Inflationary Constant Expansion).

Given this inability to see the wood for the trees, it is perhaps no surprise that when demand patterns began to change in the 2000s, policy makers instead reached for the same policy switches as before:

- Neo-Keynesianism continued to be pursued, under which lower interest rates were used through the early 2000s to re-stimulate consumption.
- In particular there was a focus on boosting consumption through encouraging house price inflation.

In the US, the chairman of the US Federal Reserve, Alan Greenspan, published a widely praised paper in 2005 that emphasised how house prices had never declined on a national basis since the Depression. He also argued continually that while central banks could not spot asset 'bubbles' developing in advance, they had all the tools necessary to successfully mop up after them. As late as July 2007, when a financial crisis had become inevitable, his successor Ben Bernanke suggested to the US Congress that sub-prime losses would not amount to more than $100bn.

Equally, in revealing evidence to the UK parliament in March 2007, the then recently retired Governor of the Bank of England, Lord Eddie George ('Steady Eddie', as he was nicknamed), explained UK policy since 2000 as follows: "When we were in an environment of global economic weakness at the beginning of the decade it meant that external demand was declining… One had only two alternatives in sustaining demand and keeping the economy moving forward: one was public spending and the

other was consumption. It is true that taxation and public spending can influence the demand climate and consumer spending, but confronted with what we saw, we knew that we had to stimulate consumer spending. We knew that we had pushed it up to levels that could not possibly be sustained in the medium and longer term, but for the time being if we had not done that the UK economy would have gone into recession, just like the economies of the United States, Germany and other major industrial countries. That pushed up house prices and increased household debt. That problem has been a legacy to my successors; they have to sort it out."

Since the financial Crisis hit in 2008, it has of course been claimed that 'nobody could have seen it coming'. Equally, the idea of unpredictable 'black swans' has been popularised, to suggest that it was beyond the normal range of expectations.

Neither argument is supported by analysis of the facts. As we shall see, Japan's experience from 1990 onwards provided a very clear example of what happens when baby boomers start to age in large numbers. Equally, the authors of this book (as well as many others) were very active in the 2006–08 period in warning that a US housing crisis was becoming inevitable.

In September 2007, for example, Paul Hodges wrote in the Financial Times that "unfortunately, the myth behind the US housing mania is likely to become increasingly transparent, as the fallout from it widens". And a year earlier, in November 2006, he had warned in the same paper that "'beware lending institutions bearing gifts'" might be the most appropriate advice to those tempted to take on property loans.

The problem was, of course, compounded by human nature. At the end of a very long-lasting SuperCycle, nobody wanted to listen as:

- Policy makers did not want to put forward hard choices, such as cutting back on expenditure, or raising taxes (or both). Like Lord George, they preferred to ignore the probability that demand was now on a declining, rather than rising trend, and that short-term stimulation wouldn't bring it back to trend, but would just create a short-term upwards 'blip'.
- Similarly, the emerging economies of Asia and other regions had committed themselves to an export-driven model of economic development. Countries such as China were reducing the share of domestic consumption as a percentage of GDP, and instead investing in factories and infrastructure to manufacture goods for Western consumers.

Thus nothing was done to head off the crisis. And since then, although the New Normal is now clearly well under way, most policy makers prefer to believe it is a crisis of liquidity, rather than solvency. And so they have developed yet more, and even larger, stimulus programmes, as well as multi-phase quantitative easing programmes.

But these treat the symptoms, not the causes, and only serve to increase public debt still further, rather than returning economies to former growth patterns.

PIMCO, the world's largest bond fund managers, were particularly active in their warnings about the dangers of the policies being pursued in order to inflate the SuperCycle bubble.

They not only established a special team in 2006 to investigate what was happening in the US subprime housing market; Managing Director Paul McCulley, who headed their team focusing on the global central banks, explained on several occasions why the work of Hyman Minsky was key to understanding how credit cycles begin, and end.

Minsky (pictured) argued that long periods of stability, such as that experienced during the NICE decade, eventually lead to major instability. This is because investors forget that higher reward equals higher risk.

Instead, they come to believe that a new paradigm has developed, where high leverage and 'balance sheet efficiency' should be the norm. They therefore take on high levels of debt, in order to finance ever more speculative investments.

In the housing sector, this meant that lenders initially applied the usual strict criteria to their loans to the baby boomers in the 1980s and early 1990s. But during the later 1990s, as defaults seemed rare, they instead began to lend on the basis that only interest costs needed to be covered by regular repayments.

The idea was that the loan was still 'safe', as the capital value was secure, and so the home could always be re-sold at a profit if the borrower defaulted.

Finally, in the late stages of the cycle, they tried to sustain the SuperCycle by offering 'teaser loans' at very low interest rates, and with high multiples of loan to value, sometimes at seven or eight times earnings (double previous standards).

The belief was now that house prices would always rise, and so the borrower could either sell up at a profit when the 'teaser loan' ended after a couple of years, or simply refinance again. In many cases, 'liar loans' were made, whereby applicants claimed much higher income levels in order to meet formal loan criteria, with no checks being made

Eventually, however, PIMCO argued that a 'Minsky moment' would occur. In the housing market, prices would start to fall, rather than rise. Equally, in capital markets, earnings from the new investments would prove too low to pay the interest due on the debt.

Confidence in the 'new paradigm' would then disappear and, with it, market liquidity. Investors would find themselves unable to sell the under-performing asset and would suddenly realise they have over-paid. In turn, this would prompt a rush for the exits. Prices would then begin to drop quite sharply as 'distress sales' took place.

PIMCO argued from 2006 onwards that housing markets would be the first to experience the 'Minsky moment'. At first, it would impact those who had financed the housing boom. Then, they suggested that we would reverse the previous direction, with "asset prices falling, risk premiums moving higher, leverage getting scaled back and economic growth getting squeezed".

Some policy makers also expressed their doubts about the policies being pursued by their colleagues. Kevin Warsh, then a Federal Reserve Governor and later head of the New York Federal Reserve Bank, warned in March 2007 that "liquidity should not be mistaken for capital".

More recently, he argued in June 2010 that it was essential to "debunk some popular truths that have become part of the crisis narrative:

- Subprime mortgages were not the core of the global crisis, they were only indicative of the dramatic mispricing of virtually every asset everywhere in the world.
- The volatility in financial markets is not the source of the problem, but a critical signpost.
- Excessive growth in government spending is not the economy's salvation, but a principal foe.
- The European sovereign debt crisis is not upsetting the stability in financial markets; it is demonstrating how far we remain from a sustainable equilibrium.
- Turning private-sector liabilities into public-sector obligations may effectively buy time, but it alone buys neither stability nor prosperity over the horizon."

He concluded that today's problems are not "a series of unrelated, unpredictable, unfortunate financial shocks". He argued that instead of continuing to focus on short-term 'fixes' to problems, "we should take the necessary measures to ensure that our economy is strong over the long term".

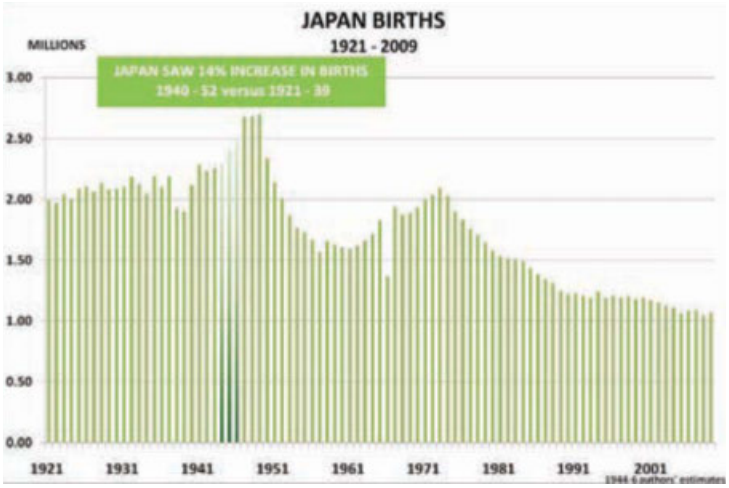


Chart 18: Japan births 1921–2009

JAPAN'S EXPERIENCE SINCE 1990

Japan's baby boom took place earlier – between 1940 and 1952 – and was more concentrated than in the rest of the G7. And so Japan's experience of its progression is a potentially excellent model for what has begun to occur since 2000 across the rest of the G7.

As Chart 18 shows, Japan's births rose by 14% between 1940 and 1952, versus the 1921–39 period, and averaged 2.4m each year. This meant that:

- Its oldest baby boomer was 25 years old in 1965 and 55 years old in 1995
- Its median baby boomer was born in 1946, and became 25 in 1971 and 55 in 2001
- All its baby boomers were in the 25–54 age group between 1977 and 1994

Chart 19: Japan Nikkei 225 Index
1970–2010 (monthly close)

Unsurprisingly, with these demographics, the 1980s was the heyday of the 'Japan story'. With all of its baby boomers in the years of peak consumption, and creating unprecedented levels of demand, numerous books and articles were published on why Japan was about to take over the world. In particular, its property market had moved into an amazing boom. By 1987, when Paul Hodges first visited Tokyo, its land values were the talk of the globe. Like most first-time visitors, he was taken to stand in front of the Imperial Palace in Tokyo, and told that the land on which it stood was worth more than all the land in California.

Meanwhile, as Chart 19 shows, Japan's main stock market index, the Nikkei 225, was reaching a similar stratospheric peak. Price/earnings ratios of 30 or more were common, with many over 100. Most analysts spent their time explaining why this was quite reasonable, due to the cross-holdings that were then common between each major company. Some complex mathematics were then employed, in an effort to show that price/earnings ratios were really quite 'normal', once these holdings were stripped away.

Of course, it was not only being powered by demographics. Japan had developed a number of innovative industrial techniques, particularly the principles of Total Quality Management adapted in the 1950s from Western thinkers such as W Edwards Deming, whose famous '14 Points' led to the transformation of manufacturing operations. But even here, Japan's advantage was beginning to wane by the late 1980s, as Deming began to be adopted by leading Western companies such as DuPont and ICI.

Instead, it was the laws of supply and demand, as determined by demographics, that were about to abort Japan's seemingly relentless rise, even though these were unrealised at the time. The Nikkei 225 index reached its all-time peak of 38,916 on 29 December 1989, only to then embark on a multi-year fall, accompanied of course by occasional rallies. Its most recent low was 7,054 on 19 March 2003, by when it had fallen 82%. This took it back to its levels of 1980 (when it had already trebled from the early 1970s as the early baby boomers began to step up their savings and investments).

Interestingly, however, just as the Nikkei was hitting its peak, so government bond yields were also peaking. They topped out in the summer of 1991 at around 8%, very similar to the yields then being offered by US 10-year Treasury bonds. But as Chart 20 shows, they have since been in a steady decline, as bond prices rose. By the end of 1993, for example, yields had fallen to 3%, and even though they then increased temporarily as global economic recovery began after the 1990–93 downturn, they soon resumed their decline. US Treasuries, however, went back to 8% during 1994 and remained consistently higher than Japanese bonds for the rest of the decade.

In the West, where the baby boomers were still in their peak consumption cohort, Japan's continuing decline made little sense. Instead, a progression of experts appeared, bearing the message that the supposedly 'strange behaviour' of Japan's stock and bond markets was simply due to Japanese policy makers having failed to implement the right policies to restore demand to previous levels.

For example, in a widely reported speech as late as May 2003, Ben Bernanke, soon to became Chairman of the US Federal Reserve Bank, took aim at virtually all aspects of Japanese government and central bank policy. He argued that its deflation and lack of growth were due to lack of a target level for inflation ("a price-level target") combined with a lack of co-ordinated policies (such as tax cuts and quantitative easing) by government and central bank that would aim "to create an environment of combined monetary and fiscal ease".

US DEMOGRAPHICS START TO FOLLOW THE JAPANESE PATH

This inability to learn the right lessons from Japan was to prove very costly to the West as the new millennium got under way. The US, in particular, had been badly scarred by the depression years of the 1930s. And as Chart 21 shows, its post-War baby boom was then easily the most dramatic of any G7 country. It peaked between 1946 and 1964, when births rose by 48% compared with the 1921 to 1945 period, to average 4m a year.

Unsurprisingly, this level of fecundity meant its share of G7 births rose from 31% to 40% over the same period. And as these babies grew up, the phrase "if the US sneezes, the rest of the world catches a cold" became widely accepted as a guide to developments in global economic growth.

Its demographics meant:

- Its oldest baby boomer was 25 years old in 1971 and 55 years old in 2001
- Its median baby boomer was born in 1955, and became 25 in 1980 and 55 in 2010
- All of its baby boomers were in the 25–54 age group between 1989 and 2001

Clearly, the post-war experiences of the US and Japan have been different in a number of important respects. But in terms of underlying demographics, one key parallel stands out in terms of the impact of their respective baby booms:

- As we have seen, all of Japan's baby boomers were in the 25–54 age group between 1977 and 1994, when (a) its stock market reached its fabulous peak, and then (b) its interest rates embarked on an equally dramatic fall.

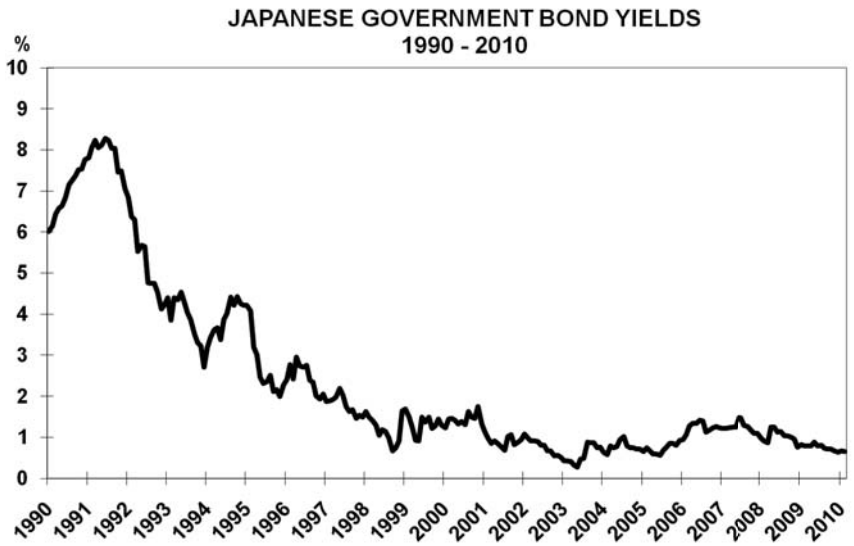


Chart 20: Japanese government bond yields 1990–2010 (monthly close)

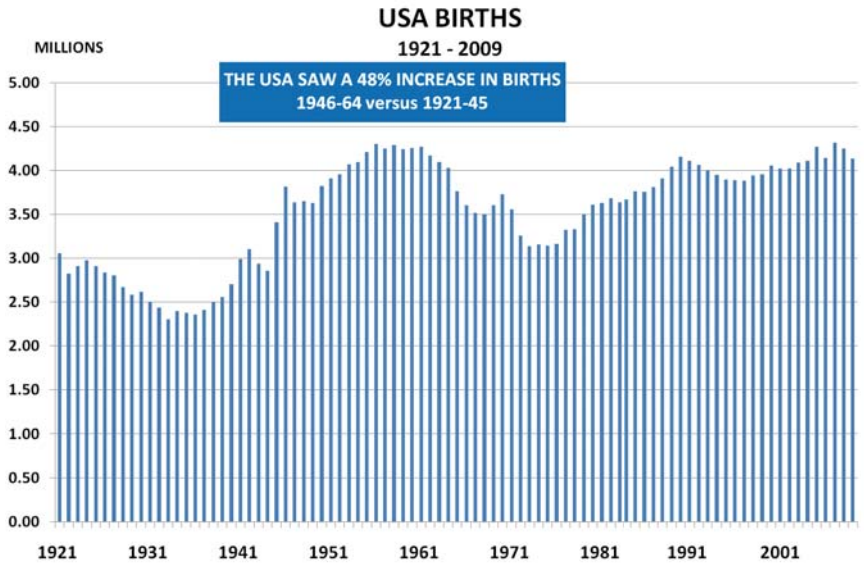


Chart 21: The US baby boom of 1946–64 was the most dramatic in the G7

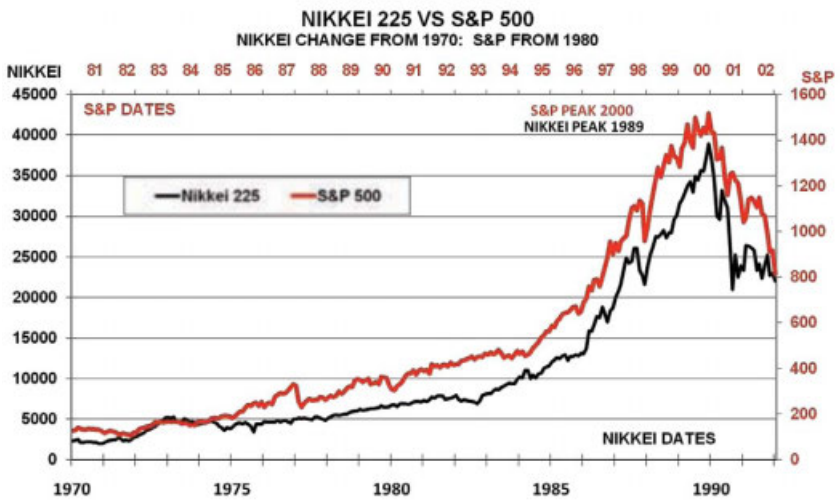


Chart 22: Intriguing parallels between the Nikkei 225 and the S&P 500 (end month)

- All of the US's baby boomers were in the 25–54 age group around a decade later, between 1989 and 2001, when its stock market reached its own fabulous peak, after which there has been an equally dramatic fall in interest rates.

This is shown by the intriguing Chart 22, which updates Chart 19 and shows the Nikkei 225 index (black line) from 1970 to 1992, with the S&P 500's (red line) performance between 1980 and 2002. It is drawn to match the peaks of the two indices (December 1989 for the Nikkei, August 2000 for the S&P). And it highlights their very similar performance over the previous 20 years, as well as in the immediate aftermath of the peaks. (NB: Nikkei dates are at the bottom, S&P 500 dates in red at top.)

The Nikkei and S&P indices both trebled in the initial decade – between 1970 and 1980 for the Nikkei, and 1980 and 1990 for the S&P. The Nikkei's peak was then more explosive, however, as it rose six-fold to December 1989, compared with the S&P's four-fold rise to its March 2000 peak of 1,527. But both then fell around 45% within three years of their respective peaks. This is strong, *prima facie* evidence to suggest that similar demographic influences may have been at work.

A second piece of evidence for the importance of demographics is Chart 23, which compares what happened to Japanese Government Bond yields in Japan (JGB, black line) and in the US (red line) in the period following the respective stock market peaks. Both have clearly moved in very similar directions. In fact, if we had chosen to show the movement for shorter-dated US bonds alone, then the parallels would have been extremely close indeed, as the US two-year Treasury bond yield fell to around 0.5%. (Again, JGB dates are at the bottom and US dates are in red at the top.)

POLICY MAKERS TRY TO ENSURE THAT 'THIS TIME, IT'S DIFFERENT'

However, stopping our discussion of stock market performance in 2003 would not give the complete picture. As we have already seen, prominent US policy makers were seemingly unaware of the potential for demographics to drive stock and bond market directions. Instead, when confronted with the

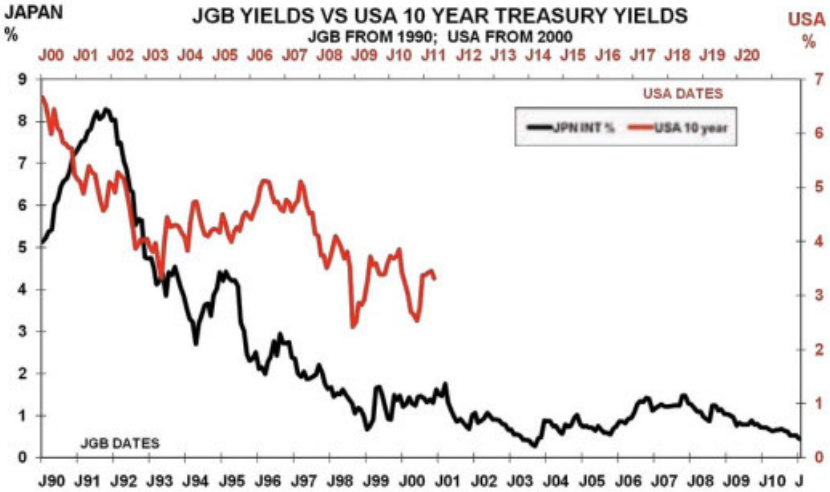


Chart 23: Intriguing parallels between Japanese bond yields and US 10-year bond yields

evidence from Japan, they convinced themselves that better policies, better implemented, were the key to restoring growth in the post-2000 environment in the West. This, it was confidently believed, would help the rest of the G7 avoid Japan's 'lost decade' of growth since the 1990s.

Their rationale was summed up by Lord George in the evidence cited earlier to the UK parliament. His view was widely shared by his G7 colleagues. A valedictory speech in September 2005 by Alan Greenspan, then retiring as chairman of the US Federal Reserve, showed that he was fully aware of the risks involved by his efforts to stimulate consumption by seeking to encourage higher house and stock prices. He noted: "It is difficult to dismiss the conclusion that a significant amount of consumption is driven by capital gains on some combination of both stocks and residences, with the latter being financed predominantly by home equity extraction."

And he also fully accepted that "we can have little doubt that the exceptionally low level of home mortgage interest rates has been a major driver of the recent surge of homebuilding and home turnover and the steep climb in home prices."

But, crucially, he went on to argue that although these rises in US house prices created a risk of a future "shock", this should not be a concern for his successors as "in a highly flexible economy, such as the United States, shocks should be largely absorbed by changes in prices, interest rates and exchange rates, rather than by wrenching declines in output and employment, a more likely outcome in a less flexible economy."

Sadly, of course, Greenspan was proved wrong with this assumption. Inflation has indeed remained low by historical standards, confounding those many experts who failed to understand that demographic drivers have a far more powerful influence than policy makers on the laws of supply and demand, which in turn determine whether prices rise or fall.

But employment has also fallen sharply, particularly in the US. Greenspan's policies, and those of his successors, succeeded in extending the demographic SuperCycle of the 1980s/90s into the 2000s, and employment rose to a peak of 138 million in November 2007. But two years after the financial cri-

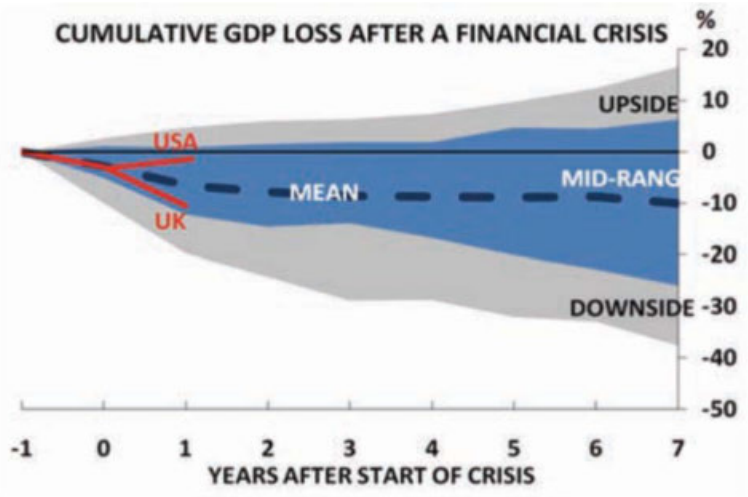


Chart 24: IMF, Bank of England analysis of the aftermath of financial crises

sis began, in 2010, only 130m Americans were employed, the lowest average of the 2001-10 period.

Equally, Chart 24 shows how GDP tends to suffer for an extended period after a financial crisis of the kind through which we are now living. It comes from an International Monetary Fund/Bank of England study of the impacts of previous financial crises. They found that credit becomes more difficult to obtain and lower activity depresses investment, as does a loss of confidence. Equally, fewer new firms are formed, bankruptcies increase and, as we have seen, unemployment rises.

The US had still not recovered its previous level of GDP at the end of 2010, while other G7 countries such as the UK were well below it. And this was despite G7 governments having provided unprecedented levels of stimulus and also having bailed out, or nationalised, many large banks that were thought to be 'too big to fail', as their failure would have caused the economy to collapse.

We can see the impact of Greenspan's policies, and those of his colleagues, in Chart 25, which takes forward the performance of the Nikkei 225 index and the S&P 500 since 2002. The policy of continued low interest rates boosted asset values, just as Greenspan intended, and allowed consumption levels to soar on the back of borrowed money. Equally, the collapse during the 2008 crisis is clearly shown, which seemed to return the S&P 500 to the level one might have 'expected' if it was still paralleling the Nikkei's path following its 1990 peak.

Since then, policy makers have again restored to extreme measures – the US has undertaken two periods of quantitative easing, amounting to $1.7 trillion in 2008/09 and a further $600bn in 2010/11, plus two stimulus packages in 2008 and 2010, each worth around $850bn. China, struggling due to the loss of its export markets, has undertaken even more extreme measures to support demand, including a doubling of bank lending to $1.4 trillion in 2009 (equal to one third of its GDP) and a $560bn stimulus programme worth another 13% of GDP, plus a further $1.2 trillion of bank lending in 2010.

The aim, once again, has been to try to ensure that 'this time, it's different' from Japan's experience.

But as Einstein wisely said, repeating the same action and expecting a different result is a good definition of lunacy. We do not believe that the underlying demographics, as described earlier in Chapter 1, can be changed by programmes of quantitative easing or short-term fiscal stimulus. Nor should natu-

Chart 25: Parallels and discontinuities between the performance of the Nikkei and S&P 500

ral events such as demographic changes be viewed as disasters. Such changes are inevitable, and there is no reason not to welcome one which would appear to involve a shift in focus from the wealthy Western few, to the poorer many of the emerging world.

THE IMPACT ON THE CHEMICAL INDUSTRY

Sadly, however, policy makers' misguided policies have, so far, made the problem worse rather than better. By stoking the housing bubble after 2000, and then having to spend trillions of dollars of taxpayers' money in bailing out the banks which they had allowed to become 'too big to fail', they have increased the debt burden on the G7 populations. And they have done this just at the moment when the potential earnings power of the overall G7 population is declining, as its baby boom generation reaches the 55+ age range.

Equally, by artificially stimulating consumer demand in the West during the SuperCycle of the 2000s, they have led to resources being squandered on building excess capacity which will never be needed. It is a repetition, but on a much larger and more global scale, of the dot-com boom of the late 1990s, when billions of miles of fibre optic cable was laid, but never actually 'lit', due to demand forecasts having been wrong by orders of magnitude.

Thus millions of houses and apartments have been built, and often partially furnished, that will never actually be used. This is true not only of parts of the US, such as Florida and Nevada, but also European countries such as Spain and Ireland. While in China, which was desperate to maintain employment once the export bubble burst, the National Academy of Social Sciences surveyed electricity usage during 2010 and estimated that 64.5m homes were, in fact, empty.

The housing mania also led companies and investors to misinterpret real demand levels. In the US, for example, auto sales had moved into a steady range of 15–17m a year from 1995, as the baby boomers had all reached peak consumption age. And after 2000, they were a prime beneficiary of the mortgage equity withdrawal phenomenon, as families often used their surplus cash to buy a new car. Thus the 15–17m level continued until 2007, worth around $50bn in chemical sales as the use of plastics, coatings etc increased.

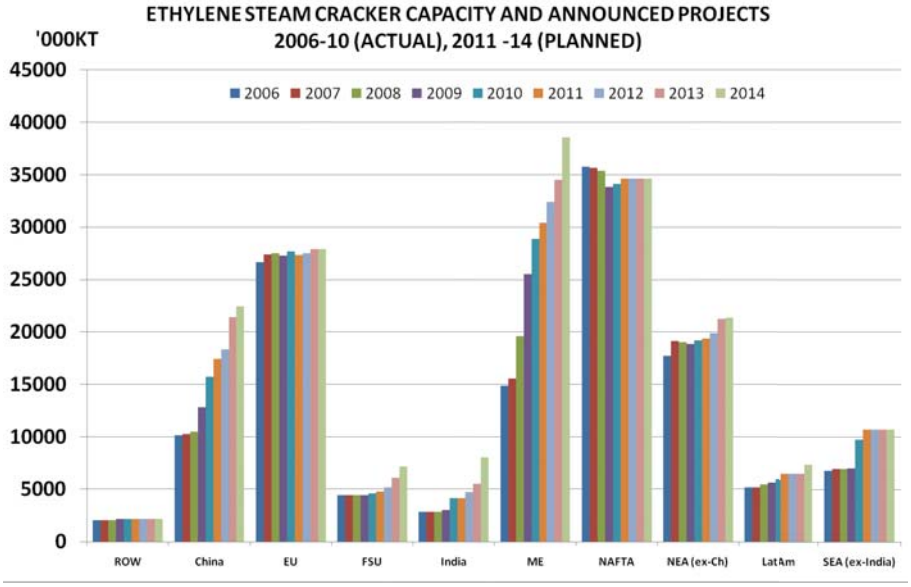


Chart 26: Ethylene capacity expansions 2006–14

Equally, central banks had grown complacent during the surge of baby boomer demand from 1985 to 2000. This had considerably simplified the role of interest rate policy in regulating the Western economy. If demand was growing too quickly, central banks could increase interest rates, secure in the knowledge that this would then create 'pent-up' demand to drive the economy again when rates were later reduced.

These factors combined in the chemical industry, for example, to create the belief that a seven-year cycle would typically develop. This would begin with a mild two-year downturn, followed by a dramatic and highly profitable recovery, as pent-up consumer demand was released when central banks eased interest rates again. This would last for another two years, and was then followed by three years of more stable growth, before central banks begin to worry about rising inflation and began raising interest rates again to begin a new cycle.

This pattern was quite different from the erratic management of the earlier post-war period in the West, when governments would often embark on what become known as a 'dash for growth', which caused boom to be followed by bust, just as day follows night.

Thus by the 2000s, policy makers claimed to have tamed the cycle. And by 2005, the consumer boom seemed not to be over-heating as before, but simply continuing to grow in strength, while interest rates stayed quiescent.

The lure of this supposedly NICE decade led emerging countries, in particular, to redouble their focus on export-development models, aimed at supplying more and more goods to feed the seemingly insatiable appetite of the Western consumer. The petrochemical industry was a classic example of this frenzy, as shown in Chart 26, which highlights how capacity for its leading product, ethylene, began to soar from 2006 onwards.

These plants typically take between five and seven years from initial proposal to completion, and

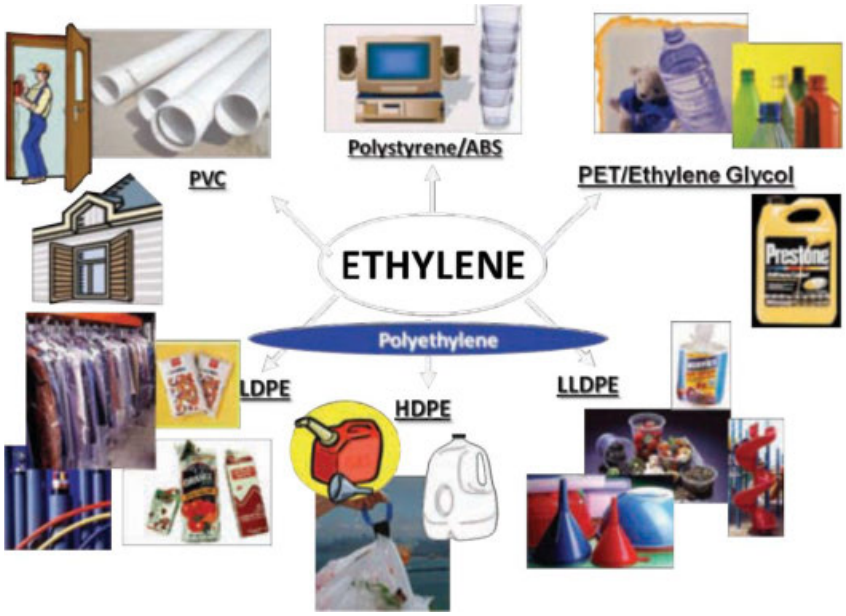


Chart 27: Ethylene demand is consumer driven

require major financing packages to be arranged because of their high cost (usually $3bn–5bn for a full complex with associated downstream processing plants and utilities such as power stations). Between 2006-9, for example, 14m tonnes of capacity were added, with a further 12m tonnes arriving in 2010. Overall, capacity expanded from 126m tonnes in 2006 to 152m tonnes in 2010, well ahead of demand, with a further 27m tonnes planned by 2014.

And as can be seen, the main activity was in the emerging economies, not the West. The Middle East was seeking to capitalise on its local supplies of cheap raw materials produced as a byproduct from its oil and gas production. Asian and Latin American countries were hoping to create more employment. Both had a strong social agenda, which went far beyond the idea of immediate profit.

But easy liquidity, and low interest rates, fostered by the central banks, meant that investors often preferred to overlook potential problems 'over the horizon', in order to avoid the low returns on offer from 'boring' Japanese or US government bonds.

Thus nobody asked serious questions about where all this product would be used. Ethylene is a mature product, being used as shown in Chart 27 to make packaging materials, as well as polymers such as polyethylene, PVC and polystyrene, and PET bottles. So demand for it grows, overall, at about the same pace as global GDP. While demand might rise strongly in one sector of the market, or region of the world, this is usually balanced by slower growth elsewhere.

Similar 'errors of optimism' have been made in many other areas. Iron and steel demand, for example, is forecast to grow to the moon as a result of China's supposedly insatiable demand for new infrastructure.

And so the same investors who committed the 'error of pessimism' during the early part of the 2000s and shied away from mining companies, have since bid up prices to stratospheric levels on the basis that a new 'SuperCycle' is now under way.

CHANGING PATTERNS OF INDUSTRIALISATION IN THE EMERGING ECONOMIES

Some years ago, our friend Rajen Udeshi of India's Reliance Industries, introduced us to the work of the development economist Sir Arthur Lewis, and his insight into how economies industrialise. Lewis (pictured) studied at the London School of Economics in 1939–40 and became fascinated with the question of why some countries had managed to industrialise more successfully than others.

His research during the 1940s–50s led him to the conclusion one essential ingredient was the supply of 'free labour', in the sense that when people moved from the land to the cities, agricultural output was maintained as productivity rose. He developed his theory from a study of the UK's Industrial Revolution when he became a professor at Manchester University, and it has been seen as an important insight since. It won him the Nobel Prize for Economics in 1979.

Chart 28, developed by Reliance and shown at our Asian Conference in 2005, shows Lewis's view of industrial development as it applies to Asia. Its horizontal axis shows the number of years from the start of 'economic progress', and its vertical axis shows how GDP/capita has risen in terms of purchasing power parity.

Thus in 2005, India was around 10 years from the start of its economic reforms, which had taken place in the 1990s, and its GDP/capita was less than $5k (even using the higher values associated with the Purchasing Power Parity metric). By contrast, at the other end of the scale, Japan and Hong Kong had been industrialising since the 1950s and had GDP/capita of over $30k.

Lewis's insight became known as the 'Lewis Curve', which is clearly evident in the path shown by the various countries as their development continued. He identified that:

- The first stage was a period of around 20 years, when 'free labour' was available to kick-start industrialisation. By this, he meant that there were plenty of surplus workers on the land, and so agricultural output was unaffected when some of them began to migrate to the cities, lured by the thought of higher and more regular wages.
- As can be seen, China in 2005 was approaching the end of this 'free ride' period. Lewis's theory predicted that it would soon have to move to more labour intensive manufacturing, from its early focus on primary production.
- And in time, say another 10 years, a growing shortage of labour would lead it to follow the path of South Korea and Taiwan, into becoming more capital-intensive.

More recently, of course, we have seen that Lewis was absolutely right. The past year has seen Foxconn and a number of other major Chinese industrial firms having to increase wages by up to 50% in order to attract labour. Foxconn employs over 1m Chinese, and is a leading manufacturer of Apple products, such as the iPod, iPad and the iPhone. Its problems gathered worldwide attention following a spate of suicides at its plants in early 2010. And since then it has also announced plans to move its

factories into rural areas over the next five years.

Clearly, they have indeed reached the point at which the 'free ride' has ended. Equally, rising standards of living in China mean that its demand for food is increasing. The transition is marked, as in the industrialised world, by a move to eat more meat – which, in turn, leads to more grains and other products being required to feed livestock. So the end result, just as Lewis would have predicted, is that the economy is now starting to move up the curve and will need to use its labour more intensively if it is to supply the population's needs.

This is a quite dramatic change, and one which we shall look at in greater detail in Chapter 6. India, of course, still has a few years to go before it reaches China's point in the curve. But its destiny, too, is very clear.

THE NEW NORMAL IS BUSY ARRIVING, EVEN IF WESTERN POLICY MAKERS CHOOSE TO IGNORE IT

Western policy makers have made enormous efforts both to stabilise the global economy following the onset of the financial Crisis and to try to return it to earlier growth paths. The first objective was clearly essential if the economy was to continue to function. But as has been widely discussed elsewhere, it would have been unnecessary had regulators done the job with which they were entrusted. The problem was that everyone knew what was happening, but only very few people worried about what might happen afterwards, and they were often dismissed as 'doomsters'.

There are plenty of examples to hand of what is happening now. Housing, for example, continues to be the eye of the storm. In the US, the US Census Bureau had reported that the total value of US housing had soared from $10 trillion in 2000 to nearly $20 trillion in 2005. Since then, however, as Chart 29 shows, average home prices according to the S&P Case-Shiller Index have fallen 30% from their 2006 peak. And in December 2010, the chairman of the Index committee, David Blitzer, forecast that despite massive government intervention over the past two years, "the double-dip is almost here, as six cities set new lows for the period since the 2006 peaks".

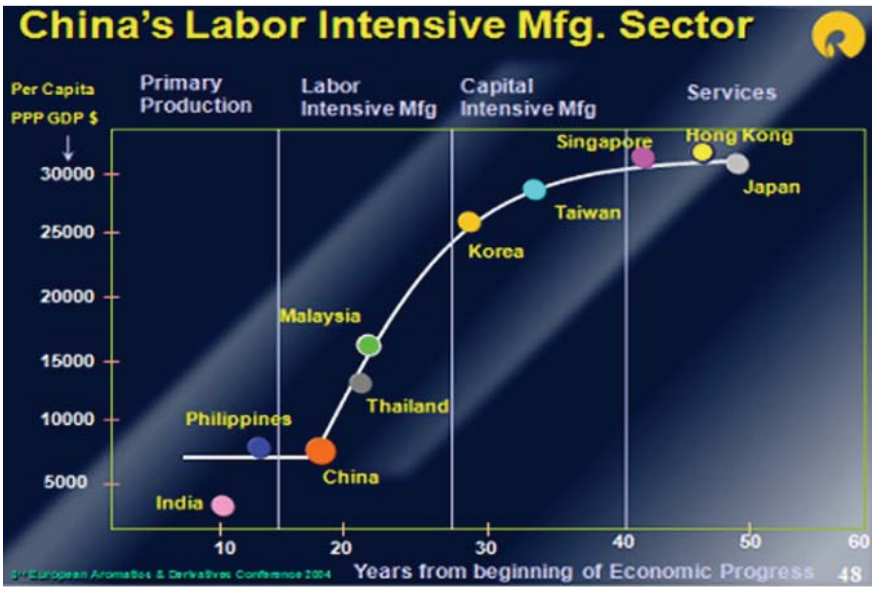


Chart 28: China's manufacturing is becoming more capital intensive

We can see the same picture in Chart 30, showing historical levels of US housing starts. It shows the jagged saw-tooth impact of earlier periods of 'boom and bust' before the 1990s, and then the smooth line to the 2006 peak of 2.2m. Since then, however, something quite dramatic has happened, with starts falling below any level seen between 1959 and 2007. They are now down below 600,000.

The value destroyed is not limited to the construction industry, where many firms are already bankrupt. The American Chemistry Council has calculated that each new home uses an average $16,000 of coatings, furnishings and other products, making it up to a $35bn chemical market in the boom years. Now it is worth just $10bn, a considerable drop in sales for all those formerly involved in selling to the industry.

Plus, of course, the demographic changes have much further to go as we enter the New Normal. The Census Bureau has identified an upswing in family consolidation as a result of the crisis. This has now jumped to 13.2% of the population, or 54m people, the highest level since records began in 1968. Young people can no longer afford to move out. Older people are also moving back with their parents, as they worry about losing a job. And their parents worry about the rising costs of health care. As a result, all those forecasts of ever-increasing need for more home construction probably need to be torn up.

Equally, it is unlikely that US consumers will be repeating their extraction of $564bn a year of mortgage equity from their homes anytime soon. Sadly, for many, fear of foreclosure is a more pressing concern, with 2.1m homes already in foreclosure and forecasts that this could double if employment continues to struggle, with unsold home inventory up 50% in 2010 versus 2009 levels.

Similarly, European consumers have also entered the New Normal. Chart 31 shows auto sales by year from 2005. 2009 (blue dotted line) saw major stimulus programmes put in place by European governments to protect car sales. This enabled the EU to maintain sales within their traditional 14–16m range, surpassing the US for the first time and enabling it to become the largest regional car market. Its sales of 14.4m compared with 13.6m in China and 10.4m in the US.

But 2010 (brown line) was a different story, with sales weakening throughout the year, despite continuing stimulus measures in some countries. They totalled just 13m, well below previous levels. 2011 (red line) seems to be following this pattern. And with many EU governments now moving from stimulus to austerity programmes, it seems unlikely that consumers will be opening their wallets to buy record numbers of new cars again for a while.

UNDERSTANDING THE OPPORTUNITIES OF THE NEW NORMAL

There are some things in life about which one can do very little. As Margaret Mitchell wrote in Gone with the Wind in 1936: 'Death, taxes and childbirth – there's never a convenient time for any of them''. Equally, trying to change a country's demographic profile, as has been tried in countries such as France and Spain, by encouraging mothers to have more children, has proved less than successful. And even if it were to be successful, there are inevitable time-lags before the new babies will enter the years of prime consumption.

The issue, put simply, is that we are now going through another period of major transition, similar to that seen in 1970s–80s, when the boomers moved into the 25–54 age group. It, too, was a time of tu-

Chart 29: US house prices have already fallen 30%, with more to come

Chart 30: US housing starts and building permits, 1959 onwards

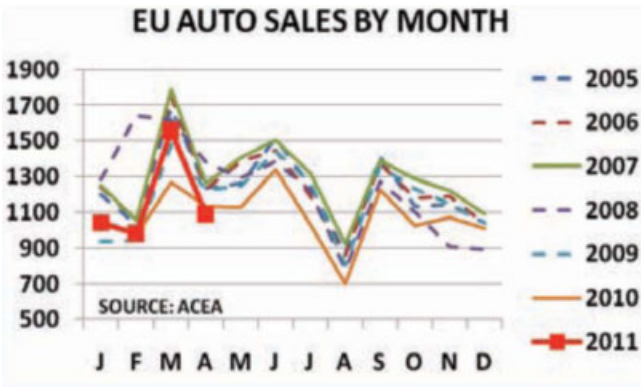


Chart 31: New car sales in the EU, 2005–11

mult, confusion and financial crisis. But like all things, it passed. And the world then began a process of successful adjustment which led to the largest increase ever in the wealth of the planet, and the highest-ever standards of living for the largest-ever number of people.

Now, as must happen, the Western baby boomers are moving into the 55+ age bracket. And the signs are that many of them will remain in it for a long time. The concept of working until around 65 years, and then dying after a brief retirement, seems to belong to history and the Old Normal. Instead, many of us in the West can look forward to a life where up to a third of our lives may be spent in retirement. And this retirement will be unlike that of our parents' and grandparents' generation, as we can expect reasonable health and physical well-being, thanks to the advances being made in understanding diet and in medical science.

Equally, although the export-development economic model of the emerging economies is now on the way out, as Western consumption slows, so a greater domestic focus is emerging. This has the potential to bring greater affluence and living standards to the majority of the world's population, and so cannot be seen as some sort of 'second-best'. But domestic demand cannot suddenly jump sufficiently to replace slowing export growth, and so there will inevitably be a 'demand-growth gap' in emerging economies, as this transition takes place, as we discuss in Chapters 4 and 6.

This chapter has aimed to explain the rationale behind the concept of the New Normal and its inevitability because of demographic changes. We now take a wider look at some of the implications of the journey on which the world is now embarked.

Chapter 3

Crude oil and the speculators

It is important to understand history before you can attempt, however feebly, to predict the future.

And so in this chapter on the ebb and flow of commodity markets, we will recount why the crude-oil markets came to be in the hands of the speculators thanks to legislative changes that date back to 2000. There are clear links between the amount of open positions held by non-commercial players, such as hedge funds and (increasingly) pension funds, and the peaks in oil prices over the past few years.

More recent history tells us that the recovery in pricing since 2009 is the result of a one-way bet created by the Federal Reserve. Hugely increased liquidity and very low interest rates have made it a no-brainer for financial players to trade paper contracts, and for the physical traders to put crude and refinery products into storage. This will be another major theme of this chapter.

Real demand has not mattered. Instead, what has counted has been the record low cost of carry (interest rates plus the cost of storage) and the markets being in persistent contango (contango is when future prices of crude are higher than prompt prices. Backwardation is the opposite – when prompt prices are higher than in the future).

Stories about real demand growth matter greatly, though, in order to convince the media and therefore the wider world that there is justification for future prices being higher than prompt pricing.

Equally important when supply disruptions dominate the agenda is convincing this wider world that the disruptions are significant enough to again support the market being in contango.

Some market participants know what's really going on, but perhaps not the pension funds which have moved heavily into commodities, and crude in particular, out of bonds and equities. Their returns from this strategy, if it is worth calling it a strategy, have been very poor.

Pension funds and other investors have bought heavily into commodity index funds that trade across a broad range of energy, other commodities and equities.

As we shall see from history again, the increasing importance of correlation trading – the bread and butter of these indexes – has led to illogical links between, for example, crude pricing and the S&P 500.

Macro trends are driving all kinds of commodity and equity markets that move in lock-step together

thanks to correlation trading, which is facilitated by super-fast computers. These computers do not look at the fundamentals of supply and demand – a dying art, perhaps – but instead focus on technical trading based on changes in sentiment.

To a large extent, therefore, the price of oil is what the financial community says it is, with the argument being spun changing on whether those with the most influence within the community have gone long or short.

On the whole, however, since 2003 the financial world has been long on crude – a major reason why oil prices have been mainly on a bull-run since that year.

Warren Buffett, the legendary investor, said: "It's only when the tide goes out that you learn who has been swimming naked."

This occurred in the fourth quarter of 2008. Many of the supposedly smart financial players who had driven crude up to an unsustainable level were left holding long positions when the market collapsed.

This danger will still be there as long as the financial sector keeps control over the price of oil.

In 2008, the catalyst of the collapse was the bankruptcy of Lehman Brothers, with the underlying cause the sub-prime crisis.

Next time round it will, of course, be something else – perhaps geopolitics, which has recently driven the price of oil to another unsustainable level.

Crude was already too expensive for motorists, shoppers etc before Lehman Brothers went under.

This reaffirms that the physical world of oil – what people can ultimately afford to pay for their gasoline or their food – has to matter in the end.

For companies down every product chain from raw materials to finished goods, guessing both the strength of final end-user demand and the price of oil has become much harder. This is largely the result of dysfunctional oil markets that led to the massive inventory losses of late 2008 – when crude suddenly collapsed

Separate sections of this chapter will also look at China.

Justification for the recovery in oil post-2008 was that while OECD demand was falling, growth prospects in emerging markets more than compensated for this decline.

China, due to the scale of its economy and its industrial production-focused growth, was leading the emerging-market charge.

But did China's demand growth justify the rise in oil prices from the second half of 2009 and throughout 2010? We believe not.

We will deal with how structural reforms of China's economy threaten its pace of overall growth – and therefore its pace of oil-consumption growth – in later chapters. This obviously presents a threat to any story that the financial community continues to sell about China driving the oil price.

In this chapter we will talk about another key element of the China story – the extremely speculative nature of its economy.

This makes understanding what is really driving demand exceptionally difficult, whether we are talking about crude oil or the example we cite here – polyethylene (PE). This is a type of plastic used to make food wrapping, food containers and numerous other applications.

China's futures market for PE is driving the physical price for the commodity.

OIL-MARKET LIBERALISATION

The roots of the collapse of crude-oil markets, along with the wider global economy, in late 2008 can be traced back to 15 December 2000. This was when US President Bill Clinton signed the Commodity Futures Modernisation Act (CFMA) into law.

The Act designated certain over-the-counter contracts to be outside the jurisdiction of the Commodity Futures Trading Commission (CFTC), meaning that financial players were able to bypass the speculative limits set by exchanges. This was thanks to successful lobbying by the now-bankrupt Enron.

The CFMA also excludes swap transactions, allowing institutional investors to take larger positions on actual exchanges than would have been the case if they still had to stick to limits on speculative positions.

The groundbreaking legislation also made it more difficult in general for the CFTC to regulate the NYMEX, according to a research paper published by the James A Baker Institute for Public Policy at Rice University. The paper was written by Kenneth B Medlock and Amy Myers Jaffe.

The authors suggest that because the International Commodity Exchange in London is outside the jurisdiction of the CFTC, this has further added to financial-sector influence. This is referred to as the "London Loophole".

Non-commercial traders were able to increase their market presence 15-fold from 1995 to August 2009, the authors add.

As Chart 32 shows, open interest (red line) held by these non-commercials in early 2005 was 20% of activity on all the futures markets. Just before the great 2008 crash it had risen to more than 55%.

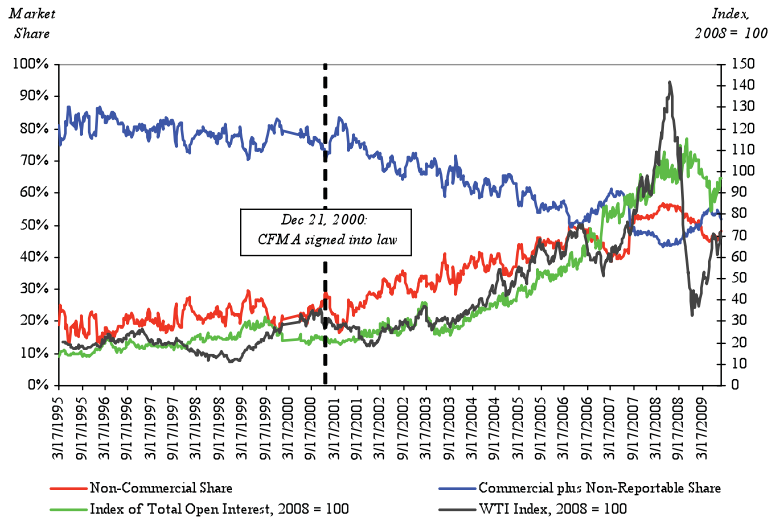
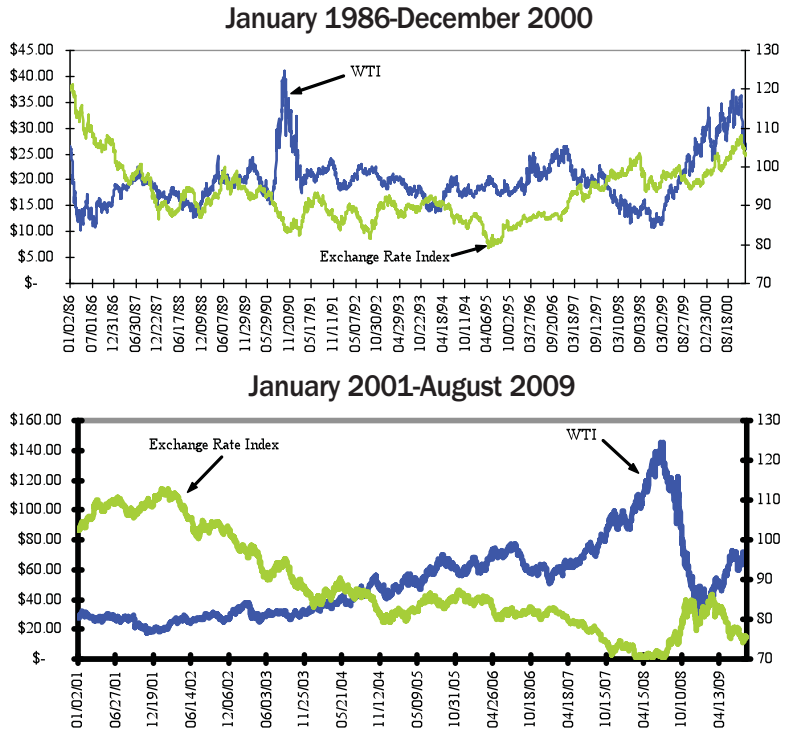


Chart 32: The growth of speculative trading in oil futures markets since 2000

Source: James A Baker Institute

"And more importantly, open interest by the non-commercial players moved from a lagging to a leading indicator of price [black line] by 2006," continues the same study.

Correlation trading is another theme the study covers and one that we will return to later on.



Charts 33 and 34: Changing correlations between the oil price and the US$

Source: James A Baker Institute

As Charts 33 and 34 show, the inverse correlation between the movements in the value of the US dollar (green line) and the price of oil (blue) was a negligible 0.08 in 1986-2000. But in 2001-2009 it had risen to 0.82.

This radical turnaround in the relationship between crude oil pricing and the US dollar is the result of the rise in oil index-linked funds.

The super-fast computers we referred to at the beginning of this chapter, which shift hundreds of millions of dollars in fractions of a second based on "technical analysis", operate these funds.

Not surprisingly, the amount of money invested in such products has risen in line with the increasing link between the greenback and crude. For example, a total of $300bn was invested in July 2008 – just before the great crash – four times more than in 2006, according to the International Energy Agency (IEA).

The economic damage caused by dysfunctional crude markets is a constant theme of this chapter and one that has been very keenly felt by the US as a result of the correlation trade referred to above.

The country's oil import bill accounted for 47% of the overall trade deficit in 2008 compared with just 19% in 2002.

As the dollar declines it creates the potential for a vicious and highly damaging downward spiral.

The weaker greenback means that producers of crude outside the US push for higher oil prices, as their returns have been reduced because oil is priced in dollars per barrel.

Rising crude prices, in parallel with a weak US currency, also make it easier for other importing countries to stomach more expensive oil. The affordability of oil improves as their local currencies strengthen against the dollar.

Producers pushing for higher pricing and unabated demand in some consuming countries tempt the funds to switch from dollars into oil and so on and so on….

A further problem identified by the James A Baker Institute is petro-dollar recycling.

Oil producers cannot fully absorb their earnings in what are often small domestic economies, particularly in the Middle East. This excess money has instead found its way into the oil-index funds, increasing their influence on the overall market.

THE ONE-WAY BET

Global surplus crude production capacity fell from 5.54m barrels a day in 2002 to 1m barrels a day in 2005. This resulted in the oil price doubling to around $50 a barrel, say those who believe that supply and demand fundamentals drive the market.

Surplus capacity, however, then increased in 2006-07 as prices rose towards historic highs, damaging their case.

Another claim was made during this period to justify the surging cost of crude. There was a lack of refinery capacity able to handle heavy grades of oil – those containing high amounts of sulphur.

This added to the premium for lighter crudes that the refineries could handle. This, in effect, reduced total supply because heavier grades could not be processed by many of the refineries.

Oil prices then tumbled in 2009 as surplus crude capacity increased from 1.49m barrels a day to 4.33m barrels a day. All well and good you might argue – a sign that the oil market was once again functioning correctly.

But 2010 saw surplus capacity increasing even further to more than 5m barrels a day and yet prices rose – because something else was happening.

That year also saw the start-up of a record amount of "full-conversion" refinery capacity able to handle heavy grades of crude, adding to the length in overall market.

There now follows an explanation about why the market behaved in this way.

"The easiest way to check the underlying health of the oil market since early 2009 has been to go to the east coast of Singapore and enjoy a seafood meal," says a senior executive with a global petroleum and chemicals logistics provider.

He is referring to the number of very-large crude carriers (VLCCs) moored outside the Singapore harbour. The higher the number of vessels in-view from the open-air seafood restaurants, the wider the contango.

When onshore storage for crude has become full, the VLCCs have been the only remaining option.

Putting crude and refinery products, such as gasoline and diesel, into storage became a no-brainer for physical traders from late 2008/early 2009 onwards. (Note that the financial, or non-commercial, players trade only in paper contracts as they never want to take physical delivery.)

This was the result of the "one-way bet" – confidence that there would be no change in US Federal Reserve policy for a length of time relevant to the markets.

Since late 2008 the "Fed" has been printing money in an attempt to achieve a lasting recovery in the US economy. The purpose had been to avoid deflation, and even to inflate high levels of debt away, while the extra money in circulation stimulated overall economic activity.

In August 2010 the Fed clearly signalled it was planning QE2 – a second round of quantitative easing.

A wide range of commodity prices, including crude, rallied as a result because of even greater confidence in the Fed maintaining both high levels of liquidity and record-low interest rates.

This was followed by the formal launch of QE2.

Record low interest rates had already made it very cheap for participants in the oil market to borrow money to either put physical crude and crude products in storage, or trade in paper contracts.

Ironically, the fall in real demand for oil, gasoline etc had reduced the cost of putting all of these commodities into storage.

Ship owners took delivery of brand-new VLCCs just as the 2008 crisis occurred.

The owners were unable to occupy these vessels by supplying real demand as demand had collapsed. The only option was to therefore rent out storage space to the speculators at very low rates.

The result was historically low total costs of carry – interest rates plus storage charges.

MORE OF WHAT MAKES YOU SICK

Like the morning-after cure for an alcoholic – a glass of whiskey containing a couple of raw eggs – the Fed had been piling-on more debt in 2008-early 2011 in an attempt to solve a debt crisis.

It was a different kind of debt, this time government rather than private. But everyone was aware that at some point the US would have to cut deep into expenditure to deal with the budget deficit.

But as long as such corrective action remained out of sight, the one-way bet on commodities continued.

As Chart 35 shows, US unemployment was at 9.4% in early 2011 and the authors of this book are prepared to lay a large bet that it remains at a very high level. The wider U-6 measure, including discouraged workers, was at 17%.

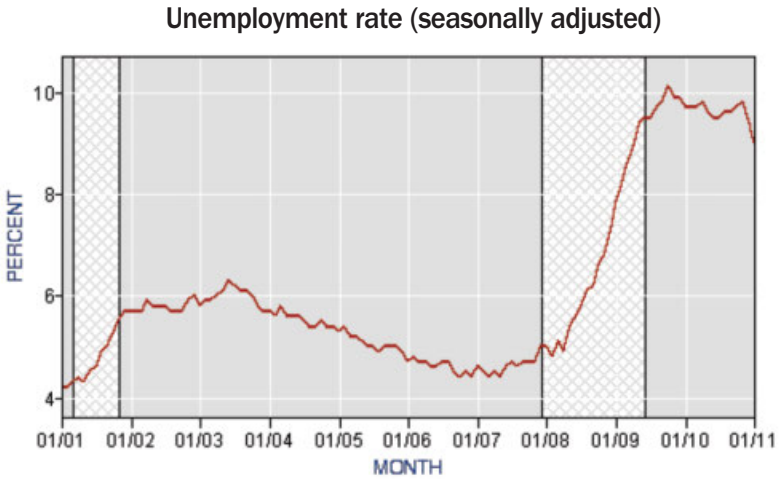


Chart 35: US unemployment rate 2001 – 11

Source: US Bureau of Labor Statistics

Quantitative easing had addressed none of the structural problems with the US economy that we highlight elsewhere in this book.

Inflation rather than deflation, largely because of rising oil prices and commodities in general, had become an issue in the US and globally.

One in seven Americans – 43m of the population – was forced to fall back on the government's Food Stamps programme in early 2011.

Mortgage interest rates had also started to creep up as a result of inflation. This was putting pressure on one of the sectors that the quantitative easing was supposed to help – the US housing markets.

As Chart 36 shows, corporate profits, however, rebounded enormously in 2010. This was to a considerable degree the result of strong emerging-market sales, cost cutting and inventory rebuilding.

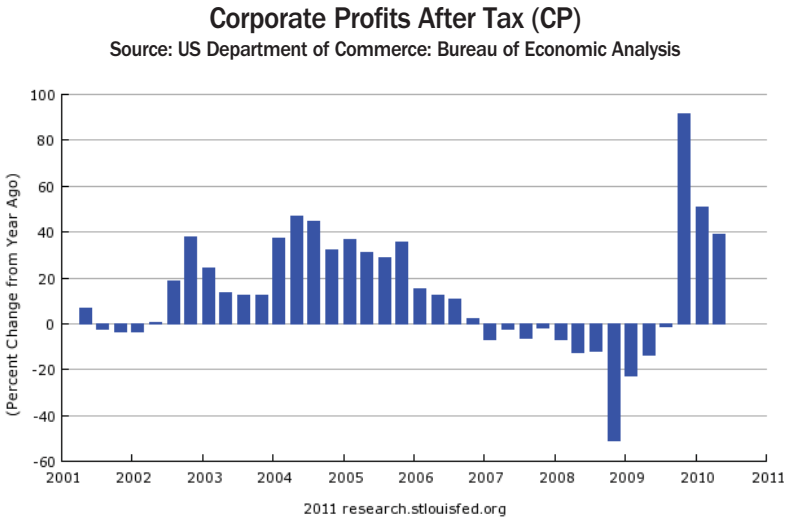


Chart 36: US corporate profits 2001 - 11

Source of Chart: Federal Reserve Bank of St Louis

Huge raw-material inventory losses were incurred by US companies in late 2008 due to the collapse of crude. This led to stocks being depleted down all production chains from basic raw materials to consumer goods.

The re-stocking process that followed was inevitable once it became clear that the world's financial system was not going to collapse. Life returned to what seemed like normality, but this was the New Normal.

WHAT USE IS REAL KNOWLEDGE?

Weighing the relative importance for each company of emerging market versus domestic sales, cost cutting and inventory replenishments are important tasks for "stock pickers" in equity markets. Parsing the data enables them to detect whether a company's shares have been over- or under-valued.

The broader growth of index-linked funds, including the oil-linked funds we referred to earlier, has diminished the role of these stock pickers. As in the oil markets, informed analysis of the fundamentals has become less important.

This broader growth has involved exchange-trade funds that move between all commodities, bonds, currencies and equities.

Chart 37 highlights that equities in the S&P 500 Index increasingly move in one particular direction on changes in the macro-economic outlook. The close links between movements in the crude price and the S&P 500 have also been the result of the growth in these exchange-traded funds.

As we have already described, these funds are run by super-fast computers that move money around based on short-term changes in overall sentiment.

Chart 37 shows the close link between the S&P 500 (blue line) and the price of two key global benchmarks for crude – West Texas Intermediate (green) and Brent (red). Both are traded on the major NYMEX futures exchange, the most liquid of all the crude futures markets.

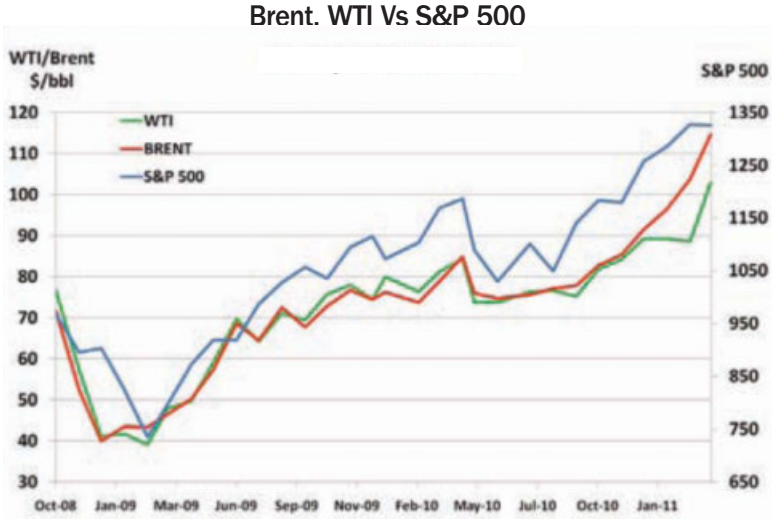


Chart 37: Correlation between the US S&P 500 and crude oil

Source of Chart: International eChem

This close correlation between the S&P 500 and WTI/Brent is another example of how commodity and equity markets have increasingly moved up and down together, in lock step, as money has swept in and out of exchange-traded funds.

When investors are "risk on", money tends to pour into equities and other investments seen as risky, such as emerging markets and commodities.

"Risk off" is when cash starts pouring out of such asset classes and into the safe havens of the US dollar (hence the correlation trade we discussed earlier on between the greenback and oil), US Treasuries and the Japanese Yen.

One can start developing conspiracy theories here to the point of paranoia about the ability of the financial world to influence sentiment, as well as react to changes in mood that have already taken place.

From the second half of 2009 and throughout 2010, anybody picking up the financial press would have seen a constant shift in the tone of the newspapers, quite often from one day to the next.

On Monday you could easily be convinced that we were heading for a double-dip recession. But by Tuesday you could have ended up in a state of delirious euphoria over a new era of sustained strong global growth. This might have merely reflected that we were living in very uncertain times. Or was it also because the banks and hedge funds etc were setting the news agenda in order to make money from short- term, micro movements in sentiment?

Arguments have been constructed to justify illogical trends in markets, which has been the case with

the correlation between the S&P 500 and oil markets.

Stronger oil prices indicated China was booming and so the S&P 500 was right to rally because US companies made a lot of their money from China, was one such argument.

The difficulty with this claim is that many of the companies that make up the S&P 500 still generate a large percentage of their sales from the US. Higher oil prices also mean higher input costs for everyone.

OIL MARKETS AND DEMAND DESTRUCTION

By as early as 2007 crude had become unaffordable for US consumers, resulting in, for example, a decline in the number of miles being driven, as shown in Chart 38.

Emerging-market consumers felt the pain a great deal less, but their governments were suffering because of heavy fuel-subsidy programmes in countries such as China and India and throughout the Mid-

Traffic volume
Moving 12-month total
January 2005–December 2010

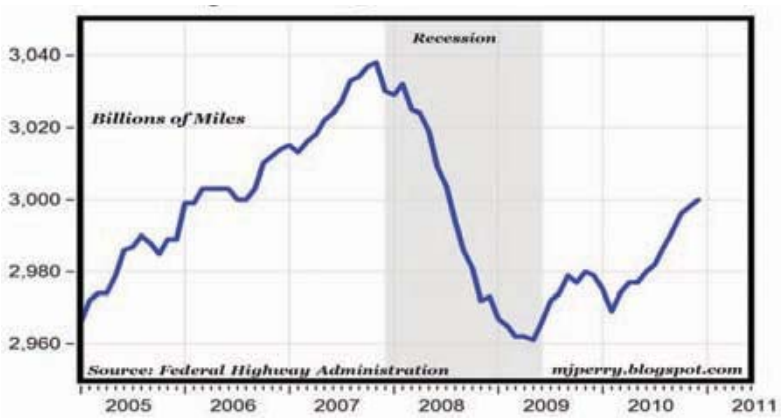


Chart 38: US vehicle miles driven, 2005-10

Source of Chart: Professor Mark J Perry's Blog for Economics and Finance

dle East. Emerging and developing countries spent a total of $250bn on subsidising fuel costs in 2010, according to the International Monetary Fund.

Returning to the US, most oil industry consultants believe that gasoline demand peaked in 2007, and then began a long-term decline.

One reason was that the Federal Government introduced an aggressive programme to increase the amount of ethanol that was blended into gasoline, thereby reducing demand for hydrocarbon-based fuels. Another reason is the near-40% increase in fuel-efficiency levels mandated to come into force by 2016 for new vehicles, which will take US autos close to efficiency levels in the rest of the developed world.

A further reason is the demographic-driven decline in overall economic growth – the beginning of the end of the baby boomer economic bonanza – that we described in Chapter 1.

Gasoline became even more unaffordable for US motorists as we entered 2008 due to the collapse in the US housing market. We were already into the sub-prime mortgage crisis, but oil prices carried on rising.

Robert McNally from the Rapidan Group, a consultancy, believes that American consumer confidence started falling once gasoline went above $3 a gallon.

Bullish oil-price forecasts made by banks in early 2008 – one in particular claiming that crude would reach $200 a barrel by the end of the year when it in fact fell to $35 a barrel – may well have been motivated by the long positions some of these banks had taken.

We believe that more demand destruction will continue to occur (and is likely to have occurred in 2010-2011 during the post-financial crisis recovery in the oil price) as long as the crude markets remain dysfunctional. Chart 39 illustrates the cost to the Western economies as a result of higher oil prices.

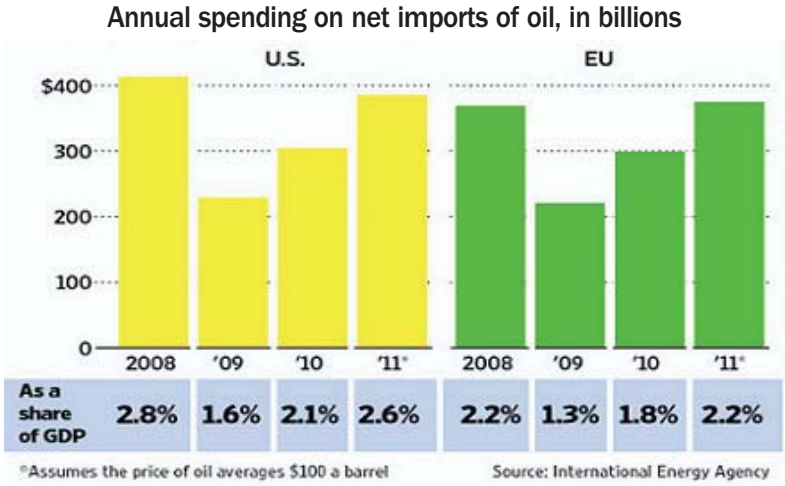


Chart 39: US and EU import costs for crude oil, 2008-11

UNDERSTANDING CHINA

The heading above smacks of extreme arrogance if you take it too literally. Do not assume that what follows will help you get a firm grip over the country's real oil demand – and therefore the direction of its overall economy.

We do not understand China. It is too vast a country with too many contradictions and complications to be adequately understood by anybody, resulting in constant surprises for oil and oil-product markets.

A case in point occurred in the second half of 2010 when the central government, scrambling to hit emissions reduction targets under its 11th Five-Year Plan, ordered the closure of many coal-fired power stations in the eastern and southern provinces.

This led to an unexpected surge in demand for gasoil needed to power small-scale generators – ironically, making local air quality worse even if overall emissions were reduced.

The surge in demand for gasoil resulted in a 17.7% year-on-year rise in apparent oil demand in December 2010, according to the IEA, as shown in Chart 40.

Rising gasoil demand accounted for a third of total fuels demand in China a month earlier.

Total demand surpassed the 10m barrels a day level for the first time to reach 10.2m barrels a day, the agency added. Gasoil demand was clearly, therefore, at risk of a sharp correction in early 2011 as China achieved its targets and turned its coal-fired power stations on again.

China invested heavily in new refinery capacity in 2009-2010 to supply booming domestic gasoline and diesel demand just as fuel affordability became an issue for many motorists due to subsidies being unwound.

This led to China becoming a substantial exporter of gasoline, indicating that a significant amount of crude was being imported to be re-exported as gasoline.

But such nuances were not reflected in markets that, as we have said, remained in constant contango in the second half of 2009 and throughout 2010.

All boats were sailing in the same direction as the oversimplified story kept being repeated – that China's oil demand was moving in a constant and uninterrupted upward direction. By itself, China was seen as more than compensating for negative or weak growth in the OECD countries.

The other problem in "understanding China" is the reliability of data which causes problems even for the experts at the IEA. This meant that oil demand could have been underestimated with the gasoil factor a big reason, according to the IEA's February 2011 Oil Market Report.

Quoting in full from the IEA report:

"China's oil demand outlook has become increasingly crucial for global oil balances. Predicting Chinese trends, however, is far from being an exact science, mostly because of huge uncertainties with respect to official data.

"With GDP growth in 4Q10 put at 9.8% year on year (from 9.6% in 3Q10), bringing full-year

expansion to 10.3% (from 9.2% in 2009), the implied oil demand income elasticity stood at roughly 1.2 – about 30–50% higher than most analysts had expected (typically 0.6 to 0.8 for an energy-intensive economy such as China's).

"This vast discrepancy may have been due to the gasoil surge, waste or a combination of both – or the result of much stronger-than-reported economic activity. Indeed, official GDP figures appear too low when compared to other indicators, such as industrial production, which rose by over 15% on average. The question on the reliability of GDP data is recurrent; if actual economic growth in 2010 was higher than suggested by official statistics, the income elasticity would indeed be closer or within the range of most observers' expectations.

China: gasoil demand

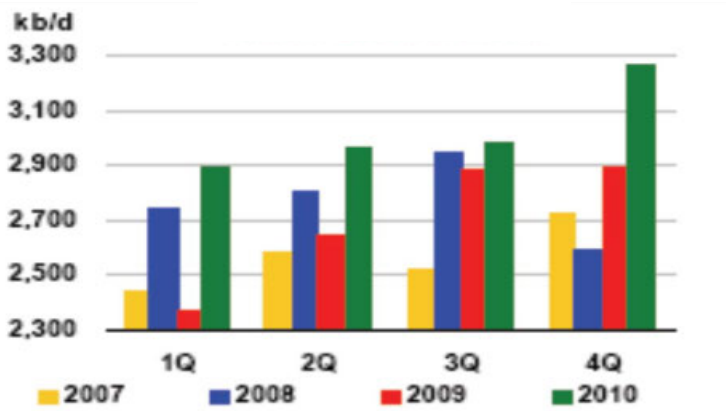


Chart 40: China gasoil demand 2007-10

That, of course, presupposes that oil data are themselves completely accurate, a challenging assertion for many countries." One could imagine a situation in the future where GDP growth is over-reported rather than under-reported for social stability reasons, creating the potential for more complications in the China oil story.

The possibility of a substantial slowdown in China is something we examine in later chapters.

THE CHINA PRICE

To date this chapter has focused entirely on Western oil and other commodity markets and what we believe has been their harmful influence on the global economy.

Here, in this final section of Chapter 3, we are going to cite one example of a commodity market within China and how it has influenced the global price of a type of plastic – polyethylene. Polyethylene is used to make all manner of consumer goods from gasoline tanks in cars to kitchen utensils and food-wrapping.

China's rapidly growing economy has meant that the "China price" – what it is prepared to pay for oil, iron ore, copper, aluminium and many other commodities – heavily influences global prices. The same applies to polyethylene as the country remains in substantial deficit for this type of plastic, leading to fierce competition for import volumes.

In 2007 a futures contract was launched by the Dalian Commodity Exchange in one particular grade of polyethylene – linear low-density polyethylene (LLDPE). At first, liquidity on the exchange was low, but then China's enormous economic stimulus package was launched in late 2008. The package included a sharp rise in bank lending.

Chart 41 shows how the surge in bank lending, which began in later 2008/early 2009, corresponded with a sharp increase in trading on the exchange.

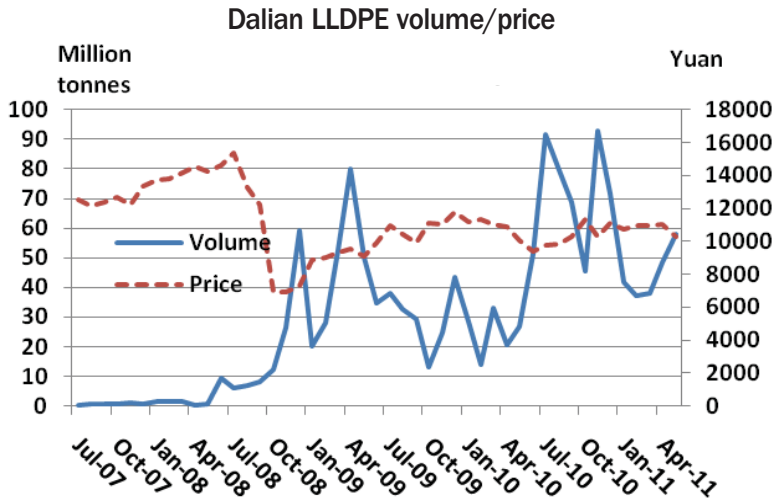


Chart 41: LLDPE Volumes and Pricing, Dalian Futures Exchange, 2009-11

Source of Chart: International eChem

Note: You will notice prices quoted are yuan per tonne as the futures contract is in domestic LLDPE. When the domestic price is sufficiently higher than import prices to cover a profit margin once import duties, local taxes, distribution costs etc are taken into account, imports take place (and, of course vice versa). As a result, local prices are keenly observed.

Dalian Futures and Spot Prices

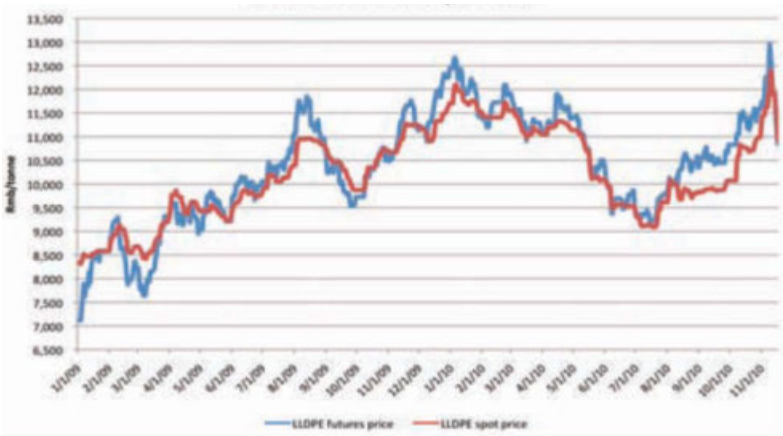


Chart 42: LLDPE Pricing, Physical market and Dalian Futures Exchange, 2009-11

Source of Chart: ICIS Chemease

The big concern among polyethylene producers is that this market seems to have added to price volatility. They also feel that they have lost influence on pricing to the physical traders and the financial players who dominate trading on the exchange.

What seems very evident, as shown on Chart 42, is that the greater volume associated with the futures price on Dalian is now setting the physical domestic price.

We make the distinction between a futures price and a "physical" price here because on the Dalian exchange, the vast amount of business transacted never involves actual delivery of polyethylene when a contract matures. Instead only paper contracts are exchanged.

Physical prices involve the actual sale of plastics, in the form of tiny pellets, by producers, traders and distributors to manufacturers who melt the pellets in order to shape them into finished goods.

As is the case with the Western oil markets, where again the bulk of business is in paper contracts, overseas producers are concerned about the role of the speculators.

The Dalian is a microcosm of what we described earlier when talking about the NYMEX etc. Analysis of the fundamentals of supply and demand for polyethylene has come to matter less than movements in overall sentiment.

And ironically, to bring us neatly back to where we began, there has been a close relationship between the movement in Dalian prices and crude oil until very recently, as shown in Chart 43!

Crude prices ultimately set the floor for the cost of making polyethylene as its basic raw material is oil.

However, as oil prices fluctuate by the minute, such short-term movements should not be setting the price of polyethylene. What should matter is the cost of oil over a period sufficiently long to influence the actual production costs of making polyethylene.

There is a further reason to be concerned about the role of the Dalian and perhaps numerous other commodity futures markets in China.

The physical traders in polyethylene – those who do actually take physical delivery of the plastic pellets and sell them on – are, as we have said, very active on the Dalian.

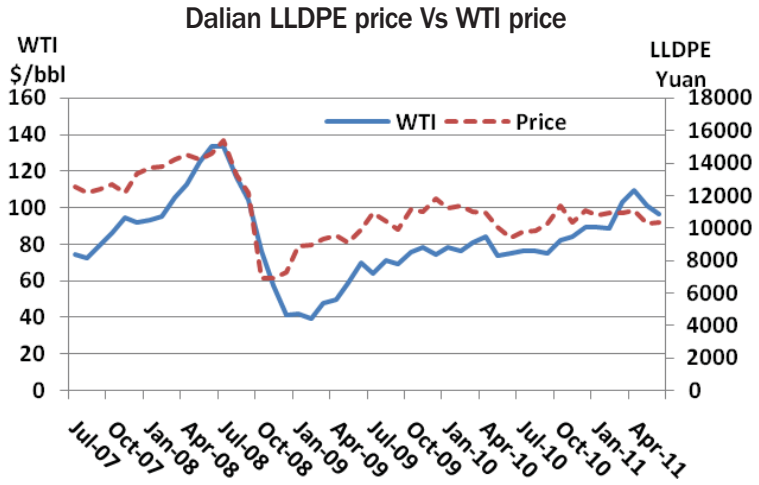


Chart 43: LLDPE Pricing and WTI Crude Oil Price 2007-11

Source of Chart: International eChem

Some of the traders say they made a great deal of money out of the Dalian in 2009-2010 by correctly guessing the direction of the futures contract.

This made the traders more willing to offload real cargoes at a loss, below what they actually paid, confusing producers. The producers were unaware of the successful positions the traders had taken on the Dalian because, as with other exchanges, business is anonymous to all but the Dalian's regulators.

Market muddle from these below-cost sales was not the only problem. Cheap polyethylene acted as a further export subsidy to the manufacturers (polyethylene is often imported to be made into finished goods and then re-exported), thereby hurting overseas competitors.

We will look at all the formal, government-directed export subsidies and their distorting effect on the global economy in the next chapter.

The right type of regulation is needed to govern the growth of these exchanges and how they operate.

Better regulations might also help decouple the global oil price from the financial sector.

In China, though, the effective enforcement of legislation is as much a problem as unreliable data.

Volumes traded on China's futures markets will ebb and flow based on the availability and cost of lending, as is the case with markets overseas.

Once markets become established during periods of easy lending, however, they may retain their influence.

CONCLUSION

It is always best not to believe in everything you read, especially if there is a financial motive behind what has been written or said (this book, at least in its online form, is free!).

One of the main objectives of this chapter was not, therefore, to prove we are right – but rather to raise some scepticism.

The other point was to further explain the roots of the global financial crisis. Now we have finished describing where we have been, we will move on to where we believe we are heading.

Chapter 4

Where we are headed

A parent's advice to their child in late 1990s Britain: "My dear child, go to university if you feel like it, but don't bother taking a degree in a subject that will help you to do something productive for the world. Instead, buy an apartment in London with borrowed money, perhaps several apartments, and your prosperity will be assured."

A parent's advice to their child in late 1990s China: "My dear child, get a degree in engineering. Then you can work for a consumer products company selling to Westerners living on the debt provided by asset-price bubbles."

All of us would love to be able to see into the future, especially when we worry about the financial security of our children. The purpose of this chapter is to argue that there is a lot of clarity about the next 10 years and beyond, although we might prefer to ignore it.

The key issue is that the next decade will be radically different for all of us, whether we live in the developed or developing world. And by 2021, the world will have realised that the SuperCycle seen between 1982 and 2007 was an exceptional period of time. It will not be repeated in our lifetimes.

The reason is that the economic boom seen during the SuperCycle was driven by the maturing of the Western baby boomers (those born between 1946 and 1970), as we discussed in Chapter 1. They are the largest, and wealthiest, generation that the world has even seen. And they created a surge in demand for housing, autos and electronics as they entered the 25–54 age range, when people typically settle down and have children.

But by 2021:

- Most boomers will have left this age range, and there will instead be 324 million Westerners over the age of 55 years
- They will account for 33% of the Western population (North America, Western Europe, Japan, Australia, New Zealand)
- By comparison, there were only 148 million over-55s in 1970, when the boomers began to move into the 25–54 age group

The over-55s typically spend less and save more. And the boomers will be spending very much less as they retire, because of greatly reduced incomes. They will have learnt the hard way that a pension pot of even $250,000 only provides a very modest income.

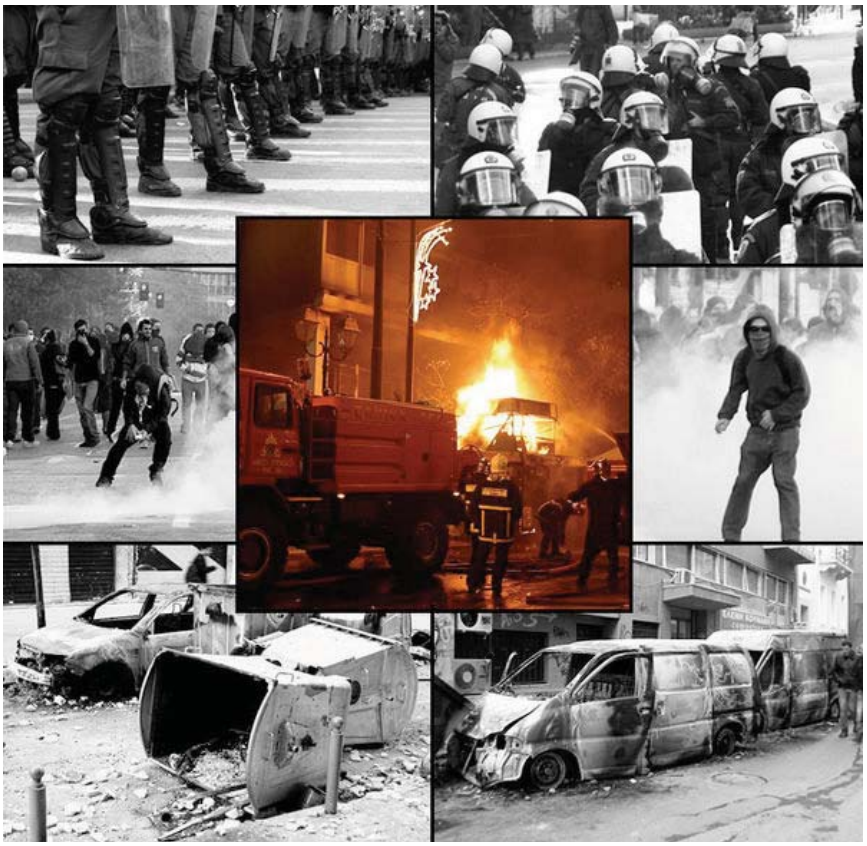
Equally, they will have to save as much as they can afford, in order to provide for their extra decade of life expectancy compared with previous generations. Their savings will have pushed down interest rates in the more stable economies to Japanese levels of around 1–2%.

As a result, this is what the world may look like in 2021:

1. Western countries will have increased the retirement age beyond 65 in order to reduce unsustainable pension liabilities. Deep cuts will have been made to social welfare programmes as governments struggle to reduce their debts
2. Taxation will have been increased across the Western world in an effort to tackle the public debt issue. It will no longer be relatively easy to move large sums of money off shore to countries with lower tax regimes, as regulations will have been tightened
3. Western and Asian property markets will be flat, having suffered major price declines. Housing will no longer be seen as an investment that will act as a pension fund. Around the world, house prices will instead be back at levels which are affordable for the majority of wage-earners
4. A major shake-out will have occurred in Western consumer markets. The SuperCycle led to a focus on the middle market as the boomers increased their spending. But by 2021, the middle classes in the West will have largely traded-down to bargain-basement shopping. The mid-market will be a small shadow of its former self. Luxury spending will once again be confined to a small minority as debt levels will be much lower
5. Consumer products companies will have also recognised that in the emerging economies the phrase 'middle-class' doesn't mean that people enjoy Western income levels. Instead it is often used to define those in the middle of the population earning only $2–10/day. Companies who have understood this and have focused on more entry-level products will be reporting very strong sales and profit growth
6. Chemical markets will have become more regional. The slowdown in boomer demand will have reduced the need to outsource production from the West. This will probably have been accompanied by a growth in protectionism as politicians – focusing only on the next election cycle – erect tariff and other trade barriers
7. Social unrest will have become a more regular part of the landscape. Countries with younger populations such as those in the Middle East will be angry at the lack of employment and prospects for income. Those with older populations will complain about the impact of government debt-reduction programmes on their lives and the reductions in entitlement programmes
8. Both young and old will be focused much more on 'needs' rather than 'wants'. Consumers will look for value for money and what is good for the environment as well as their budgets. Frequently asked questions will include "why not make the old car last a bit longer?" or "do I even need a new car?"
9. Investors will be focused on 'return of capital' rather than 'return on capital'. Their prime aim

will be to understand the riskiness of any investment rather than its potential to make them rich overnight. Financial measures such as EBITDA (earnings before interest, taxes, depreciation and amortisation) will have fallen out of favour. Investors' prime aim will be to understand the riskiness of any investment rather than its potential to make them rich overnight .

10. A new mood will also have replaced the consumerism that drove the SuperCycle. In part, this will be driven by anger over the asset-bubble era that left governments bankrupt. But it will also be driven by a growing desire to develop a more sustainable way of life in contrast with the environmental recklessness seen during the SuperCycle.



Montage of riots in Greece in 2011

Source: Wikipedia

NO NEW "WEALTH EFFECT"

The evidence is there – we only have to accept it.

"In these circumstances, human nature is to resort to an 'active state of inertia' and look back to what we are familiar with rather than try to define the new paradigm. That kind of Old Normal oriented behaviour is clouding many people's views," wrote Mohamed El-Erian, co-chief investment officer for PIMCO (the world's largest bond fund managers) in an October 2009 article.

The inflation-adjusted income of the median US household fell by 4.8% between 2000 and 2009, according to the US Census Bureau in its annual report released in October 2010. The decrease between 2007 and 2009 was 4.2%.

This was worse than in the 1970s, when incomes rose 1.9% despite high unemployment and inflation.

John Richardson remembers driving through rural Texas in March 2008 and wondering where the next "wealth effect" would come from for the vast majority of Americans following the end of the housing boom.

The surge in real-estate values enabled average and low-wage earners to use their properties as ATM machines – ie the refinancing that drove the consumer-spending boom.

But in the second quarter of 2011, the percentage of those owning a home in the US fell to 65.9%, the lowest in 13 years. This percentage is expected to fall further because of the big stock of unsold homes and persistently high foreclosure levels. Borrowers are also expected to continue to struggle to meet much stricter standards for obtaining a mortgage.

Gone forever are the days of the "no money-down, low-interest-rate mortgage" common in the West during the final years of the SuperCycle.

In the UK, average loan-to-value levels have fallen to ~55% in 2011, with lenders typically requiring deposits worth at least 25% of the value of property. Loan-to-value levels of up to 120% with no deposit were common between 2005 and 2008.

UK mortgage approvals are now at half their rate before the global financial crisis as banks are forced to rebuild their asset bases.

"The simple reality is that house prices are too high in most parts of the country and, until they fall significantly, there will not be a strong housing industry," Jonathan Davis, a financial adviser, was quoted as saying in *The Independent*, a UK newspaper.

Even the US, which launched $5 trillion of stimulus spending, has still not yet seen its GDP recover to pre-Great Recession levels, as shown in Chart 44.

There are many reasons for the slow recovery of the US economy since its 2007 peak, including a failure to create new types of employment to compensate for the great jobs drift to countries such as China.

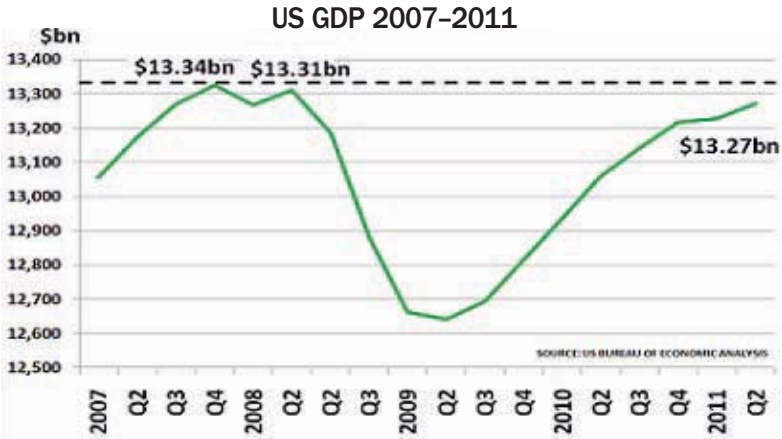


Chart 44: US GDP growth between 2007 and 2011
Source: US Bureau of Economic Analysis

More than eight million American people lost their jobs in the recession, and fewer than two million of those jobs had been regained by July 2011.

Nearly half of the unemployed had been without work for more than six months, the highest percentage since the Second World War.

Many of these workers may well stay unemployed, and so risk losing their self-confidence and self-esteem and seeing their skills atrophy.

An additional problem is that state and federal governments will have less money to support the unemployed, pensioners and those in need of state-funded medical care through these difficult years, because of the unavoidable need to reduce debt levels.

LIVING LIABILITIES

The dream of retiring after 30 years on 50 per cent of your final salary will no longer be an option for most boomers. Pension funds are already suffering as stock markets weaken and government interest rates reduce in the more stable countries.

We focus on the US debt crisis below as, of course, its economy matters the most to the world.

"In addition to our existing $10 trillion of outstanding Treasury Debt, the US has $66 trillion of future liabilities at 'net present cost'," wrote Bill Gross of PIMCO in an August 2011 article. "The combined present cost payment due from Medicaid, Medicare and social security is (therefore) over six times obligations of Treasury debt."

The financial press was used to only measuring paper debt, instead of also including these living liabilities, he continued. But "as long as 330 million Americans require promised entitlements, the $66 trillion figure is as much a liability as the $10 trillion on paper," he added.

As people get older and live longer, entitlements will therefore have to be reduced and retirement ages increased.

The scale of the US debt problem also represents a huge threat to the rate at which the economy can grow, according to academics Kenneth Rogoff and Carmen Reinhart.

They have studied what happens when countries assume liabilities which future growth cannot easily finance. The watershed line is 90 per cent debt to GDP, beyond which economic growth slows by approximately one percentage point as high levels of interest payments stunt potential growth.

"Developed countries in general are approaching or have already gone beyond this watershed. This means we can expect growth of only 2% rather than 3% per year, which represents "stall speed" for the economy," said Gross in another article written for the *Financial Times* in July 2011.

At this low level of growth, corporations lose the incentive to invest because profit growth stagnates and so unemployed workers are not rehired. Economic models of cyclical recovery will no longer apply.

The US Treasury Department announced in August 2011 that gross debt had risen to above 100% of GDP. This meant America had joined a small group of countries whose public debt exceeded GDP. These included Japan (229%), Greece (152%), Jamaica (137%), Lebanon (134%), Italy (120%), Ireland (114%) and Iceland (103%), said the International Monetary Fund.

Chart 45 gives some historical perspective to the US debt crisis up until the end of 2010.

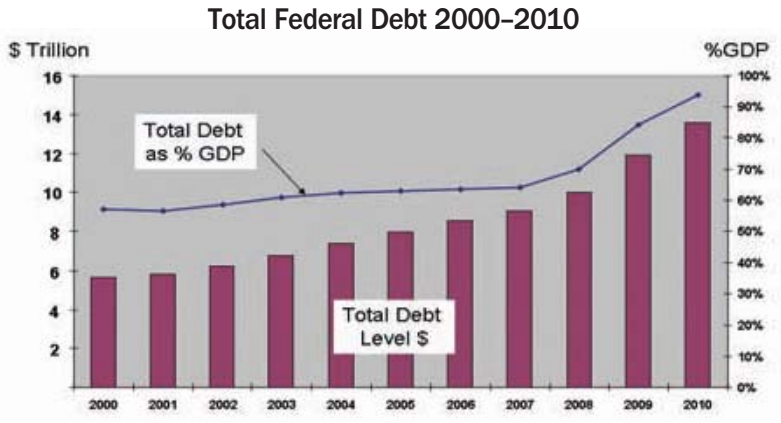


Chart 45: Total US Federal Debt 2000–2010
Source data: BEA, CBO, Treasury Direct
Source of chart: Wikipedia

A FOCUS ON NEEDS RATHER THAN WANTS

A remarkable shift in spending habits is taking place as the middle classes come under enormous pressure in the West.

Some of the changes have already taken place and will remain a permanent feature of the new retail environment. Further changes lie ahead due to the loss of household wealth, the stagnation in wages and fiscal austerity. There will be no return to either the consumption levels or consumption patterns of 1982–2007.

Neilsen Australia, the consumer analytics company, conducted an online survey of changing consumer behaviour in Australia in April 2009, which showed that:

- 56% of shoppers had switched to cheaper grocery brands as a result of the global financial crisis
- Around one-third said they would continue to purchase these cheaper items even when economic conditions improved
- In January 2011, 92% of Australian consumers said they would stick to cheaper groceries or "private label" supermarket brands.

Yet Australia, being an economy based on natural resources, has seen a relatively strong recovery since 2008 compared with most other Western nations.

"People are now spending more time collecting money-off coupons from magazines etc and searching the shelves for 'two-for-one offers'," we were told by a Melbourne-based plastics packaging manufacturer. "I wouldn't be surprised if a survey came out showing that the average time spent shopping had gone up."

Throughout the developed world there has been a shift from frippery to value-for-money. The image of a product has become less important as shoppers focus on a deeper analysis of cost benefits.

Other emerging trends include:

1. The rise of online shopping as "bricks and mortar" retailers are replaced by "clicks and mortar" business models. Tesco, the world's third-largest retailer, expects to see a world where consumers take advantage of cheap offers online and then collect their purchases from a local store. This is in complete contrast to the retail growth model developed during the SuperCycle, where

consumers were prepared to drive out to superstores and load up with purchases. This new hybrid online model is set to accelerate thanks to improved internet connectivity and better customer protection, payment and delivery systems

2. A focus on needs rather than wants driven by the need to save money, plus a growing recognition that much of the wealth created during the SuperCycle was wasted rather than being used to provide the basis for future growth. Thus car owners are keeping their vehicles for longer, while those without a car are wondering whether they really need one even if they can afford it.

NOT AS RICH AS EVERYONE THOUGHT

The New Normal will be a more realistic world where people enquire more deeply into the facts given to them by talk-show hosts. One such 'fact' is the idea that China and India each have a billion-plus consumers and their growth in demand will more than compensate for weak Western demand.

A whole industry has built up to promote the idea that this is the 'Asian century'. It is based on the idea there will be an explosion of demand for autos, washing machines, refrigerators, computers, mobile phones – you name it – in China, India and elsewhere. And we are meant to become optimistic and excited by the opportunities of turning China and India into another America.

Sadly, the truth is far more prosaic, as Chart 46 demonstrates in the case of India.

India will only have 11 million "affluent" households by 2013, according to India's National Council of Agriculture & Economic Research. Its definition of affluent is any household earning more than $4,675 a year.

In the West, entitlement systems would kick in for any individual, never mind household, earning anywhere close to this amount. They would be classified as very poor.

An even more striking figure is that the aspirers, those households hoping to become middle class, earn just $975–4,675 per year. They will total 124 million by 2013. This is a level of poverty beyond the comprehension of most Westerners.

This is not going to be a nation of mid-priced SUV buyers, of families who can afford one modest foreign holiday a year and the odd flat-screen TV.

The big opportunity is in the 'aspirers' market as the affluent segment will remain small

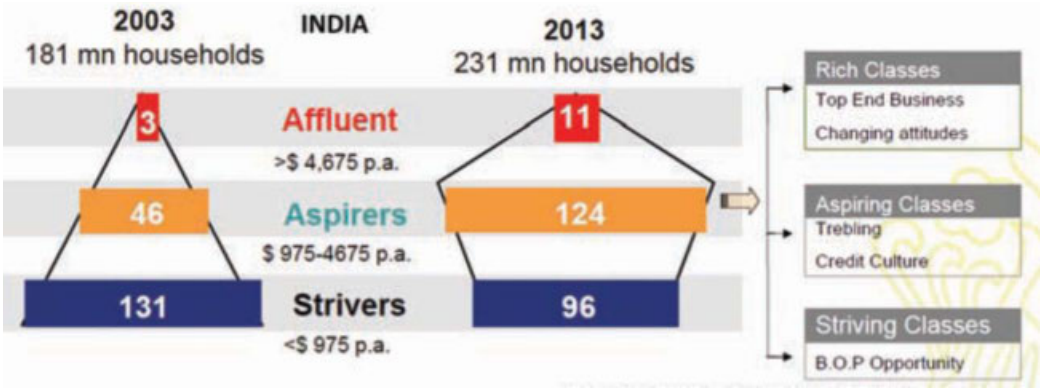


Chart 46: The Real Nature Of The Indian Opportunity
Source: National Council of Agriculture & Economic Research, India

China's 'aspirers' and 'affluent' are the main urban growth market

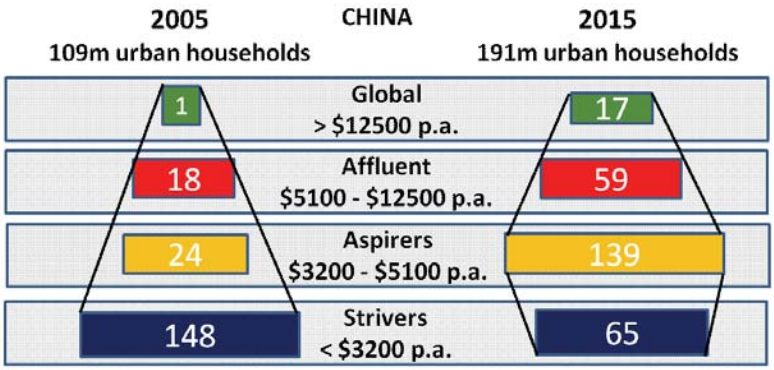


Chart 47: What It Means To Be Middle Class In China
Sources: National Bureau of Statistics, McKinsey Global Institute, Beijing Axis

These are "dirt poor" by the definition of Western consumer-goods companies, with the 96 million households earning less than $975 a year by 2013 way off the scale for any conventionally-minded company.

Indians, despite the high-profile millionaires and billionaires, will predominantly get about on scooters or push-bikes and if they can afford TVs they will want the most basic of designs. And they will probably buy only one such TV for their extended family.

They will be ferociously cost-conscious and they will continue to shop hard for bargains and re-use and recycle – skills Westerners are going to have to learn.

An Indian bargain is a single-serve sachet of shampoo at one rupee a time. Tens of millions of Indians are so poor that consumer-goods companies provide numerous personal care and food items in single-serve pouches. Being too poor to afford a whole bottle of shampoo is beyond the imagination of most Westerners, who are used to collecting such sachets as free gifts from even the cheapest of hotels.

The story is the same in China as Chart 47 also illustrates.

As with India, consumer goods companies are going to have to produce very-low-cost products to meet the needs of China's Affluent and Aspiring households.

This will require a great deal of innovation and creative thinking to find cheaper ways of making existing product lines while also developing whole new product lines. Can a computer be manufactured that will retail at less than $100 and can it be made to last several years?

And as China's economy has been so focused on exports, it risks considerable disruption as it moves to become more focused on the domestic market. This differentiates it from India, which is much poorer, but whose economy has always been primarily domestic-focused.

This might be the Asian century in the sense that emerging economies such as India and China will, perhaps, continue to grow at higher rates than the West. But it will take several generations before most of those in India and China are anywhere close to being as rich as the American or Western European middle classes, as we discussed in Chapter 1.

Maybe the transition to a Western way of life will never be achieved in countries such as China. Resource constraints could make it impossible for the Chinese to, for example, end up with per-capita car ownership the same as the US.

The New Normal might instead offer us a new model for economic growth, based on the megatrends now being pursued by some leading companies.

IT DOESN'T HAVE TO BE THIS WAY

The New Normal offers the potential to restore a greater balance to society if companies refocus their creativity and resources on real needs, as we shall discuss in the next chapter. These include the global megatrends of increasing life expectancy, improving water availability, increasing food production and reducing carbon footprints.

"As a consequence of climate change, farmers will face growing unpredictability and variability in water supplies and increasing frequency of droughts and floods," said the Food and Agriculture Organization of the United Nations.

"By the 2080s, land unsuitable for rain-fed agriculture in sub-Saharan Africa due to severe climate, soil or terrain constraints may increase by 30 to 60 million hectares.

Water shortages caused by climate change are just one of the megatrends that provide tremendous opportunities for economic growth over the next decade and beyond if companies have the will and ability to develop the necessary solutions.

The examples we give here are not meant to be exhaustive – you can even add your own.

Returning to water, what about the problem of leaking old ceramic and metal water pipes in urban areas? How should companies innovate in order to provide cost-effective solutions to this problem?

It is not just about just preserving water but about treating water. Millions of people die every year in developing economies and suffer serious illnesses because of water-borne diseases. The SuperCycle led to a world where the affluent rich worried about obtaining the latest smart phone, while the majority of the world's population worried about access to safe water and sanitation.

Food preservation is a huge challenge in countries such as India. More than 50% of food rots before it gets to the people who need it. This is nothing short of tragic, perhaps criminal in this current age of

Projected climate change impact on agricultural GDP and cereal production by 2080

Region	Percent change in agricultural GDP	Percent change in cereal production
World	-1.5	-1.4
Developed	-0.5	+2.8
North America	+7.5	+1.3
Europe	-14.7	-3.4
Developing	-1.9	-3.9
Sub-Saharan Africa	-4.9	-0.6
Asia	-4.3	-8.6
Latin America	+3.7	+15.9

Chart 48: Projected climate change impact on agricultural GDP and cereal production by 2080
Source: Food and Agriculture Organization of the United Nations

supposed technological advancement. As population pressure increases in India, lowering this percentage would be another route to profitability and employment – and to a stronger sense of social justice.

Because the West is getting older, the lifestyle and healthcare opportunities are also nothing short of enormous. Is there a way of manufacturing a lightweight, very cheap chairlift that can be self-installed? What about the scope for constant innovation in food supplements, and gene-based pharmaceuticals to tackle key ailments?

Sustainability is in itself a megatrend. The boomers fiddled around the edges of the problem with heavily-subsidised government renewable-energy schemes. As Bill Gates has argued, solar-cell panels and wind turbines are "cute", but don't do anything to solve the problems.

There is an urgent need for companies to focus on basic research rather than on using government grants to deploy old technologies. Industrial-scale solar-cell schemes in the desert might just do the trick of providing viable alternatives to fossil fuel-based energy.

Solutions such as this will have to be the result of long-term partnerships between governments and companies.

Things also need to be made to last. Gone will be the days of throwaway junk. This will be better for the environment in many ways, not just in terms of CO_2 emissions. Companies successfully tackling this problem will benefit both from heightened environmental consciousness and the need to save money because of the much-more straitened economic circumstances of the vast majority of Westerners.

Queueing for essentials in Britain during the Second World War
Source: Associated Newspapers/Rex Features

A DIFFICULT JOURNEY

These are going to be difficult times, less comfortable and less assured for many millions of Westerners.

The wider population will find itself following the model of the ageing boomers as it gets used to consuming less and saving more. Rather than expecting their assets to grow magically in value every year, they may find instead themselves struggling to pay-down debt left over from the credit binge.

Education systems are going to have to change in order to enable a transformation in manufacturing industry. More engineers and more scientists are going to be required to create the new products that will serve the needs arising from the megatrends. But this will take time, even if we start today.

It is easy to make fun of how useless "soft degrees" from third-rate educational institutions have become. But it is going to be very difficult to return to a world where a degree really means something and is much harder to attain. How long will it take to convince young people that a greater focus on vocational skills is required?

This highlights the key issue of mindset. Recognising the scale of the problem is the first step towards changing attitudes. The acceptance of failure as a learning experience will also be crucial as companies search for solutions to the megatrends.

We will also need to find politicians with sufficient vision to lead the biggest economic and social transformations since at least the Second World War. If such politicians are going to survive in office, voters will have to accept that economic problems are not going to be solved overnight.

Of course we could, as Mohamed El-Erian says, simply decide to ignore all of this unpleasantness and sink into an "active state of inertia".

But doing nothing is not a solution. It will mean we miss the opportunity to create a new wave of global growth from the megatrends. And we will instead end up with even more uncomfortable outcomes.

Chapter 5

The ageing baby boomers in the West

Will you still need me? Will you still feed me? The Beatles asked the right questions back in 1967, when they sang 'When I'm Sixty-Four' on their iconic Sergeant Pepper album.

What would happen to the baby boomers when they became 64? Would they be about to die, like their parents' generation? Or would they have a different future? The boomers believed they were a different generation and they hoped that this difference would extend to a longer life expectancy.

Today, we know this hope has come true, thanks to the scientific advances driven by chemicals and pharma companies. And we are about to discover the answer to The Beatles' question, as the oldest boomer reached the age of 64 last year.

So this chapter aims to help companies to adapt their business models to this new normal.

As Chart 48 shows (on the next page), life expectancy in the More Developed Regions (MDRs)[i] was only 46 years in 1900, just a century ago. In the poorer Less Developed Regions[ii] it was nearly half this at 26 years. By 1950, it had reached 66 years in the MDRs and was still rising, making 'When I'm Sixty-Four' very topical at the time it was written.

This means that two-thirds of all those who have ever reached the age of 65 years in the world are alive today[iii]. The number of these over-65s is also set to increase dramatically over the next 20 years, due to rising life expectancy, as the boomers begin to leave the 25–54 age group in increasing numbers.

This is the demographic timebomb that faces us. The boomers have been the richest, and largest, generation that the world has ever seen. But since 2001, they have been entering the 55+ age range, when people typically spend less and save more. By 2020, an unprecedented 33% of the developed world population will be over 55 years old.

It is not surprising, therefore, that recent 'recoveries' have proved relatively weak, in spite of unprecedented amounts of stimulus. The boomers simply do not need more housing or new cars. And they have to save more, to fund their extra decade of life expectancy compared with their parents' generation.

Life expectancy at birth, 1900–2025

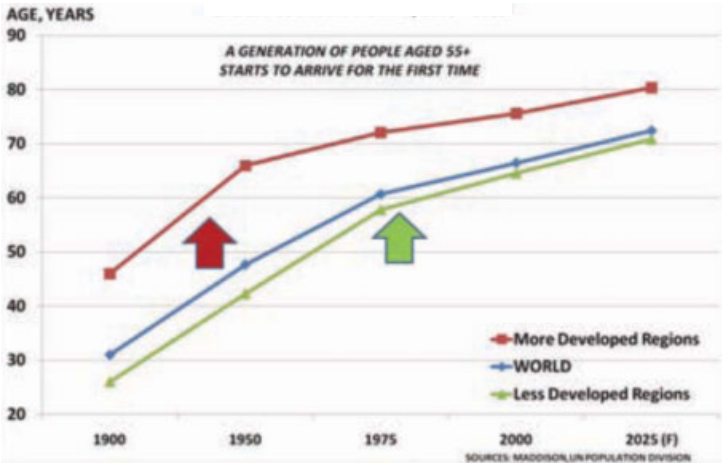


Chart 48: Rising life expectancy has created a new generation of people aged 55+

We cannot move forward, therefore, in terms of stimulating demand, until we recognise that there is no way back. Equally, though, this change in mindset could then help to open our eyes to the opportunities that will exist in this new normal.

The key issue, as The Beatles remind us, is that we can only guess at what their needs will be. But we do know that over-55s tend to spend less and save more. And we can assume they will need to spend less and save more, in order to enjoy their extra decade or more of life expectancy.

THE CULTURAL ISSUES OF AGEING

The baby boomers have been on an extraordinary journey since they were born between 1946 and 1970. As Chart 49 shows[iv], the 0–24 age group was the largest demographic group in the Most Developed Regions by 1970 – Europe (blue), Australia/New Zealand (orange), N America (purple), Japan (green) – accounting for over 40% of the total population in each area.

Since then, however, this cohort has been in steady decline. It is heading towards 30%, or even lower, by 2030. The 25–54 age group instead became the largest demographic cohort as the boomers grew up.

There was a surge in demand as more and more boomers settled down, had children and entered their peak period of consumption. This meant that companies were forced to find new sources of supply. They went first to Eastern Europe after the fall of the Berlin Wall in 1989. And then they discovered the BRIC countries (Brazil, Russia, India and China). China became particularly attractive as the 1990s continued and the word 'outsourcing' became part of business language. Yet as Chart 50 shows, neither the word or concept had existed before 1979. At that time, exports had accounted for just 5% of China's GDP. Today, they are around 40% of the economy.

The power of the new demand unleashed by the boomers was not only felt in Eastern Europe and the emerging economies. The size of their generation was also a major factor in sustaining the view within the West that older people were not very important as a potential source of demand. This

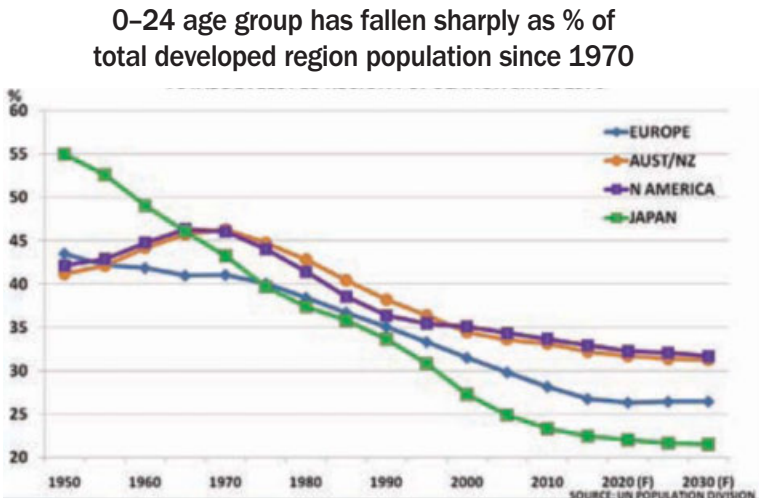


Chart 49: The falling percentage of people aged 0 – 24 in the West

view had developed prior to 1950, when life expectancy was still only 66 years. Historically, those above 55 years with good health and significant discretionary income have been a very small minority.

After 1950, as we shall see, this view was becoming increasingly outdated. But the sheer size of the boomer generation meant that the growing wealth of the 55+ age group was widely ignored. Most advertising is still focused on just two very similar demographic groups: the 18–49 age group and the 25–54 age group. Until very recently, when the boomers themselves began to move into this age bracket, those who had reached 55 were considered valueless[v] as potential consumers. Even today, a recent study by the UK's University of Kent has shown that "older people are stereotyped as friendly but incompetent"[vi].

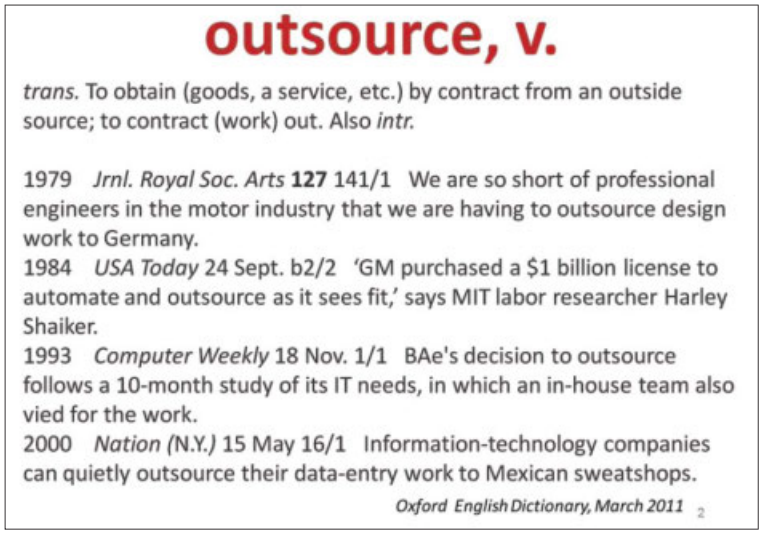


Chart 50: The word 'outsource' only dates from 1979

55+ age group in developed regions rises sharply after 2005
(55+ as percentage of total population, 1950–2030)

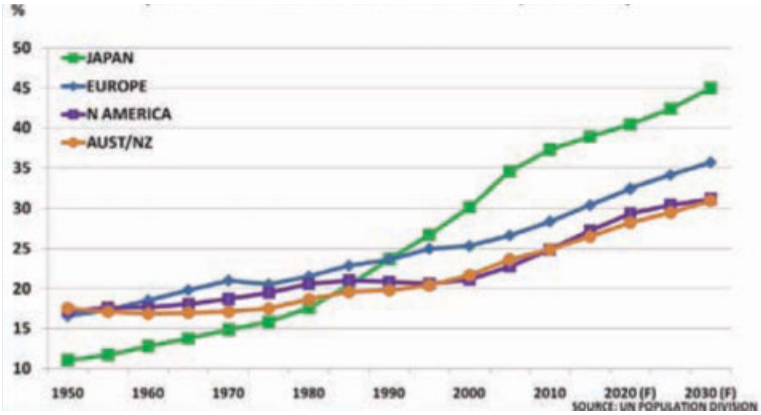


Chart 51: The rising percentage of people aged 55+ in the West

This view needs to change, and quickly. Businesses who fail to notice what is happening to the wider population will find the future much more difficult than the past. Demand patterns are changing quite dramatically from those seen since the 1980s. And they will continue to change for the next 20 or more years. This is the wonderful thing about population data – anyone who is going to be 25 years old in 2035 has already been born, so forecasting has a sound basis from which to work.

Every silver lining has a cloud, of course. And in this case, the cloud is based on the fact that those who became 25 after 1970 have lived in a world that has been economically dominated by the baby boomers. As we will see later in the chapter, this has been very different from anything seen previously in the modern world. For example:

- The US economy was in recession for 35% of the period between 1854–1982, according to Deutsche Bank research[vii]
- The average cycle time from peak to peak was 56 months (4.7 years)
- But between November 1982 and December 2007, it was in recession for just 5% of the time – 16 months in 25 years

Very understandably, therefore, those who entered business since the early 1980s have a very different view of business cycles from their predecessors. This means it is very hard for many people to now imagine a world where demand is not supported by a wave of new boomers, all wanting to buy more of nearly everything – and having the money to pay for it. But we need to recognise that we have already left this SuperCycle behind, and are instead moving inexorably towards a new normal dominated instead by the over-55s.

The rise of the baby boomers in the Developed Regions meant that during the 1950s and 1960s, as Chart 51 shows, the over-55s were only around 15% of the population. Average life expectancy still hovered around 65 years. But over the past decade the picture has begun to look very different, as the proportion of over-55s has followed the upward path already seen in Japan (green line). It has already reached around 25% in Europe (blue), N America (purple) and Australia/New Zealand (orange). By

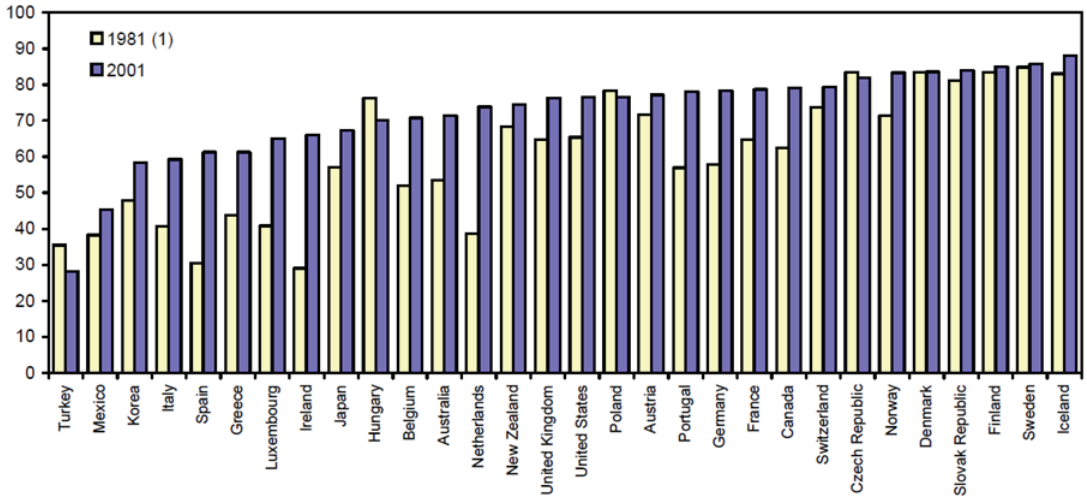


Chart 52: Labour force participation rates of prime age women (aged 25–54), 1981–2001[viii]

2020 it will have doubled to around 30% versus the levels seen in 1950.

And it is unlikely to stop there. There is no reason to doubt the UN's statisticians when they project that the proportion of over-55s will continue to increase post-2020. This is one of the main reasons why we believe individuals and companies need to start thinking in terms of a new normal that will be unlike both the Super Cycle of recent years and the earlier 'old normal' before 1980. The boomers will continue to dominate markets, given the relative size of their generation versus those of their parents and of their children. But their needs will be very different from those that have sustained growth over the past 30 years.

THE IMPACT OF FEMALE BABYBOOMERS

Another key unknown arises from the boomer-led change in social attitudes and behaviour. As Chart 52 from the OECD shows, female participation in the Western workforce rose quite dramatically between 1981 and 2001.

In the UK, for example, it rose around 10% over the period:

- Until the introduction of the Sex Discrimination Act in 1975, women had often been forced to give up their jobs on marriage. This was the result of the earlier belief that it was the man's role to be the breadwinner while the woman stayed at home to bring up the children
- And until the introduction in 1975 of the Equal Pay Act (passed in 1970), it was perfectly legal to pay women a lower wage for the same work
- Today, female workforce participation is over 75%, and this increase in earning power has been another important contributor to boosting consumption over the past 20 years

The same OECD study shows that around 25% of all female workers are in part-time employment, working less than 30 hours/week. This factor, and the relatively recent introduction of equal pay, means that most boomer women have historically earned less than men. Until recently, they have also had an earlier retirement age than men even though they have longer life expectancies.

Thus their move into the 55+ generation will add to the downward step-change in demand growth. They are unlikely to want to return to the second-class status of their mothers and grandmothers. They are better educated and they do not expect their lives to be focused on caring for their children, partners and parents.

But they are particularly likely to become more cautious in their spending. Their higher level of part-time employment, and greater use of career breaks, means their prospective pensions are even smaller. They will therefore need to spend less and save, even more than the male population.

Thus the next decades are likely to provide a much bumpier ride than those experienced since 1980. We will be very lucky indeed if we don't find ourselves returning to a world where markets are much more volatile and recessions much more regular.

CHANGES UNDER WAY IN CONSUMER MARKETS

Some major companies, particularly in the consumer area, have already started to focus on the changes taking place. The research arm of NBC Universal (the US television network) has undertaken some pioneering work in which they have studied what they term the "alpha boomers" – those boomers in the 55+ age bracket.

Already, they have discovered that these consumers, quite unlike their parents' and grandparents' generations, are heavy spenders on electronics and digital devices. They also spend more than average on areas such as home improvement, large appliances, casual dining and cosmetics. Although they may not buy many video games, they do like to load up on iPods and iPads.

Equally, the main US networks are seeing a steady increase in the median age of their audiences. Over the past five years, CBS has moved to a median age of 56 years, while ABC is at 52.5 years, NBC at 50.1 years and Fox at 45.4 years. All these ages have risen between two and five years since 2005. Similarly, 'American Idol', the hit US variety show, now has an audience with a median age of 47.2 years compared with 32.1 years when it was launched ten years ago. Unsurprisingly, Neilsen, the audience measurement company, suggests that the 35–64 age range is slowly becoming a much more common target market for advertisers.

This trend is common across all Western countries. The Financial Times columnist Robert Shrimsley has written amusingly[ix] about turning up for a Roger Waters 'The Wall' rock concert in London to find that this was not "the young, happening event of the capital". Instead, he realised that boomers "don't want to think they are too old to go to gigs, so we've found a class of gigs that are old enough to come to us". Bands such as the Rolling Stones are still touring worldwide, performing for the same people who followed them in their youth.

Shrimsley's comment also highlights the disconnection that runs right through current attitudes to ageing throughout the population. Boomers grew up with the view that 'old people' such as their grandparents were generally "friendly but incompetent". Ask any of them about their image of an 'old person' and they will mention Zimmer frames and an inability to care properly for oneself.

But ask them about themselves and you will find they believe that "60 has become the new 40" in terms of the perceived start of middle age. And when they sing the famous line from The Who's 'My Generation' record, "I hope I die before I get old", they do not associate this, as their parents would have done, with being dead at 65 or 70.

Life expectancy at birth, 1950–2030

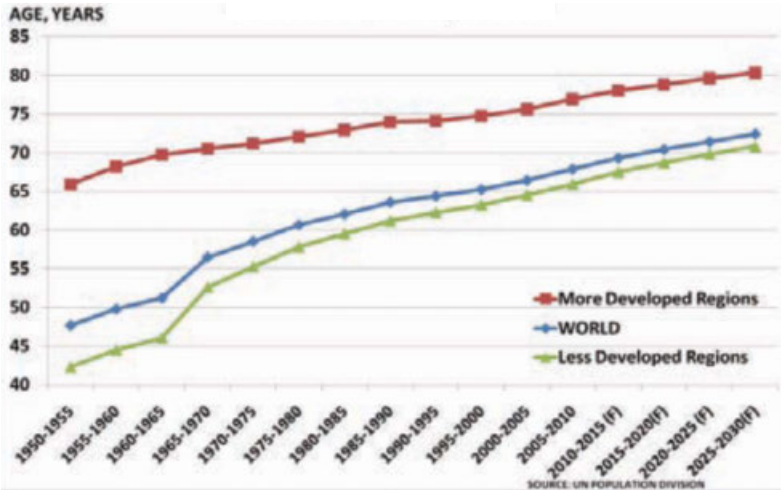


Chart 53: Increasing life expectancy, 1950 - 2030

THE IMPACT OF INCREASED LIFE EXPECTANCY

Adequate financial provision is critical for individuals as they move into the 55+ generation. It is also critical for companies targeting products at the 55+ generation. The potential costs of pensions are also critical for governments and companies who have promised to pay them.

But the concept of the state pension is a recent invention. As we noted in Chapter 1, the first state pension was only introduced 125 years ago in 1889 in Germany. The UK then followed 100 years ago in 1908. Neither government ever considered the idea that it would be a 'universal benefit' likely to be available to all.

In Germany, pensions were only for those who had reached 65 years. Very few people were therefore eligible as average life expectancy was just 45 years. In the UK, pensions were only available at the age of 70, while life expectancy was 50 years. And in the UK, then the wealthiest country in the world, the benefit was restricted to those with incomes below 12 shillings a week (£40, $65 and €45 in today's money). Equally, there was no thought of subsidised or free health care or any of the other benefits that we take for granted today.

All these benefits seemed to become much easier for society to afford after the Second World War. This was because of two key developments:

- Social security systems had typically been established on a 'pay-as-you-go' basis. So as the boomer population expanded post-war, payments increased into these funds every week and every year. Yet the inter-war generation born between 1919 and 1939 was characterised by low birth rates and low life expectancy (as discussed in Chapter 1). Thus a large number of younger people were paying for a small number of older claimants, and every year the balance was becoming more favourable.
- Affordability was also increased by the fact that even in 1950, the pension age was still very close to average life expectancy. This had increased between 1900 and 1950 as we showed in Chart 48. But pension ages had originally been set at between 65 and 70 years. So even in 1950, it was only those who survived beyond average life expectancy who became eligible for a pension or other benefits.

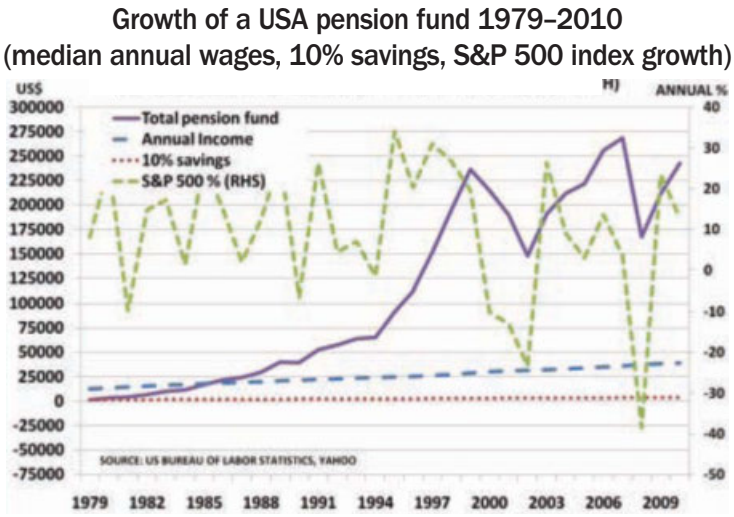


Chart 54: Growth of a US pension fund, 1979–2020

The position has changed quite dramatically since 1950 as Chart 53 shows. Thanks in good measure to the chemical industry, via the development of better health care, food quality and living conditions, life expectancy in the More Developed Regions (red line) had reached 66 years between 1950 and 1955. It then reached 72 years by 1975–80 and 77 years by 2005–10. The UN forecasts it will reach 80 years by 2025–30.

The dilemma is simply stated. People still expect to draw a pension at 65 years. But they can now expect to receive it for 15 years or more, on average. This is a quite different scenario from that envisaged when pensions were first introduced. The sums of money required to fund this pensionable period are much larger. The ordinary Western pensioner will have needed to save very hard during their working life, and also to have achieved a good investment return on their money.

Chart 54 is an example of the mountain that has to be climbed. It is based on official US earnings statistics, which start from 1979. Over the period to the end of 2010, this worker would have earned a total of $811,096 if they had earned median wages every year. The chart is based on the assumptions that:

- The worker earned median wages from 1979 till the end of 2010 (blue dashed line)
- They saved a regular 10% of this income (red dotted line), a total of $81,110
- They achieved the average S&P 500 Index growth as a return on their investment each year

By the end of 2010, this worker had a pension fund of $242k (purple line), worth an annual pension of around $10k/year, with inflation proofing. A prudent 65-year-old male pensioner would probably want to include a continuing pension for his spouse, in case he died first, as females normally live longer than males. But this would reduce the starting pension below $10k.

No single chart can cover all circumstances. But achieving the S&P Index growth, after all investment charges have been paid, is a pretty stiff target over 30 years. And as the green line shows, S&P 500 performance can be quite erratic. Its overall growth since 2001 has actually been non-existent (it ended 2010 at 1258, compared with a value of 1320 at the end of 2000). Similarly, managing to save 10% year after year would be a considerable achievement for most people.

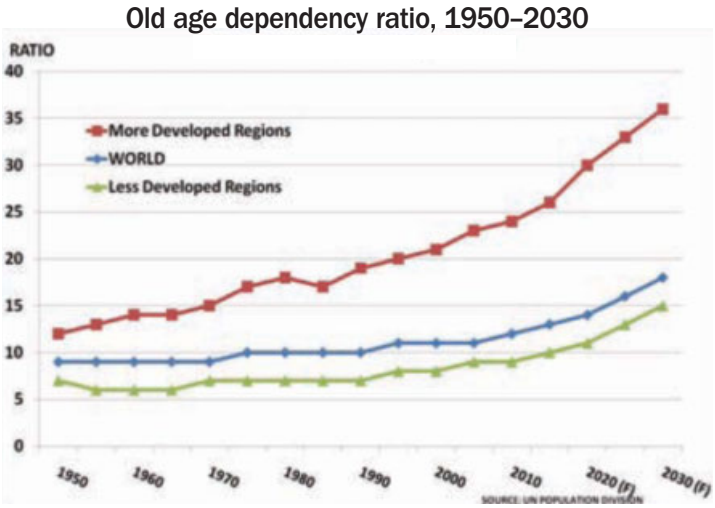


Chart 55: The Old Age Dependency Ratio, 1950–2030

Of course, some people will be more successful than this by, for example:

- Managing to save for more than 30 years
- Earning more than the median wage, at least for a period
- Reinvesting dividends from their investments

But they will not be the majority. And many people, unfortunately, will have suffered the reverse of these events. They will have instead have had periods of:

- Part-time employment or unemployment
- Earning less than median earnings
- Achieving less success with their investments

The definition of median, after all, is that it is the middle value, which separates the top half of US incomes from the bottom half. And as the US is the wealthiest country in the world, even its poorer members may well still be in a better position than their peers in other countries.

The dilemma is simply put:

- Companies and governments have offered pensions from the age of around 65
- They took contributions via payroll deductions and taxes to pay for these
- Boomers were happy to pay these costs, to have the benefit of a secure old age
- But one part of the contract was left unstated
- This was that life expectancy would remain at around the pension age

Now that this part of the implied contract has changed, then the whole system risks becoming increasingly unaffordable.

The virtuous circle of the post-War period is thus starting to turn vicious. More and more people are becoming eligible for pensions as the vast boomer generation reaches retirement age. But increasing life expectancy means many have not saved enough to survive in the comfort they had expected. Equally, as we have also seen, the generation behind them is becoming smaller and smaller.

The developing world (green line) faces the same problem. Its increase in average life expectancy has been even more remarkable, from 43 years in 1950–55 to 70 years by 2005–10. However, very few countries in the Less Developed Regions have the formal pension and social security structures that have become established in the West over the past century. Younger members of a family still expect to be responsible for their parents as they age. We will look at the implications of this in Chapter 6.

One way of looking at the issue is via the concept of the Old Age Dependency Ratio, shown in Chart 55. This measures the number of people aged 65+ years versus the number aged 15–64. The ratio is then given as the number of people aged 65+, per 100 people of working age (15–64). It is a good indication of spending trends and likely demand growth as younger people spend more and older people save more.

As the chart shows, this ratio is rising in almost every country in the world. Here, we will just look at the implications for the more developed Western world (red line). We will look at the position in the Less Developed Regions (green line) in the next chapter.

The rationale behind the definitions is simple:

- Age 15–64 is taken as a broad range of adulthood when people typically earn money
- Age 65+ is the period when people might currently expect to receive a pension

As can be seen from the chart:

- The ratio in the more developed world was at 12 in 1950
- This meant there were 12 people aged 65+ years being supported by 100 people aged 15–64
- By 1980, the ratio had risen 50% to 18 as life expectancy increased
- By 2010, it had doubled to 24 as life expectancy increased and births decreased
- By 2030, the UN forecast it will have trebled to 36

All of this has happened seemingly without our noticing it. On the one hand, boomers can still sing "I hope I die before I get old" and feel that for them, being 60 years old is the same as being 40 for their parents. And increasingly, in terms of life expectancy, they are right. Their parents and grandparents did expect to die at 65 years on average or even earlier. But today, boomers can hope to reach 80 years.

This disconnection has very important implications for future demand patterns. In the short term, it is reasonable to assume that society will continue to honour the pension promises it has made, although governments are already increasing future retirement ages by one or two years. So today's ageing boomers appear to be well-positioned as they start to retire in increasing numbers from 2011 onwards (assuming retirement at 65 years).

But this is probably an unsustainable position, as a personal anecdote may help to clarify. When Paul Hodges joined ICI in 1978 – then the UK's largest private company and the world's second-largest

chemical company – he was congratulated by the older people in the office. They explained that ICI was a good company to join as while most people would work till 65 years, and then die at 66 years, retirement in ICI came at 62 years. Thus he could look forward to four years on the golf course at the company's expense rather than just one year.

This highlights the fact that companies, like governments, have offered generous pension benefits while assuming that very few would actually receive these benefits for more than a few years.

It seems strange, looking back, that the impact of increasing longevity combined with a lower birth rate was not recognised during the 1980s or even the 1990s. It would have been relatively easy for companies and governments to explain to prospective pensioners that they were going to index pension age to life expectancy. People might have grumbled a bit, but they would probably have accepted it on the basis that "what you never had, you never missed".

This would have meant people would now be working longer on a routine basis. And it would have also meant that some reappraisal would have had to have taken place of working arrangements, as clearly people in their 60s do not have the same physical vigour as those in their 20s and 30s. But equally, older people have other things to offer society, such as experience and judgement, which could be put to good use. And today's typical boomers are still mentally fresh, and physically not usually in need of Zimmer frames when they reach 65 years.

Instead, however, we face a future where companies are finding it very difficult to maintain the promises made in easier times. Most have already made the pensioner responsible for much more, if not all, of their eventual pension. Yet little has been done to help educate prospective pensioners about their future financial needs. Thus many believe that $100k (or €100k or £100k), is a small fortune, and one that will keep them in luxury till they die. But if you divide by 20 to determine the probable value per year over 20 years the result is a pitifully small annual sum.

It is highly likely, therefore, that people will increasingly rebel against this unexpected collapse in their living standards. They will also feel that a pension is "their money" and that they have earned it. They will not want to understand that 30 years of modest payments into a pension fund cannot be expected to fund an adequate pension for the next 10 or 20 years. Equally, they will resist the idea that they should be, as they will see it, "forced" to continue working beyond their expected pensionable age at 65 years or similar.

This makes the outlook highly uncertain over the next 5–10 years. Social unrest is already increasing in the peripheral eurozone countries as they battle to reduce spending. More widespread social unrest may well occur as the problems of the pension system become more widely understood in the major Western economies.

It will become particularly acute in the US, where the Medicare trust fund (which pays healthcare bills for the over-65s) is already scheduled to run out of cash in 2024, according to its trustees[x]. The main reason is increased life expectancy beyond 65, which is now 18.6 years for men and 20.7 years for women. A secondary reason is high unemployment, as both Medicare and Social Security are financed by payroll taxes.

In an ideal world, politicians and companies would explain the position to people, and they would reluctantly accept the logic. But politicians, dependent on votes at the next election, are most unlikely to take this risk if they can avoid it. And top company executives, seen already as 'fat cats' due to their higher than average salaries and special pension schemes, are most unlikely to be seen as neutral

advocates in the debate.

Thus it is hard to see how society might initiate a rational debate about this key issue. Yet there is a pressing need to develop innovative solutions to the 'income trap' being faced by more and more boomers in retirement. An example of the difficulties that lie ahead is the suggestion being made in the US that the more widespread use of 'reverse mortgages'[xi] might be one way to address the problem. These allow an elderly homeowner to receive a lifetime income from a bank or insurance company tied to the value of their home. On death, the home is then sold to repay the loan.

But in recent years, such plans have often been a scam, used by unscrupulous salesmen to cheat trusting pensioners. This makes their mere mention a potential source of argument. Any suggestion that they might work well if properly regulated would seem laughable to many people after the scandals that were allowed to develop during the financial excesses of the 2000s.

Yet, properly regulated, they could well have a role to play in allowing people to keep a roof over their heads while receiving an income on which to live. They may be a necessary option for many retirees with low savings. They are therefore also an example of the uncomfortable fact that an achievable 'good enough' solution will often be better than the obstinate pursuit of an unobtainable 'best' outcome.

THE END OF THE GOLDEN AGE OF PENT-UP DEMAND

Along with the word 'outsource', another new concept entered the language after 1980. This was the idea of 'pent-up demand'.

Our analysis suggests that the rise of the baby boomers created a Super Cycle of demand growth as they entered the 25–54 age group, primarily between 1980 and 2000. This meant that demand did not disappear when interest rates were raised to tackle rising inflation. Instead, it went into abeyance, and the phenomenon of 'pent-up demand' developed. Thus, when central banks lowered interest rates again, after the inflation scare had passed, demand rebounded very strongly.

This was because:

- All the boomers already in the 25–54 age group could afford to extend their home as well as buy new autos and electronic equipment. And they wanted to do this as their families were growing up and creating new demand.
- More boomers had entered the age range while rates had been rising so their demand had also been put 'on hold'. They also wanted to make up for lost time.
- Until 2001, boomers were only entering the age group. None were entering the 55+ generation.

Then, the first boomers began to exit the age group in 2001. And each year, more and more boomers followed them. By 2013, the typical Boomer will be 55 as the youngest Boomer was born in 1970. Thus demand growth will become less robust. And so it is no surprise that central banks have had to resort to ever more desperate measures to stimulate demand since 2001.

We can also see the boomers' impact in the reaction to the infamous stock market crash of October 1987, when major Western markets collapsed by 25% or more in a day. At that time, all the major Western

US GDP annual % change ($bn 2005)

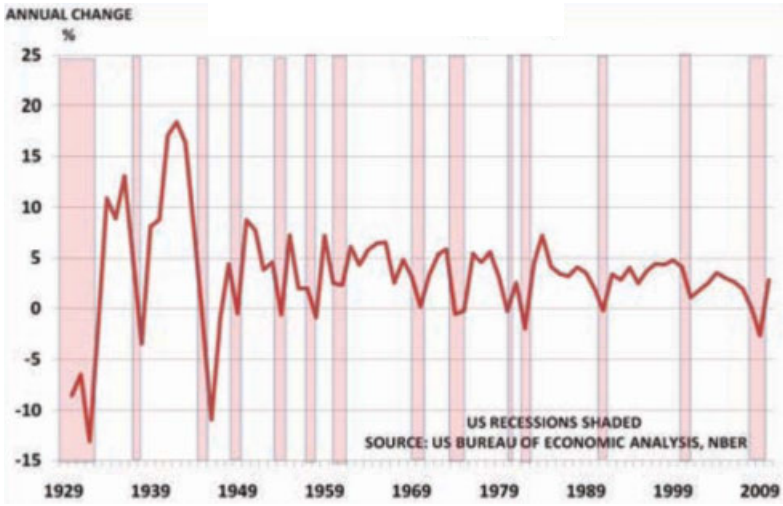


Chart 56: US recessions, 1929 - 2010

pension funds were in excellent shape financially. They were only paying pensions to the small inter-war generation, while receiving large amounts of regular monthly income from employed boomers.

This made it almost essential for the pension funds to continue to invest after the crash, and helped to ensure that most markets had recovered lost ground within just two years. But as one senior pension fund manager has told us, this kind of support for equity markets has now declined. The large pension funds no longer have large incomes to invest each month. Instead, they are often paying out more than they receive.

As a result, central banks have instead moved centre stage, replacing this loss of new capital with artificial liquidity. This is achieved by expanding their own balance sheets, via the process called 'quantitative easing' or more popularly, 'printing money'. Yet liquidity, while useful for solving cash flow problems, is not the same as capital. It cannot help to pay down the debt that many companies, governments and individuals accumulated during the latter stages of the Super Cycle.

This argument is not yet widely understood, although history shows that the past three decades have been most unusual in terms of economic stability. Several alternative arguments have instead been put forward as to why this has occurred, centring around the idea that governments allowed central banks to become more independent, enabling them to take a strategic view of likely market developments.

The theory holds that this independence in itself led to a much better outcome compared with the earlier periods when politicians would try to 'fine-tune' the economy in line with the electoral calendar.

This theory developed great credibility in the West during the late 1990s and early 2000s, as it appeared to fit the facts. Chart 56 shows the percentage change in US GDP since 1929, with periods of recession shaded. It highlights the major change in economic performance that took place.

Between 1933 and 2007, the US economy was in recession for 14% of the time (125 months in 75 years)[xii]. This period excludes the 43 months of the 1929-1933 recession, which if included would increase the recession total to 18%.

But this period seemed in turn to be divided into two distinct eras:

- Between 1933 and 1982, the US economy was in recession for 18% of the time (109 months in 50 years). Including the 1929–33 recession would increase this to 23% (152 months in 54 years)
- Between 1983 and 2007, it was in recession for just 5% of the time (16 months in 25 years). There were only two minor recessions – each lasting eight months – in 1990–91 and 2001

Thus it came to be widely believed that better economic management had largely 'tamed the cycle'. Much of the credit for this success was given to the policy of having independent central banks. More recently, though, this belief has begun to be seriously questioned as a result of the 2007–09 downturn. This also meant that the US's time in recession during 1983–2010 increased to 10% (34 months in 28 years).

The key question, of course, is whether it is this recent recession, or the 1983–2007 period, that proves to be the exception in the future. We have argued that it was the demographics that drove the change, not the decision to give central banks rather than politicians the power to set interest rates. And we would also argue that the position of Japan is once again strong evidence in support of our argument. Its central bank, after all, had the power to set interest rates, but this clearly did not enable it to ensure the country avoided the problems seen since 1990.

Ben Bernanke and others would, of course, disagree with this view. Instead, as we have seen, they argue that Japan's problems have been due to the failure of its policymakers to do a good job. But to us, this argument still undermines their position. If one has to have exceptional central bankers in order to achieve a good outcome, it is hard to see how this can be guaranteed.

In addition, we believe that the myth of central bank omnipotence has probably helped to confuse the whole debate. If policymakers had not promoted this view so wholeheartedly, there might well have been more dispassionate analysis undertaken since 1982 – which could have highlighted much earlier the importance of demographics in driving demand. After all, if demographics don't drive demand, what does?

Our analysis also has the significant benefit of helping to resolve some otherwise puzzling factors:

- Policymakers around the world completely failed to spot the onset of the crisis that began in 2007. And even as it got under way, Ben Bernanke argued that its likely total cost would only be around $100bn. His predecessor, Alan Greenspan, had always argued that it was both impossible and unnecessary to spot potential financial market 'bubbles', as central banks had the tools to clean up after them.
- Yet central bankers in the West, and in China, have since had free rein to prove this ability over the past two years. US demand, for example, has been artificially inflated via tax credits for house purchases and 'cash for clunkers' programmes to boost auto sales. In addition, financial markets have been flooded with two major waves of liquid-

ity, with the latest $600bn of loans only ending in June 2011.

- Stimulus measures to support housing/auto markets have also been key areas for China's policymakers. They doubled banking lending to $1.4trn in 2009 and cut car taxes in order to stimulate sales. As investment bank UBS noted recently, "real estate and housing construction pervade the entire Chinese growth model. They are the most important determinant of commodity demand". We will consider the outcome of these policies in the next chapter.
- If we look at US housing and auto demand today, it is clear that the government's vast stimulus policies have failed to deliver the expected results. US housing starts are now down around 600,000 per year compared with a 2006 peak of 2.2 million. They are lower than at any time since records began in 1959. Auto sales have slipped to a 10–12 million/year range, versus a steady 15–17 million during the Super Cycle.

There are growing signs in Europe and the USA that the liquidity-fuelled boom of the past two years is now coming to an end. We believe that this makes it all the more imperative to consider a more fundamental analysis of what has gone wrong, and what can be done to help move the Western economy in the right direction.

We think there is more than enough evidence to support the argument that the pent-up demand of the previous 30 years no longer exists. And given the small size of the post-1970 cohort, it will not return for a very long time, if at all. Economic policies therefore have to change, and quickly, to adapt to this new normal, where the 55+ age group will increasingly become the main driver of demand.

And this is truly a new normal, as the over-55 cohort has never previously been a major demand generator, due to the simple fact that it only really came into existence as a result of the relatively recent increase in life expectancy.

THE NEW NORMAL – THE RISE OF THE 55+ GENERATION

The new normal is one of the most remarkable developments that any society has ever seen. If we go back to the year 1000, economic historians such as Maddison[xiii] tell us that average life expectancy was around 24 years in all major regions. In this period, Asia was responsible for around 70% of global GDP, and Western Europe less than 9%.

But over the next 1000 years, the pendulum swung in the direction of the West as:

- Life expectancy increased to around 36 years by 1820, and then to 46 years in 1900, 66 years in 1950 and 78 years in 2000
- The average for all More Developed Regions (ie including eastern Europe) is also expected to reach this level by 2030
- Meanwhile, outside the West, life expectancy remained virtually static to 1900, when it was only 26 years, before starting an even more dramatic increase to reach 44 years in 1950 and 64 years in 2000
- Over the same 1,000-year period, the West's share of global GDP grew to 46%, while Asia's declined to 30%

Western countries see growth in 55+ age group as boomers age

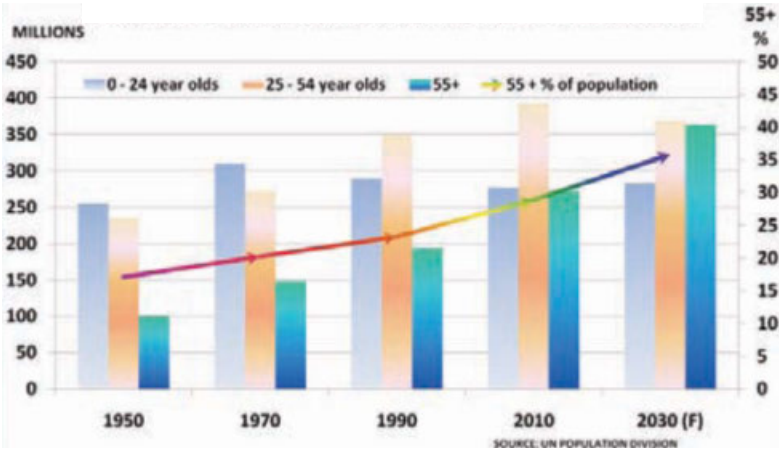


Chart 57: The Boomers are becoming the largest demographic group

- Average per-capita incomes show a similar disparity today, as we saw in Chapter 1. People in the Western world remain around 10 times wealthier, on average, than people in the developing regions

Population levels fluctuated very widely over the past millennium due to disease, wars etc. Since around 1800, however, the Western population has embarked on a steady increase, due primarily to a long-term decline in mortality. People have been living longer, not only because they are less affected by disease, but also because the availability of food has increased and diets have improved.

This then leads us to the picture shown in Chart 57. It shows:

- The Western population was very young in 1950. There were 255m in the 0–24 age group (blue column); 235m in the 24–54 cohort (orange column) and only 101m in the 55+ cohort (green column).
- Fast forward to 2010, and it had become quite middle-aged. The number of 0–24 year olds had plateaued at 277m, after peaking at 310m in 1970, while the number of 25–54 year olds had risen to a peak of 392m. And those in the 55+ cohort had almost trebled to 272m.
- By 2030, the population will have aged still further. The number of 0–24 year olds is expected to remain stable, while the 25–54 cohort reduces to 369m, almost identical to the 55+ cohort at 364m.

The arrow (multi-coloured) uses the right-hand scale to demonstrate the critical change, which is the growth in the 55+ group's share of the total population. This share rose very slowly from 17% in 1950 to 20% in 1970, and then to 23% in 1990. Understandably, nobody really noticed this, as the boomer increase was so much larger.

But less excusably, it was still being ignored as it rose to 29% in 2010.

Thus in this section we aim to rectify this omission. By 2030, the over-55s are forecast to be 36% of the

total Western population. This fact needs to be much more widely known and better understood. Then companies can position themselves to serve its emerging needs.

The key question is therefore one of mind-set. There are very few historical examples to guide us. Until recently, the 55+ generation had no real existence as a separate economic unit. Advertisers ignored it, for the simple reason that once people reached the age of 55, their needs usually began to reduce quite sharply, and often became primarily focused on relieving health-related issues – the Zimmer frame of popular mythology.

So if we are going to venture into the unknown it seems sensible to avoid being too prescriptive about what we might expect to see over the next 20 years. Instead, we might sensibly try to construct some potential scenarios, to highlight some of the key variables that need to be considered. Flexibility of outlook, and the adaptability it promotes, is likely to be a very critical success factor for companies as we approach this brave new world.

THE 'ALL'S WELL THAT ENDS WELL' SCENARIO

In this scenario, the key dynamic is that there is a rapid adaptation to the new normal. This may be driven by the observation of the major pain being suffered in countries already at the sharp end of some most unwelcome restructuring – Greece, Portugal, Ireland and Spain, for example. This gives Western politicians the courage to talk seriously about the issues that society now faces, while the wider population becomes prepared to listen to their messages and to accept that major changes need to be made.

Even so, the necessary changes will take some years before any real benefit begins to appear and the intervening period has the potential to be very painful for some parts of society. Unilever CEO Paul Polman summarised the position well when he noted in June 2011 that:

"There is already very slow growth (in Europe) and there is less disposable income. And I think we have just scratched the surface; what is of main concern is the social cohesion, the unemployment that comes with it. There are some structural issues that need to be solved, not only in the peripheral countries, the Portugals, Greeces or the Spains, but also increasingly in the core of Europe."[xiv]

Polman went on to add a second idea to our list of potential critical success factors – the need "to be very close to the consumer" in order to manage the volatility that will accompany less stable demand patterns. His rationale for this is that companies need to allow the consumer to switch price points and product offerings as their circumstances change. This seems to be important for companies all along the value chain, not just those directly serving the consumer.

The reason is that it highlights the increasing level of financial insecurity that we are all likely to face through the transition. Many countries, companies and individuals will come to realise they have too much debt. Their creditors are thus likely to find themselves disappointed more than once.

THE 'MUDDLE THROUGH' SCENARIO

In this scenario, there is no rapid adaptation to the new normal, and although a higher quality of dialogue takes place between policymakers and the electorate than in the past, no firm agreements are reached on key policies and objectives. However, and most importantly, social cohesion is retained, and so society does not fragment into warring groups.

This scenario presents numerous challenges for companies as they seek to position themselves to best meet its future needs. It highlights again the need for flexibility and adaptability and staying close to the

consumer. It also emphasises the need to be able to live with uncertainty. This is another critical success factor, as it reminds us that it is impossible to plan with precision when the variables are so unclear.

It will be a major change from the past 30 years, when the steady growth of the 25–54 age group led to the concept of pent-up demand. The arrival of the personal computer added to the sense that all problems could be properly described in a spreadsheet. Equally, it fostered the belief that a good PowerPoint presentation was all that was required to ensure that the key elements of an Action Plan could be described and then implemented.

This scenario does not mean that people lack any sense of how the future might look. Rather, it means that everyone has their own idea of what this will look like, rather than the more coherent vision of the first scenario.

THE 'IF YOU DON'T KNOW WHERE YOU'RE GOING, ANY ROAD WILL DO' SCENARIO

A third scenario needs to be added to those above. This is based on the potential for politicians to remain more focused on soundbites than policy. It assumes they will prefer to focus on the ephemeral demands of the 24-hour news cycle than on the issues that will drive long-term success for their populations. In this scenario, the current dysfunctional state of many Western political systems, and their alienation from the wider electorate, is not a temporary phenomenon but a sign of the future.

Clearly this is not an optimistic scenario. But considering it leads us to discover a fourth critical success factor. This is the need to remain focused on deliverables and real needs. Over the past few years, policymakers and electorates have come to assume that 'wants' can be the same as 'needs'. But in the uncertain world that awaits us under any of these scenarios, it would be a brave company indeed that set out to provide goods or services which relied on government subsidy, or people's belief that anything they want can be afforded via judicious use of a credit card.

This scenario also highlights a fifth critical success factor. This is that it is important to do something rather than sit back and wait for the position to clarify. It suggests that we are living in a world where there is no obvious strategic path because there is no common objective. So instead, companies will need to look closely at individual market sectors and segments, as Polman suggested, in order to form their own view on where these might be headed, and the opportunities they could contain.

THE 'DON'T WORRY, EVERYTHING WILL BE JUST FINE' SCENARIO

This is the scenario under which the West has been effectively operating for the past few years, ignoring the demographic changes which have taken us in a new direction. It is characterised by an increasingly desperate belief that everything is just about to 'return to normal' (ie the former Super Cycle), and that all that is needed is more time and a larger dose of stimulus expenditure.

While we therefore recognise its existence, and its obvious short-term attractions, we do not regard it as a realistic scenario for the future. Even Ben Bernanke, of whom we have been critical earlier, has summarised the position for the US as follows, and his logic also applies more generally to all Western nations[xv]:

"The most important thing for people to understand about the federal budget is that maintaining the status quo is not an option. Creditors will not lend to a government whose debt, relative to national income, is rising without limit; so, one way or the other, fiscal adjustments sufficient to stabilise the federal budget must occur at some point.

"These adjustments could take place through a careful and deliberative process that weighs priorities

and gives individuals and firms adequate time to adjust to changes in government programmes and tax policies. Or the needed fiscal adjustments could come as a rapid and much more painful response to a looming or actual fiscal crisis in an environment of rising interest rates, collapsing confidence and asset values, and a slowing economy.

"The choice is ours to make.... we should reform the government's tax policies and spending priorities so that they not only reduce the deficit, but also enhance the long-term growth potential of our economy – for example, by increasing incentives to work and to save, by encouraging investment in the skills of our workforce, by stimulating private capital formation, by promoting research and development, and by providing necessary public infrastructure.

"We cannot reasonably expect to grow our way out of our fiscal imbalances, but a more productive economy will ease the trade-offs that we face."

Critical success factors for companies in the new normal focus on meeting future market needs "Make what you can sell most cost-effectively"

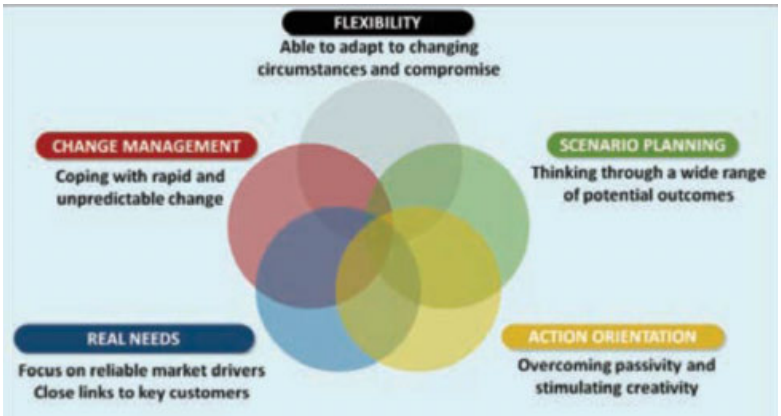


Chart 58: Critical Success Factors in the New Normal

CRITICAL SUCCESS FACTORS FOR THE TRANSITION TO THE NEW NORMAL

These scenarios give us some valuable insight into how companies, and individuals, can maximise their chances of a successful transition to the new normal. They are valuable whichever scenario eventually turns out to be accurate, or indeed if others develop. They also suggest some critical success factors for managing the transition, which are set out in Chart 58 and can be summarised as follows:

1. **Flexibility**. This involves adapting to new circumstances and being willing to compromise, rather than battling for an impossible nirvana. The potential of reverse mortgages, cited earlier, is an example of the need to accept a 'good enough' solution when this is likely to be the only viable one available.
2. **Change management**. We have all become used to a remarkable degree of stability in the business environment over the past 20 years, due to the steady growth of boomer demand.

Now, however, we are likely to have to deal with rapid and unpredictable change. Sometimes this may have positive aspects, but often this will not be the case. Recessions, for example, are likely to become more frequent again, and deeper, as we have discussed earlier.

3. **Scenario Planning**. Companies need to adapt their planning processes to cope with the greater uncertainty that will come from living in a more 'event-driven' world. It also has a personal dimension, as most of us prefer to have a clear idea of what is happening and what we are expected to do. Companies will need to recognise this need in their thinking, if they are to have a chance of successfully implementing their plans.
4. **Real needs**. Over the past 20 years, Westerners have often been spoilt by comparison not only with those living in emerging economies, but also with earlier generations. As a result, we have often confused 'wants' with 'needs', as there seemed no good reason to compromise. Companies will have to become aware of this distinction, however, as mere 'wants' are unlikely to be reliable market drivers for the future.
5. **Action orientation**. Uncertainty often breeds a loss of energy, as people worry about whether they are doing the right thing. In addition, creativity has been stifled by the box-ticking environment of recent years, which has demanded conformity with arbitrary rules. This combination can breed inertia, and so companies will need to encourage their employees to experiment creatively, if they are to move forward.

The positive news is that most boomers are likely to lead active and healthy lives well into their 60s and 70s. So the opportunities to capture their interest and their business are still very large indeed. We will highlight some valuable case studies to help with this process in chapter 7.

Companies seeking to be successful in the emerging economies face a similar challenge, as we will discuss in chapter 6. Their core market will also be a currently unknown demographic: those just moving out of poverty and able to afford a bar of soap, or a bra and pair of panties, for the first time.

But the Beatles provide a reliable guide, if we are prepared to listen to their message from 'When I'm Sixty-Four'. The megatrends such as an ageing population, and the need for improved food production, provide the key to future success.

SOURCES

[i] More developed regions comprise Europe, Northern America, Australia/New Zealand and Japan in the UN definition.
[ii] Less developed regions comprise all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean plus Melanesia, Micronesia and Polynesia in the UN definition.
[iii] HSBC advertisement, Heathrow airport
[iv] Data from UN Population Division.
[v] New York Times, 14 May 2011, 'In shift, ads try to entice over-55 set'
[vi] Policy Unit, Age Concern, 2008, Ageism in Britain, 2006
[vii] Deutsche Bank, 'Long-term Asset Return Study', September 2010
[viii] OECD, Female Labour Force Participation, May 2004, www.oecd.org/dataoecd/25/5/31743836.pdf
[ix] Financial Times, 21 May 2011, 'Suits and cars and rock'n'roll'
[x] New York Times, 13 May 2011, Good news for Grandpa
[xi] New York Times, 25 June 2011, 'Reverse Mortgages Here to Stay',
[xii] National Bureau of Economic Research
[xiii] Maddison, opus cit.
[xiv] Financial Times, 13 June 2011
[xv] Federal Reserve Board, June 14, 2011, Fiscal Sustainability

Chapter 6

Life's only certainty

There is sadly only one certainty in life. But over the last decade or so, it seemed as if a second certainty had been added to that of our mortality: That China and India would inevitably achieve the transition from developing to developed economy status. This would result in "the end of economic cycles", as one excited chemicals industry executive said in 2008, because of the strength of their future growth.

For a while it seemed the chemical executive might be right, as China's economy expanded at more than 10%/year. At the same time, India began its long-awaited economic reforms necessary to unlock its enormous potential.

"Decoupling" became a more-fashionable term after the global financial crisis began in late 2008. The suggestion was that China, India and other emerging markets would take over from the West as the main drivers of global growth.

This would be the Asian century, the century when hundreds of millions of new consumers would enter the global economy, more than adequately compensating for lost demand in the US and Western Europe.

But, as we discussed in Chapter 4, being "middle class" in China and India is radically different from the West. Income levels are a tenth of those in developed markets and will remain so for years and decades to come. This has major implications for the nature of consumption in China and India – the type of products that will need to be made if companies are to prosper.

And further – which is the main theme of this chapter – the transition from developing to developed country status was never guaranteed and is fraught with risk.

It takes a long time to become a rich country, according to the economist Michael Spence – who with Joseph Stiglitz won the Nobel Prize for economics in 2001.

For a country to boost per capita income from $500 to $20,000 takes 50 consecutive years of 7% annual growth, writes Spence[1]. China's per capita gross domestic product was only $4,382 at the end of 2010, and India's was $1,265[2] – indicating that both countries have a long way to go.

In the last half century, only 13 nations – mostly Asian countries, plus Brazil and Botswana – have managed to post 25, never mind 50, straight years of 7%/year growth.

Only five economies – Japan, South Korea, Taiwan, Hong Kong and Singapore – have moved from middle-income nations to developed country status, while maintaining relatively high growth rates, adds Spence.

The formula for success is not as simple as free-market economists make out, he continues. It is not just about opening markets to trade, of fully taking part in globalisation. Success requires good leadership and governance, transparent and efficiently run institutions and stable politics.

China and India face big challenges in achieving all of the above and more. They both need to address environmental degradation. Growth has come at a price: Poor air quality, chronic water shortages and deforestation.

Each has its own set of problems including, in China's case, rebalancing its economy away from over-reliance on exports. India must do something about the atrocious infrastructure and harmful government subsidies that are holding back the agricultural sector.

Economic history includes examples of countries that have made the successful transition from developing to developed-country status – for example, South Korea. Its GDP per head rose from just $350-400 in 1960 to $20,000 in 2005.

Textbooks detail stories of economic failure, perhaps most notably Argentina. In the early part of the 20th century, it looked set to become the world's biggest economy

But corruption, unstable politics and inadequate industrialisation has left the country as the 62nd richest in the world in terms of per capita income ($9,138 in 2010) out of the 183 nations tracked by the International Monetary Fund (IMF).

At the end of this chapter, we will revisit the scenarios we introduced in Chapter 5, along with the critical success factors for companies, and see how they apply to India and China – the world's most-important emerging markets.

Dollar Circulation

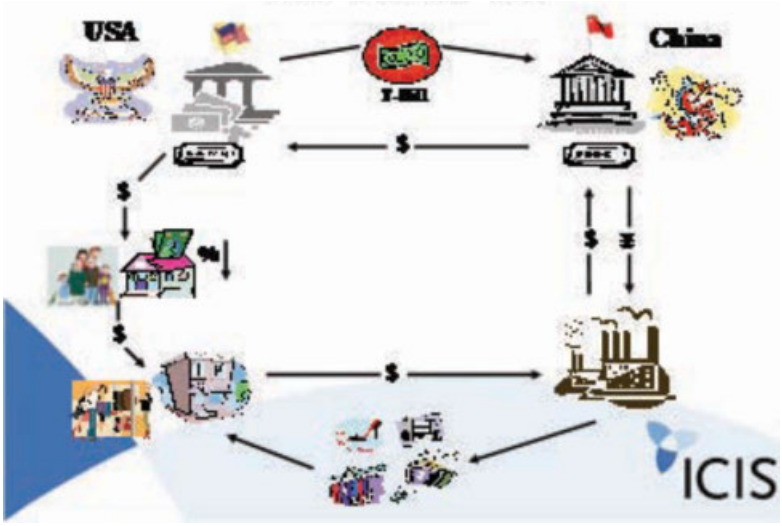


Chart 59: China's financing of Western debt

Source of Graph: ICIS

CHINA

A VIRTUOUS CIRCLE TURNS VICIOUS

The theory about the inevitability of China's economic rise was partly founded on its extraordinary growth in terms of trade, particularly after its accession to the World Trade Organisation in 2001.

But continuation of this export-based growth depended on credit remaining easy to obtain in the West. This, of course, is no longer the case.

China contributed to the credit boom by creating "a virtuous circle" as Chart 59 illustrates.

Heavy investment by China and other foreign governments in US Treasury Bills helped keep long-term US interest rates low, thereby making it easier for US consumers to keep buying goods from China.

This provided the cash that allowed US financial institutions to develop new lending products, including most importantly mortgage derivatives. These were the root cause of the 2008 economic crisis, as we discussed in Chapter 2. Because long-term interest rates were kept low by generous foreign support of US government debt, financiers sought more and more exotic instruments designed to yield better returns.

Long before the global financial crisis occurred, as long ago as 2003 in fact, China's leaders recognised that the export growth model was unsustainable as its success was founded on subsidies that were damaging the economy. But the lure of seemingly easy, endless growth proved irresistible in the short term.

TURNING AN OIL TANKER AROUND

So, how successful will Beijing be in managing this transition?

Six major challenges need to be addressed if China is to continue to achieve high levels of GDP growth:

1. THE DEMOGRAPHIC CHALLENGE

We need to start this analysis by looking at the country's demographics. These stand apart because, as we saw from Chapters 1 and 2, there is nothing that politicians or anyone else can do to change the direction of demographics.

In China's case, demographics appear to represent an almost existential threat. China introduced its one-child policy in 1978, and from 1979 imposed fines and denial of services to families who broke the law.

The policy was aimed at countering what Chinese leaders at the time feared would be major complications of over-population, including burgeoning urban slums, epidemics, overwhelmed health, education and law enforcement services, food shortages or even famine.

By China's own accounting, the policy prevented about 400m births between 1979 and 2010. Many Chinese couples that started families in the 1980s and later wanted to have a male as their one allowed child, with the expectation that a son would more likely be able to support them in their old age.

Over the past 30 years, the one-child policy has been implicated in a sharp increase in forced abortions and widespread female infanticide. The result is that China now has a disproportionately large population of 20 to 30-year-old males compared with women. Demographer Kenneth Gronbach[3] believes that:

- In the 1960s and 1970s China was having 40m babies annually, but that birth rate has now fallen to close to 10m/year

- China reduced its fertility rate from four or more children per family to one child for most households, a 75% reduction
- China's 25 to 35-year-old age group is fully 75% less in number as a result of the one-child policy. "The issue is that it will be the responsibility now of those 30 [year olds] and under in China to do the heavy lifting, caring for the growing population of elderly, and for the nation's children. The thirty-somethings will have to do the majority of China's production, consumption and taxpaying, and when you have a 75% reduction in the group that is chiefly responsible for those activities, you've got a real problem," he says
- China is already beginning to feel a labour shortage that will only get worse as the much-diminished one-child generation moves into its principal productive years
- In the next 10 to 15 years, China will face major production problems as labour shortages tighten production capacity and reduce the competitiveness of exports.

2. MORE INCLUSIVE GROWTH

China's 12th Five-Year Plan (FYP) seeks to set the direction of the economy for at least the next decade, not just the next five years.

Hu Jintao, China's president, in an early 2011 speech, talked about more "inclusive" growth, which is one of the slogans underpinning the 12th FYP. This is supposed to mean a more rational balance between growth and sustainability, production and consumption, and hard and soft infrastructure[4].

One of the key overall objectives is to raise consumption as a percentage of GDP, which at 35% is less than other developing countries. For example, consumption in India accounts for more than 50% of GDP.

This will involve an attempt to redistribute income. The big state-owned enterprises (SOEs) have become extremely rich because of government subsidies, which include cheap land, loans and energy supply.

While they have been getting richer, this has not been to the benefit of the average Chinese citizen.

In the ten years from 1997, the share of workers' wages in national income figures fell dramatically, from 53% to just 40% of GDP[5]. Wage growth has lagged behind the rise in corporate profits.

Chart 60 shows how the gap between urban and rural incomes has grown over the past decade:

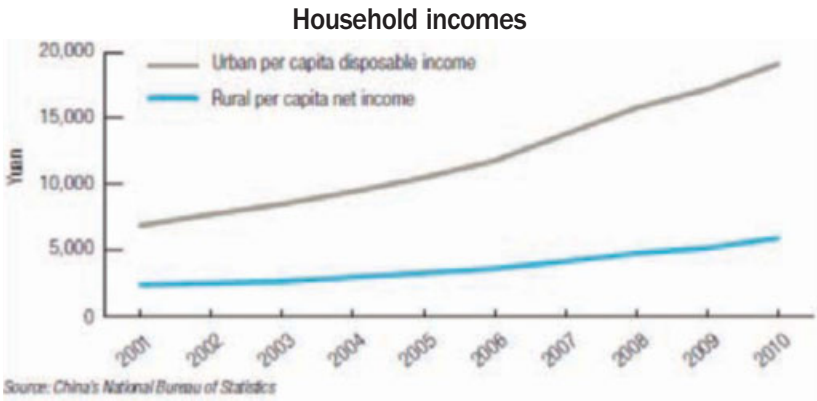


Chart 60: The growing income gap between China's rural and urban areas

Source of Chart: The Eurasia Group

Chart 61: China's manufacturing is becoming more capital intensive

One way of boosting rural incomes would be a more market-based system for setting agricultural product prices. But if inflationary pressures persist, there could be strong resistance to any changes in how farm prices are set from the National Development and Reform Commission (NDRC)[6].

The NDRC is just one of several government bodies that wield varying degrees of power within the government. They can effectively resist or force-through policy initiatives.

Wage hikes are inevitable, as China transitions to a more capital intensive economy.

Chart 28 in Chapter 2 (repeated here as Chart 61) highlighted the work of Nobel Prize winner Sir Arthur Lewis, who identified the need for countries to change gear as their economic development progressed. Failure would result in the 'middle income trap' that derailed growth in Argentina and other countries.

Yet the NDRC might also resist further wage hikes because of concerns over inflation. Wages in some provinces were raised by 20–30% last year with further increases expected as part of the FYP.

The big, politically well-connected SOEs are sure to resist further wage hikes that would eat into their profit margins. SOE resistance could limit progress on another key means by which the government aims to redistribute income – an increase in their dividend payments to the central government, which would be used to fund social welfare programmes.

Savings rates are high in China because healthcare, education and pension provision is very much do-it-yourself. The absence of a nationwide safety net has another consequence: It limits migration from the countryside to the cities as rural residents often find that when they move to the rich coastal provinces in search of work, they are not entitled to locally funded benefits.

The Hukou system – a method of restricting migration from rural to urban areas through different classes of residency permits – also limits the access of migrant workers to benefit systems.

Official reluctance to do away with the system because of fears of overcrowding is adding to migrant-worker discontent, along with soaring property prices. In the southern city of Guangzhou, the cost of apartments increased by 50% in 2008–2010.

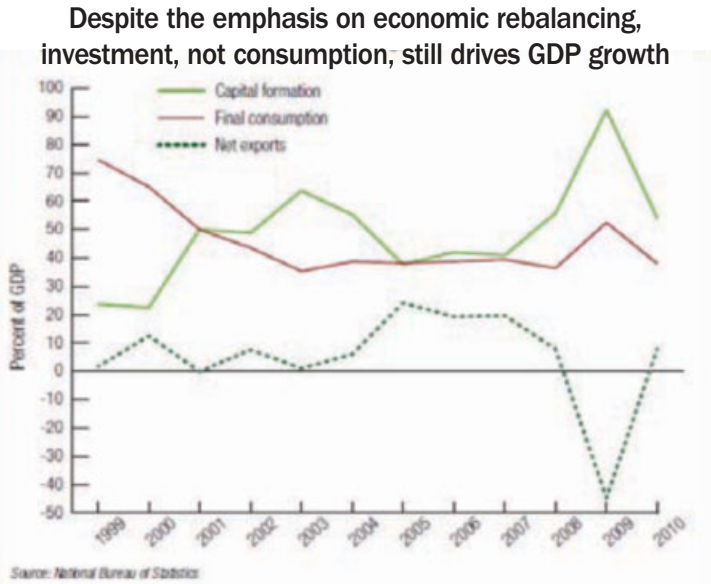


Chart 62: China's increasingly unbalanced economy, 1999–2010

Source of chart: Eurasia Group

3. REBALANCING THE ECONOMY

Successful income distribution is key to boosting domestic consumption, which, as Chart 62 illustrates, lags investment as a driver of GDP.

The global financial crisis set back the reform efforts. Tens of millions of migrant workers found themselves out of jobs in early in 2009 as a result of the collapse in finished-goods orders from the West. The response from Beijing was the biggest economic stimulus package in economic history for a country the size of China – some $600bn of direct state spending on infrastructure projects.

Much of the stimulus money was spent on new industrial capacity at a time when aggregate global demand was less than before the global financial crisis.

But losing money in oversupplied markets was not a concern for the SOEs because they had received loans on favourable terms from the state-owned banks, which were desperate to lend to fulfil government objectives.

Because of the unfair bias towards SOEs in the system, the domestic private sector has shrunk in relative and absolute terms since the start of the global financial crisis. This means that there is more reliance than ever before on SOEs to create jobs throughout the country.

But the number of people employed in manufacturing has not increased, and might have even decreased since 2007. This suggests that economic stimulus has failed to resolve the challenge of creating enough jobs for China's 750m-strong workforce, 200m of which are itinerant workers.

Domestic consumption (red line in Chart 62) has nearly halved as a share of GDP over the past decade.

Infrastructure and capital spending (green line in Chart 62) has, meanwhile, more than doubled, because the government has to date bet just about everything on investment as a means to stimulate jobs.

"Turning the Chinese economy around will be a bit like turning around an oil tanker – it is going to take a while," says the Greater China head of sales and marketing for a major plastics producer.

China's Monthly Bank Lending, 2008–2011

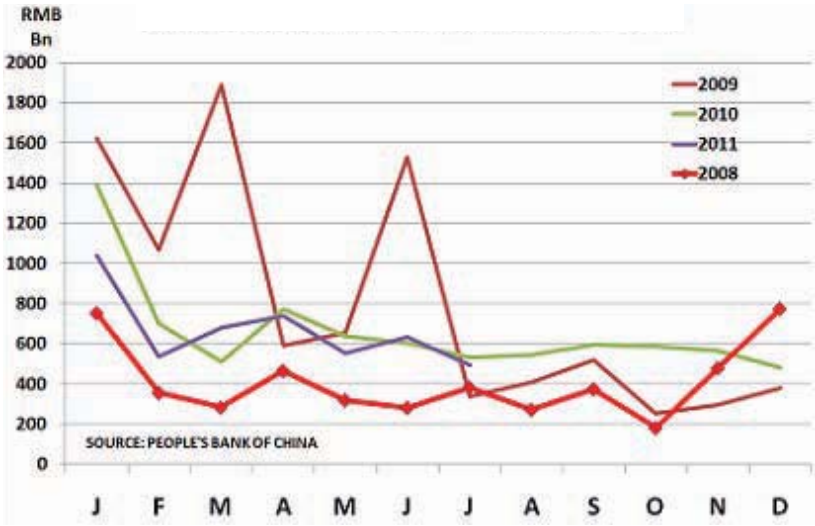


Chart 63: China's lending growth 2008-11

Source of Chart: International eChem

4. THE LENDING PROBLEM

State-owned banks were instructed to go out and lend as part of the post-2008 stimulus programme. As Chart 63 shows, lending doubled in 2009 to $1.4 trillion – about one-third of total GDP. Most of this money went into housing in the belief that the government would never let property prices fall.

Real estate prices surged because of speculation[7]. This widened the gap between the super rich and the majority of citizens. About 20–40% of all lending since 2009 has gone to fund the building of residential property that few average workers can afford to buy[8].

Up to half of local government revenues are via local financing vehicles, which make most of their money from real-estate. Provincial and local government officials significantly influence lending decisions made by local branches of the state-owned banks.

China faces a non-performing loans crisis that could potentially destabilise its financial system. Total local government debt alone was equal to as much as half of China's GDP in mid-2011.

If property prices start declining in an oversupplied market, much of this lending could turn bad. Breaking the addiction to investment is going to be difficult because:

- Up to half of local government financing, as we have said, comes via investments in real estate and other types of infrastructure. There are an estimated 45 million local government officials in China. Controlling what they do is a huge task
- The success of these local officials has traditionally been measured by setting GDP growth targets. The easiest and quickest way to achieve growth is to invest, for example, in new real estate, factories, bridges, roads
- Big government projects provide tremendous opportunities for corrupt officials to "skim off the top", as the bigger the project the harder it is to keep control of the final cost
- Building lots of low-end manufacturing capacity is an easy way of creating lots of jobs,

thereby keeping a cap on social unrest. Former US President George W Bush once asked Hu Jintao what kept him awake at night, to which he replied "25m new jobs a year".

This is the scale of the problem China's leaders confront as they attempt to re-engineer the economy away from an over-reliance on investments and exports towards higher levels of domestic consumption.

And as they try and enact the biggest policy changes in a generation, they could well face persistent inflation and a major non-performing loan crisis as a result of all this misallocation of capital.

5. THE ENVIRONMENTAL PROBLEM

Quality of life has deteriorated as a result of environmental degradation. Poor environmental standards and low energy prices have helped give China its export edge.

Many of the 100,000 or so public demonstrations that take place in rural areas every year are the result of the state of the environment.

More than 650,000 people are estimated to die from air pollution in China every year. Around half a million of these deaths[9] are from coal pollution. China has an abundant supply of coal and so relies heavily on coal for electricity generation.

The rapid growth in rail, road and other infrastructure investments in China's inland provinces might reap rich rewards. Low-end manufacturing has become less competitive in the coastal and southern provinces because of rising wage costs and so the 12th FYP involves shifting this type of manufacturing inland.

But time to market, even with the best infrastructure in the world, is likely to remain an issue for foreign investors as it would still take several days at best to move goods from deep inland to where the real demand is – the coastal and southern regions.

Building factories in some of China's more-remote provinces might help narrow the gap between the rich coastal and southern regions and the rest of the country. In 2010, per capita GDP in the six richest provinces was double that of the rest of the country[10].

How effectively, though, will capital allocated for inland industrial investments? Won't this just represent another opportunity for government officials to "skim off the top"?

6. THE NEED TO MOVE UP THE VALUE CHAIN

Another aim of the 12th FYP is to move up the manufacturing value chain in the richer coastal and southern provinces.

Targeted industries include renewable energy as China tries to reduce the amount of energy it consumes to produce each unit of GDP.

The central government has lots of cash to spend on research and development and on acquiring overseas patents. But without an improvement in intellectual property rights enforcement will China be able to attract the foreign investment to fulfil its objectives?

And how will it deal with overseas perceptions over the poor quality of its manufacturing?

The July 2011 bullet train crashes at Wenzhou in China have damaged these perceptions, as government officials were widely reported to have buried train wreckage to impede an investigation into the cause of the accidents[11].

Buying a cheap DVD player that might break down after a few months is one thing, but trusting Chinese manufacturers to make high-speed trains that meet international standards is something altogether different.

Only one-third of China's 700m-strong workforce is skilled or highly skilled, and so improving education is another challenge of moving into higher-value industries.

China also has relatively few college graduates – just 98.3m in 2009. And their numbers will only increase slowly. It will take until 2020 to double their numbers to 195m.

THE POLITICAL CHALLENGE

How successful will central government politicians be in seeing-through the 12th FYP reforms?

Hu Jintao and premier Wen Jiabao are due to give up their main Communist Party posts in late 2012 and their state posts in 2013. Vice president Xi Jinping is expected to replace Hu.

Most of the nine-member standing committee – the party's decision-making core, which includes Hu and Wen – are likely to step down.

This process could delay decision-making as politicians jostle for power.

Social unrest is a distinct possibility as the economy is retooled – for instance, as coastal low-end manufacturing factories are closed down and replaced by higher tech manufacturers.

China's new leaders might want to tread the cautious middle path. This would avoid unrest and placate resistance from those who have done well from China's existing economic model, such as the SOEs.

Jim Chanos, the famous investor, said in a lecture last year: "We are often derisive towards the ability of governments to do what markets do better.

"When it comes to China, though, everybody is willing to bet that nine guys in a room [the country's top leadership] will get it right all the time. I am willing to bet this is not the case."

He might eventually be proved right and history certainly supports his view: Political miscalculations were a significant factor behind the Tiananmen Square protests in 1989.

So what might be the outcome for China of all the issues we have highlighted?

China's income growth and stage of economic development today is broadly similar to Japan in 1969 and South Korea in 1988, before their rates of expansion fell, according to Morgan Stanley[12].

Japan's growth slid to an average 5.2% in 1970–79 from 10.4% in the previous decade, the bank said. South Korea's expansion cooled to 6.3% in 1989–98, from as much as 12.3% during the previous decade, government data shows.

Growth declining to 5–6% would therefore create huge social pressures, particularly given that the costs of caring for an ageing society are set to rise steeply over the next two decades.

INDIA

THE SCALE OF THE CHALLENGE

Poverty has to be the first word in this section of the chapter. It is the first word which comes to mind when most foreigners think of India and quire rightly so. Here are a few sobering statistics:

- India is home to a third of the world's poor people, with 37.2% of its population (about

410m) classified as poor[13]

- India's high-income states have successfully reduced poverty to levels comparable with richer Latin American countries. But its seven poorest states – Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, and Uttar Pradesh – lag behind their more prosperous counterparts, and are home to more than half of India's poor
- There is a pressing need to build a more diversified agricultural sector through creating more competition. Large agricultural subsidies are holding back productivity enhancing investments as overregulation has increased costs, price risk and uncertainty. About 70% of holdings are less than one hectare in size. The partial failure of land reforms in many states has left farmers unsure of their ownership rights, leading to low productivity. Lack of finance and a high level of illiteracy are also holding back agricultural development
- The overall literacy rate is 61% and just 47.8% for women[14]. This compares with an overall 92.2% for China and 88.5% for China's women
- The majority of Indians have a per capita living space of 100 square feet (9.3 square metres) or less. Three years ago, one-third of urban Indians lived in homes too cramped to exceed even the minimum requirements of a US prison cell[15]
- India's rapidly growing economy has been placing huge demands on power supply, roads, railways, ports, transportation systems, and water supply and sanitation, adds the World Bank. Bottlenecks in both urban and rural infrastructure have been eroding the country's competitiveness
- India's government has increased infrastructure investment under its 11th FYP (2007–2012). However, India has a low taxation base – only some 15–16% of GDP is collected as taxes in India compared with 25–40% in developed countries. The country is therefore short of budgetary resources.

Reforming agriculture is absolutely crucial for creating more balanced and sustainable growth as it accounts for 52% of the economy. Some two-thirds of the population depend on the rural sector for their employment.

In contrast, industry accounts for just 14% of the economy as against 27.8% in China – although as we talked about in the earlier section, China's dependence on industry might be on the wrong side of dangerous because of its focus on exports rather than domestic markets.

Disputes over land acquisition, unreliable and inadequate electricity supply and famously restrictive labour laws all make it difficult for manufacturing investors in India. Successful investors have had to build their own power plants, their own roads and other infrastructure. This has acted as a deterrent to foreign investors who have preferred China, where infrastructure in the developed regions is excellent.

Red tape remains another impediment, despite the dismantling of the "Licence Raj" in 1991. It still takes 200 days to close a business down, for example. A complicated, multi-layered bureaucracy creates numerous opportunities for corruption.

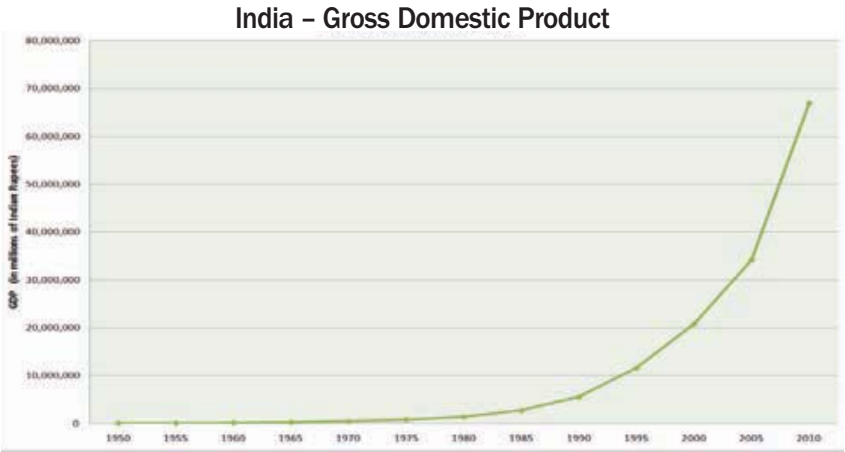


Chart 64: Growth in Indian GDP, 1950-2010

Source of Graph: India's Ministry of Statistics and Programme Implementation

WILL POLITICS GET IN THE WAY, AGAIN?

But a great deal of progress has been made in tackling all of the above problems. For every negative statistic we have detailed above there are positive alternatives. For example, the number of out-of-school children fell from 25m to 8m between 2003 and 2009. This meant that the percentage of 6 to 14-year-olds who were not receiving any education dropped to just 5%.

And just look the acceleration in economic growth shown in Chart 64.

In per capita growth terms, however, India lags behind China as Chart 65 shows on the following page (the units are in 1990 year dollars terms):

Up until mid-2010, confidence that India was heading in the right direction was high thanks in large part to political stability. Manmohan Singh, as finance minister, began the process of liberalising the economy in 1991 and, as prime minister, has been credited with continuing the process.

"The traditional Indian economic dance used to be one step forward and two steps back. Now it is more like only two steps forward," said an Indian colleague of co-author John Richardson in early 2010.

But what had changed, as Chapter 6 was being finalised in September 2011, was an evaporation of much of that confidence because of a perceived slowdown in the reform process and increased public anger over corruption.

"I have been told by several large industrial houses that they are now looking at investing abroad as it's much easier. Their aim or strategy is to now have 50% of their turnover from abroad," said Deepak Parekh[16], chairman of the Housing Development Finance Corporation in July 2011. The corporation is one of India's leading finance companies.

"No one is talking about [opening] new factories. Those wanting to do so are getting delayed either because of not getting an approval or land trouble. Basically, there is uncertainty," he continued.

"What is causing this uncertainty? It is just lack of decision[s] by bureaucrats and politicians… There is total paralysis in policy."

In the fiscal year ending March 2011, Indian companies invested $43.9bn outside their home market, according to the Reserve Bank of India. This was a 144% increase over the previous year.

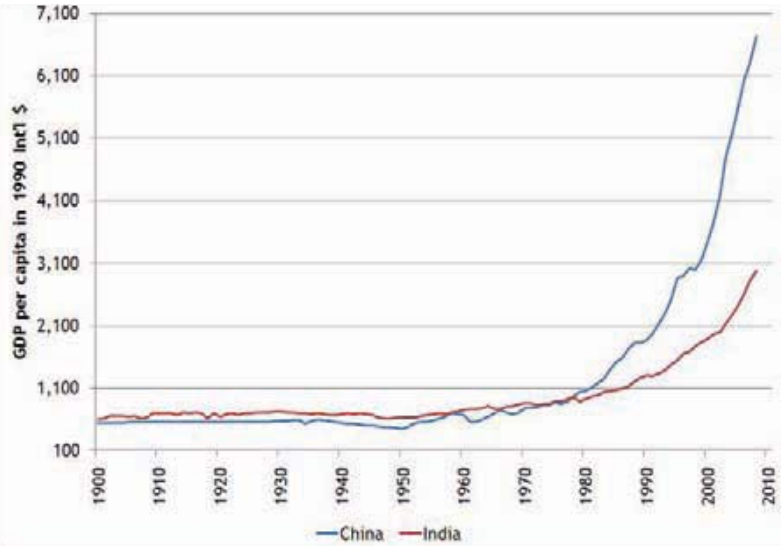


Chart 65: Growth in per capita GDP in China and India, 1900 - 2010

Source of Chart: James Randi Educational Forum

Foreign-direct investment fell by 25% to $24.2bn as overseas companies were deterred by the slowdown in economic reform, corruption scandals, high inflation and high interest rates.

It seemed as if long-running disenchantment with corruption had crossed a psychological Rubicon. Some 80% of those interviewed in a survey conducted in early 2011 said they believed that corruption had got worse rather than better.

India, like China, has above average levels of corruption, as shown in Chart 66 (red colour).

The billions of dollars siphoned-off from the 2010 Delhi Commonwealth Games was a major cause of anger. Most the buildings for the event, which were built at great cost, have since fallen into disrepair, and were constructed after thousands of slum dwellers lost their homes.

Then came the 2G telecoms scandal when the government lost an estimated $40bn from the allegedly crooked sale of licences. A further $40bn was reported to have disappeared in Uttar Pradesh, one of India's seven-poorest states, through money stolen from schemes that subsidise fuel and food for the poor.

The extraordinary popularity of the hunger strike against corruption by the veteran activist Anna Hazare pointed to rising public discontent during the first seven months of 2011. In the end the government was forced to reach a deal with Hazare over anti-corruption legislation.

"Until now we've been funding Swiss citizens' old age. Now it's going to come home," a young Indian professional was quoted as saying in an article in the *Financial Times* in August 2011 by Delhi-based novelist, Rana Dasgupta.

The young professional was referring to "black money" – estimated to total $350bn – $1.4 trillion – that has been moved offshore by domestic businessmen, some of which represents corrupt earnings.

Dasgupta talked of the middle class rage of the hardworking teachers and public servants who believed in "frugality, hard work and nationalism". This middle class was living next door to those who flouted those values in increasingly overcrowded and expensive cities (perhaps these hardworking citizens were also living in rooms smaller than US prison cells).

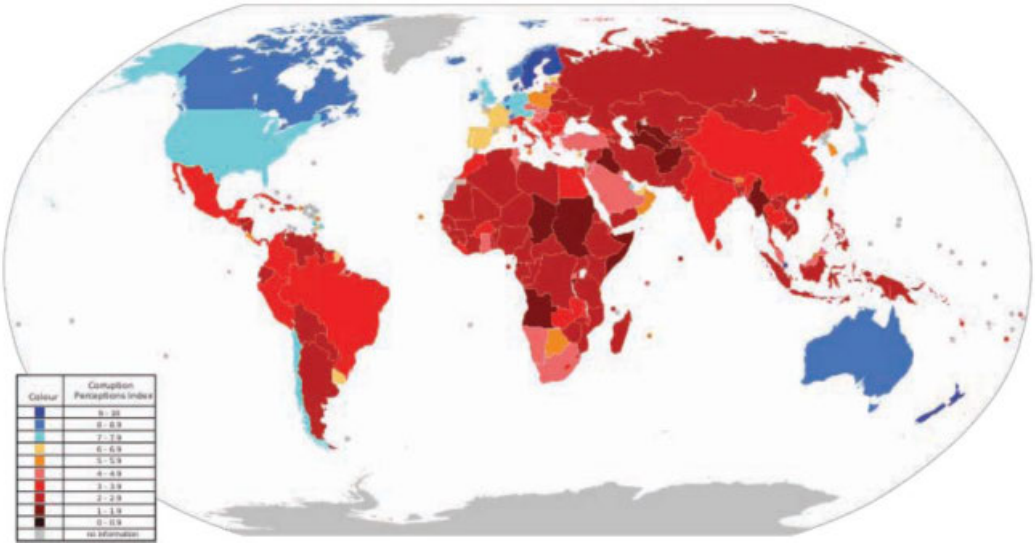


Chart 66: World Map Illustrating Different Perceptions of Corruption In 2010

Source: Transparency International

Seventy-hour weeks are common in India and elsewhere in Asia. Work has traditionally expanded to fill most of the hours available. The Western concept of a 9–5 routine, with evenings and weekends strictly reserved for friends and family, is alien to the middle classes across Asia.

Whether mid-2011 marked a breaking point for India's hardworking professionals, or merely indicated a temporary surge in discontent, was obviously impossible for us to tell as we wrote this chapter.

But public discontent over corruption is likely to remain an issue for India's politicians, even if only in the background; and until or unless corruption is rooted out of the economy, it will remain a drain on development.

The trouble is that corruption permeates many levels of society as the website ipaidabribe.com[17] illustrates. The objective of the website's founder, Swati Ramanathan, is to detail the extent of corruption throughout Indian society and by so doing work out its total economic impact.

Contributors are encouraged to lodge stories of officials asking for bribes, both petty and large, and how they responded. For example, a Bangalore resident in August 2011 disclosed how he was forced to pay 900 rupees to a traffic policeman because he wasn't wearing a motorcycle helmet.

Manmohan Singh's government might not last until 2014, when the next general election is scheduled, because of public discontent.

Lack of progress on reform seems likely as long as the government struggles for survival.

And what might follow if the government loses power? Maybe a new administration will emerge where religious or caste-based interests dominate at the expense of the country as a whole.

Whoever ends up taking office, the same problems we highlighted at the beginning of this section on India will remain.

Infrastructure is worth revisiting as unless, for example, electricity supply and roads are greatly improved, economic growth could soon hit a speed limit.

The government's next FYP (2012–2017) is targeting infrastructure spending of $1 trillion compared

with $500bn during the current FYP (2007–2012)[18].

The $500bn target looks as if it will be achieved, substantially thanks to contributions from private industry – mainly the telecoms sector.

A six-fold increase in private investment will be required if the new target is going to be met during a period when the telecoms industry is under investigation over the 2G licence issue.

Only 12 kilometres (km) of new roads per day have been built during this FYP, compared with a target of 20km/day, with the target for raising electricity generation capacity reduced by 20%.

SUSTAINABILITY VERSUS GROWTH

Every emerging country faces the dilemma of coping with the environmental problems created by rapid expansions in their economies.

The stresses placed on water, food supply and air quality are particularly acute in China and India, representing as we shall discuss in Chapter 7 and Chapter 8 tremendous opportunities for companies that can provide innovative solutions.

In fact, to take this even further, selling more of the same stuff – low-tech, energy-inefficient products – may no longer be possible in certain industry segments.

Take autos in China as an example. In September 2011, government policymakers were leaning towards more limits on the rise in car ownership to address China's steeply rising dependence on imported oil, its traffic jams, air pollution and shortages of land in many areas for more road construction[19].

This was despite strong industry pressure to reinstate reduced sales taxes and subsidies for rural purchases. The incentives had resulted in a 33% surge in sales in 2010 over 2009. After the incentives were removed, January–July 2011 sales were up by just 5%.

Individual cities, such as Beijing, have also introduced restrictions on new vehicle registrations in order to deal with chronic traffic congestion and dreadful air quality.

The government was considering raising minimum kilometres per litre, or miles per gallon, requirements for new vehicles – and introducing subsidies to promote the production and sales of fuel-efficient and battery-powered cars.

For the numerous foreign and automakers who were building-up capacity in China – perhaps on the assumption that the old growth model still applied – these were worrying times. Annual auto production capacity was expected to increase from almost 17m vehicles in 2010 to 31m vehicles by 2013.

Beijing's attitude to the auto industry is consistent with the objectives of its 12th FYP, some of which we highlighted earlier on.

The government wants to reduce carbon intensity per unit of GDP by 17%, with an 11.4% target set for increasing non-fossil fuel use in the primary energy mix. China also aims to increase its forest coverage by 21.7% – 14.3bn square metres. The last FYP did not include targets for any of the above[20].

An Emerging Strategic Industries development plan was scheduled to be announced in the second half of 2011, involving over a trillion dollars of public and private investment into industries, including renewable energy, alternative energy vehicles, and advanced equipment manufacturing.

A second major food price rally in the space of three years has raised questions over the sustainability of existing approaches to growth[21].

Poor harvests caused by bad weather, changing diets as the rich in the developing world eat more meat, and the increasing use of biofuels led to steep increases in maize, corn, wheat and pork prices in January to July 2011.

A further problem is that the supply of arable land in China has been reduced because of the surge in real estate construction since 2008, driven by the country's huge economic stimulus package. As discussed, local governments have become heavily dependent on land sales for revenue – often to real estate developers.

Food prices had previously rallied in 2008, forcing 105m people into the World Bank's definition of extreme poverty. The 2011 food crisis threatened to push a further 44m into extreme poverty.

In the longer term, the question remains, how does the world properly feed itself?

REVISITING THE SCENARIOS FROM CHAPTER 5

Here are the scenarios we introduced in the last chapter. This time we look at the outcomes from an Asian perspective. We also re-examine the same critical success factors to see how they apply to China and India:

THE ALL'S-WELL-THAT-ENDS-WELL SCENARIO

There is a rapid adaptation to the New Normal. Politicians in China effectively resist the vested interests of the SOEs and the state-owned banks etc. The country's leaders are able to control social unrest as the economy is transformed from its over-reliance on exports.

But the changes in the economy are huge and painful for a large percentage of the population. The changes will take a decade or more to complete, during which time there could be periods of sharply lower economic growth as, for example, coastal low-end manufacturing factories are closed down to be replaced by high-tech industries.

This best-of-all-outcomes scenario assumes that the multi-billionaire businessmen, who have benefited the most from China's economic model, accept a transfer of wealth. It also assumes that those lower down in the economic pecking order accept periods of great difficulty. For example, unskilled factory workers on the coast will have to either upgrade their skills or lose their jobs.

In India, political stability will develop, as a single strong leader – or a group of strong leaders – overcomes factional politics driven by the interests of religion and special-interest groups.

Agriculture will be effectively modernised to bring the two-thirds of the population that depend for their jobs on the rural sector into the modern Indian economy.

Education, healthcare and sanitation will all have to be greatly improved. And as with China, a more sustainable growth model will emerge that better protects the environment and reverses some of the damage already caused.

India's rich and poor will have to share the same set of objectives. A greater sense of civil society will develop as corruption is reduced at all levels of the economy.

This highlights the first of our critical success factors – **flexibility**. Companies will constantly need to re-evaluate how they assess supply and demand – and crucially, the rapidly evolving nature of demand – as they adapt their product portfolios.

Unilever chief executive Paul Polman was quoted in our last chapter as saying that European companies will need to be "close to their customers". This is necessary to manage the volatility that will accompany less stable demand patterns, he argues.

His rationale is that companies need to allow consumers to switch price points and product offerings as their circumstances change. This is likely to be important for companies all along the value chains, not just those directly serving consumers.

In China, economic circumstances are going to change as the economy shifts direction. There could be periods of joblessness for factory workers and times where they will need to return to education to acquire new skills.

This will create frequent changes in what they can afford to buy, as will the progress made in moving the industrialisation process inland. Nothing will be a straight line – for example, a steady, easy-to-predict progression of consumption patterns towards the creation of hundreds of millions more Western-style consumers.

In India, too, companies will need to be alive to the success, or otherwise, of economic reforms. How quickly will the poor become slightly less poor? In Western terms, the vast majority of Indians are still likely to remain very poor, regardless of the success of reforms. This will again mean no steady, easy-to-predict progression towards typical Western middle-class consumption levels.

Being close to government policy will as be important for companies. Resources will need to be allocated to understanding changes in policies and how they are being implemented.

THE MUDDLE-THROUGH SCENARIO

In this scenario, compromise deals are reached between politicians and a wide range of special-interest groups, businessmen, workers, local bureaucrats and religious and regional groups.

Reform is patchwork, hesitant – it will go forward, it will go back – leaving China still too-dependent on exports. In India agricultural reform will be only partly achieved. For instance, better irrigation systems will raise output per hectare of farmland, but market-distorting agricultural product subsidies will largely remain in place.

The compromises reached will keep politicians in power by keeping all the various interest groups more or less happy. Major social unrest will be avoided.

This scenario presents numerous challenges for companies as they seek to position themselves to best meet future needs. It again highlights the need for flexibility and staying close to the consumer.

THE IF YOU DON'T KNOW WHERE YOU'RE GOING, ANY-ROAD-WILL-DO SCENARIO

Politicians will entirely give-in to the interests of their most-powerful constituents. The SOEs in China will maintain their wealth and corrupt businessmen and politicians in India will stay out of prison.

In this scenario, societies will remain far-too uneven and driven by frequent bouts of social unrest as the dispossessed demand more money and an improvement in the overall quality of their lives. Better working conditions and a cleaner environment will remain predominant concerns.

Clearly this is not an optimistic scenario. But again, like the second scenario, considering it will lead

us to discover another critical success factor – the need to remain focused on deliverables and real needs. As the transfer of wealth from the rich to the poor will be extremely limited, the demand for new showrooms full of BMWs or Mercedes is going to remain limited.

The fearsomely price-sensitive Indian middle class shopper (again see Chapter 4 for the definition of what it really means to be middle class in India) will remain the norm – meaning they will purchase cheap "big ticket" item consumer goods that will need to be made to last a long time.

This scenario highlights a further critical success factor – that it is important to do something rather than sit back and wait for the position to clarify – to be **action-oriented**. We will be living in a world where there is no obvious strategic path because there is no common objective. If this scenario comes true, companies will need to look closely at individual market sectors and segments, as Polman suggested. This will allow them to form their own views on where the opportunities lie.

THE DON'T WORRY, EVERYTHING-WILL-BE-JUST-FINE SCENARIO

China will take the view that the export growth engine has only temporarily stalled, and that demand from the West will come roaring back. This seems the most unlikely of outcomes right now as China's leaders appear to recognise the scale of the problem. But the leadership is set to change in 2012–2013.

In India, the business of politics will remain the business of making of money out of business. Corruption will continue to be a huge drain on the economy, and the pace of overall economic reform will stay exactly as it is now as everyone accepts that the status quo is good enough.

Again, the assumption will be that the global economy will return to good health and that the rise of the East will resume its previous trajectory. "The Indian way of doing things works, with all its faults, and so there is no need for any major changes," will be the prevailing view.

CRITICAL SUCCESS FACTORS FOR THE TRANSITION TO THE NEW NORMAL

The scenarios we have listed above are, of course, not set in stone. They will evolve and new scenarios might emerge as the transition to the New Normal continues.

Here are all five of our critical success factors and some suggestions on how they apply to China and India:

1. **Flexibility**. This involves adapting to new circumstances and being willing to compromise, rather than holding out for something which is unlikely to be achieved. Don't stick to the old sales plan that assumes double-digit growth for your top-range products. Also, look for opportunities from different and constantly changing patterns of economic growth. For example, a leading producer of the raw material plastics used to make babies nappies tells us that:

i. China has abundant capacity to make the front and back panels for babies nappies, but labour costs in the coastal provinces are now too-high to justify final assembly

ii. India does not have the manufacturing capacity to make the panels themselves because infrastructure problems and restrictive labour practices have held back investment in state-of-the art factories. So China ships the panels to India for final assembly

Critical success factors for companies in the new normal focus on meeting future market needs "Make what you can sell most cost-effectively"

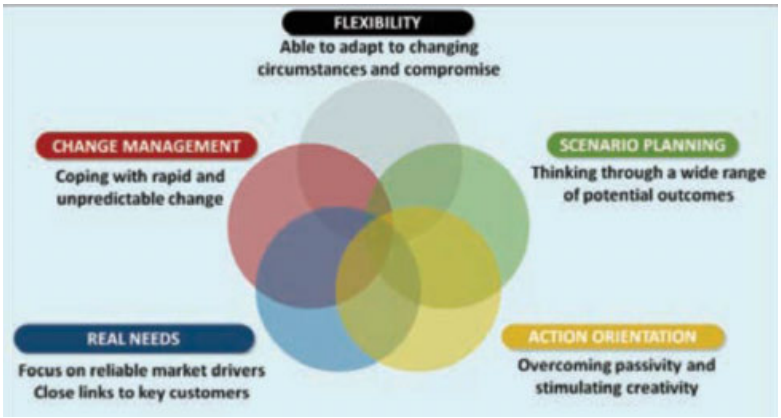


Chart 67: Critical Success Factors in the New Normal

in village workshops, and even in people's homes, where labour costs are lower. The nappies are then sold in the Indian market at a profit for as little as one rupee per nappy.

2. **Change management.** We have all become used to a remarkable degree of stability in the business environment over the past 20 years due to the rapid growth in emerging markets. But there are no guarantees anymore as China and India attempt to redirect their economies.
3. **Scenario planning.** Companies need to plan for uncertainty and recognise that they cannot be certain that even the most carefully considered plans and strategies will work in practice. A one-dimensional view of emerging markets will no longer do. For example, the success of businesses might need to be road-tested under the scenario of China growing at less than 8%/year over the next five years.
4. **Real needs.** The emergence of the middle classes in China and India might not be as you had expected. According to the Asian Development Bank, only 4% of China's population earn more than $20/day[22]. Most people could remain poor by Western standards – meaning that you will have to be able to produce a washing machine that retails for $100, but that lasts for at least five years.
5. **Action orientation.** "If we build capacity in India, the demand will come," said a senior industry executive in 2009, who worked for a leading plastics producer. This type of assumption has driven how individuals within companies think about emerging markets, whereby all you have to do is build capacity in any industry, even if it isn't differentiated or cost-efficient, and you will make money. As we have seen throughout this chapter, the old ways of thinking will not do. Innovative solutions will be needed to meet the needs of the millions emerging from poverty in Asia, as they will be the key

driver of growth in the New Normal. Success will only happen if management teams overcome their own inertia and that of their employees.

Life is always easier when you assume that the future will be the same as the past. But this could prove a dangerous assumption over the next decade.

SOURCES

1 *The Next Convergence: The Future of Economic Growth in a Multispeed World. Farrar Straus Giroux*
2 IMF
3 http://kgcdirect.com/
4 http://www.eurasiagroup.net/
5 Richard McGregor, The Party, HarperCollins
6 http://www.eurasiagroup.net/
7 http://www.icis.com/blogs/chemicals-and-the-economy/2011/08/chinas-bank-lending-nears-its.html
8 http://www.businessspectator.com.au/bs.nsf/Article/China-resources-commodities-prices-Australia-Dutch-pd20110901-L9UJZ?OpenDocument&src=srch
9 http://nextbigfuture.com/2011/03/deaths-per-twh-by-energy-source.html
10 http://www.eurasiagroup.net/
11 http://newyork.ibtimes.com/articles/186208/20110725/china-bullet-train-crash-death-wreckage-bury-hide.htm
12 http://www.bloomberg.com/news/2011-08-29/china-faces-upgrade-or-die-deadline-as-one-child-policy-saps-labor-supply.html
13 http://www.worldbank.org.in/
14 https://www.cia.gov/library/publications/the-world-factbook/geos/in.html
15 http://articles.timesofindia.indiatimes.com/2008-11-25/india/27912135_1_sq-ft-sq-feet-urban-areas
16 http://articles.timesofindia.indiatimes.com/2011-07-07/india-business/29747100_1_deepak-parekh-housing-loan-market-growth
17 http://ipaidabribe.com/
18 http://www.heritage.org/research/reports/2011/08/what-indian-economic-reform-could-mean-for-the-us
19 http://www.nytimes.com/2011/09/05/business/global/china-changes-direction-on-car-sales.html?ref=business&pagewanted=all
20 http://www.eurasiagroup.net/
21 http://www.icis.com/blogs/asian-chemical-connections/2011/09/there-is-no-going-back.html
22 The rise of the Middle Class in the People's Republic of China, Asian Development Bank, February 2011

Chapter 7

Lessons from consumer markets

Consumption dominates chemical demand. This chapter therefore looks at the changes taking place in consumer markets, in order to provide insight into how chemical markets are likely to develop in the New Normal.

The clear conclusion is that companies are learning to re-adapt their business models. The focus on purely financial metrics and shareholder value was very successful in its day, but has now become a dead end. Instead, the great companies of tomorrow will build their businesses by learning to provide products that are of genuine benefit to society.

The boomers' arrival at their peak spending years created a structural change in Western demand patterns. Chart 68 shows how a new 'middle ground' was created, whereby the previous division between providing either luxury goods with high-perceived value, or functional products with a low de-

The middle ground is becoming less attractive as the boomer supercycle ends

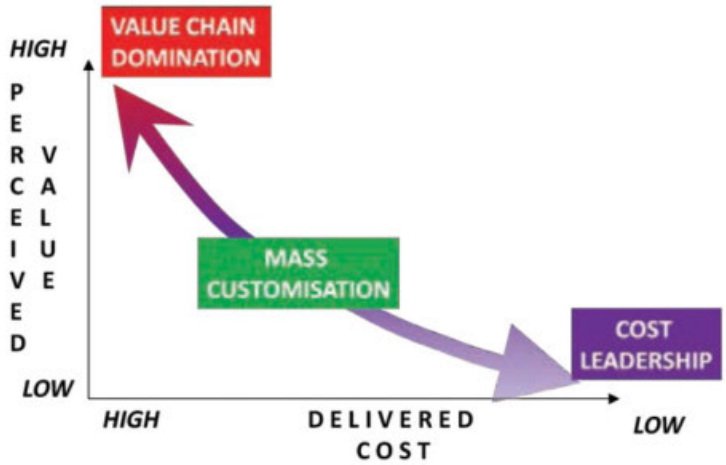


Chart 68: Consumer markets are polarising again

livered cost, became less important. Instead, the major manufacturers aimed to maximise the value perceived by the consumer within the chosen price range.

This led to a major change in the role of branding, as originally invented by Neil McElroy at Procter and Gamble in 1931. He had argued that each product range should be managed as a separate unit by a brand management team. The idea was that its qualities could be distinguished from those of other brands within the company. Wasteful competition would then be avoided between different brands, as each would have their own core value proposition and target markets.

The concept of brand management was thus one that allowed a company to delegate operational authority to line management, whilst retaining authority for portfolio management at the centre. As such, it became a highly successful model. It also led to a tendency by companies to group their offerings within specific areas, based on their core competences, so that they focused either on the luxury end of the market, or on more functional sectors.

However, the arrival of the boomers changed this dynamic. 1980–2000 seemed to make this polarisation obsolete, as consumer companies instead saw the opportunity to refocus on the middle ground of the value versus cost spectrum, via a process of 'mass-customisation'. This meant that consumers were provided with extra value on a cost-conscious basis – often due to the benign influence of the outsourcing model that we discussed in Chapter 5.

Some companies went even further, as in the case of those auto manufacturers who got into the habit of adding so-called 'Go Faster' strips to their cars, as a means of increasing the perceived value of the product. In essence, these companies developed what become known as 'lifestyle brands', which promoted a feel-good mentality amongst customers, but had nothing very tangible behind them. This move proved extremely popular, and many boomers wore their new status with pride.

A luxury suit from Savile Row, or a Dior dress, had always been immediately obvious to those whom it aimed to impress. The label was hidden discreetly inside the garment, and acted simply as a reminder to the owner from the manufacturer.

But for many boomers, the label instead became their own advertisement to the rest of the world, helping to define their own status. Thus, even the simple T-shirt became worthy of a logo. Scarves from Burberry became the badge of the soccer hooligan.

But as we transition to the New Normal, this infatuation with 'show and tell' will become increasingly irrelevant because:

- The ageing boomers no longer have the cash to support the additional costs associated with the 'mass customisation' model. Their pensions are unlikely to provide the kind of lifestyle that they had expected on retirement.
- Equally, their more recent confidence that their homes would represent a 'pension fund' has been shaken. Partly in response to these shocks, they are also no longer valuing themselves by the size of the house they own, or the car parked in the driveway.
- Consumer markets are thus returning to their previous, more bi-polar status. Citigroup has christened it the 'Consumer Hourglass Theory', and are urging investors to "focus on companies best positioned to cater to the highest income and lowest-income consumers"[i].

- Novelist F. Scott Fitzgerald highlighted the chasm that separates these two groups in 'The Rich Boy' (1926): "Let me tell you about the very rich. They are different from you and me. They possess and enjoy early, and it does something to them, makes them soft where we are hard, cynical where we are trustful, in a way that, unless you were born rich, it is very difficult to understand."
- Companies who serve the consumer sector, just as much as consumer companies themselves, need to respond to the transition underway. Otherwise, they risk finding themselves in a 'soggy centre', bereft of pricing power and suffering from falling volumes.

We start this chapter by looking at the challenges posed for consumer markets by the arrival of the 'great unknown'. The boomers became the 'consumer generation' when they were in their peak consumption years in the 25 – 54 age range. But now they are entering the 55+ cohort, their values are changing quite dramatically. Equally, as we shall see, they are not following in the path of their grandparents' generation, for whom 55+ was assumed to be an 'end-of-life' period.

The three case studies that follow will then hopefully provide some key insights into how companies can take practical steps to position themselves for success.

ADAPTING TODAY'S BUSINESS MODELS TO THE NEEDS OF THE OVER-55S

The chemical industry successfully followed this earlier move into 'mass customisation' during the 1980–2000 period, via its development of the specialties sector. Specialty companies targeted the same middle ground, and focused on helping the customer to obtain more value from their purchase.

They also really did provide more value, by assisting the customer to obtain 'value in use', unlike many of their counterparts in the consumer industry. Successful companies became very highly rated in financial markets, as they seemed to be able to sustain high levels of growth and high margins.

But in recent years, as can be seen in Chart 69, specialty companies have found it increasingly difficult to maintain their pricing power under the influence of Asian cost pressures, and the price discovery offered by the internet. They have thus entered a vicious circle, where they can no longer afford the

Companies are adjusting to the transition ahead – by focusing on being low-cost or R&D-led

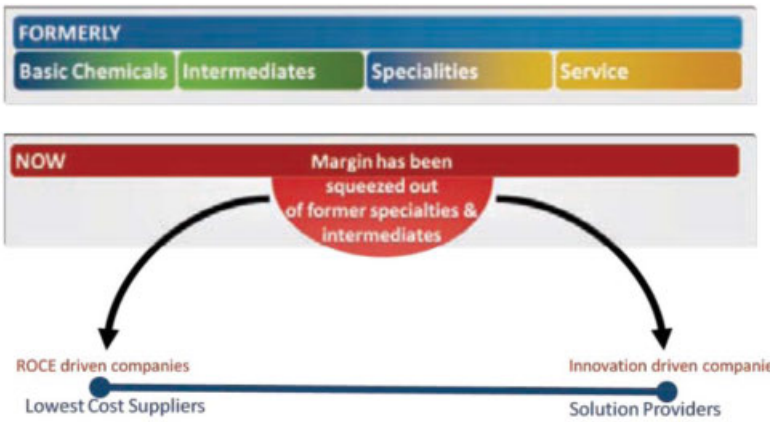


Chart 69: Chemical markets are polarising again

level of innovation required to support the high prices being charged to customers.

Unsurprisingly, therefore, the chemicals landscape is following consumer markets once again, and repolarising:

- Companies such as ExxonMobil and Shell are focusing on cost leadership, as they aim to be amongst the lowest-cost suppliers in their markets. This is also driving them to maximise the use of advantaged cost feedstocks, to help sustain their advantage over the longer term.
- At the other end of the spectrum, companies such as DuPont and Bayer are more focused on becoming solution providers, where R&D is used to maintain market leadership.

Chapter 5's discussion of the Critical Success Factors (summarised in Chart 70), showed that there is unlikely to be one 'right answer' for the transition to the New Normal. Rather, our research suggests that a variety of approaches are now being trialled by different companies. These provide critical insights as to how companies can improve their chances of success.

One key issue behind the changes underway is that the majority of the Western population have not saved enough money to provide the size of pension which they expect to receive. Instead, they have been putting aside perhaps 5 – 10% of their income into a pension fund for 30 – 40 years. They expect this to produce an adequate income at age 65 for the rest of their lives, which might easily be 20 – 30 years.

The problem is compounded by the fact that much of the original saving was done when they were earning a relatively low salary, and yet they expect pensions to be based on final salaries on retirement. It is clear, as shown in Chart 71, that the sums simply do not add up.

This describes the position of a 65-year-old male in the USA who had:

- Earned the median salary between 1979–2010.
- Saved 10% of it each year.
- Achieved the same return as the US S&P 500 benchmark index (red dotted line).

Critical Success Factors for companies in the New Normal focus on meeting future market needs "Make what you can sell most cost-effectively"

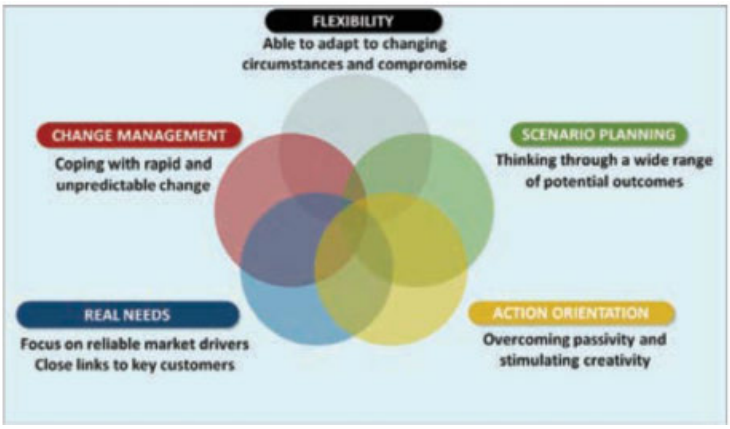


Chart 70: Critical Success Factors in the New Normal

Growth of USA pension fund 1979–2010
(Median annual wages, 10% savings, S&P 500 index growth)

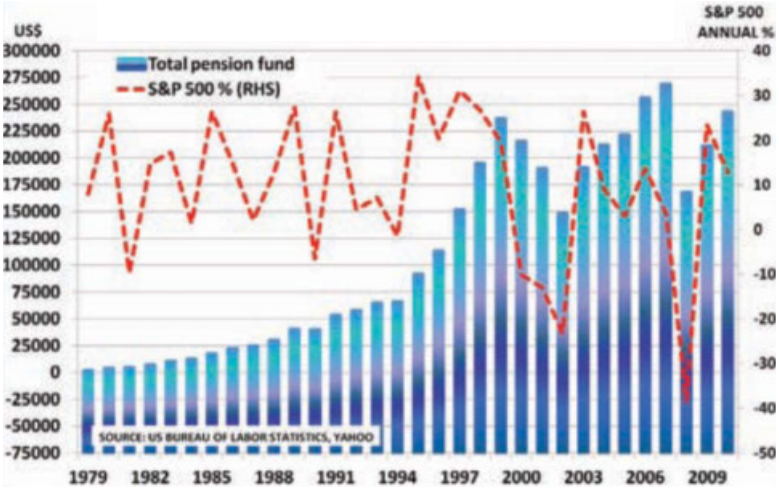


Chart 71: Growth of a US pension fund, 1979–2010

Source: US Bureau of Labor Statistics, Yahoo

This would provide a final pension fund of $242k (blue column). Such a fund might provide an index-linked pension of just $10k/year. This figure would be even lower if he prudently wanted to provide a pension for his spouse after his death, on the basis that women normally live longer than men.

Equally, Americans' equity in their homes halved in value to $6.1trn between 2006 and Q1 2011, severely damaging the earlier belief that a boomer's home could also represent a pension fund[ii].

The rationale for this unhappy state of affairs, as we have already seen, is that politicians and the general public found it easy to extend pension benefits during the rise of the boomers. A large number of young boomers were collectively funding a very finite pension obligation to the small inter-war generation. This generation also had relatively affordable pension needs, as Western life expectancy even in 1950 was only 66 years, in line with the pension age.

Today's story is quite different. If Lloyd George or Bismarck were alive today, they would be astonished at the idea that the majority of the population would expect to receive a pension and retire. This was never their intention, as we have seen, and they would have thought it an impossible dream.

The dilemma is that in the space of 100 years, the concept of a pension has changed dramatically:

- It had been based on the idea that society would pay a small sum of money to a small number of people for a very small period of time at the very end of an exceptionally long life.
- Today, it has become seen as an earnings-linked benefit payable to the vast majority of the population for a period of time that might now easily last for half of their working life.

The obvious solution would be to retrospectively index the pension age to life expectancy, in order to make payments affordable again. This would cause howls of protest, however, as people understandably now regard their pension as a 'right', not a 'benefit'. Politically, therefore, this would prove difficult, if not impossible, to achieve.

Doing nothing, however, is not a great option. In the US, for example, analysis by Credit Suisse suggests that company pension funds had assets worth only 78% of their liabilities at the end of H1 2011, due to a funding gap of $388bn. Lower interest rates, and falling equity markets, mean that this position becomes even worse[iii].

Thus there is an increasing probability that some, maybe many, company pension schemes will eventually be unable to meet their commitments and default. This would leave their beneficiaries without any source of income. It would also lead to the loss of jobs and tax payments as firms go bankrupt.

The outcome of today's position can therefore probably best be defined by the maxim 'what is too good to be true, usually is'.

The issue, of course, is whether the boomers choose to focus on the downside or upside aspects of the issue. In time, they may become more energised by the amazing benefits they have gained by adding an extra decade to their life expectancy, compared to their grandparents' generation.

But even if they do recognise the benefits, society will still need to develop creative options to allow the boomers to work part-time beyond a certain age. The focus will have to be on utilising the skills and experience of the older generation, and not on asking them to undertake manual labour.

This would, looked at dispassionately, represent a genuine win-win for most people. There is plenty of medical evidence to show that health declines quite rapidly if a person is no longer engaged in some form of activity. We are wired to be busy, and this keeps our minds alert and our bodies fit.

This would also benefit the wider economy – not only by keeping health bills affordable, but also by keeping up employment numbers. In turn, this would boost individual incomes and national government finances.

The boomers, after all, have never seen themselves as simply following in the footsteps of their parents' generation. When Paul McCartney sang 'When I'm Sixty-Four' on The Beatles' iconic Sergeant Pepper album in 1967, he highlighted the young boomers' worries over whether they would still be needed, and fed, on reaching this age.

The underlying assumption behind 'When I'm Sixty-Four'' was that the world would become quite different. It accurately predicted how the boomers would come to value relationships over consumerism, as they began to age in large numbers.

Thus it is becoming essential that companies start to plan for a different era. Chart 72, based on Euromonitor data assembled by McBride – Europe's largest own-label consumer products company – maps the changing focus of the Western consumer. Their research suggests that:

- Consumers no longer define themselves by the size of their car, house or new kitchen.
- Instead, their focus is in 5 key areas:
    1. Value for money – they are highly price sensitive.
    2. Simplicity – they are looking for less complex lifestyles.
    3. People, not things – family and friends are increasingly important.
    4. Values – they value trust, and are concerned about their carbon footprint.
    5. Convenience – they want products to last, and to be available locally.

These represent quite dramatic changes from the values espoused by the boomers when they were in their peak consumption years.

Chart 72: Western consumers refocus on people, not things

Tesco, for example, the UK-based global retailer, is starting to respond to these changes. Turnover in its vast superstores, formerly its key profit and growth driver, is now under pressure. In response, it is trialling a 'clicks and bricks' strategy. This allows consumers to order online from their homes and then collect their goods from a local store. It avoids the inconvenience of either having to drive to a distant superstore, or waiting around for a delivery that never arrives on time.

Similarly, frugality is on the increase. In the USA, consumers are now holding on to new cars for an average of 63.9 months. And the average for all cars, including used ones, is also a record at 52.2 months[iv]. Having a new car in the driveway is no longer seen as being essential as a statement of one's self-esteem. We are moving away from the 'disposable society', where products were thrown away long before they broke down, as fashions changed.

This is leading to slower growth for consumer product companies such as Colgate-Palmolive, as people squeeze out the last bit of toothpaste in the tube, and add water to the shampoo to make it last longer. Frugality is thus allying itself with conservation:

- Jeans manufacturer Levi Strauss is already profiting from this new trend, by telling customers how to minimise the number of pairs of jeans that they buy. It encourages them to wash their jeans less often, and in cold water. The idea is that the jeans will last longer and water usage will be reduced. The aim is to build trust with consumers, whilst also emphasising the durability of the product.
- Energy company British Gas, the UK's market leader, is offering to install free loft and cavity wall insulation for all its customers. It has realised that future growth is unlikely to be dependent on simply building more and more power stations, and piping more gas.
- Similarly, the world's largest energy company, ExxonMobil, believes that "the most important 'fuel' of all will be energy saved through fuel efficiency[v]".
- Consumer products company Procter & Gamble is following the same path. During the golden age, it only operated in the top segments of most markets, where strong branding and marketing enabled it to generate premium pricing. But over the past 2 years,

60% of all its new laundry and detergent product launches have been in the lower-tier segments. Even global brands such as Pampers – the leading disposable nappy (diaper) – are now also being targeted at the 'own label' segment.

- Renault, the French-based global auto company, reports that 25% of its sales are now of low-cost models. These were first introduced in 2004, in emerging markets such as India, but with prices starting at €7,600 ($10,500), half of these sales are now in Europe. These are 'no-frills' entry-level models such as the Dacia, which sold 250k in Europe in 2010[vi].

All of these examples highlight the importance of the Critical Success Factors set out in Chart 70.

Change management skills and scenario planning are going to be a vital part of corporate strategy in the future, as companies seek to understand future market needs in the West, as well as the emerging economies. Renault, for example, didn't intend to sell the Dacia in Europe when it began manufacturing in Romania. But it moved quickly when it found that the cars were being sold there by independent importers.

Similarly, P&G had trialled the new value version of Pampers in Belgium in 2007, only for it to then be shelved for fear of cannibalising sales of its existing brands. The advent of the great recession in 2008, however, led to a greater willingness to experiment and take risks, as the alternative was to accept a permanent loss of volume and profit.

Action orientation is also an important direction for every company, as we move into the New Normal. Doing nothing, and hoping that the status quo will continue to prevail, is no longer the low-risk option. 'Who dares wins' might instead be a good motto to post on every boardroom wall. This, after all, is how the great companies of today have survived in the past, through world wars, depressions and many other equally uncertain times.

PROCTER & GAMBLE TRANSITIONS TO THE NEW NORMAL

Procter & Gamble is the world's largest consumer products company. Its purpose statement is "to touch and improve lives, now and for generations to come". And in 2009, it updated its growth strategy to become "More consumers in more parts of the world, more completely". Chart 73 highlights how their strategy fits with the Critical Success Factors we have developed.

P&G argues that "a purpose-inspired growth strategy is intrinsically rewarding and motivating (because) it unleashes creativity, commitment and peak performance"[vii]. In addition, it believes that it attracts talented people and partners to work for and with P&G, whilst also building goodwill with external stakeholders.

FLEXIBILITY

P&G used to be seen as having a monolithic culture, based in the US midwest. It tended to focus on affluent consumers in the West, and to operate in the most value-added segments rather than in those that were more price-competitive. For many years, of course, this was a highly successful strategy. But in the end, even for a giant company like P&G, it meant that growth became increasingly hard to find in its 38 major product categories.

P&G's focus on meeting future market needs: "P&G aims to reach more consumers in more parts of the world, more completely"

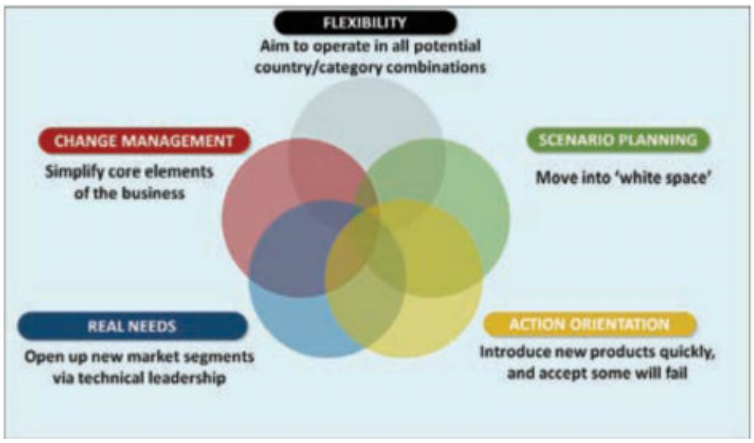


Chart 73: How P&G strategy fits with out Critical Success Factors in the New Normal

The new strategy opens many more doors, by helping to reduce the internal barriers to growth. In 2010, P&G was competing in less than 50% of potential country/category combinations in its top 50 markets. Suddenly, as a result of its new-found flexibility, it discovered it had a "tremendous growth opportunity", by positioning itself to fill out the product portfolio in every category and expand in the most relevant geographic markets.

CHANGE MANAGEMENT

One key aim for P&G is simplification of its business. It has always been a very disciplined company, with a talent for cash management and cost reduction. But this, alone, was no longer enough to take it forward. So instead it has adopted a number of targets that will enable it to drive out costs by simplifying the way it does business.

For example, it estimated in 2010 that it had over 16,000 product formulas and used more than 4,000 colours in its product labels and packaging. It now aims by 2012 to reduce these product formulas and specifications by 30%, whilst reducing the number of colours used by 50 – 75%. These are, of course, major challenges. P&G has recognised this, and aims to be successful by adapting its proven global product launch processes, under the leadership of line management.

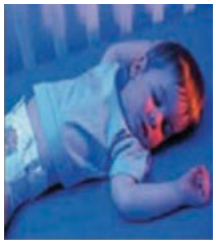
REAL NEEDS

Bob McDonald, P&G CEO, argues that their purpose is "a game-changing growth strategy" and not merely "a noble ideal". It is also backed by real cash, with the R&D budget now set at nearly $2bn. Some of this money goes into taking existing products into new markets. In China, for example, it has launched its highly successful Crest toothpaste brand, via its traditional focus on oral hygiene and lifestyle appeal.

But it has also broadened its approach quite significantly. In Africa, it has launched

a holistic campaign to increase the number of women who use sanitary pads for protection during periods. This includes a puberty education campaign which now reaches three million women. Commercially, this has helped to boost the number of sales outlets, but it is also reducing the number of girls who miss school during their period.

SCENARIO PLANNING



P&G, like many companies, was taken unawares by the start of the great recession in 2008. It was caught flat-footed, with sales down 4% in Q2 2009, and profits down 18% versus the previous quarter. It responded by developing the concept of "white space" opportunities, where it had not previously competed. As these were unknown segments for P&G, it necessarily had to develop different scenarios, particularly in order to ensure that it didn't simply cannibalise existing higher margin sales.

One example of this is in the Pampers nappy brand, where P&G has global leadership. Traditionally, however, it had not competed in the lower priced own-label market. But it had previously test-marketed a product in Europe, and so was able to use this data when planning the new range. Even though time was of the essence, it still spent time modelling the optimum positioning for the new product. It also introduced a number of modifications to existing products to help secure their positions in premium sectors.

ACTION ORIENTATION

P&G moved very quickly once it had recognised that its premium pricing strategy was no longer producing results. McDonald noted in October 2010 that 60% of all new laundry and detergent products in the past 18 months had come from entering lower-tier segments. This is an impressive rate of market innovation by any standard, and clearly the organisation was galvanised to adopt new ways of working. Equally, such an action orientation involves an acceptance that some innovations will not work.

An example of this was when P&G ended its trial of a Tide Basic product in the USA. This was a laundry detergent using the Tide brand name, but offering reduced technical performance and a 20% price advantage. However, within a year, P&G rethought its position and (presumably to avoid cannibalisation) re-launched its Cheer product in the same market segment with a 13% price reduction.

P&G is one of the largest companies in the world, with sales of around $80bn a year. Therefore, its new direction does not only affect its own organisation. It also impacts the thousands of companies that supply P&G, and partner with it. Equally, of course, P&G is not acting in isolation:

- It reacted initially because it was losing market share to more nimble competitors.
- These faster-moving companies have already moved in similar directions as P&G.
- Slower-moving companies will also have to react, or risk going out of business.
- Thus, most suppliers in the value chain will also be forced to respond over time.

P&G is introducing these changes on a global basis, not just in its Western heartland. It needs to do this, as otherwise it cannot fill in the 'white space' that it has identified as being a core area for future

Chart 74: Traditional family travel by motorbike in India

growth. Thus its new direction will not just affect Western companies. It will impact companies who currently do not even think of P&G as being a likely competitor in their regional or geographic markets. And in turn, this will impact their supplier base across the entire chemical industry.

TATA MOTORS IN THE NEW NORMAL

P&G is one of the oldest companies in the world, having been founded in 1837. By contrast, Tata Motors of India only moved into the passenger car market in 1991, as a step-out from its existing business as a manufacturer of locomotives and commercial vehicles. And it was only in 1998 that it introduced India's first entirely indigenous passenger car, the Indica.

Yet since then it has produced a total of two million cars. And more recently, it has pioneered a potentially game-changing new model, the Nano, which aims to be the cheapest passenger car in the world. Interestingly, as with P&G, this is based upon an holistic view of the world, and a purpose statement that goes beyond mere financial imperatives.

Tata's chairman, Ratan Tata, identified a market opportunity from the alarming road accident statistics in India. This is a country where 10m motorbikes are sold every year, versus just two million cars. And as Chart 74 shows, these bikes are often used for family transport. In turn, Tata found that 600 people die each year on two-wheelers in the capital, New Delhi, compared to just 90 people in cars. Within India, Tata's strategy is therefore:

"To leverage the company's strengths in the design and development of products for the base of the pyramid, namely addressing the often-underserved large potential market at the low-end, whilst also growing in the higher priced segment"[viii].

This led to the launch in July 2009 of the Nano, shown in Chart 75. It is the lowest-priced car in the world, with the cheapest version selling for under $3,000. This has been achieved by adopting the "no-frills" model of the airline industry, and a consistent focus on driving down costs. Clearly the use of low-cost Indian labour has helped with this target, but so has the decision to reduce steel usage in favour of plastics (thus reducing weight and increasing fuel efficiency).

In addition, the concept of the car represents a comprehensive redesign, such that the trunk is only

Chart 75: the Tato Nano car

accessible from inside, as well as a large number of minor changes which together make a considerable difference – for example, using three wheel nuts instead of four. The car also lacks a number of essential features common in Western markets, such as airbags and radio/CD players. An export model is planned, which will include these and other features, for around the double the cost.

Thus, as Chart 76 shows, the Nano can also be used to highlight the importance of the Critical Success Factors we have discussed earlier.

Tata's problems since the launch of the Nano also provide a good 'sense check' for these factors, and highlight their importance during any implementation process. This 'sense check' emphasises that having a great strategy, and a powerful organisation, are not enough to guarantee success in the New Normal.

Tata's focus on meeting underserved market needs: "It aims to leverage the company's strengths in design and development to address this market"

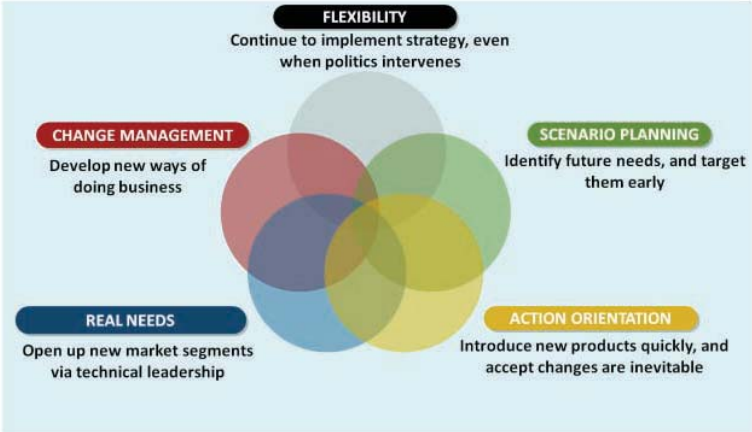


Chart 76: Tata's Nano car highlights Critical Success Factors in the New Normal

FLEXIBILITY

Tata's concept for the Nano shows great flexibility in itself, with its willingness to contemplate not just an Indianisation of Western models, but a complete redesign. It has also had to cope with major problems that arose at its original manufacturing site at Singur in West Bengal. Strong protests by local farmers eventually forced Tata to close down the site and transfer production to Sanand in Gujarat.

This was achieved in just 14 months, which Tata claims is a record for any new car manufacturing plant to become operational. And in the meantime, whilst the new plant was being built, Nano deliveries were made from the Tata plant at Uttaranchal. Further evidence of Tata's flexibility is that whilst the Sanand plant was designed to produce 250k Nanos, it has the capability to expand this volume to 500k, assuming sales take off as planned.

CHANGE MANAGEMENT

A key area for the Nano's development has been the need for a new business model, designed to make the car affordable in the targeted market. One of the main reasons for the under-serving of markets at the bottom of the pyramid is that people in these segments have very little spare cash and zero credit history. Credit is generally not available to them, except from loan sharks at penal rates of interest.

Tata was slow to recognise this as a problem in the early days of the Nano's launch. But then CEO Carl-Peter Forster realised in 2010[ix] that this, alongside the lack of a national distribution system, could destroy Tata's ability to build volume sales as planned. Forster also recognised that as India's largest auto company (with sales of $27bn), Tata had significant influence when it came to finding a solution. Tata has since persuaded a large number of finance companies to enter the market, offering packages which include 90% loans.

REAL NEEDS

The Nano is clearly targeted at a completely under-served market, and one that has a real need for better transport solutions. It is pioneering the concept of 'frugal engineering'. Thus it aims to be a widely affordable car for India's emerging middle class, whilst being light and simple to drive, yet made from high-quality materials. As Ratan Tata said at its 2009 launch: "Here in India we see four people travelling by motorbike… I thought they could travel more safely by car. However, in the United States it could be for younger [people] who want a low-cost car".[x]

Tata has already begun to roll out sales to other developing countries with similar demographic profiles to India. It started with Sri Lanka and Nepal, and expects to target China and others in the future. The Nano also seeks to address issues of sustainability, by being the most fuel efficient car on the road. It covers 24.6km/litre (58 miles/US gallon) according to India's Automobile Research Association. In addition, it emits only 101g of CO2, which is the lowest on sale in India, and also low for developed markets.

SCENARIO PLANNING

The Nano has not had the easiest of introductions, and even today its success is by no means assured. One key reason is that Tata seems to have failed to follow P&G's example, and didn't undertake suffi-

cient scenario planning before its launch. Understandably, Tata has had to innovate in a large number of key areas, including manufacturing, design and financing – and it has not got all of these 'right first time'. But it would appear that many of its problems have been self-inflicted, due to not having taken the planning process to the next level.

It will be interesting to see if they learn from this experience, as they now plan to produce different versions of the range, starting with a diesel version and moving on very quickly to an electric model (pictured at the Geneva Motor Show). This represents a major challenge to conventional product development models, which would normally expect to fully establish a new range, before moving on to offer seemingly futuristic extensions such as an electric vehicle.

ACTION ORIENTATION

Tata has clearly made mistakes with the launch of the Nano. The choice of manufacturing site had to be revised, and the Nano's actual specification turned out not to be as attractive as first expected. Problems were also reported with the exhaust system, which had to be rectified. However, Tata has not reacted defensively to these problems. As R Ramakrishnan, VP commercial for passenger cars told the Wall Street Journal: "we are still at the early stages of understanding the market for the Nano. We are going through the learning curve. We are trying a lot of things in our marketing activities"[xi].

Thus it now offers a standard four-year/60,000km manufacturer's warranty, at no extra cost, and has extended this to all existing owners of the car. Similarly, Tata has made the car more robust, with enhanced features in the car's electrical and exhaust systems. These are standard for new customers, and are also offered to existing owners at no extra cost.

Tata's launch of the Nano thus offers an excellent example of the need to think through an implementation plan in relation to the Critical Success Factors that we have developed. Mistakes and dead-ends will still be inevitable, as P&G found with their Tide Basic launch. To an extent, one cannot avoid the 'learning by doing' process, during such a major transition as the one now underway to the New Normal.

But failure to properly consider one's implementation plan in the light of the Critical Success Factors can clearly jeopardise the chances of success. Nano sales today are well below those expected, and have failed to build on its early momentum due to the problems encountered. This is a salutary lesson for a company like Tata, which is the market leader in India's auto industry.

Of course, one key strength of its approach has been that it has admitted mistakes, and not tried to ignore them. Tata appears comfortable with going up the learning curve in real time, and in public. This confidence seems to come from the belief that even initially flawed offerings represent a step-change in performance compared to existing products on the market. This is clearly a very valuable characteristic.

PATH'S CREATION OF A VIRTUAL VACCINE COMPANY

Tata's way of working contrasts very sharply, however, with our final case study. The relatively unknown success of the Meningitis Vaccine Project (MVP) is one of the most remarkable of all New Normal opportunities, as it shows how it is possible to create a completely new business model in a very

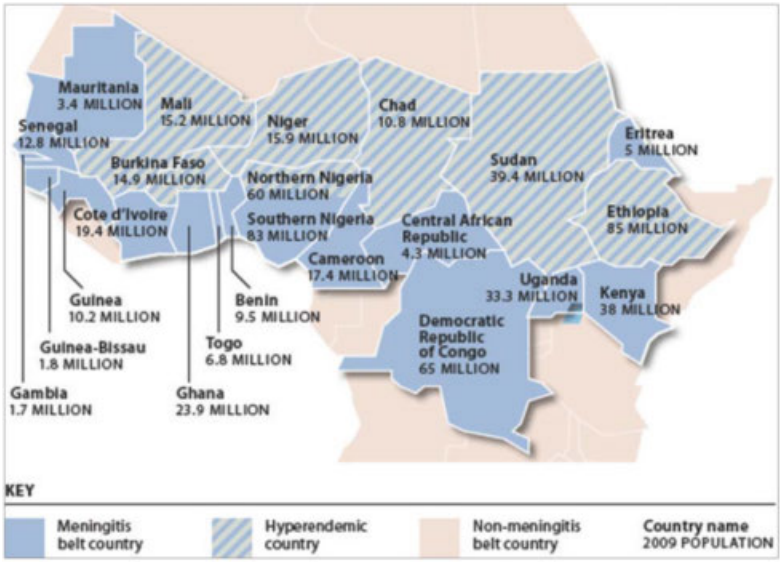


Chart 77: Map of Africa's meningitis belt

traditional and heavily regulated field such as vaccines.

The first interesting feature of the business model is that the Project is a virtual company. It was established in 2001 as a partnership between PATH (a not-for-profit healthcare organisation), the Bill & Melinda Gates Foundation and the World Health Organisation. They were responding to the deadly meningitis epidemic of 1996–7 in sub-Saharan Africa, which killed 25,000 people and left many others scarred for life.

A second key feature is that it was established to do the impossible. Its aim was to develop a 50 cent vaccination to protect 450m people at risk from meningitis in the region. Chart 77 shows the area affected, between Ethiopia in the east and Senegal in the west.

Meningitis can cause loss of hearing, severe brain damage, or death. It is particularly a killer in sub-Saharan Africa, where 5,000 people died as recently as 2009 across 14 countries. Meningitis A is the main danger, killing one in 10 of those affected within two days of the symptoms appearing. It also accounts for 90% of all meningitis epidemics in Africa. One in four of those infected suffer permanent damage such as hearing loss, mental retardation, seizures, paralysis of infection requiring amputation of limbs[xii] and learning disabilities[xiii].

When MVP was initially established in 2001, the obstacles in its way were formidable. Its way of overcoming these obstacles, and its successful development of a virtual business model, are therefore of great interest for anyone in the business community:

- Western pharma companies were not interested in developing low-margin drugs for sale to the developing world. Most saw more profit potential in focusing on traditional 'blockbuster-type' drugs and lifecycle drugs for wealthy Westerners, as these could achieve billions of dollars in sales.
- This forced MVP to look at alternatives. They began to realise they would have to develop their own business model if they were to succeed. So they began working with the Serum Institute of India, a vaccine manufacturer located in a developing country.

- They then teamed up with Synco BioPartners in The Netherlands for the supply of the necessary raw materials for the proposed vaccine – the protein tetanus toxoid and the group A polysaccharide antigen.
- Next, they needed access to the technology and intellectual property (IP) surrounding their proposed method of making the vaccine. This conjugation technology is valuable and highly protected, but MVP was able to form the necessary partnership with an off-shoot of the US Food and Drug Administration (FDA) – the Center for Biologics Evaluation and Research.

Having put the mechanisms in place, the Project could then tackle the real challenge. Making the vaccine was expected to be a technical issue, with a good chance of success. But making the vaccine at an affordable price was an immense challenge.

This, of course, highlights the ground-breaking role of the Bill & Melinda Gates Foundation. It is strongly against the 'cheap and cheerful' approach to science, where money is spent simply to deploy old technologies. Instead, as Bill Gates has highlighted a number of times, it believes in supporting projects that are capable of achieving real breakthroughs by funding basic research. This approach is behind the success of many of today's great companies. But the recent short-term shareholder value focus of financial markets has made the model much harder to emulate.

One further problem for MVP was the need to develop its own economic model in order to conduct a cost-benefit analysis. Typically, poor people in Africa and elsewhere have been ignored as a target market. But a pioneering study by the French organisation, l'Association de Médecine Préventive, in Burkina Faso in 2007 showed how preventing meningitis could be a catalyst for economic growth, by helping families to avoid falling back into poverty[xiv]. This would help them to remain productive, and lead to an improvement in overall economic prospects.

The study found that just a single case of meningitis would cost a family $90. This represented between 3 – 4 months of the family's disposable income. Money was spent on existing medicines, nursing care and transportation to hospital, wages and other direct and indirect costs. If an adult died, then the financial consequences were, of course, even more severe.

Meningitis epidemics would often overwhelm rural health services, causing nurses and doctors to abandon other vital activities. In Burkina Faso, the study found that fighting a meningitis epidemic cost 5% of the government's total health expenditure.

MVP therefore shares a number of important characteristics with both P&G and Tata. Crucially, they all take a holistic view of the world, and operate in accordance with objectives that go beyond mere financial imperatives. As Chart 78 shows, it also provides further insight into the Critical Success Factors we have identified earlier:

FLEXIBILITY

The MVP is based in a very difficult geography. It also has to deal with a very wide range of stakeholders – its customers are some of the poorest people in the world, whilst its main funder is the world's wealthiest person. MVP found it impossible to attract the interest of the established Western pharma players, and therefore had to strike out on its own and develop a virtual partnership involving people

MVP develops a new business model:
"A virtual partnership delivers an otherwise impossible target"

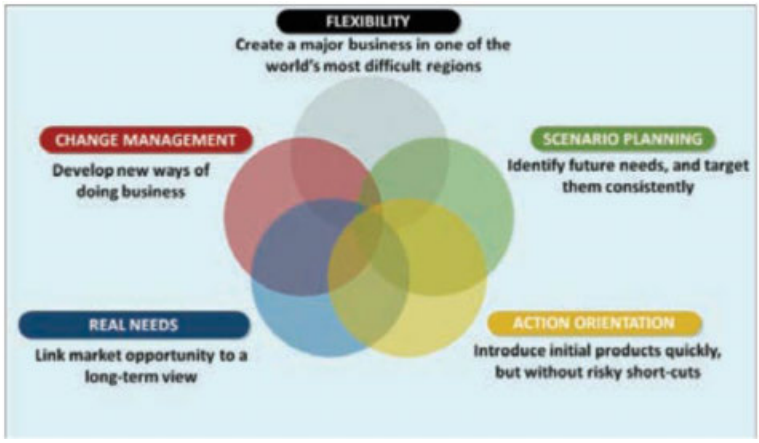


Chart 78: The Meningitis Vaccine Project highlights our Critical Success Factors in the New Normal

and organisations who had never worked together before.

It has therefore shown great flexibility in developing products alongside users and its sponsors, and in developing a business case based upon a pioneering cost-benefit assessment of the opportunity. In addition, MVP has managed to keep governmental sponsors onside with its development, and has avoided becoming part of energy-sapping debates about how its objectives should be achieved.

CHANGE MANAGEMENT

Clearly, MVP has developed a completely new way of doing business in this market. It has not tried to bypass existing channels to market – government, health professionals for example – as this would have doomed the project to failure. Instead, it has enlisted their support, and allowed them to dictate key terms. The 50 cent target was probably the most important single fact in ensuring that the project can be successful, and this was set locally, not in the West.

The development mechanism for the vaccine has also been very innovative. It is easy to overlook the very real difficulties that develop when professionals from different disciplines and cultures are asked to work together on a project. MVP has managed to foster a very successful and collaborative way of working that focuses everyone concerned on the importance of the long-term objective.

REAL NEEDS

The MVP has not set out to be a simple 'do-gooder' type of project, where everyone feels better, even though no real progress is achieved. Instead, it has undertaken its own research to identify the value that is being created by, for example, enabling even the poorest people to achieve financial benefits by reducing treatment costs. This willingness to understand the importance of avoiding negative outcomes – a $90 cost of treatment – sets it apart from much of conventional business economics.

It has also been realistic about the nature of the product that it has had to create. Vaccines to treat meningitis do already exist, and have been administered when epidemics strike. But they have severe

limitations, particularly in terms of cost and efficacy. The MVP will give protection for 10 – 15 years, instead of the current 2-3 years from existing vaccines. And it may also provide 'herd immunity' – those immunised may block colonisation of the disease in the wider community.

SCENARIO PLANNING

The MVP timescale meant it was essential to consider a range of possible scenarios. Even today, some 10 years after the original launch, a number of critical unknowns remain. For example, the actual impact of the vaccine on the general population could not be known before vaccination began, in terms of whether 'herd immunity' would be established and its likely extent. This is because it is the first conjugate vaccine to specifically target group A meningococci – the pathogen responsible for most epidemics in the region.

Equally, MVP had to consider both the scientific element of the project and the implementation programme, which included meeting the regulatory requirements and strengthening the host countries' ability to administer the vaccine successfully. In addition, a timetable had to be developed for rolling out the vaccination programme, as clearly not everyone could be immediately protected. This also involved considerable forward planning, and the ability to gain agreement from a wide variety of stakeholders.

ACTION ORIENTATION

Introducing a new vaccine into a developing country is one of the most difficult challenges that any organisation can face, given the lack of support infrastructure. Medical standards have to be met, and cultural issues recognised. Equally, as many NGOs have found over the years, it is critical to obtain ownership of the project from the people who are going to be most affected by it. Simply dropping in Western aid workers, and trying to ignore potential issues in a rush to achieve the objectives, is a sure guarantee of failure.

MVP has moved very quickly over the past 10 years. It has been willing to adopt parallel pathways in order to reduce timescales. At the same time, its project plan has been developed very carefully, to ensure that critical inter-dependencies are not ignored or compromised. The organisation has also continued to look forward, and is now aiming to gain WHO approval for the infant version of the vaccine by 2013.

Overall, the project is clearly now becoming a success. The vaccine itself was developed at a cost of less than $50m, a fraction of the $500m that would have typically been expected. Already, 19.5 million people have been vaccinated since the programme began in June 2010. MVP believes that a total of at least 250m people need to be protected.

PROF MICHAEL PORTER'S SHARED VALUE CONCEPT

Michael Porter is recognised as one of the great management thinkers. His work on competitive forces and company strategy has influenced all the major companies over the past 30 years. His latest work, on the "need to reinvent capitalism – and unleash a wave of innovation and growth", provides an excellent way to conclude this chapter.

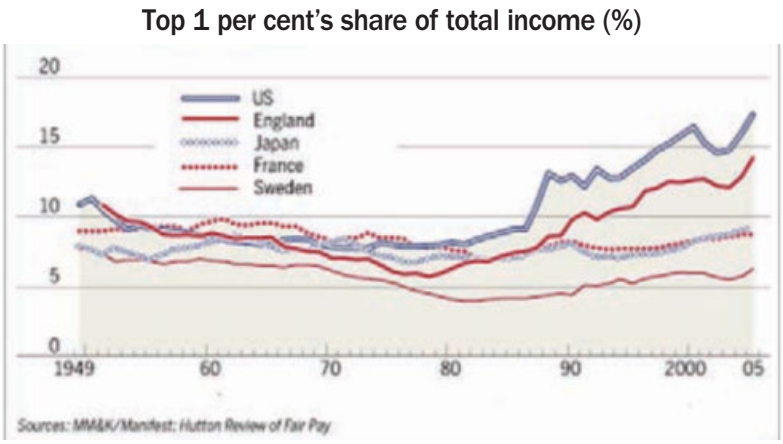


Chart 79: Top 1% share of total income, 1950–2005

Source: Financial Times[xvii]

Professor Porter titles his article 'Shared Value'[xv] and takes as his main theme the idea that companies: "Continue to view value creation narrowly, optimising short-term financial performance in a bubble while missing the most important customer needs and ignoring the broader influences that determine their longer-term success".

He goes on to argue that leaders and managers need "to develop new skills and knowledge – such as a far deeper appreciation of societal needs, a greater understanding of the true bases of company productivity and the ability to collaborate across profit/non-profit boundaries". At the same time, he emphasises that the role of governments also needs to change. They need to become enabler s of shared value.

This leads him to define a purpose statement for corporations that is "redefined as creating shared value, not just profit per se. This will drive the next wave of innovation and productivity growth in the global economy." This is very similar to the message of the three case studies that we have described in this chapter.

Porter also discusses whether taking a more societal approach might in some way damage companies' ability to operate. One argument put forward in recent years by the supporters of the shareholder value concept has been that companies should only exist to maximise shareholder return. In other words, they should aim to reduce costs to a minimum and so maximise profits.

When this argument began to emerge in the mid-1980s, it was widely thought that companies had become too big and lost focus. It was further charged that managements ran firms for their own benefit, with no thought of the needs of investors – who were supplying the cash that enabled them to operate. In addition, of course, many industries featured state-owned companies, which were unresponsive to their customers and had no sense of a wider purpose.

Thus, the idea of using metrics such as return on equity to measure financial performance, and the balanced scorecard to measure customer satisfaction, seemed a sensible way forward.

However, like many management trends, what started out as a new direction has actually taken us back to where we started. Today, too many CEOs and their boards run their companies for their own benefit, and focus on ensuring that their own financial rewards are as high as possible. This is most true of the financial sector, of course, where investors have recently begun to complain that "investment

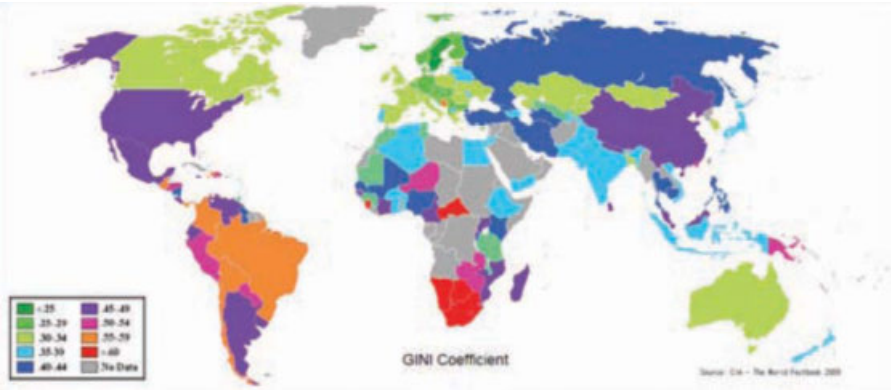


Chart 80: GINI coefficients 2009

Source: Wikipedia, CIA Factbook

banks have become like football clubs". As Julian Cane of fund managers F&C Asset Management told Bloomberg:

"Being a footballer must be great fun and very lucrative. But owners of football clubs rarely make any money. It's better to play for the club than to own it"[xvi].

In 2010, these investors claim, Barclays Bank paid out 22 times as much to its employees as to its shareholders, handing over £11.9bn in compensation versus £531m in dividends.

But, of course, financial firms are not alone in prioritising the welfare of their employees above that of their owners.

Chart 79 from the Financial Times shows how the top 1 per cent's share of total income has soared over the past 20 – 30 years. In the USA, the share of the top 1 per cent in terms of total pre-tax income has risen from 8 per cent in 1974 to 18 per cent in 2008. Yet median male real earnings (adjusted for inflation) are at the same level as in 1979.

Top earners have become very much richer in countries as diverse as the UK, USA, Germany and Japan. Thus the OECD (Organisation for Economic Co-operation and Development) has reported that "there are signs that levels [of inequality] may be converging at a common and higher average, as countries such as Denmark, Germany and Sweden, which traditionally had low inequality, are no longer spared from the rising inequality trend"[xviii].

This is shown in Chart 80, which uses colour coding to highlight different levels of national income equality. The GINI coefficient is a number between 0 and 1, where 0 means everyone has exactly the same income, and 1 means one person has all the income (with everyone else having nothing). Together with the Financial Times chart, this presents a sobering picture, highlighting the importance of Porter's message about the need to refocus on societal value.

GINI coefficients are now widely used in P&G, where VP Phyllis Jackson has described their surprise when first confronted with the data:

"We [the USA] have a GINI coefficient similar to the Philippines and Mexico – you'd never have imagined that", she said

She also confirmed its value for new product launches when commenting that: "I don't think we've typically thought about America as a country with big income gaps to this extent"[xix].

Not only does this growing inequality in the West risk the creation of the social unrest feared by Unilever's Paul Polman, as we discussed in Chapter 5, but the lack of spending power amongst the broad mass of the population has left the economy unhealthily reliant on ever-larger injections of liquidity from the central banks, in order to sustain even today's very modest growth rates. As Porter summarises the position:

"Firms have focused on enticing consumers to buy more and more of their products. Facing growing competition and shorter-term performance measures from shareholders, managers resorted to waves of restructuring, personnel reductions and relocating to lower-cost regions, while leveraging capital to return capital to investors. The results were often commoditisation, price competition, little true innovation and no clear competitive advantage… Companies have overlooked opportunities to meet fundamental societal needs… Our field of vision has simply been too narrow."

As we have seen in the case studies in this chapter, companies can create economic and societal value by becoming aware of the 'white space' around their current operations. They can also reconfigure their value chains to create products that are affordable for currently unserved or under-served markets. The two major examples of this are the 55+ generation in the West, and the large numbers of people emerging from poverty in the emerging economies. Both sectors represent major opportunities for future growth.

This is where the concept of the megatrend shows its full power. Meeting the needs of the ageing Western population, improving water quality, increasing food production and reducing carbon footprints, are all profit opportunities that rely for their power on creating societal value, as well as financial gain.

We will discuss this in more detail in the next chapter, as we look in more detail at the challenges and opportunities facing manufacturers.

SOURCES

i Wall Street Journal, 12 September 2011, 'As middle class shrinks, P&G aims high and low'
ii Wall Street Journal, 12 September 2011, 'As middle class shrinks, P&G aims high and low'
iii Financial Times, 5 September 2011, 'Gap in US pension funds hits $388bn'
iv New York Times, 25 February 2011, 'In recession's wake, frugal ways make a comeback'
v ExxonMobil, 'December 2009, 'Outlook for energy, a view to 2030'
vi Wall Street Journal, 2 February 2011, 'Renault's Basic Car Detours'
vii Procter & Gamble Annual Report, 2010
viii Tata Motors Annual Report, 2009-10
ix The Economist, 20 August 2011, 'Stuck in low gear'
x The Guardian, 24 May 2009, 'Tata Nano: World's cheapest car is India's answer for cash-strapped drivers'
xi Wall Street Journal, 2 August 2011, 'Tata plans Nano factories overseas'
xii MVP website
xiii BBC News 22 November 2010 'New jab for millions across African 'meningitis belt''
xiv Clin Infect Dis. (2009) 49 (10): 1520-1525. doi: 10.1086/644623. 'Costs for Households and Community Perception of Meningitis Epidemics in Burkina Faso'
xv Shared Value by Michael Porter and Mark Kramer, Harvard Business Review, January 2011
xvi Bloomberg, Banks Must Cut 'Footballer Pay' to Help Investors, Say U.K. Fund Managers, , 29 July 2011
xvii Financial Times, 27 July 2011, 'Executive pay: the trickle-up effect'
xviii Financial Times, 27 June 2011, 'Spectre of stagnating incomes stalks globe'
xix Wall Street Journal, 12 September 2011, 'As middle class shrinks, P&G aims high and low'

Chapter 8

Doing more with less – the products of the future

The global economy is moving into a difficult period, as it transitions to the new normal. Debt levels are high, and saving levels (particularly in the West) are well below the required levels. So cost must be the key criteria when examining the opportunities for research and innovation. Equally, the money that is available must be spent wisely. We cannot afford to waste precious resources in satisfying mere 'Wants', when 'Needs' are still unmet.

This chapter examines the application of this philosophy to the four megatrends that we have identified as being key to the future of the chemical industry:

- Improving water availability
- Improving food production
- Increasing life expectancy
- Reducing carbon footprint

It argues that the key need is to be practical:

- In the field of water and food, we should focus on reducing the amount of waste, and the output that is lost when product is moving to market
- In developing new products and services for the over 55s, we should focus on core needs, such as food, water, health, shelter and mobility
- In turn, this will enable us to 'do more with less'. We will reduce carbon footprint, and ensure that our output can be afforded by the maximum number of people

This philosophy is quite different from that seen during the 'super cycle'. Then, companies competed for the middle ground, as we saw in chapter 7. They added features, and pursued the concept of adding

Chart 81: Research needs to focus on basic needs, adding functionality where affordable

value in order to boost profits. Over time, they focused more and more on the wealthier parts of the global population, and became increasingly disinterested in those outside this privileged group.

Today, however, it is no longer viable to focus in this way. The Western baby boomers are leaving the 'wealth creator' 25–54 age group, and they face the prospect of much lower incomes as they transition from salaries to pensions. Equally, they, and the smaller group of new wealth creators who are following them, face a world where credit is much less available to support their desired lifestyles.

Thus, as we have already seen, our focus must be on more basic products and services. This is especially true for those aiming to target populations in the developing and emerging economies. Incomes in these regions are dramatically lower than those in the West, and it is wishful thinking to imagine that they can therefore somehow replace the demand for added value products that is disappearing in the West.

However, this is really not bad news, although it may seem so at first. Change is always difficult to manage, and there is a natural fear that its downsides will prove almost certain, while any upsides will prove less reliable. A key purpose of this chapter is therefore to insist that the opportunities ahead of us are enormous and will more than reward the pain that may be suffered during the transition period.

Chart 81 sums up our proposed new philosophy for research and product development. It starts with the megatrends, and bases its thinking for these on the work done to produce the UN Millennium Development Goals in 2000. These may not be perfect, but they represent the best possible starting point, given that speed is of the essence. There is no reason why people should continue to die, while we indulge in time-wasting argument over details.

We should also focus on affordability, rather than value in use. The PATH Case study in chapter 7 on the meningitis vaccine project highlights the criticality of this approach. Whatever we produce must be able to be used by as many people as possible, given that we are talking about basic needs such as water and food. The core markets for these products will be driven by volume, not 'value in use', whether we are talking about potential consumers in the emerging, developing or developed worlds.

The advantage of this approach is that more functionality can then be added where this can be afforded by wealthier consumers. Products and services used by the 'middle income' groups in the developing world should be able to afford more functionality, while those in Western countries will have

even higher affordability. At the top of the pyramid, there are also the luxury markets. These markets are small in volume, but they are not geographic in their origin. Much of their demand will effectively fall into the 'wants' category, rather than the 'needs'.

The key to this new philosophy is that it takes a wider view of companies' responsibilities to the societies in which they operate. As we have argued, the concept of shareholder value has taken us up a blind alley. Operating on just a financial parameter is no longer affordable. Instead, we need to adopt the concept of shared value because, as Professor Michael Porter has argued, this is the only way to "drive the next wave of Innovation and productivity growth in the global economy".

THE NEED TO LOOK LONG TERM AND THE ROLE OF GOVERNMENT

The need to restart the innovation process is one of the key challenges of the transition to the new normal. This will require the development of partnerships between universities and companies, probably supported with government money, to fund the kind of basic research that leads to breakthrough innovation. As chart 82 shows, based on a concept from the American Energy Innovation Council (AEIC), this type of research-led innovation is quite different from the standard product development process, which instead aims to convert scientific discoveries into a usable product.

Typically, innovation involves taking a group of creative and committed experts, and giving them licence to follow their own instincts over a 5–10 year timeframe. This means a commitment to world-class facilities, and to a hands-off management approach. It also involves an acceptance that even then, successes will occur as much by accident as design. For example:

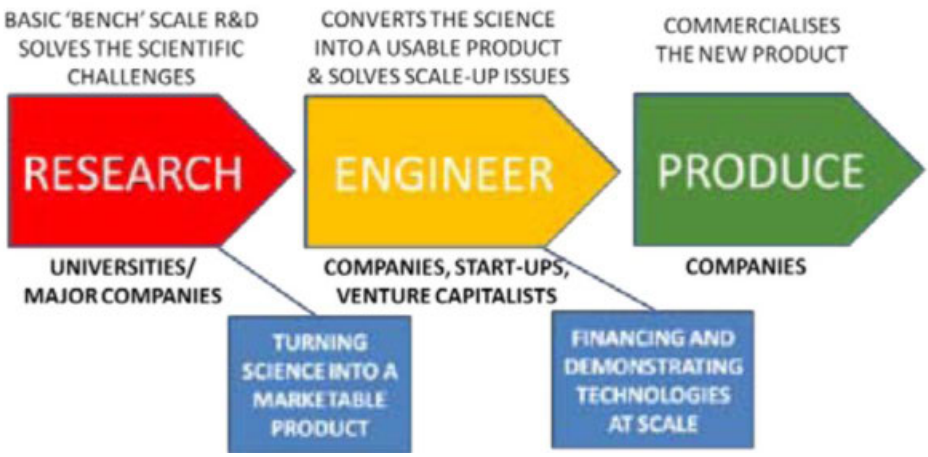


Chart 82: The Innovation Chain

- ICI's discovery of polyethylene in 1933, the first and largest volume polymer, was "a complete fluke" according to one of those responsible, as it was caused by a leaking reactor vessel[i].
- Sir Alexander Fleming regarded his discovery of penicillin as being a fortuitous accident due to the contamination of a plate culture that had been mistakenly left open in the laboratory.

Chart 83: Global and US R&D spend on industrial energy, 2009-2012

Source: Battelle, R&D Magazine

The ability to recognise that an accidental event has produced something of value is thus also a key skill within the innovation process

In recent years, however, many companies have abandoned this kind of basic research due to pressure from shareholders to maximise short-term returns. Their priority has instead become development activity, focused on adding value to existing products and services. Thus today, very little work is under way, even in basic fields such as energy, or areas such as fusion and the super grid.

As chart 83 from Battelle shows[ii], the world spent just $17bn in 2011 on basic energy research, compared with its $3 trillion spend on oil alone.

This, of course, is deeply worrying. Today's global economy cannot operate without energy. And it is obvious that current energy resources are not nearly enough to provide for our future needs. Bill Gates, the founder of Microsoft, summed up the position very well when commenting that "over 90% of subsidies are on deploying technology and not on R&D. You can buy as much old technology as you want, but you won't get breakthroughs, which only come out of basic research. If we don't have Innovation in energy, we don't have much at all[iii]".

Gates' argument is that politicians have focused on "cute" technology, which makes voters feel they are doing something useful. He warns that "sure, attaching solar panels to roofs, building windmills in backyards or deploying other small-scale energy technologies is a fine idea. But they can't significantly aid developing nations thirsty for cheap energy. The solutions that work in the rich world don't even come close to solving the energy problem. If you're interested in solving the world's energy problems, it's things like big solar projects in the desert."

In the past, countries and companies would have regarded such research as the crown jewel of scientific activity. They established leading laboratories and research institutes, and the best and the brightest researchers competed to work in them. This led to the breakthrough discoveries on which much of modern life is based. The gap that has developed over the past 20 years will take a considerable time to fill, especially as the amount of available funding is likely to be severely constrained by the financial problems now facing the world.

However, the position will only get worse, not better, if we further delay. It is therefore essential that top executives and policymakers start to accept the necessity of undertaking a 180 degree shift from current priorities, which have focused instead on the easier and less costly area of development. And they need to move urgently to start establishing such programmes, to try and make up for lost time. Our problem today is that the lack of past investment in innovation means the pipeline is perilously empty, particularly when we consider that lead times for the widespread application of such new discoveries are likely to be measured in decades rather than years.

Shell's CEO Peter Voser made this point in April 2010, when highlighting the length of time it takes for new energy technologies to gain adoption[iv]. He noted that it takes "30 years for new energy types to capture 1% of the market". This is a complete contrast with an industry like electronics for example, where a new mobile phone will routinely have to be commercialised within 18 months "to beat the competition".

The issue is the complexity of the development process required in the energy industry, and the sums of money involved. According to Voser:

- It takes three years to built a pilot plant, after the original scientific breakthrough
- Then it takes one year to start it up and two to five years to achieve reliable operation
- It takes another 10 years to build 12 or more plants
- And then it takes another decade to gain public acceptance

Thus biofuels are only now reaching 1% market share, after starting in 1980. Wind, which began in Denmark and the US in the mid-1980s, is also on track to reach 1% by 2015. The '30 year rule' equally applies to nuclear power, which took from 1950 to 1980 to become established.

This distinction is highlighted in chart 84, which compares product life cycles (horizontal axis) with the lead time for their development (vertical axis).

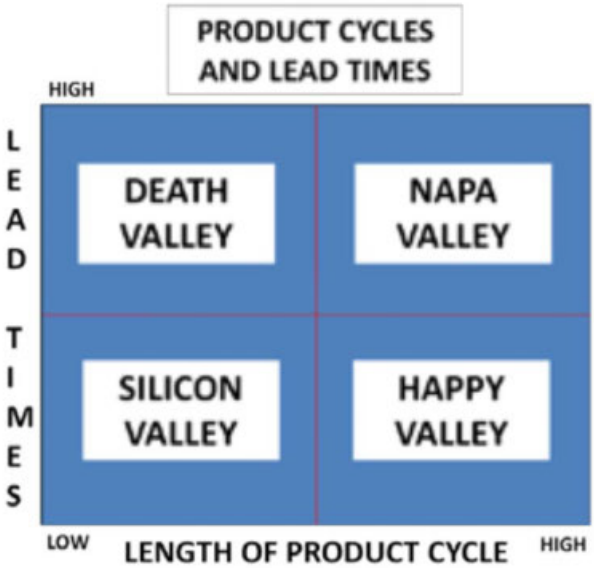


Chart 84: Chemicals is a Napa Valley industry

- In Silicon Valley, product life cycles are often measured in months, so lead times have to be correspondingly rapid
- In Napa Valley, however, product lifecycles tend to be measured in years, so the industry has historically been able to spend time on innovating and introducing the new product or service
- Now, however, we need to develop a change of mindset, whereby we aim to enter Happy Valley where lead times are short, but lifecycles are long
- It is also essential that we avoid the trap of the supposed short-cuts beloved of politicians and investors. These aim to produce a quick and dazzling result. But too often, these would take us into Death Valley, where lead times are relatively high while life cycles prove only temporary

The key is to choose areas where long product life cycles can be expected. It is no use spending time on developing a new product, only to then find that its potential market has either disappeared, or never existed in sufficient scale. This is why we suggest that companies should focus on what we term potential megatrends.

These are the areas where demand should grow steadily for decade after decade, and companies can therefore expect to obtain a reasonable return for their investment of time and money.

We have identified four such potential megatrends, which we will discuss in more detail later in this chapter. But first we need to explore the megatrend concept itself in more detail.

THE NEED TO FOCUS RESEARCH ON THE MEGATRENDS

The Western world's current lack of interest in basic research is no accident. It is due to the rise in recent decades of the 'shareholder value' concept, which we discussed in chapter 7. This has led companies to develop a short-term focus on 'the bottom line', rather than on the medium and longer term. Similarly, CEOs were incentivised by share options to focus on driving earnings higher on a quarter-by-quarter basis, rather than on acting as a steward of the business for future generations.

Thus major global companies such as ICI, where co-author Paul Hodges worked, decided to close Corporate Laboratories where such 'blue sky research' had been previously carried out[v]. This was seen as both a cost-saving measure, and as a reflection of the decision to focus on exploiting existing knowledge rather than developing new insights. Other leading companies took the same decision as ICI.

Instead, development was seen as a more attractive use of cash, due to the fact that the end reward could be calculated more accurately. Companies set out to establish portfolios of such projects, to mitigate the risk that a certain percentage would fail.

This approach was much admired by financially driven investors, because it also enables them to model future earnings streams in a spreadsheet. They can easily understand existing technologies, and more reliably estimate likely future earnings streams by reference to known markets and competitive offerings.

Thus the American Chemical Society (ACS) has reported that "during the past two decades, most large chemical companies have favoured 'sustaining' Innovations which have added to their capacity

- **Money spent**
  - Throwing money at a problem rarely achieves the desired effect. No more is this true than in the field of innovation.
  - Creative people are rarely driven by the desire to become wealthy. Therefore money cannot stimulate them to greater creativity.
  - Reported "R&D spend" mainly measures the cost of "D" and neglects the unpredictable "R"
- **Numbers of patents**
  - Often quoted, but really signifying little other than the numbers of patent lawyers active in an organisation/country

Innovation is driven by ideas

Technology by implementation of the successful ones

Chart 85: Fallacies about measuring Innovation

Source: Agranova

and to the variety of product offerings that they are able to deliver to market, but have not fundamentally changed their businesses[vi]". We, however, share the ACS's view that "disruptive Innovation is the more reliable way to create new growth business".

Another reason why research went out of favour is summed up eloquently in chart 85, developed by Agranova, the world's leading source for information on new crop protection technologies. It notes that innovation cannot be obtained by a simple cost-benefit model, where a certain amount of investment can be expected to produce a defined increase in earnings. They add that the creative people who generate most Innovation are rarely driven by financial goals. Therefore rewarding them with share options or other financial incentives will not usually improve their productivity.

Thus the past 20 years have often been a wasteland in terms of genuine Innovation. Had research been allowed to continue, then we would be approaching the 30-year point at which the fruits of work begun in the 1980s would now be reaching the market.

But instead we have to play catch-up, at a time when the availability of finance for even the most essential of purposes is likely to be severely curtailed.

This is not a clever position in which to find ourselves. And it is made more damaging by the fact that the task of recreating a vibrant research activity will itself take time and money. But we have no choice. We cannot simply decide that the past 20 years were merely a 'what-if' calculation on a spreadsheet, and now wind back the clock to start all over again.

Instead, we need to move forward with all possible speed. This will require a laser-like focus on the really super-critical issues. Equally, although we must strive with all urgency to make up for the time that has been lost, it is also essential that decisions about priorities are preceded by informed discussion. This is why we suggest that there is a need to focus on clearly defined megatrends, where research can have the most widespread and important impact.

We believe this approach offers the world the best possible chance of speeding up Shell's 30-year process. And we take some comfort from Voser's belief that "the 30-year law is not a natural law. It is a

societal one". In principle, he argued, it should be possible to speed up the process, if governments give their support. But even so, Voser warned that "there are no easy and quick successes", even if "we all feel a sense of urgency".

We believe governments and companies therefore need to generate a sense of urgency around the need to invest in four megatrend issues where the chemical industry should take a leading role, as follows:

- Improving water availability
- Improving food production
- Increasing life expectancy
- Reducing carbon footprint

A further advantage of this approach is that all these issues are inter-connected. This helps to mitigate the risk that work on one area might fall foul of the law of unintended consequences. Taking a simplistic approach to improving food production and water availability, for example, could easily lead us down a dangerous path by simply increasing the world's carbon footprint.

Instead, we believe there is a need to take a holistic approach, as with the case studies we discussed in chapter 7. This approach will also enable companies and governments to agree set criteria, against which they can narrow down the range of potential solutions and technologies. Such criteria could usefully include reference to overall impact, as well as to the immediate ability to help solve the problems we face.

This is potentially a very helpful methodology, as it enables scarce resources to be focused on a narrower, and therefore potentially more achievable, range of options. But it does create a new risk that endless argument will take place about which options should be selected. This would, of course, only delay the day when actual research begins. This temptation, where the pursuit of 'the best' takes place at the expense of 'the good enough', needs to be strenuously avoided.

There would equally be little point in trying to reinstate the importance of research if the shareholder value doctrine was still seen as the way forward for company development. It would effectively stifle the rapid adoption and development of any innovative new products or technologies. However, there are encouraging signs that the primacy of the shareholder value cult is coming to an end.

Even former General Electric CEO Jack Welch, widely regarded as its inventor, has more recently changed his mind and argued that it is "a dumb idea for executives to focus so heavily on quarterly profits and share price gains. Shareholder value is a result, not a strategy. Your main constituencies are your employees, your customers and your products[vii]".

One can only hope that his former supporters will come to share his new insight.

THE NEED FOR CRITICAL SUCCESS FACTORS IN RESEARCH AND DEVELOPMENT

Chapter 5's discussion of the critical success factors (summarised again in chart 86) showed that there is unlikely to be one 'right answer' for the transition to the new normal. This is true whether companies are more focused on development or research. The reason is simple. The ageing of the Western baby boomers means that their stabilising impact on demand, and their creation of 'pent-up demand' during

Critical success factors for companies in the new normal focus on meeting future market needs
"Make what you can sell most cost-effective"

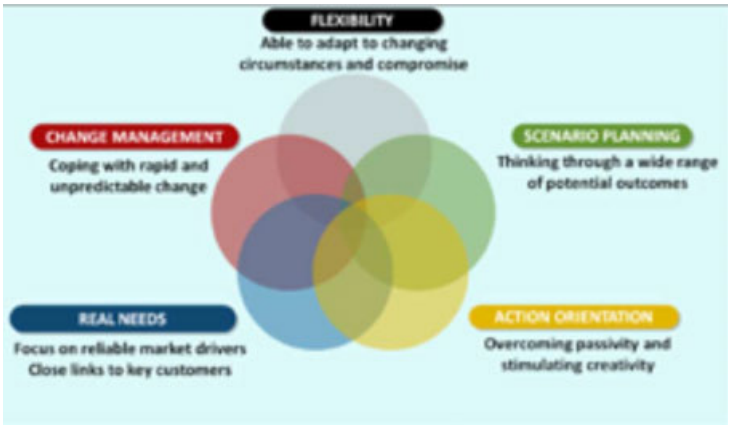


Chart 86: Critical Success Factors

periods of economic stress, has now disappeared. So we must expect greater economic, political and social volatility as a result.

In turn, this means that the environment in which both research and development are carried out will become more uncertain. This will be particularly true for research activities, where the timetable for activity is a minimum of five years, and more typically 10 to 20 years. The advantage of the critical success factors (CSFs) is that they provide a common language to bridge the gap between those undertaking the work and those operating in business management, government and universities.

The CSFs thus provide a neutral platform on which this essential dialogue can take place. Not only does this mean that those involved have a mechanism with which to influence the rest of the business, but it also means that they can mobilise relevant people in the business to facilitate early adoption of new products as these come through the research pipeline. This could prove an immensely valuable mechanism for reducing lead times and helping to fast-track promising innovations into the external market.

The obvious potential starting point for agreement on the megatrends are the Millennium Goals agreed back in 2000. So far, as chart 87 shows, many of these targets have either failed to progress as required (brown squares) or have even gone backwards (red squares). But this does not undermine their potential usefulness for the future. They have the enormous advantage of having been agreed on a global basis. So although some may be capable of improvement due to the passage of time, their underlying validity is hard to question. Three of our proposed megatrends thus link to these, while the fourth – the ageing population – was understandably hardly recognised 10 years ago.

THE MEGATRENDS – IMPROVING WATER AVAILABILITY

Water is the key to life. And many forecasters now worry that the world may suffer major wars over water supplies in future decades, as countries suffer from an increasingly difficult supply position. Improving water availability is thus an obvious megatrend for the future.

There are two ways of approaching the issue. One is to look for more ways of finding water; another is to make better use of the water that is already available. As only 1.5% of current supplies are actually

Chart 87: The UN Millennium Development Goals, 2011 Progress Chart

required for drinking water and washing[viii], the second option would seem to offer most chance of success. But to achieve this would require a major change in the way that water supply and treatment is currently delivered.

The key issue is that civil engineering concepts have historically dominated the water industry. Supply chains typically start with the development of reservoir capacity, for example, which are formed by digging a big hole and then pouring concrete, before connecting the new supplies to a pipeline network. Sewage and effluent treatment operates on a similar basis, with some basic biological forms of treatment and screening added at the front end.

Unsurprisingly, this mindset has acted as an enormous constraint on the development of the new products and technologies that could dramatically improve the supply position[ix]. A new approach is clearly long overdue. Encouragingly, there are already signs that change is on the way in key areas. These offer a good model for future Innovations.

DATA AVAILABILITY

One key initiative is backed by the Aqueduct Alliance[x], which includes Dow Chemical, Coca-Cola, General Electric and the World Resources Institute. This aims to help manage water supplies in regions threatened by shortages. Coke notes that "water is the lifeblood of our business" and has provided the Alliance with its own proprietary data on water availability, collected over many years.

The idea is to provide "strategic decision-makers in business, the public sector and non-governmental organisations with the fullest possible information about water supplies". And, as Coke adds, "it's also the right thing to do".

AGRICULTURAL WATER USE

One key area where change is long overdue is in the use of water for agricultural purposes. The US Geological Survey estimates that "almost 60% of all the world's freshwater withdrawals go towards (crop) irrigation uses"[xi]. Yet many countries make no charge at all for its use, or only a nominal charge which bears no relevance to the cost of provision. As a result, there is often little incentive for a farmer to minimise his water use, or use recycled water.

The position has already become serious enough for some far-sighted companies to begin to develop strategies to reduce water usage, by tackling the problem from a different perspective. By bringing their expertise to bear on the problem, they can help to create a more sustainable solution for local communities, and thereby help to build increased financial security for those who live and work in them.

PepsiCo has thus decided that "we need to start diversifying our supply chain, first in terms of where we source for our global business, and look to where we could boost production without changing the environment". Alongside this, the company also "aims to lift communities out of poverty and turn subsistence farmers into entrepreneurs through the provision of superior seeds, training in modern farming methods and irrigation".[xii]

Cotton production provides another example of what can be achieved. It accounts for more than 3% of all agricultural water use. And currently its output is globally constrained by lack of water. Yet traditional cultivation processes such as field flooding are obvious targets for reducing water use.

Chart 88: An Indian farmer using the new drip system

Source: New York Times

This has led to the development of a programme organised by the Better Cotton Initiative (www.bettercotton.org) to provide technical know-how to Indian farmers. Over three years, this has enabled a 32% drop in the use of water and pesticide[xiii]. The farmers' profits are 20% higher as a result, thus also helping to stimulate economic development. BCI now plans to roll out the initiative to 150,000 farmers in their focus regions of Brazil, India, Pakistan and West/Central Africa. This will represent a doubling of the effort in 2010–2011, when 68,000 farmers were involved. The Better Cotton Initiative plans to start to work in China in 2012.

The key is to use drip irrigation systems, essentially plastic veins that can direct water to each plant's root system, with the results as shown in chart 88. This not only spreads water and fertilizer more evenly than traditional pumping, but also means less water is available to encourage weed growth around the plants. In addition, electricity consumption is reduced, as the drip irrigation does not require extended power supplies to be available.

Of course, these techniques are not new concepts in themselves – in many ways they go back to principles first established by the earliest agriculturally based societies. And cotton is only one crop which would benefit from the techniques that have been developed. But they highlight a clear potential for many more Innovations that chemical and polymer companies could help to deliver.

The key to success is for companies to adopt the wider shared value approach advocated by Professor Michel Porter, and to focus on the societal value that can be obtained, as well as the profit potential from additional sales. They will then position themselves to benefit from what is already becoming a tried and trusted approach, as we discussed in chapter 7.

Jeans manufacturer Levi Strauss, for example, estimates that a typical pair of its blue jeans consumes 919 gallons (3,479 litres) of water during its life cycle. This holistic approach to the issue has led the company to introduce the Water-Less brand, which aims to discourage consumers from washing jeans on a regular basis. Clearly this is a counter-intuitive approach which would not work with all product categories. But Levi has found that jeans marketed as being less water-intensive sell better than regular brands at equal prices.

SELF is another Indian project, involving use of Dow Corning's silicon technology. It uses photo-

voltaic panels to power pumps that can lift water from boreholes to drip-feed irrigation hoses. As a result, food production has increased in the local community, allowing families to earn more money by selling produce in the market. Thus over time the families become able to pay for the panels and pumps, meaning that the whole initiative becomes self-sustaining[xiv].

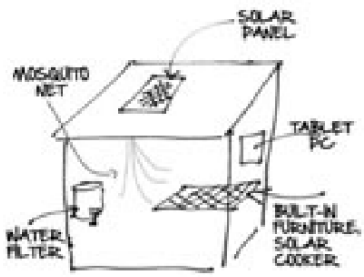
WATER USE IN SANITATION

The UN's World Millennium Goals, announced in 2000 by world leaders, and targeted for achievement by 2015, aimed to halve the number of people who existed without sustainable access to safe drinking water and basic sanitation (goal 7, chart 87). Yet with only three years to go, neither target seems likely to be met. In sanitation, the position has actually got worse, not better, because population growth has outstripped its provision. Some 2.6bn people were without access to sanitation in 2008, up from 2.5bn in 2006.

As the charity Water Aid notes[xv], it is mainly women who have to carry water, and care for children who become sick because of poor sanitation. It argues that "without proper sanitation you cannot achieve universal primary education, you cannot promote gender equality and empower women, you cannot reduce child mortality". It also estimates that lack of water availability and poor sanitation cost up to 5% of GDP in the worst affected areas, such as sub-Saharan Africa.

Similarly, Dow Chemical's Water and Process Technologies unit is pioneering the "smart deployment of chemistry" to solve some of the world's major water challenges. It also co-sponsored a web-based seminar on the issue, which examined the potential for better land stewardship, wastewater treatment, agricultural practices and government subsidies.

Only 44% of rural households currently have access to safe drinking water[xvi]. And as one NGO participant in the seminar noted, "half of all hospital beds around the world are filled with people with waterborne diseases"[xvii]. In itself, this provides a powerful value proposition for prioritising the issue. Enlightened self-interest in the developed world would suggest that helping to reduce the number of people impacted would not only reduce costs for rich and poor governments. It would also provide a mechanism for driving the next wave of innovation and growth in the global economy.



THE $300 HOUSE for the POOR

One example of this can be seen in the "$300 house" project (www.300house.com), which aims to create a well-designed, safe and affordable house for the world's poorest people. The winning entry in their recent competition (pictured, from Simple Earth Structures) included the use of rainwater barrels to provide water supplies, along with a filter to supply drinking water for the occupiers.

This further example of innovation also highlights the potential for the wider use of rainwater and so-called grey water (water recycled from a previous use). This would immediately increase the amount of water available for non-potable uses. It would also initiate the development of a virtuous circle, whereby the use of water can be prioritised to achieve most societal value.

There is no reason why all new houses and commercial buildings should not be designed to use rainwater and grey water for most day-to-day purposes. This would avoid all the costs of capturing new water supplies via dams and reservoirs, plus the costs of then transporting it to where it is actually required.

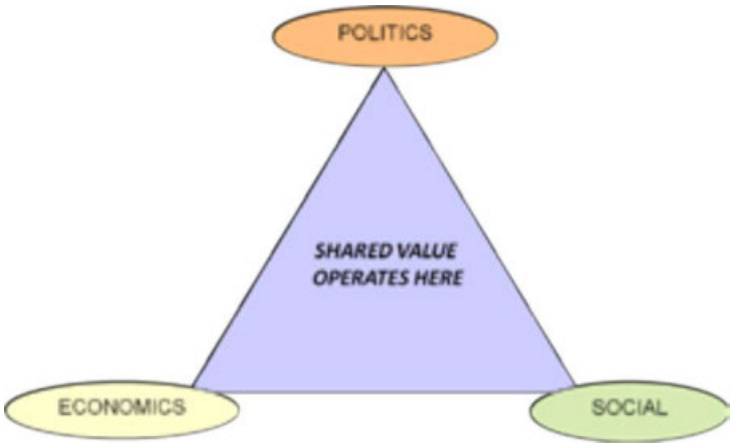


Chart 89: Shared Value synthesises Politics, Economics and Social Values

And, of course, this is not just an issue for the developing world. In the US, for example, the National Resources Defence Council suggests that 10 major cities are in severe danger of water shortages in the relatively near future. Cities such as Los Angeles, Houston and Phoenix are already looking at such options as a matter of urgency, in order to avoid finding their development constrained by a growing lack of water supply.

REDUCING WATER LOSS

Another key area for potential research and development programmes is the need to reduce water loss. One example from Italy, which helped to pioneer water supplies across Europe 2000 years ago during the Roman period, highlights the scale of the problem, and of the opportunity for improvement.

ISTAT, the country's national statistics organisation, revealed in 2010 that "total water losses amounted to 65% of the water fed into the network in 2008. This included an average leakage figure of 47%"[xviii]. And Italy, of course, is certainly not alone is suffering from such problems. Across Western Europe, countries in the north have leakage rates between 30–40%, while those in the south average 68%.

This also confirms the perception that new ways of operating, which go beyond civil engineering solutions, offer a much greater chance of success. In particular, a more localised system, based on modern technologies such as filters and membranes, would provide consumers with higher quality and more reliable sources of water.

This type of approach, combined with a greater awareness of the potential for increasing the use of recycled water for non-drinking water applications, could produce very significant improvement for all stakeholders.

The water issue highlights how companies need to consider social and political issues alongside pure economic values when formulating their plans. As chart 89 shows, economics alone are unlikely to be sufficient if genuinely innovative solutions are to be introduced successfully.

One great value of the shared value concept is therefore that it enables these sometimes conflicting sets of values to be successfully synthesised within a common goal. The example of the Meningitis Vaccine Project, as discussed in chapter 7, also demonstrates that this can indeed be achieved, even in the poorest of societies.

THE MEGATRENDS – IMPROVING FOOD PRODUCTION

Water and food are essential to life. Another target of the UN's Millennium Development Goals was to reduce hunger by half (goal 1, chart 87). As with water, there are two ways of approaching the problem. One is to produce more food. Another is to make better use of the food that is already available.

Agrochemical companies are already involved with the first option. They are building on the successes of the Green Revolution in the 1960s, which is credited with saving at least 1bn people from starvation. It focused on the development of higher-yielding crops, expansion of irrigation opportunities, and the greater use of pesticides and fertilizers.

The second option is one where chemical companies can have a major role to play.

SUPPORTING UN PROGRAMMES

Life-science company DSM is actively supporting the World Food Programme by providing vitamins, minerals and protein which can be handed out to children at selected schools. Research shows that children who start the day with a healthy meal are more alert and learn better. In later life, this provides them with greater opportunities to find work[xix].

DSM deliberately works in a "very holistic way" with the programme. As it told the BBC in September 2010: "Our shareholders are interested in us having sustainable businesses and we can only do so if we develop a population. Two-thirds of the world's population, some 4bn people, are at the base of the pyramid and half of them are suffering from malnutrition, so we are doing this not only for the benefit of our company, but also supporting the growth of that population. We are not only working in the area of life science, biology, pharmaceuticals and vitamins, we also work in the area of materials such as plastics."

IMPROVING FOOD INFRASTRUCTURE

The Food and Agriculture Organisation (FAO) estimated in May 2011 that "roughly one third of the edible parts of the food produced in the world for human consumption – approximately 1.3bn tonnes – gets lost or wasted every year"[xx]. Chart 90 summarises the detail of the report, highlighting losses and waste on a per capita basis by the consumer (red column) and in the 'production to retailing' chain (blue column).

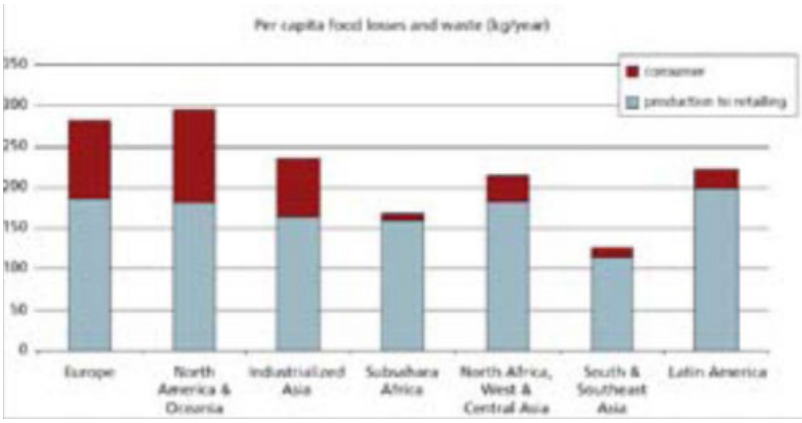
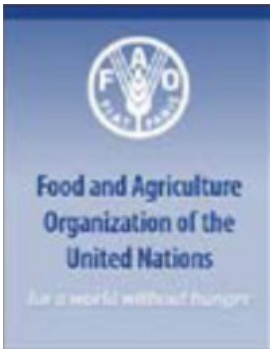


Chart 90: Per capita food losses and waste, at consumption and pre-consumption stages, in different regions

Source: FAO



Reducing this loss and waste could clearly make an enormous contribution towards reducing hunger. The FAO goes on to add that different issues affect the developed and developing world:

"**Food losses** – occurring at the production, harvest, post-harvest and processing phases – are most important in developing countries due to poor infrastructure, low levels of technology and low investment in the food production systems.

"Food waste is more a problem in industrialised countries, most often caused by both retailers and consumers throwing perfectly edible foodstuffs into the trash. Per capita waste by consumers is 95–115kg a year in Europe and North America, while consumers in sub-Saharan Africa and South and Southeast Asia each throw away only 6–11kg a year.

"Total per capita food production for human consumption is about 900kg a year in rich countries, almost twice the 460kg a year produced in the poorest regions. In developing countries, 40% of losses occur at post-harvest and processing levels while in industrialised countries more than 40% of losses happen at retail and consumer levels."

The report also noted that "food losses during harvest and in storage translate into lost income for small farmers and into higher prices for poor consumers. Reducing losses could therefore have an 'immediate and significant' impact on their livelihoods and food security".

The report goes on to identify a number of practical ways for reducing losses and waste. It is therefore an ideal starting point for any company wishing to develop its business in this area. Much of the brainstorming required to establish research and/or development programmes in this area is already contained in the report. For example, it suggests that:

"In developing countries the problem is chiefly one of inadequate harvest techniques, poor post-harvest management and logistics, lack of suitable infrastructure, processing and packaging, and lack of marketing information which would allow production to better match demand.

"The advice is therefore to strengthen the food supply chain by assisting small farmers to link directly to buyers. The private and public sectors should also invest more in infrastructure, transportation and in processing and packaging."

Critically, the FAO recommends "that given the limited availability of natural resources it is more effective to reduce food losses than increase food production in order to feed a growing world population....

Chart 91: Shrink-wrapping extends a cucumber's shelf life from 3 to 14 days

Chart 92: ITC's e-Choupal initiative aims to tackle critical weaknesses in India's farming

Rich-country consumers should be taught that throwing food away needlessly is unacceptable".

It also highlights the important role that could be played by the development and use of "appropriate packaging" to reduce "losses occurring at almost every stage of the food production chain".

India's position provides a clear illustration of the problem, and the opportunity. Its premier, Mammohan Singh, estimated in December 2011 that 40% of its food rots on its way to the consumer[xxi]. Yet as chart 91 highlights, simple shrink-wrapping can extend shelf life for a cucumber from three to 14 days.

Equally, India's farmers suffer from an over-complicated supply chain, where much of the margin is taken by third parties. Thus, as chart 92 shows, a cycle develops whereby their low margin leads to a low risk-taking ability, low investment and low productivity. In turn they have a weak market orientation, and so suffer low margins.

A key area is therefore to provide them with timely information on the weather, crop conditions, best practices and international prices. One ground-breaking development is the e-Choupal digital network (www.echoupal.com) established by India's ITC, which now has 6,500 installations supporting 4m farmers and 40,000 villages. The aim is to extend this to support 100,000 villages by 2016, representing one-sixth of rural India.

Of course, there are many other areas that could, and are, being developed to tackle the problem of hunger. But the areas highlighted by the FAO present a practical guide to what can be done, today, in terms of both research and development. Reducing waste and loss may not be glamorous, but it could be very effective.

THE MEGATRENDS – INCREASING LIFE EXPECTANCY

Demographics, as we noted in chapter 1, is one of the few subjects where it is possible to be quite precise about the future. We may not know about every baby born every year, or count every individual in a census. But the data available in both areas has reasonable accuracy. It is certainly "good enough" for our purposes in this chapter, in terms of understanding how population trends will develop over the next 20 years. We can be absolutely sure, for example, that only those people already alive today can be part of either the 25–54 age group or the 55+ group in 2030.

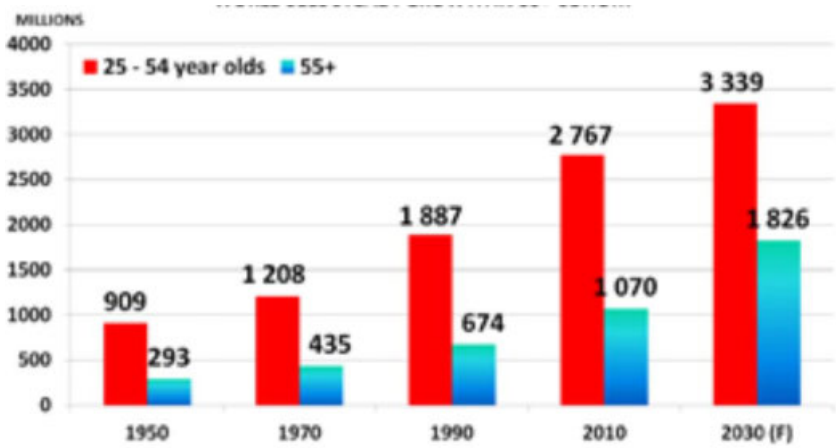


Chart 93: The world sees steady growth in the 55+ cohort

Source: UN Population Division

Chart 93 shows the UN Population Division estimate of the likely numbers in both cohorts, and the trend since 1950. As we can see, on a global basis:

- The 25–54 group (red column) doubled between 1950 and 1990 to contain 1.9bn people
- It is forecast to grow a further 75% between 1990 and 2030 to contain 3.3bn people
- The 55+ group (blue column) also doubled between 1950 and 1990 to contain 0.7bn people
- It is forecast to almost treble between 1990 and 2030 to contain 1.8bn people

The ratio between the 25–54 group and the 55+ group is thus changing very quickly. In 1950, there were three times as many people in the 25–54 age group as in the 55+ age group, and this was still broadly true in 1990. But today, the ratio is already down to 2.7, and by 2030 it will be just 1.8.

This has considerable implications for the global economy, as we have already discussed in earlier chapters. But it is also critical when trying to develop the products and services that will be needed over the next 20 years.

One cannot after all, sell anything to people who don't exist. Nor can one sell something to those who do exist, unless it has been invented and developed into a marketable form.

And therein lies a key problem. Much attention has been paid to the needs and wants of the 25–54 age group in recent decades, as it was rightly taken to be the growth engine for demand. People in that group were effectively the main wealth creators. But very little attention has been paid to the 55+ age group. It has simply been assumed that its main interest was in preparing for death in the most comfortable way possible. Sanitary products and Zimmer frames were considered to be the focus of purchases, as we saw in chapter 5.

This, of course, was a wrong judgement, given what was happening to life expectancy. Yet even in 1990, there were three times as many potential buyers of products and services in the 25–54 age group. So companies were safely able to ignore the 55+ cohort without going out of business.

But this is not the case today, as the ratio is already coming down quite fast. Equally, companies' lack of interest in the 'New Old' generation creates a major impediment to global growth. It is extremely hard for the economy to grow, when the needs of nearly one-third of the population are being largely ignored.

Even more importantly, as chart 94 shows, the wealthy Western countries can now look forward to a decline in the absolute number of 25–54 year olds:

- There were 2.3 times more 25–54 year olds in 1950 than 55+
- The ratio was still 1.8 in 1970
- But it is already down to 1.4, and is heading to parity by 2030

So it really is time that companies began to learn more about these prospective customers. We call them the New Old, to describe how they represent a completely new demographic sector. Our aim is to highlight that they:

- Are an entirely new generation, which has never existed before in such numbers
- Have an average life expectancy of decades, rather than years
- Are not 'old' in the way that our grandparents and earlier generations were old
- They can instead look forward to many years of active and healthy life

They are also vastly under-served in terms of the range of products and services targeted at their needs. Any business that is worried about a lack of demand should therefore find it worthwhile to understand more about them.

The Massachusetts Institute of Technology (MIT) is one of the few organisations that has begun to try and understand the opportunities that this major change can create. The director of its AgeLab, Professor Joseph Coughlin, believes that "ageing is a multi-disciplinary phenomenon, and it requires new tools to look at it"[xxii]. Along with researchers at Stanford and the Oregon Health & Science University, he argues

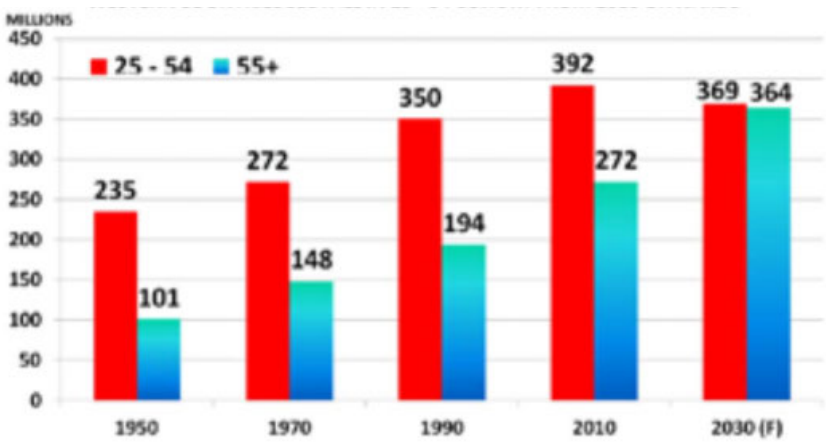


Chart 94: Western countries see fall in 25–54 age group by 2030

Source: UN Population Division

that "devices for the 'I've fallen and can't get up catastrophes' represent the old business of old age".

MIT's research shows that "the new business of old age involves technologies and services that promote wellness, mobility, autonomy and social connectivity". Already, products being used in these applications have become a multi-billion dollar business. But this is more by accident, than design, as the New Old cohort is still largely unrecognised by the wider world. And, of course, enabling people to stay fit and healthy for longer carries a major societal benefit, as it means the costs of supporting them are not only postponed but also greatly reduced.

HOUSING

Housing is a key area for the future. Western societies are going to be poorer in the future than in the past, as the great weight of debt accumulated during the later stages of the super cycle is eliminated, either by repayment or default. Equally, most New Old baby boomers face a substantial drop in income as they move from work into retirement (as we discussed in chapters 5 and 7).

One consequence of these factors is the previous growth in household formation is likely to reverse. The New Old will want to stay in a family home for as long as possible, as they will not be able to afford extended residence in retirement homes. Equally, their adult children will find them very valuable as carers for their children, particularly when both parents work. In turn, of course, this will have major impact on demand patterns.

It is likely that families will stay together for longer, and that several generations will end up living under the same roof. The trend is already well under way, particularly in the US, although it is still hardly recognised. It is likely to prove a key growth area for the future, as some data may illustrate:

- The US 'multi-generational family home' segment grew by 30% between 2000 and 2010[xxiii].
- 5.1m families were living in three-generational homes in 2010, versus 3.9 million in 2000, according to the US Census Bureau
- The Pew Research Center estimated 51m (17% of the population) were living in homes with at least two generations of adults in 2009, versus 42 million in 2000.

Essentially what we are seeing is a reversal of the household formation trends that dominated as the baby boomers entered their peak consumption years after 1970. Research is therefore clearly needed to understand how this new trend might develop, and also how it can be optimised for the benefit of the individuals and the wider society. What are the products and services that will be needed by such families?

One example is the range of Next Gen homes now being marketed by Lennar, the US's third-largest homebuilder. While duplexes, granny flats and guest houses have a long history, the 'two-homes-in-one concept' is completely new for mass-market builders. Yet as one of the few growth segments in the housing markets, supply is likely to now ramp up rapidly to meet this widely ignored need. Lennar only unveiled its first Next Gen homes in September 2011, in the Phoenix area, but was already offering them in 40 communities by the end of the year.

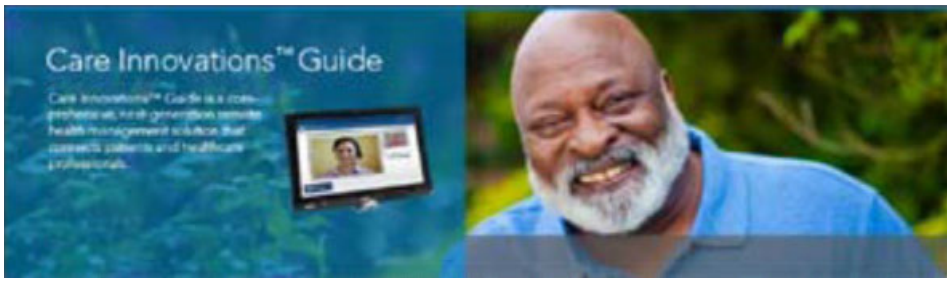


Chart 95: Care Innovations advertising for its remote healthcare technology

ELECTRONICS

Electronics is another area of potential major growth. Older people are already great users of products such as e-Readers, and of personal video communication services such as Skype. But there is very much more that could be done. For example, Intel and GE have recently announced a new joint venture named Care Innovations to research and develop technologies that help older adults stay independent. As chart 95 shows, one product already on the market is their Health Guide, which helps doctors remotely manage patient care in the home.

This area of 'life enhancement technology' is still in its infancy. There are clearly a multitude of products and services still to be created. Older people have often kept active in the past by taking educational and other courses. Clearly, with the spread of the internet, there is great potential for these to become more widely available online.

All that is needed is for some of the energy and funding currently lavished on the video games industry to be refocused on this potential market, to capture the profits and societal value that would result.

HEALTH

Health is another area where more research is long overdue. In recent years, some pharma companies have gone up the blind alley of producing 'lifestyle enhancement drugs'. Instead, research needs to be targeted at real needs such as studies of the brain aimed at treating diseases such as Alzheimer's and Parkinson's. Astonishingly, no drugs currently exist to treat these illnesses despite the potential worldwide market. As highlighted by Nobel Prize winner Stanley Prusiner and former US Secretary of State George Shultz[xxiv], this would enable older people "to remain productive longer and contribute to the well-being of the nation instead of adding substantially to the costs and other burdens of healthcare".

As well as this societal value, it should also be a profitable market. Alzheimer's is rare before age 60, but afflicts one in three people by age 80. A key issue is the change of mindset that is involved: currently, both diseases are considered to be the inevitable consequence of ageing. But in fact, Prusiner and Schultz note that "the majority of elderly people aged 80 to 100 have well-preserved memories and intellect".

MOBILITY

Mobility is another key issue for ageing populations, particularly in societies such as the US where many people live out of the reach of public transport. As Professor Coughlin notes, "if you don't have transportation, you have the same accommodation as a prison[xxv]". Older people who feel they have to

keep driving, even when they are no longer competent, present a danger to society. Older drivers have the highest accident rates of any group apart from teenagers, and these can easily have tragic results for themselves, and innocent victims.

This is one area where Research is already under way, thanks to MIT's AgeLab. They have built a driving simulator known as AwareCar (pictured, source *Financial Times*), with sensors to monitor driver eye movements and pulse rates. It is also working with auto manufacturers to develop information systems that can make drivers more aware of hazards and obstacles.

This research may well have wider value by helping manufacturers to better understand the effects of fatigue and distraction on driving ability. It may also provide pointers on the type of roadside and other information that may help either focus, or distract drivers generally.

Another area is the simple one of car-sharing. ITNAmerica (www.itnamerica.org) is the US's national non-profit transportation system. It demonstrates another variant on the initiatives described above in the housing and electronics sections. This is because its "model marries the power of information technology and the strength of local, grassroots support".

At its most basic level, it has created a cheap community-run taxi service staffed by a mix of paid and volunteer drivers, to enable otherwise home-bound seniors to get around. It also enables drivers to build up credits for the future, by driving older people around today. This is a wonderful example of the ability of ordinary people to plan ahead. It stands in marked contrast to the recent efforts of very highly paid professionals in the financial sector.

The key to success is, once again, a change in mindset. As Professor Coughlin has noted, "we spend billions of dollars trying to live longer, but no one puts any thought or any investment into how to live longer, better".

THE MEGATRENDS – REDUCING CARBON FOOTPRINT

Reducing carbon footprint is our final megatrend. This is because it combines a number of key issues which will drive consumption patterns in the new normal:

- Most Western individuals will have reduced spending power
    - The New Old boomers will be moving from salaries to pensions
    - Younger people will have less access to credit
- The growth markets in developing economies will be different
    - The key demographic will be people emerging from poverty
- Debt repayment and default will reduce capital availability
    - Banking systems will be retrenching and under strain
- Social values are changing
    - Consumers are becoming more focused on people than things
- Concerns are rising over the future we will leave to our children
    - Sustainability, and 'doing more with less' are already key themes

Companies and individuals have a large role to play in this area. And as with the other megatrends, the role of government will be of key importance.

One starting point, and perhaps the easiest, is around the issue of waste and loss. This parallels and supports what we have seen above, in our discussion of issues relating to water and food. Our friend Professor Stuart Read of the IMD Business School in Switzerland has kindly highlighted three companies he has studied in this area, which provide important pointers for the future. Their message can be summed up by the title of one of his studies, 'From trash to cash', as this sums up a key unmet need.

It describes the work of Agilyx (www.agilyx.com), a company which claims to be "the first in the world to economically convert difficult to recycle waste plastics into crude oil [in a way that] is scalable, versatile and environmentally beneficial". Agilyx operates in Oregon, USA, and is particularly interesting because it allows small cities, or recyclers, to save the cost of transporting plastic waste to a large landfill. Instead, they can turn this into crude oil for local consumption, perhaps even on the same site.

Thus it enables the development of more local, distributed systems of energy generation. And it has captured the interest of some very smart investors and partners, such as the US's leading waste company, Waste Management, as well as the French oil company Total. The aim of both companies is to support further investment in the technology, as part of the growing move towards making 'waste-to-energy' and 'landfill gas-to-energy' part of the overall energy mix.

The second study features TerraCycle (www.terracycle.net), whose mission is "to eliminate the idea of waste by creating collection and solution systems for anything that today must be sent to a landfill". Plastic waste is again a key area of activity for the company. It is part of the trend that has seen manufacturers increase their use of recycling options in response to consumer demand. TerraCycle now has 26m people collecting waste in 14 countries. And it is turning the waste into usable products stocked by major retailers such as Wal-Mart and Whole Foods Market.

Reid's third study in this emerging field looks at the Danish company Novozymes. It claims to be the world leader in bio-Innovation, and it confirms that $1bn+ turnover companies can operate profitably on the same principles as start-up ventures. Its focus is similarly to "help companies make more from less, as our solutions save energy and raw materials, and reduce waste. The result is higher quality, lower costs, lower CO2 emissions, and a better environment". Equally interesting is the fact that it already spends 14% of its revenue on research and development, highlighting how important this area will be to the successful companies of the future.

Moving up the scale again, Dow Chemical is developing roofing shingles wrapped in plastic to be installed on ordinary homes. The aim is to supply about half of their required electrical power[xxvi]. Similarly, the Middle Eastern company Borouge and its European affiliate Borealis (a joint venture with Austrian company OMV) have established www.waterfortheworld.net to help pioneer work in the plastics industry to address water and sanitation challenges.

Activity is also under way in the auto industry, where companies such as Hyundai are working on opportunities for polymer batteries in the next generation of electric vehicles. This type of battery is an example of a product with enormous potential in terms of market growth and benefit. Audi has already used them in a prototype Audi A2, enabling the car to cover a record distance of 600km (375 miles) without recharging[xxvii].

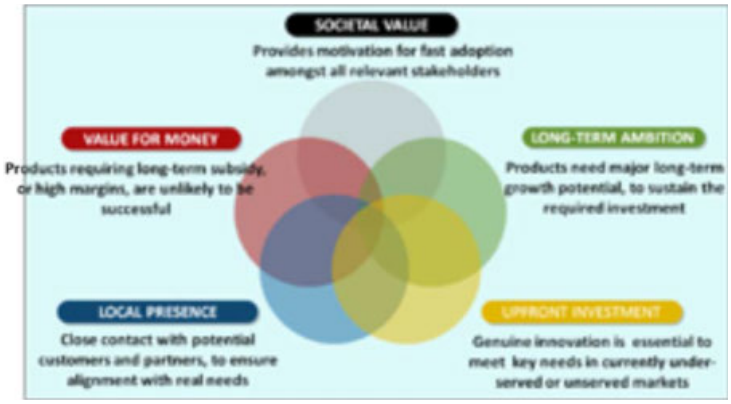


Chart 96: Key principles for successful new product R&D

At the moment, polymer batteries are being mainly developed for use in applications such as mobile phones, where the ability to shape the battery can be important. But long-term funding of research and development could well ensure that their potential benefits can be realised in numerous other applications.

These examples provide us with some potential ground rules for success, as summarised in Chart 96. These map on to the critical success factors described earlier, and can help to guide R&D project selection and portfolio development:

1. Societal value is the key factor. This provides the essential motivation to attract potential stakeholders and value-chain partners, and thus drive fast adoption.
2. 'Value for money' is also critical. The market for products that require long-term subsidy or high margins to recoup development costs will be much smaller than in the past.
3. Local market presence is essential. A centralised organisation will almost certainly either fail to notice the new opportunity, or regard it as being 'too small to matter'.
4. Upfront investment in developing the initial offering is required. Companies have to be prepared to develop new products and services, rather than just following a me-too process.
5. Long-term ambition is also key. These are not "cute technology" products, but have genuine long-term growth potential. Dow, for example, is expecting its shingle business to reach $1bn turnover by 2015[xxviii].

SOME KEY QUESTIONS WHEN PLANNING NEW RESEARCH PROJECTS

Companies and governments are inevitably going to have to prioritise potential areas of new research, even in such fundamental areas as the megatrends.

The final cost of any new product or service is also likely to be a critical driver in most countries and applications. Agreed criteria will therefore need to be developed, to help set priorities and expedite the work that needs to be undertaken.

The principles above lead to some key questions that can guide all those involved in financing and managing R&D programmes:

- Can I do it cheaply enough to meet the more constrained pockets of the West?
- Can I do it cheaply enough to make my new products affordable to the middle classes and the poor in developing countries?
- What resources do I need to put in place to stay close to customers and to governments?
- How do I keep up to date with changing needs?
- How do I create societal value alongside financial profit and develop shared value?

We would suggest that research also needs to focus on the specific applications where improvement is most desperately required. This could perhaps be best achieved by a skilful segmentation of the underlying need, with some key questions being asked upfront, before any research is undertaken. In the case of water, for example, these might include:

- Could the application be replaced by another way of achieving the same objective?
- Is water currently essential for the application, or is only being used because of its relatively low cost, or easy availability?
- What type of water would be best suited to the application, if water is required?
- What alternatives could be developed, if water itself is actually not an essential ingredient in the process?
- What existing technologies could be adapted for use in this application?

Readers, and companies, can obviously draw up their own list of relevant questions for the areas in which they propose to work.

And, of course, they should consider themselves fortunate if such a process reveals that new blue-sky research is not essential, as development of an existing product or technology could instead provide an adequate solution. The involvement of development personnel in the research process, as we suggested earlier, will help to ensure that these potential 'quick wins' are progressed optimally.

We now turn to look at how the process of manufacturing needs to change as we transition to the new normal.

SOURCES

i http://www.icis.com/Articles/2008/05/12/9122447/polyethylene-discovered-by-accident-75-years-ago.html

ii Battelle 2012 Global R&D Funding Forecast

iii Wired magazine, http://www.wired.com/epicenter/2011/05/bill-gates-energy-tech/

iv http://www.shell.com/home/content/media/news_and_library/speeches/2010/voser_bejing_21032010.html

v www.rsc.org/pdf/general/m&aukreport.pdf

vi American Chemical Society, 'Innovation, Chemistry and Jobs', June 2011

vii Financial Times, 12 March 2009

viii http://online.wsj.com/article/SB10001424053111904787404576529912073080124.html

ix The advice of water expert Paul Hipwell of International eChem throughout this section is gratefully

acknowledged by the authors

[x] http://www.ft.com/cms/s/0/ac39db6c-c75a-11e0-9cac-00144feabdc0.html

[xi] http://ga.water.usgs.gov/edu/wuir.html

[xii] http://www.ft.com/cms/s/0/cc8a5464-fb08-11e0-bebe-00144feab49a.html

[xiii] http://www.nytimes.com/2011/11/02/science/earth/levi-strauss-tries-to-minimize-water-use.html?pagewanted=all

[xiv] ICIS Chemical Business, 17 October 2011

[xv] http://www.bbc.co.uk/news/business-15552967

[xvi] Water for the world

[xvii] Chemical Week, 5 September 2011

[xviii] http://www.globalwaterintel.com/archive/11/1/general/italys-leakage-embarrassment.html

[xix] http://www.bbc.co.uk/news/business-11297290

[xx] http://www.fao.org/news/story/en/item/74192/icode/

[xxi] http://www.ft.com/cms/s/0/374a3070-1cd9-11e1-a134-00144feabdc0.html#axzz1goPbSdY4

[xxii] http://www.nytimes.com/2011/02/06/business/06aging.html?_r=1

[xxiii] http://www.businessweek.com/news/2011-11-17/homebuilders-target-in-laws-dogs-as-extended-families-grow.html

[xxiv] http://online.wsj.com/article/SB10001424052702304584004576417992683738086.html

[xxv] http://www.ft.com/cms/s/2/1fed1eee-b34b-11e0-9af2-00144feabdc0.html

[xxvi] Battelle, R&D Magazine, December 2010

[xxvii] http://en.wikipedia.org/wiki/Lithium-ion_polymer_battery

[xxviii] Battelle, R&D Magazine, December 2010

Chapter 9

Maintaining and growing your business

Please print what follows and stick it on the wall of your control room or your work station.

These are the three big transformations in the nature of consumer markets covered in previous chapters:

- The increasing size of the 'New Old' 55+ generation in the West.
- The number of young Westerners struggling with higher unemployment.
- The increasing number of people moving out of poverty in the developing world.

These are the great opportunities for future growth, if our economy can be adapted to serve their needs. At the moment, it is being driven in second gear as policymakers mistakenly try to turn back the clock to the days of the economic 'super cycle' in 1982-2007.

The Western baby boomers (those born in 1946-1970) are the largest and richest generation that the world has ever seen. As they moved into their peak consumption period between the ages of 25 and 54 years, so the global economy boomed. The US suffered only 16 months of recession in the 25 years between 1982 and 2007. There was always 'pent-up demand', as more and more boomers were entering the age group.

But since 2001, the oldest boomers have been entering the 55+ age group, when people typically spend less as the kids have left home. And the boomers have to spend less, and save more, because they also have the longest life expectancy in history. Today, and in the future, we need to focus on the megatrends that will drive future demand growth. In the fields of water and food, we should focus on reducing the amount of waste, and the output that is lost when product is moving to market. In developing new products and services for the over 55s, we should focus on core needs, such as food, water, health, shelter and mobility.

In turn, this will enable us to 'do more with less'. We will reduce carbon footprint and ensure that our output can be afforded by the maximum number of people.

These changes in market drivers will have a profound impact on how, and where, products are manufactured.

INTRODUCTION

This chapter is for the engineers who run chemical plants and car factories, and for the people who build houses, refrigerators, TVs, computers and so on. It is about practical solutions to the problem of what manufacturers should do to maintain and grow their business in the transition to the New Normal.

Luckily, we do not have to guess what needs to be done. As we saw in chapter 7 (on consumer markets), we can instead follow the path established by those who have already started to make the leap that is required.

Companies need to think long and hard about their manufacturing processes, if they want to survive in the New Normal. Process intensification will be a key area for future success, as it enables products to be made with lower capital and operating costs, and with less waste. We will look at this in more detail at the end of the chapter.

Toyota is the great example that can get us started down this path.

THE EVOLUTION OF THE QUALITY MOVEMENT, AND THE TOYOTA WAY

First of all, here is the history of how The Toyota Way evolved.

It built on the 'learning organisation' model that was brought to the West from Japan, beginning with the Quality Circle approach. Next came the Quality Movement in the 1980s and 1990s – through people such as Deming with DuPont and ICI, and then Juran and his Six Sigma approach with GE.

This led companies to realise that quality was not something to be 'added on' after the event via a process of inspection. The 'old style' approach to quality assurance was replaced by a realisation that quality had to be designed into the whole manufacturing process, just as it had to be designed into the business itself.

Measurement thus became key, and companies learnt how to detect the sources of problems, rather than their symptoms, through the use of tools such as 'fishbone diagrams', originally known as 'Ishikawa diagrams'.

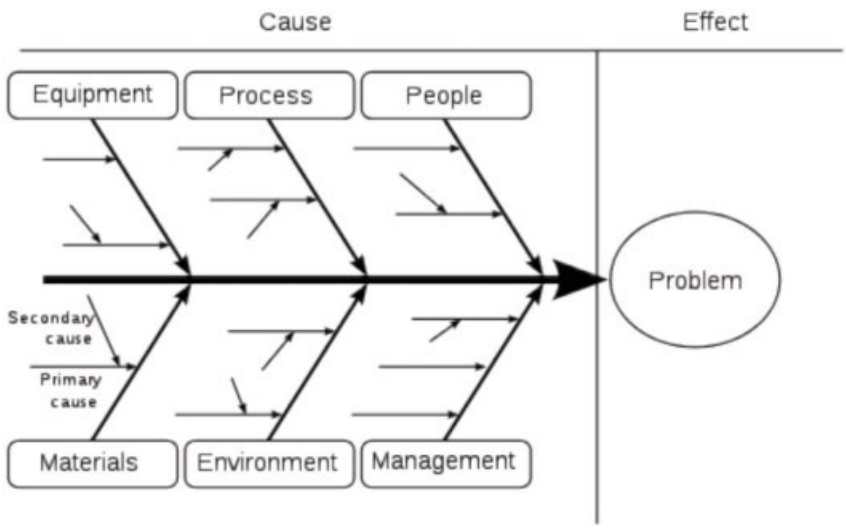


Chart 97: the Fishbone diagram approach

Source: Wikipedia

Kaoru Ishikawa developed the Ishikawa, or fishbone concept (because the diagram looks like a fishbone!), in the 1960s, during pioneering work on quality management at the Kawasaki shipyards.

It encouraged a holistic approach for improving product design and avoiding quality defects by standing back and seeking to identify previously unrecognised links between people, processes, machines, measurements, methods and the environment. For example, it might emerge that poor training and badly motivated staff were affecting how data on product quality was gathered and measured.

Ishikawa identified six key components to quality improvement:

- **People**. Anyone involved with the process.
- **Methods**. How the process is performed and the specific requirements for doing it, such as policies, procedures, rules, regulations and laws.
- **Machines**. Any equipment, computers, tools and so on required to accomplish the job.
- **Materials**. Raw materials, parts, pens, paper and so on used to produce the final product
- **Measurement**. Data generated from manufacturing processes.
- **Environment**. The conditions, such as location, time, temperature and culture under which processes take place.

The impact was widespread. Safety cultures were also revolutionised as companies realised that accidents did not just happen and so could be prevented.

Products could now be made to very tight specifications on a consistent basis, as more was understood about how to improve manufacturing processes. Managers and workers came to understand the meaning of the phrase "rubbish in, rubbish out". They learnt to work together, to ensure that reliability and safety went hand-in-hand when manufacturing products that met customer needs first time around.

But in the early 2000s, it all began to go wrong. Badly wrong. The people who had launched this revolution retired and some companies began to forget that quality was a process, and had to be reinforced by senior management at every possible opportunity. Safety and quality not only stopped being the first item on the agenda for every board meeting at every company. It actually fell off the agenda altogether in some companies. It once again came to be assumed that 'accidents just happened'.

One of the key drivers for this loss of direction was China's admission to the World Trade Organisation in December 2001. It wanted to boost its economy by becoming the manufacturing capital of the world, and offered plenty of incentives including cheap labour and a highly disciplined workforce as attractions to would-be investors.

China cannot be blamed for what then went wrong. Under leaders such as Deng Xiaoping, it had gone a long way in recovering from the madness of the Cultural Revolution of 1966-1976. But it had very little tradition of manufacturing and certainly made no pretension of being a manufacturing centre of excellence.

Back in 1978, when records began[i], just 18% (172m) of the population was living in urban areas, compared with 82% (790m) in rural areas. And although the growth of the textile and other low margin industries had begun to change the picture, only 31% of the population (388m) was living in urban areas even at the end of 1999, compared with 69% in rural areas (870m).

The problem was caused by many of the companies who arrived and the values of the Western markets that they aspired to serve.

It is important to note that some companies did take the time, and spent the necessary money, to ensure that Western standards of quality and safety were adopted in the factories and plants that they established in China. They remained committed to the philosophy of 'continuous improvement' that had driven success in the past.

But most did not. They simply focused on the principle of being 'cheap and cheerful', which was by then becoming the motto of the West's 'throwaway society'. What did it matter if a T-shirt ripped, as it had only cost $2 and was bought to be worn once and thrown away? And, anyway, the credit boom meant people had loads of borrowed money to throw away on T-shirts that ripped and DVD players that broke after only a few months' use.

Today, however, these values and the 'throwaway society' they reflected are on the way out. Instead, the key markets for the future are going to be those we detailed at the beginning of this chapter. This is why we asked you to pin them to your work station or control-room wall. They mean that we are all going to have to re-learn what has been too widely forgotten or ignored over the past decade.

The best and quickest way to go back up the learning curve is by taking a close look at The Toyota Way.

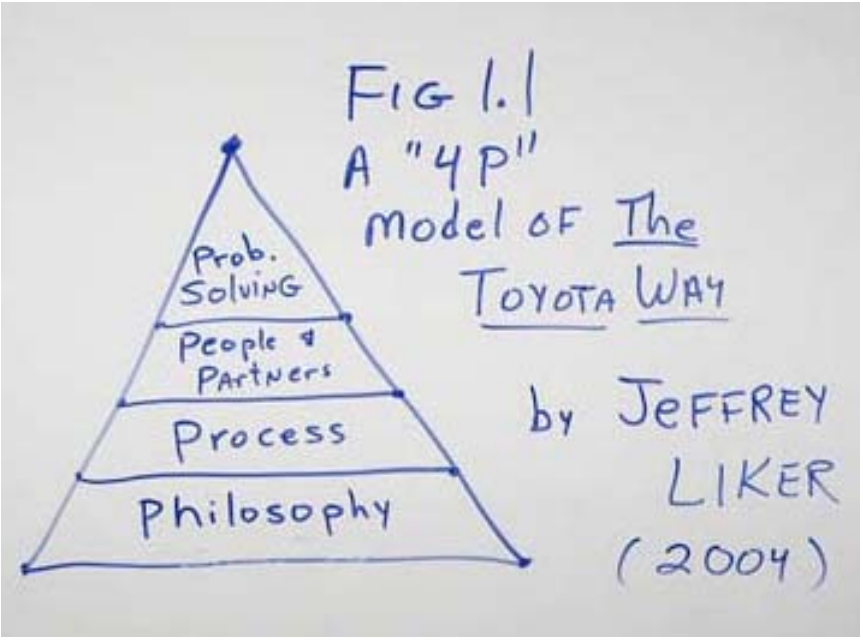


Chart 98: The four cornerstones of The Toyota Way

Source: www.newbricks.blogspot.com

THE TOYOTA WAY

Constantly reducing costs while improving product quality will be key to business success in the New Normal.

A methodology to get there is going to be essential. An excellent framework is provided by the 14 principles outlined by Dr Jeffrey Liker, University of Michigan professor of industrial engineering, in

his 2004 book, 'The Toyota Way'.

More recently, Toyota suffered 9m product recalls in the US, resulting from suspected uncontrolled acceleration and faulty brakes in some of its vehicles in 2009-2010[ii]. Importantly, however, extensive official investigations have since concluded that the problems were not the result of manufacturing issues. Driver error or pedal misapplication were found to be responsible for most of the incidents.

Toyota realised, in the spirit of 'continuous improvement', that this favourable verdict from the authorities was not enough. Instead, Akio Toyoda, Toyota's president, announced in December 2010[iii] that he was establishing a special committee for global quality under his leadership, and was "taking the company back to basics… We are putting our customers, and the values on which our company was founded, front and centre." The committee's remit included:

- Strengthened ability to monitor and evaluate customer concerns.
- A new vehicle development cycle expanded by four weeks to help ensure reliability and safety.
- One thousand Toyota engineers assigned to focus on component design and quality.

This serious incident, which could have destroyed a lesser company, emphasises that The Toyota Way is not an easy option for any business. There is always more to learn. Constant vigilance and application of the 14 principles[iv] of The Toyota Way are required at all levels of the organisation. It requires a great deal of commitment by each employee to continuously improve their performance, and that of the company as a whole.

It also confirms that manufacturing activity cannot be separated from developments in consumer markets themselves.

Liker divides the 14 principles of The Toyota Way into four broader categories, starting with the essential foundation of the right long-term corporate philosophy. We will cover all of these four broad categories in detail, with examples of the 14 principles of The Toyota Way that fit beneath these four headline categories.

1. THE PHILOSOPHY OF THE TOYOTA WAY

"Philosophy", in the way Liker describes it, is not an abstract and remote concept more suited to academia, but instead relates to getting yourself in the right framework. He writes:

"Have a philosophical sense of purpose that supersedes any short-term decision-making. Work, grow, and align the whole organisation towards a common purpose that is bigger than making money. Understand your place in the history of the company and work to bring the company to the next level. Your philosophical mission is the foundation for all the other principles."

This requires a remarkable turnaround from the thinking that currently pervades many Western companies, from the level of the factory worker all the way up to the CEO. We have identified a number of steps that need to be taken in order to align a company's operations with this corporate philosophy, and we describe them below.

STEP ONE – GET RID OF SHAREHOLDER VALUE

Shareholder value has been the cornerstone of corporate philosophy since the super cycle began in the 1980s. Today, it is clear it has failed to deliver sustainable value for employees, customers or even the shareholders that it was established to benefit in the first place.

Engineers – often way down the corporate food chain from the board of directors – might very well say: "What's this got to do with me as I don't run the company I work for?" But if you do not either seek to change your employer, or switch jobs if you decide you cannot achieve the changes necessary, you are likely to find yourself out of work over the next few years.

Companies still living by the principles of the old normal face a real risk of future bankruptcy, as their products remain focused on the needs of the 'throwaway society' and not on those of the New Normal.

As a reminder, shareholder value is based on the now increasingly discredited 'efficient market hypothesis' – that stock markets are an accurate means of determining the future value of a company. Therefore, so the notion goes, if a company focuses on its share price this will automatically, somehow, make the company a good manufacturer.

Volumes of research have been published indicating that stock prices are instead often driven by error, emotion and the perverse incentives of market participants. Meanwhile some CEOs, motivated by stock options, play the "expectations game". This involves striving to hit or exceed quarter-by-quarter analysts' expectations of future earnings at the expense of just about everything else.

Does this remind you of your company?

A Deloitte comprehensive survey of 20,000 US firms[v] in 2010 concluded that:

- The rate of return on assets of US firms was only a quarter of what it had been in 1965.
- The life expectancy of a firm in the Fortune 500 had declined to less than 15 years and was heading towards five years unless something changed.
- Executive turnover was accelerating.
- Only one in five workers was fully engaged in her or his work. The larger the company, the lower the level of passion among the workers.

Between 1933 and 1976, before shareholder value took over as a corporate philosophy, real compound annual returns on the S&P 500 were 7.5%, according to Roger L Martin's book 'Fixing the Game: Bubbles, Crashes And What Capitalism Can Learn from the NLF'.[vi] Since 1976, the total real return on the S&P 500 has been 6.5% on a compound annual basis, he adds.

This all suggests that shareholder value simply does not work, a view now supported by Jack Welch. It was Welch, while CEO of GE, who proved to be exceptionally successful at shareholder value.

"During the heart of the Jack Welch era," continues Martin in his book, "GE met or beat analysts' forecasts in 46 of 48 quarters between 31 December 1989 and 30 September 2001 – a 96% hit rate." While Steve Denning, the author of books on management and innovation, notes: "Welch famously transformed GE from a firm with a market capitalisation of $13bn in 1981 into the most valuable company in the world, worth $484bn at his retirement in 2001.

"Yet, to keep increasing shareholder value, Welch had to keep pushing the company to higher and

higher growth. The biggest engine of growth at his disposal was an initially insignificant unit called GE Capital, which came to account for about half of GE's earnings by the end of his career. Yet in 2009, GE took massive write-offs related to GE Capital and saw its market capitalisation fall as low as $75bn."

Welch has since conceded that shareholder value does not work. In fact he has called it the "dumbest idea in the world"[vii].

STEP TWO – FOCUS ON YOUR CUSTOMERS

"The only rational purpose of a firm is to create a customer," wrote the author and management consultant Peter Drucker in 1973 – before the advent of shareholder value.

The fantastic opportunity for people who enjoy making things is that the transition to the New Normal will mean us returning to the era of quality. Attention to customers and detail will matter, not just the ability to talk up the share price.

Take Procter and Gamble, the world's largest consumer products company. It declares in its 'Purpose' statement[viii]:

"We will provide branded products and services of superior quality and value that improve the lives of the world's consumers, now and for generations to come. As a result, consumers will reward us with leadership sales, profit and value creation, allowing our people, our shareholders and the communities in which we live and work to prosper."

In chapter 7, we profiled how P&G has introduced its "white space" strategy to help transform its formerly monolithic culture to one that can better respond to the real nature of the opportunities ahead.

STEP THREE – GENERATING VALUE FOR CUSTOMERS, SOCIETY AND THE ECONOMY

The Toyota definition of philosophy also requires that all employees "generate value for the customer, society and the economy – it is your starting point. Evaluate every function in the company in terms of its ability to achieve this", Liker adds.

Every detail of each manufacturing process needs to be constantly assessed and re-assessed. This will ensure you are geared to respond to our three big new customer needs, and to the megatrends.

An example of the change in mindset that this requires is the One Laptop per Child (OLPC) initiative, run by the US-based non-profit organisation of the same name[ix]. The computers are made by Quanta Computer of Taiwan[x] – the biggest original design notebook computer manufacturer in the world.

For example, OLPC's first laptop – XO 1.0, which was launched in 2005, included:

- Free or open-source software.
- No motor-driven parts, no hard drive or optical media (CD/DVD).
- Versions with conventional plug-in power, solar power or 'human power'. Human power in this first version comprised a built-in hand-crank, which later became a detachable optional extra device.
- Wi-Fi mesh networking protocol. This enables a large number of computers to share the same internet access, provided at least one of the machines can see and connect to a router or other access point.

Chart 99: Nepali schoolchildren with their OLPC computers in July 2009

Source: http://womennewsnetwork.net/2009/11/09/nepalgirlseducate820/

The above picture – chart 99 – shows a later version in use in Nepal in 2009.

Two years later, a low-cost tablet version was introduced, which is shown in chart 100 below.

It focuses on localisation of hardware and software, avoiding the need for additional hardware such as keyboards. It features a solar panel alongside the battery, so that the sun can recharge the battery while the tablet is being used in school.

This example highlights how OLPC has overcome the challenge of manufacturing products of the right price and the right quality. Instead, and paradoxically, the big challenge has proved to lie in distribution and teacher training[xi].

Professor Nicholas Negroponte, of Massachusetts Institute of Technology who launched OLPC, had originally aimed to send 150m annually to developing countries by 2007[xii]. Yet so far only around 2.5m children and teachers in 42 countries have received the laptops[xiii]. And even some of those that have been delivered are lying unopened in a dusty corner. If teachers have not been trained to adapt teaching methods to utilise laptops, as has happened in Peru, this potentially transformational resource remains untouched in its box.

This highlights again the key message of The Toyota Way, which is that companies have to adopt a holistic approach to their markets if they want to be successful. Brilliant manufacturing operations on their

Chart 100: The OLPC tablet version, unveiled in early 2012

own will not be enough to ensure companies survive and prosper in the New Normal. So manufacturing folk have to take an interest in what is happening outside the factory gate if they want to stay in work.

STEP FOUR – TAKE RESPONSIBILITY FOR DEVELOPING YOUR OWN SKILLS

The cornerstone of the Toyota philosophy, writes Livers, is: "Be responsible. Strive to decide your own fate. Act with self-reliance and trust in your own abilities. Accept responsibility for your conduct and maintain and improve skills that enable you to produce added value."

It is not going to be easy, as we keep stressing, and no training courses yet exist for many of the skills that we will need to thrive in this radically changed environment. People will need to "think on their feet", to be innovative, to be original and to be creative.

But at the same time the right process will be essential.

2. PROCESS IN THE TOYOTA WAY

This process section can also be broken down into numbered steps.

STEP ONE – PULL RATHER THAN PUSH

George Bernard Shaw, the 20th century Irish dramatist and author, said: "If history repeats itself, and the unexpected always happens, how incapable must man be of learning from experience."

A case in point is the story of Taiichi Ono, the prominent Japanese businessman, who is considered to be a founder of the Toyota Production System that led to The Toyota Way. Ono realised, very early on, that levels of demand in the post-World War II Japanese economy were low. This meant that a mass production model – making items at the lowest-possible unit costs via economies of scale – had little application.

Scheduling of work had to therefore be driven by actual sales, not by sales or production targets. Japan's difficult financial situation also meant that overproduction had to be avoided. This led to the development of the Pull concept. Pull is building to order rather than the Push approach of setting targets.

There are, of course, big differences between the world we live in today and that of post-war Japan. But one overarching similarity is slower demand growth and greater volatility. There is a big need to more accurately tailor-make production schedules to actual sales.

Hence, under the process heading of the Toyota Way, Principle 3 tells us to "Use Pull Systems to Avoid Overproduction". As Liker writes, "provide your down-line customers in the production process with what they want, when they want it, and in the amount they want it. Minimise your work in process and warehousing of inventory by stocking small amounts of each product and frequently restocking based on what the customer actually wants. Be responsive to the day-to-day shifts in customer demand rather than relying on computer schedules and systems to track wasteful inventory."

STEP TWO – ACCEPT THAT OLD DEMAND PATTERNS HAVE CHANGED

Ignore outdated computer schedules. Programmed into these schedules is the assumption that demand will always come roaring back after brief periods of weakness. This no longer applies as demand patterns are much less predictable than before. In the past, as we have described before, economic downturns were relatively brief, as central bankers only had to reduce interest rates to release "pent-up demand".

But now, as the global economy adjusts to the New Normal, there are no younger boomers about to enter the wealth creator 25–54 age group creating this pent-up demand. Equally, capital is in short supply, due to the mountain of debt overhanging the Western economies. The economy is instead relying on repeated bursts of money printing by central banks (described as 'quantitative easing') to keep demand moving ahead.

But this liquidity is not the same as capital. And when each burst of money printing ends, the economy relapses again. The great advantage of a Pull over a Push system is therefore that it will enable you to both stay cash-positive when demand falls very sharply, and to profit when it, quite unpredictably, recovers.

STEP THREE – HOW TO REASSESS DEMAND

In order to better understand the greater volatility confronting your customers, you will need to spend more time:

- **Talking to your sales and marketing teams and challenging their assumptions, which might still be based on super cycle expectations.** Sit down with them and plan best-, medium- and worst-case scenarios for monthly, quarterly and annual production levels based on the new economic realities.
- **Calculating whether you can still run your plant economically at the low operating rates required in the worst-case scenario.** Will you need to shut down? If so, for how long – and how do you propose to find the product to meet contractual obligations during these shutdown periods? Are there innovative solutions you can propose to your senior management team? For example, could you scrap an older plant in order to improve your economies of scale?
- **Talking to your raw-material suppliers.** Questions to ask include: 'Do I continue to buy as much on existing contract terms from a current raw-materials supplier or do I adjust the contract terms to build in more flexibility? Am I able to do this with my existing supplier base? If not, who else do I need to go to? In general, do I need a broader range of suppliers to hedge against bankruptcies among my suppliers? Do I adjust my overall contract versus spot purchasing ratio?'
- **Thinking about the changes in the behaviour of your customers and how this will affect your production planning, in liaison with your sales and marketing team.** Your customers – and of course your raw-material suppliers and your own company – have become practised at running on very low stock levels in recent years. Much-reduced global credit availability is also a factor behind more prudent inventory management.
- **Constantly low inventories make for increased price volatility.** Can you identify long-standing short-term seasonal variations in demand that are likely to have a much greater impact in the New Normal because stock levels are so low? Have new short-term demand patterns emerged? What does this mean for how much you produce and when?

STEP FOUR – TAKE INTO ACCOUNT THE EXTRA PRESSURE ON PEOPLE

The pressure on people is already enormous. Many are worried about their jobs and, as a result, the security of their families. Wave after wave of redundancies are already taking place when companies panic as temporary, stimulus-induced recoveries are followed by further slowdowns in demand.

Turning up for work each morning has therefore become much more stressful than in the super cycle, as employees constantly worry: "Is this my last day? Will I be out by mid-day with my personal items in a cardboard box and a redundancy payment that's not going to cover school fees or medical insurance, never mind enough for my family to live on?"

STEP FIVE – ELIMINATING OVERBURDEN

Principle 4 of The Toyota Way is: Level out the workload (heijunka in Japanese). Work like the tortoise, not the hare.

Under Principle 4, Liker talks about "eliminating overburden to people and equipment". Manufacturers will need to form senior-level work teams, across all functional areas, in order to work on the four suggested areas above – quite likely on a daily basis. One obvious challenge is to simplify an incredibly complex and ever-shifting new economic environment so that junior-level employees can understand what they are expected to achieve.

You may also need to fight hard to avoid hasty and ill-thought-out rounds of redundancies. There is little point in devoting all this energy to a new production strategy, only to then lose the people that you need to make it work.

STEP SIX – HOW TO KEEP YOUR TEAM MOTIVATED

Fortunately, we are not stumbling around in the dark here, as there are examples of companies that have in recent times addressed the challenge of bringing their employees along while completely transforming the way that they do business.

Salesforce.com provides an on-demand online service for customer-relationship management. It has more than 2.1m subscribers and processes more than 100m transactions a day. It has also learnt the hard way that as companies grow, innovation can slow down as bureaucracy sets in. "Firms succumb to what is known as hierarchical bureaucracy," writes Denning[xiv].

Five years ago, Salesforce.com was no exception to this phenomenon. In its early years, the group was delivering an average of four major releases each year. But by 2006, the pace had slowed to one major release a year, he adds. Hence, in 2007 the company adopted a new management approach, known as Scrum and Agile, within three months.

Cross-functional teams were established to address the problems of slower development and product performance. These teams rebuilt the software development process from the ground up, using key values from the company's founding: keeping things simple, iterating quickly and listening to customers. A core document was prepared describing the new process, its benefits, and why the firm was moving away from the old process.

Teams held 45 one-hour meetings with key people from all levels in the organisation. Feedback from these meetings was incorporated into the document after each meeting. Management then opted for a

"big bang roll-out" to ensure everyone would be doing the same thing at the same time, thus avoiding what Denning says would have been "operational dissonance".

Salesforce.com managers Chris Fry and Steve Greene believe that the roll-out was successful as a result of:

- Strong executive support. At several points in the transition, boundaries were tested, and without strong executive support, the transition might have failed.
- A strong nucleus to lead the charge. Having a dedicated, fully empowered leadership team built from a cross-section of the organisation also helped. This team was empowered to make decisions and held meetings in a public space where everyone could see what was going on.
- Principles ahead of mechanics. Focusing on the principles rather than the mechanics also helped people understand why the firm was moving to a new way of working. When teams ran into a problem, they could refer back to the principles and adjust anything they thought did not correlate with these principles.

3. PEOPLE AND PARTNERS IN THE TOYOTA WAY

People and Partners is the third section of our pyramid diagram. Its full title is Add Value to the Organisation by Developing Your People.

As we shall see, The Toyota Way extends the definition of "Your People" to beyond just a company's employees, to include suppliers and customers. But first you need to start with a good leader for your company.

On leadership, Liker writes: "Grow leaders from within, rather than buying them from outside the organisation. Do not view the leader's job as simply accomplishing tasks and having good people skills. Leaders must be role models of the company's philosophy and way of doing business. A good leader must understand the daily work in great detail so he or she can be the best teacher of your company's philosophy."

This is, as always, easier said than done – but fortunately we again have examples from the real world that point us in the right direction.

STEP 1 – GOOD LEADERSHIP, A CASE STUDY OF COSTCO, THE US

Take Jim Sinegal, the son of a steelworker and a coalminer. In 1954, while studying at the San Diego Community College in California, US, he worked unloading mattresses for a month at a discount warehouse company called FedMart[xv]. This part-time job became a life-time career, as Sinegal became the protégé of the FedMart chairman, Sol Price, who invented the concept of high-volume warehouse stores that sell a only a limited range of products.

Chart 101: Jim Sinegal

The key to this concept is to stock a narrow range of brands and so create bargaining power with suppliers. Equally, labour costs are reduced by repacking goods into bulk items; purchasing full truckloads of merchandise from manufacturers; and storing merchandise on the sales

Chart 102: Costco's business model

(source: company presentation)

floor rather than in central warehouses.

In 1983, a Seattle entrepreneur, Jeff Brotman, helped Sinegal launch Costco Wholesale Corp. It began with a single store outside Issaquah, Washington, near Seattle. At end-2011, it was the third-largest retailer in the US with $65bn in domestic sales.

Costco has always ignored the shareholder value trap. For example, in 2011 its average wage was 40% higher than its biggest domestic competitor – Walmart's Sam's Club. Costco also offers an excellent benefits package, including full-time health coverage to more than 90% of its employees. Nearly 100% of all upward internal vacancies are recruited from within.

As Sinegal noted in 2005: "On Wall Street they're in the business of making money between now and next Thursday. I don't say that with any bitterness, but we can't take that view. We want to build a company that will still be here 50 and 60 years from now."

Sinegal retired as CEO in January 2012, but until then he had been employed on one-year contracts, which included 'termination for cause' clauses. Thus he was not entitled, unlike most of his peers, to a multimillion dollar severance package if he was fired in the event of failure.

Costco is thriving in the transition to the New Normal while many other retailers struggle to maintain revenue and profits. As Costco noted in its 2011 annual report:

"We believe that great companies cannot only survive, but [can also] actually thrive and increase market share during times of economic downturn; and the past two years have provided an excellent opportunity for us to prove this."

Costco's business model, shown in chart 102, meant its same-store sales were up 10% in 2011 while its profits increased by 12%. Equally, it had a low level of debt-to- equity of just 19% at the end of 2011. So it didn't have to cut wages or increase prices in order to pay its interest bill.

In fact, it has a rule that limits its 'mark-up' on a product sold to never more than 14% – something that inspires great customer loyalty. Yet despite failing to follow shareholder value principles, it achieved a 14.2% return on capital employed and returned $1bn to shareholders through share repurchases and dividends.

STEP 2 – DEALING WITH BUSINESS PARTNERS

The Toyota Way's advice on how to deal with partners and suppliers is as follows:

"Have respect for your partners and suppliers and treat them as an extension of your business. Challenge your outside partners to grow and develop. It shows that you value them. Set challenging targets and assist your partners in achieving them."

When it comes to suppliers, economists talk of how unethical retailers, and manufacturers, generate "transfer costs" to governments through damage to society and to the environment. This particularly applies when manufacturing is outsourced to developing countries, where, of course, labour costs, general working conditions and environmental standards can often be lower than in the developed world.

This is now coming to be seen as a major downside of the recent boom in outsourcing manufacturing operations outside the West.

As we discussed in chapter 6, China helped to fuel the boom through deliberately keeping labour costs down, through poor environmental standards and through subsidising the costs of land and energy.

Labour costs in China are on the rise, resulting in the relocation of outsourcing of low-end manufacturing to Bangladesh and Vietnam, for example. If it is not China it will be somewhere else for the "Old Normal" companies.

But as we discussed in chapter 7, Western consumers are now starting to operate with a new mindset, one that values people rather than things.

The "new old" over-55s have already changed their spending habits from those of their peak consumption years. They are buying fewer things – for example, only a new car when absolutely essential. They also want stuff to last as they rebuild savings following the global financial crisis for their retirement.

Young people dealing with lower income and employment prospects also want things to last – they really want quality. The throwaway society is over. As we have seen, quality comes from well-motivated employees, whether internal or external.

There is also a movement towards more "sustainable" businesses practices, not just in terms of the use of resources, but also in the overall societal impact of how things are made.

Ignoring these new trends creates additional risk for any company still welded to the old approach to outsourcing. Equally, as economies suffer from the ongoing financial crisis, trade protectionism is likely to rise. One of the justifications for trade barriers against certain products is likely to be that they are only cheap because of low, even exploitative, labour costs and poor environmental standards.

The further risk is that governments in host countries such as China will seek to transfer the costs of the damage to society and the environment back to companies. Ethical investors will also be more likely to punish bad companies as the approach to investing changes – a theme we will cover in chapter 10.

STEP 3 – AUDITING YOUR BUSINESS PARTNERS

So, on a practical level, how do you go about auditing your existing contract manufacturers, and potential manufacturers, to ensure they measure up?

How you do go about avoiding Foxconn-style events? In 2010, there were 14 suicides and 18 attempted suicides at Foxconn's complex in China, where Apple iPhones, iPods and iPads are assem-

bled, along with the Microsoft Xbox 360 and the Amazon e-book reader, the Kindle.

Oekom research[xvi], the German sustainable investment ratings agency, monitors companies in the retail, textile, food, information technology and electronics sectors. A December 2011 Oekom study[xvii] found that 40% of the mobile phone and computer manufacturing companies it covered were in breach of international standards on child labour and forced labour, discrimination, bans on trade unions and associations, working hours and pay, and health and safety. Thirty percent of textile companies also fell down in all of these areas.

Oekom advises companies to develop comprehensive supply-chain management systems, including the following elements:

- Guidelines/codes of conduct. Companies should draw up comprehensive and binding guidelines on labour standards for their entire supply chain, which in addition to the International Labour Organisation's core labour standards, should also cover the issues of working hours and pay, as well as health and safety in the workplace. The guidelines should also have regard to the payment of living wages, as minimum wages are often too low to meet the basic needs of workers and their families.
- Reviewing/monitoring compliance with supplier standards. This includes risk assessments, regular site inspections by independent monitors, drawing up plans of action where standards are not being complied with and providing training on the standards for relevant company employees.
- Empowerment/Capacity building. Companies should help their suppliers to comply with labour standards, for example through manuals containing examples of best practice and through training on setting up management systems. At the same time, companies should take a critical look at the impact of their own purchasing practices.

Critically, companies also need to take formal action when they find violations of their agreed policies are taking place. "Sweeping the problem under the carpet" is not a recipe for sustainable business success in the New Normal. As financial services companies have already found to their continuing cost, once trust has been lost, it is very hard to regain.

4. PROBLEM SOLVING IN THE TOYOTA WAY

The difficulties in getting there, in becoming a New Normal company, will be huge and so a good system for problem solving will be essential. Equally, companies will need to be very aware of cultural differences in the countries in which they operate. What works well in one region may need to be adapted for success in another. The key is to ensure that the underlying principles involved are well understood by those who will implement them.

Thus the final tier of our pyramid – problem solving – has as its full title, Continuously Solving Root Problems Drives Organisational Learning.

The overarching theme of The Toyota Way is people. Liker repeatedly stresses, throughout his book, that the right people, inspired by the right culture, are more important than any set of efficiency or im-

provement techniques. He also notes, that the advantages of a consensus-based decision making approach, as "this consensus process, though time-consuming, helps broaden the search for solutions".

Equally, once consensus has been reached, decisions then need to be rapidly implemented, rather than ignored or continually revisited. This brings to mind the salesforce.com example we referred to earlier. The company changed its entire strategy in three months, while adopting a policy of total openness in order to win "buy-in" from its employees.

PROCESS INTENSIFICATION

This is about reducing the size of chemical and other plant equipment which "parallels the miniaturisation of computers and is a subset of green chemistry and engineering – a subset of sustainable development", says a consultancy specialising in process intensification[xix] (PI). And they add that "PI uses modern developments and novel ways to enhance throughputs and e- heat and mass transfer and reaction rates by several folds".

Moving from batch to continuous processing is a key component of PI. The reason is that it enables manufacturers to achieve major increases in process efficiency while reducing waste. In many cases, it therefore can literally enable companies to "use less to produce more".

To again use a real-life example, Paul Hodges is chairman of Scottish technology start-up company NiTech Solutions, which won the ICIS Innovation Award in 2010 in the SME section for its technology breakthrough. It has developed new reactor technology that enables chemicals, pharmaceutical, food and other companies to switch from batch to continuous processing.

Batch processing is still widely used in all of the above industries in order to achieve consistency of production. However, energy, raw material and capital costs are higher than where continuous processing can be used. NiTech's patented baffled reactor technology has achieved some tremendous results in allowing companies to make the switch.

For example, Genzyme, the biotechnology producer, would normally have to construct two 150m3

Chart 103: NiTech Solutions' laboratory scale equipment

pressurised stirred tank reactors to make its required active pharmaceutical ingredients in volumes of hundreds of tonnes/year[xx]. Instead it has installed a NiTech reactor that is less than 3m high with a reactor volume of less than $1m^3$ for the same output. Reaction speed has been improved by a factor of 30.

The availability of this new technology has led to the development of a 10-year research programme funded by the UK and Scottish governments (via their technology funding programmes) and involving a number of major UK universities such as Cambridge, Heriot Watt and Strathclyde. The programme is also being supported by major companies including GSK, AstraZeneca and Novartis.

Twelve million pounds ($19m, €13m) of initial funding has been raised to establish a world-class Centre of Excellence in continuous manufacturing and crystallisation (CMAC)[xxi] based at Strathclyde University in Glasgow. This gives NiTech the opportunity to participate in major research programmes, which would otherwise be well beyond its own resources.

This research also provides wider benefits for NiTech as it focuses on development efforts designed to build sales in the short and medium term. A key challenge in this process is the need to change the mindset of potential customers to ensure that they gain the full benefit of the paradigm shift offered by NiTech's technology.

This challenge was well described in a recent paper by Peter Hobin, manufacturing technology leader at lubricants company Infineum[xxii], a joint venture between ExxonMobil and Shell. Hobin notes that:

"One of the perceived benefits of PI is a smaller manufacturing footprint and capital cost. However, in order to take a PI process into an existing plant environment and capture the expected savings, several additional challenges need to be addressed and overcome. Simply inserting a PI plant into a traditional plant layout and using conventional screening cost tools is unlikely to yield an overall lower capital cost. Instead there is a need to adapt to a different form of plant layout, design equipment for the highest levels of reliability and establish a compact design while ensuring easy access for operation and maintenance. Such considerations are rarely discussed in PI forums."

Hobin's paper highlights the need to make "such challenges more visible with a view to encouraging whole system solutions".

This points to the need for a holistic approach to manufacturing. Hobin notes that otherwise, PI risks being caught in the Catch 22 situation that not enough people will try it because of a lack of experience of how it should be implemented.

"It may be necessary for suppliers of PI equipment to initially heavily discount the cost of investment and support. In some senses this would be like a 'loss leader'," he continues in the same paper. "However, PI suppliers tend to be young companies with little reserves or capacity for such an approach." So, again, the solution comes back to being holistic through "substantial sharing of business sensitive information between supplier and user".

The challenges facing manufacturers are big, but not insurmountable, provided the work starts now. But companies can only achieve so much by themselves. They also need the right public policy framework in which to operate.

We need policies that will better regulate the financial sector and foster sustainable job growth and innovation.

That is the subject of our next chapter.

SOURCES

i http://www.stats.gov.cn/english/statisticaldata/yearlydata/YB2001e/ml/indexE.htm

ii http://en.wikipedia.org/wiki/2009%E2%80%932011_Toyota_vehicle_recalls

iii http://pressroom.toyota.com/article_display.cfm?article_id=2825

iv http://icos.groups.si.umich.edu//Liker04.pdf

v http://www.deloitte.com/view/en_US/us/Industries/technology/center-for-edge-tech/shift-index-tech/7f7d13c8d767b210VgnVCM2000001b56f00aRCRD.htm

vi http://www.amazon.com/gp/product/1422171647/ref=as_li_ss_tl?ie=UTF8&tag=stevdenndotco-20&linkCode=as2&camp=217145&creative=399373&creativeASIN=1422171647

vii http://www.ft.com/cms/s/0/294ff1f2-0f27-11de-ba10-0000779fd2ac.html

viii http://www.pg.com/en_US/company/purpose_people/pvp.shtml

ix http://one.laptop.org/about/mission

x http://www.quantatw.com/Quanta/english/about/company.aspx

xi http://www.brookings.edu/papers/2012/01_education_technology_winthrop.aspx

xii http://www.jstor.org/pss/10.1525/cmr.2011.53.2.50

xiii http://news.cnet.com/8301-13924_3-57354391-64/$100-olpc-tablet-to-debut-at-ces/

xiv http://www.forbes.com/sites/stevedenning/2011/04/14/how-marc-benioff-of-salesforce-com-became-the-most-valuable-ceo-of-all/

xv http://www.ou.edu/russell/UGcomp/Cascio.pdf

xvi http://www.oekom-research.com/index_en.php

xvii http://www.oekom-research.com/homepage/english/oekom_PositionPaper_LabourRights

xviii http://www.ilo.org/global/lang–en/index.htm

xix http://processintensification.net/

xx http://www.icis.com/Articles/2010/10/11/9398519/the-icis-innovation-awards-2010-nitech-solutions-wins-sme.html

xxi http://www.epsrc.ac.uk/funding/centres/innovativemanufacturing/Pages/imrccontinuousmanufacturing.aspx

xxii Issues that need to be addressed when trying to capture process intensification credits, EPIC 2011

Chapter 10

A policy framework for the transition to the New Normal

In this chapter we are going to address the biggest challenge to the acceptance of our ideas among Western economic policymakers – their belief in the life-cycle hypothesis.

This economic theory holds that we are on the whole rational beings, meaning that most of us save enough money for our retirements.

Policymakers are therefore convinced that the total volume of spending will not decline when populations age, even though the nature of spending might undergo some radical changes. Those over 65 are, for example, going to buy fewer sports cars, but the economy will be compensated by an equal amount of spending on Zimmer frames, and for those more able, sedate walking holidays in the countryside, they believe.

What about the effect on pensions of the recent collapse in equity and housing markets? "No problem," say the policymakers, "all we have to do is re-inflate stock and housing markets with a few hefty doses of fiscal stimulus to enable everyone to rebuild their savings for retirement." We have seen this happen in the US through several rounds of quantitative easing and Operation Twist [i].

We are going to argue that people are far from rational, making life very difficult for policymakers and economists who like nice, neat models to explain where things are going. This helps keep them in jobs.

We shall also examine:

- How the size and rewards of the financial industry have become way out of line with the needs of society, and are distorting Western economies. The industry needs to be reformed and we will make some suggestions on how this can be done.
- How governments need to support a rejuvenation of manufacturing industry. This will help the middle and working classes, who have seen their incomes stagnate, find both financially rewarding and meaningful work. This rejuvenation needs to involve more government support for R&D, for instance, for education and for vibrant new business

clusters. But this will only work if the right products are made, and at the right cost, which we shall discuss from a policy perspective. It will be about encouraging the development of the products of the future which will tap in to our megatrends – carbon footprint, demographics and food and water scarcity.

- How China's highly ambitious 12th Five-Year-Plan, which we first outlined in chapter 6, is at risk of failure. The plan defines a clear path towards a new, sustainable growth model. But the reforms will only work if China becomes more open, and, dare we say it, more democratic – perhaps the biggest of all the policy challenges. The very fact that we worried about mentioning the "D" word is, in itself, a problem.

THE LIFE-CYCLE HYPOTHESIS

Individuals smooth out, or even out, their saving and spending in the best possible manner over their entire lifetimes, argue the supporters of the life-cycle hypothesis.

The key assumption is that all individuals choose to maintain stable lifestyles. This implies that they usually do not save up a lot in one period to spend furiously in the next period, but keep their consumption levels approximately the same in every period.

The theory was developed in the early 1950s by the Italian economist, Franco Modigliani and his student, Richard Brumberg. They observed that individuals build- up assets at the initial stages of their working lives. Later on, during retirement, they make use of their stock of assets.

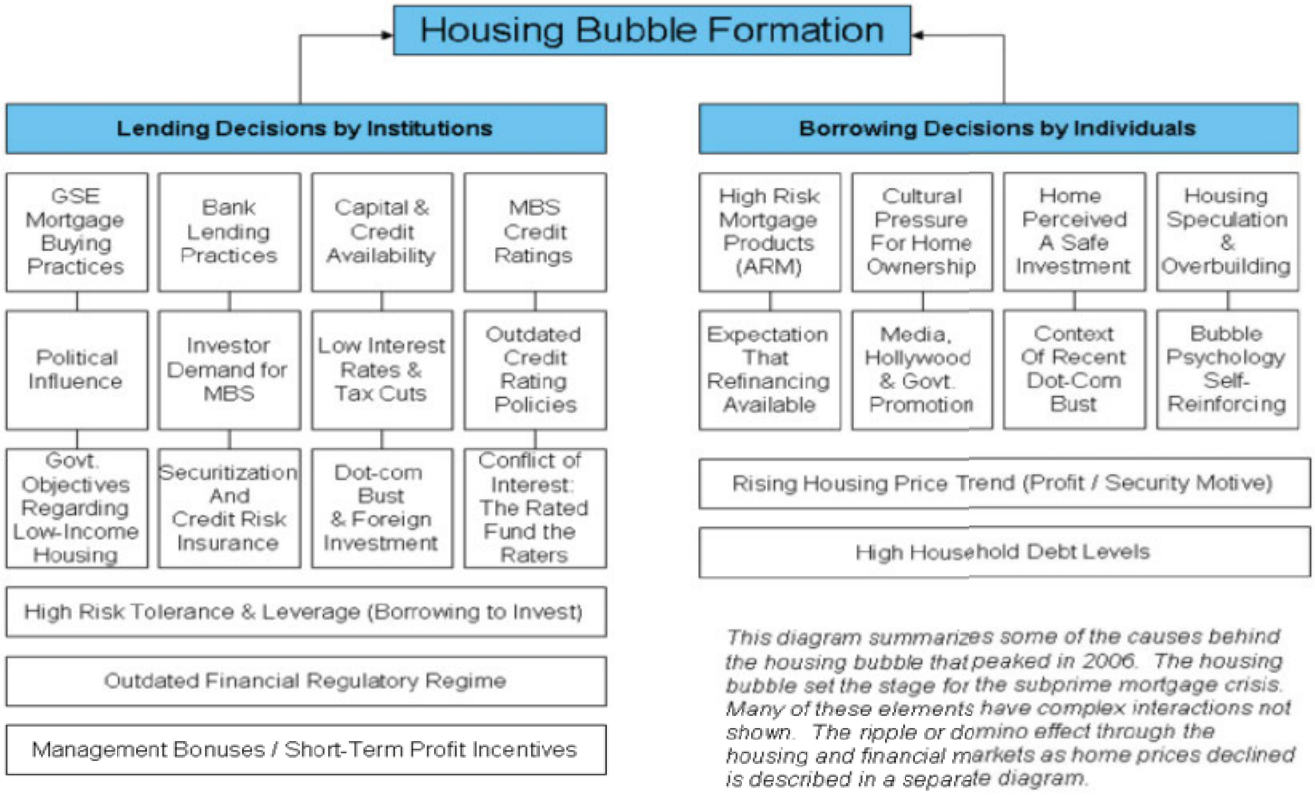


Chart 104: Psychological factors behind the US housing bubble

Source of chart: Wikimedia

Albert Ando and Milton Friedman (1957) further developed the hypothesis to include the theory that people borrow against future earnings during their early working lives when incomes are low, save greatly during their most productive working years, and consume saved assets during retirement. Even a portion of windfall gains – for example, first prize in a lottery – are saved for retirement.

If people are rational, why did median and low-income Americans fall into the trap of believing that house prices would always go up, thus overextending themselves during the sub-prime mortgage boom? During this time, personal savings levels fell to record lows.

Chart 104 on the sub-prime disaster, analysing both sides of the equation – lending decisions by institutions and borrowing decisions by individuals – illustrates that we are, of course, often irrational.

For example, the chart mentions the dot-com bubble. People were desperate to rebuild their savings after the bubble burst in 2001, thus taking more big risks, this time on property rather than equity.

The psychology of any bubble can be re-enforcing, as again the chart points out. People tend to believe that "this time it will be different" – ie that a particular bubble will go on forever, rather than the inevitable eventual end of all bubbles.

The influence of the media, and of the "Hollywood" effect, on people's lifestyle choices is also highlighted here. We are constantly bombarded with images, through TV and magazines etc, of the seemingly wonderful lives of the rich and famous, and so can be tempted into taking on too much debt in futile efforts to emulate those we envy.

Thus was the case during the sub-prime mania, with average income earners further lured into high debt levels by the failure of politicians to issue warnings about the risks ahead. Why on earth did we expect anything better of the average guy or gal when their supposed betters, their political leaders, and most economists and other "experts", failed to see this coming?

Following the collapse in the US housing market, extensive research has been carried out by behavioural economists and psychologists (sometimes one and the same thing) into the irrational way people in general behave during investment bubbles [ii].

One can argue that the roots of behavioural economics – although at the time it was not given such a name – date back to the publication of Adam Smith's The Theory of Modern Sentiments in 1759.

Hersh Shefrin, an economics professor at Santa Clara University in California, argued – after the 2008 global financial crisis – that investment decisions were heavily influenced by the human propensity to be optimistic.

"I think that what would have happened is if investment professionals were less overconfident, then they would have better assessed the risk of holding such huge amounts of their portfolios in mortgage-backed securities, given the risk of being in a bubble," he said.

"And you would have had less lax lending. Homeowners who took out those loans simply wanted the American dream – they bought during a bubble on the assumption that house prices are going up and will continue to go up."

According to Shefrin's colleague, Meir Statman: "Growth in the housing or stock markets only serves to increase people's overconfidence, since people tend to attribute their gains or losses to their own skill rather than the vagaries of the market."

Daniel Kahneman is a psychologist who in 2002 won the Nobel Prize for Economics, as a result of

Growth of a USA pension fund 1979–2011
(Median annual wages, 10% savings, S&P 500 index growth)

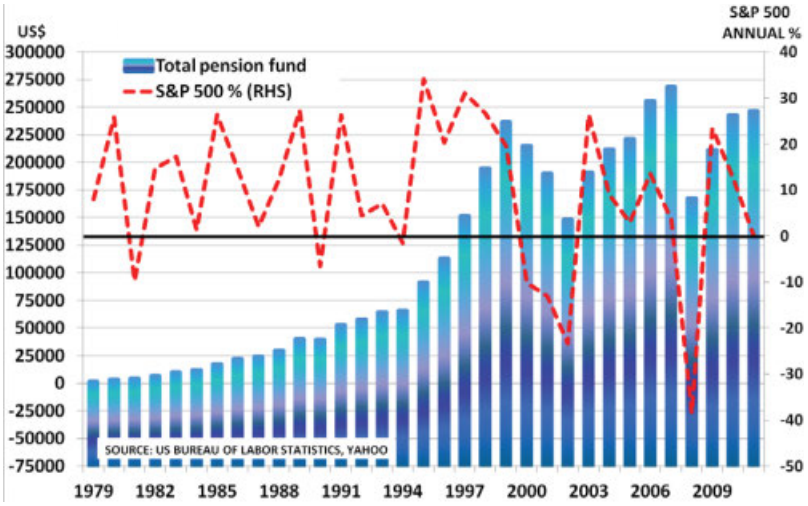


Chart 105: Growth of US pension funds 1979-2011

Source: International e-Chem

research that has helped expose the flaws in economic models that assume we rationally save, spend and invest for our retirements. The Nobel committee wrote that Kahnemam had ""integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty". He is viewed as the father of modern behavioural economics.

Thinking Fast and Slow, a book he published in December 2011, which summarises much of his work for the benefit of the lay person, argues that there are two types of thinking [iii].

System 1 is fast, intuitive, associative, metaphorical, automatic, impressionistic, and cannot be switched off. Its operations involve no sense of intentional control, but it is the "secret author of many of the choices and judgments you make", he writes.

System 2 is slow, deliberate and effortful, requiring a great deal of attention.

Because people become quickly exhausted by System 2 thinking, System 1 tends to dominate the way we behave, often to our detriment. It is of little use for the type of statistical thinking often required for good decisions, it jumps wildly to conclusions and is characterised by a wide spectrum of irrational biases identified by psychologists. These include framing effects[iv] and confirmation bias[v].

Much of the evidence that ordinary people encounter in their lives points to the highly irrational nature of human saving and spending decisions.

We only have to look again at consumer markets to find the evidence for our views.

Government efforts to revive Western housing and auto markets have been misguided because they have failed to address the root causes of the problem – lower total demand and the change in the nature of demand, as we have discussed in previous chapters. For example, the "cash for clunkers" programmes, where people were given money for trading in their old autos, merely brought forward demand rather than achieving a long-term rise in consumption of new cars.

Here we will look at pensions to provide more evidence of the fallacy of the life-cycle hypothesis.

GETTING OLDER AND POORER

Chart 105, updated from chapter 7 to include 2011 data, illustrates that people have not saved enough for their retirements.

Based on official US earnings statistics from 1979 until end-2011, the above chart shows that a worker on median wages would have built a pension fund of $247,000 (blue column), assuming that they had:

- Earned median wages during that period.
- Saved a regular 10% of their income, a total of $85,025.
- Gained S&P 500 Index growth (red line) on their investments each year.

At the beginning of 2011, this fund would have bought an annual pension of $10,000/year, with inflation proofing.

Today, the figure will be even lower as US interest rates are below end-2010 levels.

This highlights the potential income drop that employees face on the day they retire. In this example, income drops from median earnings of $39,000 to a pension of less than $10,000.

Even worse, most people have actually saved less than this amount. The median US household headed by someone in the 55–64 age bracket had only saved $87,200 at the end of 2011.

The data will obviously change over time, as will the country-by-country specifics, but the general direction will be the same, driven by longer life expectancy thanks to the advances in medical science and diets.

When pensions were first introduced in Germany in 1889, and then in the UK in 1908, life expectancy was 30 years less than it is today, yet the pension age was still set at between 65 and 70 years. Even in 1950, life expectancy was still only 66 years.

Pensions have to be stretched over longer life spans and have been de-pleted by the global economic crisis.

The strain on company and government pension provision is nothing short of enormous. For example, in November 2011 the European Central Bank issued a report calculating the state-funded pension obligations of the 19 EU countries, where sufficient data existed.

These countries had combined pension obligations of €30 trillion ($48 trillion) against total EU 2010 GDP of only $16 trillion.

Returning once more to the life-cycle hypothesis, it assumes that as people retire, while their spending needs might change (as a reminder, fewer sports cars and more sedate walking holidays in the countryside), they will have built up sufficient assets through prudent planning to be able to spend as much as when they were working.

The evidence from pension provision clearly points in the opposite direction. Individuals, private pension funds and governments did not see the demographic time-bomb coming, and also failed to anticipate the global financial crisis.

Two thirds of the people who have ever been 65 are alive today. This suggests to us that even if there is some truth in the life-cycle hypothesis, such a large number of retirees create the potential for statistical anomalies that challenge its validity. Only two percent, say, of over 65s behaving irrationally is still an awful lot of people.

Long, and possibly very miserable, periods of retirement confront hundreds of millions of pensioners as they are forced to spend less. They will have less than they, and many others, had anticipated.

In addition, their children are going to have less. Parents will, as a result, have to dig deep into pension incomes and assets to look after young people struggling to find work.

This is all very bleak, but it does not have to be this way if politicians in the West adopt the right policies.

Here are our suggestions.

RE-SHAPING FINANCE AND MANUFACTURING

The Occupy Wall Street movement says "we are the 99%", referring to the widespread feeling among the middle and working classes throughout the West that they have suffered at the expense of the 1% – often those who work in the financial sector.

Policymakers need to recognise that shuffling money around, through high-frequency trading and through the financial innovations that led to the 2008 crisis, has to change because of:

1. The potential for major social unrest as economies deteriorate.
2. The danger that the financial sector could cause a repeat of 2008.
3. Skewed incentives, leading to some of the best brains in the world being drawn to the financial sector because of high compensation. These brains are needed to rejuvenate manufacturing sectors in the West, and to invent and develop the products needed to deal with the megatrends of demographics, carbon footprint, and food and water scarcity.
4. Governments have become over-reliant on tax revenues from financial sectors. This has lessened the appetite for investments needed in the infrastructure, education and R&D necessary to create meaningful, as well as financially rewarding, work for the 99%.
5. Tax revenues from the financial sector are highly unreliable, as 2008 demonstrated. Government finances have been placed under further strain by the need to bail-out financial institutions seen as "too big to fail".

And so, financial-sector reform that works is needed.

Major doubts surround one particular piece of legislation, the Dodd-Frank Act in the US, which runs to some 1,800 pages. Its immense complexity, leading to what will no doubt be numerous legal challenges clause by clause, has led Jonathan Macey of the Yale Law School to describe the legislation as "a full employment bill for lawyers and regulators"[vi].

Whatever the rights and wrongs of Dodd-Frank, and new regulations elsewhere, Macey says that the core of all good laws should be the break-up of financial institutions into several smaller, more "digestible" companies, if they become too big to be allowed to fail for political or systemic reasons.

One specific thing that needs to be tackled in the financial world is high-frequency trading, which we discussed in chapter 3.

This involves computer 'black-boxes' which are programmed with complex algorithms to trade vast

numbers of contracts on a micro-second by micro-second basis.

High-frequency trading accounts for 70% of all US equity trading[vii.] But it does not exist to perform the usual function of financial markets, which is price discovery.

Instead, it confuses people, and it misleads, giving the impression that recoveries are occurring, when all that is happening is that computers are moving large amounts of money around in fractions of a second.

Referring back to our point about skewed incentives, non financial-sector companies are rewarded for "talking up" their share prices because of the shareholder value culture we discussed in chapter 9. If less attention was paid to the share price, more effort might well be devoted to making the products of the future.

Roger Martin, in his book, Fixing the Game: Bubbles, Crashes and what Capitalism can learn from the NFL[viii], has some practical and detailed suggestions on how the law could be changed in the US to get rid of the obsession with shareholder value:

- The 1995 Private Securities Litigation Reform Act's "safe harbour" provision should be repealed. This would remove the legal protection company executives enjoy from giving guidance to the stock market. The executives, and their companies, would as a result become legally liable for any attempt to manage expectations.
- The elimination of regulation FASB 142, which forces the write-downs of real assets based on the company's share price. The current rule forces executives to concern themselves with managing expectations in order to avoid such write-downs. Changing the rule would remove the major sanction that now exists for executives who ignore the "expectations market".
- Getting rid of stock-based compensation as incentives for executives. This does not mean that executives would not be allowed to own shares. If an executive wanted to buy stock as some sort of bonding with the shareholders, or for whatever other reasons, that would be fine. Executives would, however, be prevented from selling any stock, for any reason, while working for their company – and for several years after leaving their posts.

This last reform, being proposed not just in the US but also in France by presidential candidate Francois Hollande, would help to deal with income inequality.

Using the US as an example again, at the start of the 1970s, average top-100 CEO pay was roughly 40 times an average worker's pay. By 2000, it had reached 1,000 times an average worker's pay, largely thanks to stock options, and has remained at about that multiple since then, according to French economists Thomas Piketty and Emmanuel Saez.

The West, as we have already indicated, faces some huge challenges in retooling its manufacturing and service industries in order to benefit from the new normal.

If it fails in this monumental task, not only will the global economy continue to struggle, but there will be an enormous waste of human potential.

Hundreds of millions of average and low-income workers will be unable to find the kind of meaningful, and financially rewarding, work that will keep them healthy and happy – and out of poverty.

Failure to rise to this challenge will place an ever-greater burden on government entitlement programmes. Unemployment payments will continue to rise, as will healthcare payments because unfulfilled people are more subject to depression and physiological ailments.

It would be morally, as well as economically, wrong if we fail to raise this challenge. And it might even invite the kind of social chaos that led to the rise of fascism in Europe ahead of the Second World War.

So, in addition to financial sector reform, which we have discussed above, here is what governments need to do:

- Increase investment in R&D, creating the need for a huge change in mindset among some politicians. Peter Spitz, who worked for oil and chemical company research and engineering departments – and who founded the consultancy, ChemSystems – provides some excellent historical context for the US when he writes[ix]: "Federal technology investment – supporting basic research and promoting early commercialisation, has been crucial to the creation of many industries in the US. Examples include the Internet, transistors and SEMATECH (next-generation chips). It is fair to say that the country's need to make high-octane aviation gasoline, synthetic rubber and polyethylene for radar installations was to a considerable extent responsible for creating the petrochemical industry. Many of the top innovations in the US were supported by a combination of government and industry funding." He warns that today, other than the horizontal drilling and hydraulic fracturing techniques for shale gas and shale oil extraction, there are no other "breakthrough technologies" that he is aware of in the US. He blames this on lack of coordination between government and business.
- Invest more in education to create the skills necessary to make the products of the future. People are living longer and so we need to provide the opportunities for retraining in order for us to no longer, in effect, have to say to a 50-year-old auto worker who has just been made redundant, "that's it as far as meaningful work goes. The best you can hope for is poorly paid part-time work from now on". There are obviously also all the young people who need help in finding the right type of work. This again needs partnerships between governments, both central and local, to provide the right type of education and retraining programmes. "The US no longer has the best-trained workforce," writes management consultancy Booz & Co in a fourth-quarter 2011 report, Manufacturing's Wake-Up Call[x]. The consultancy talks of the need to boost engineering and science-based skills directly relevant to particular industrial sectors. It adds that guidance on opportunities in industry needs to be improved, and that there is a "desperate need" for better classroom instruction for non college-bound students. An excellent model for all the above is the ReadySC[xi] programme in South Carolina, which maintains regular communications between industrial leaders and college-aged youngsters about the skills that are required, adds the consultancy.

- Provide the investment incentives necessary for companies to invest in more R&D, and in new manufacturing facilities. Another essential element to investment decisions is decent infrastructure. As China builds hundreds of thousands of new roads, railway lines, ports and so on, in the US, the American Society of Civil Engineers has issued constant warnings about the poor quality of the country's roads, with bridges and dams worn out and in danger of collapse, says Jeffrey Sachs in his book, The Price of Civilisation[xii], published in late 2011. Levee and river systems need major upgrades, as was exposed by the tragic events in New Orleans after Hurricane Katrina, he adds.
- Western governments need to get rid of the "revolving door" between the financial sector, government and lobbyists, which Sachs also discusses in his book. This comprises the constant stream of former bankers becoming politicians, and of politicians returning to Wall Street or joining lobbying firms that promote the interests of banks etc.
- Governments need to develop more of what Michael Porter discussed in his 1990 book The Competitive Advantage of Nations: Business clusters, which are geographic concentrations of interconnected companies, suppliers, service providers, and associated institutions, such as university research laboratories. Examples in the US include Silicon Valley and the aerospace cluster in Wichita, Kansas; and the auto and engineering clusters in Germany.
- They also need to get real about the unlevel playing field confronting many of their manufacturers. The developing countries have skewed the competitive environment in favour of their state-owned manufacturers through, as we discussed in chapter 6 in the case of China, subsidised land, cheap energy, cheap labour and great investment incentives. Mike Devereux, chairman of Australian car manufacturer Holden, said in February 2011 that without either government support or high tariff barriers, domestic production of vehicles would ultimately fail[xiii]. This neatly summarises the dilemma facing many Western manufacturers. Whether Australia needs an auto industry is not a debate we want to get into here, but it is an issue that the country's politicians have to seriously consider. Every Western government needs to pick, and then adequately support, "industrial champions" in a world where trade is far from free. Just as Australia will have to make a choice over its auto industry, so will every Western government over every industry that is put forward as a potential champion. There is a risk that short-term political objectives – for example, preserving votes in regions where industries are under threat – will lead to bad decisions. If an industry in a particular country has no long-term future, politicians will need to be bold and brave enough to let it close down, rather than wasting tax breaks and other incentives that would be better-spent elsewhere.

The lack of genuinely free and fair trade is further illustrated by fact that the industrial champions in countries such as China do not necessarily have to always make a profit. Take Sinopec, for instance, the state-owned energy, refining and chemicals producer. Its role is seen as a utility provider – ie ensuring

the reliable supply of raw materials for manufacturing in order to keep people in jobs, even if that means sometimes losing money.

This is not meant as a criticism of countries such as China and, in its earlier years of development, South Korea – a country we shall discuss in more detail later on.

Without government support for strategic industries, hundreds of millions more people across the developing world would still be in severe poverty and societies would be badly destabilised.

Heavy government involvement is the pragmatic and right thing to do at certain stages in any country's development.

Take South Korea as an example again. In 1950, during the Korean War, the country was 39th out of a listing of 52 countries in terms of per capita GDP ($876.00)[xiv]. It was only five places ahead of the Democratic Republic of Congo.

By 2011, according to the International Monetary Fund, South Korea was ranked 25th with a GDP per capita of $31,753 – ahead of the EU[xv].

The graph below is a good basis for a workshop involving policy makers and industry leaders:

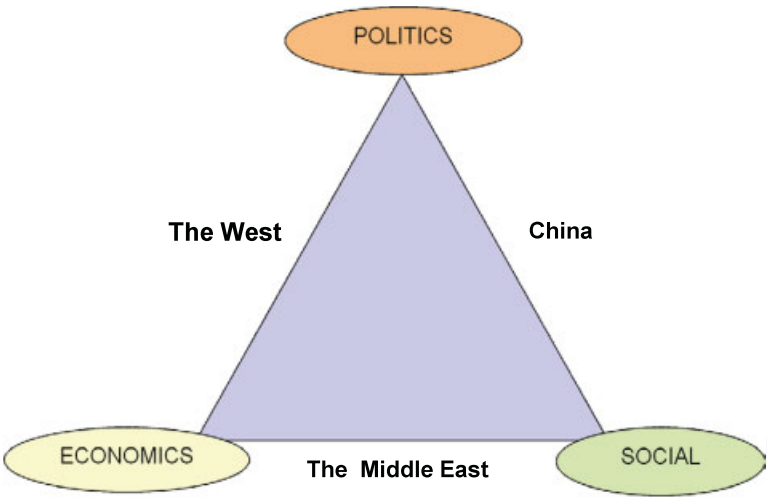


Chart 106

Source: ICIS

In the case of China, used as an example in the chart above, industrial policy has, as we said, a social aspect. It is about creating jobs for a population that remains very poor by Western standards.

Its rising economic power has been accompanied by more political influence. China is, as a result, being pressured by the West to play more of a global political role. This, in turn, is helping shape economic policy through, for example, calls for China to allow the yuan to further strengthen.

The Middle East faces a big challenge of creating sufficient jobs for very youthful populations. In Saudi Arabia, for instance, the median age is just 25.3[xvi], compared with 36.9 in the US[xvii].

Its industrial policy is therefore heavily focused on the social aspect of how to widen manufacturing beyond just extracting value from hydrocarbons. The problem with the oil, gas and petrochemical industries is that, while generating enormous revenues and profits, they do not create many jobs.

And so, to use Saudi Arabia as an example again, the education system is being reformed from the kindergarten level through to university education – in order to develop the skills necessary for a big growth in manufacturing industry.

New industrial cities are being constructed, complete with government-funded infrastructure. Financial incentives have been drawn up in an effort to attract domestic and foreign investors.

But even with all this government support, critics point out that Saudi Arabia will still be hampered by the logistics costs of shipping manufactured goods to the big consumption markets in Asia and the West. Labour costs are also viewed as uncompetitive.

It is, however, to repeat, not just about economics – and so industrial development in countries such as Saudi Arabia is likely to still go ahead, representing an opportunity for Western companies to license technologies and build manufacturing plants. By so doing, they will create strong "societal value".

Western policymakers and companies should also use the slide above to think about how to aid the development of their own societies.

In the short run, quarterly results might suffer. But in the long run this is a win/win, as jobs will be created, societies will more stable, and companies will survive and prosper through developing the products and services that tap in to our megatrends.

We mentioned earlier on in this chapter the need for more government spending on R&D, but it needs to be investment in the right kind of R&D.

In chapter 8, we also talked about how the "middle ground" in consumer products is being eroded.

During the golden economic era of 1994–2007, favourable demographics supported manufacturers adding more and more features to their products, in order to make money out of the wealthy baby boomers.

But now this middle ground is disappearing as the boomers enter retirement and therefore spend less and save more.

Populations in general will also be short of money due to lower economic growth and reduced credit.

As a result, "value for money" and "built to last" will be key considerations for the products of the future – and politicians cannot afford to lose sight of this.

The same applies to the developing world, where the majority of people remain poor by Western standards. Political leaders need to see beneath the surface of all the talk about the rise of the middle classes in countries such as India and China, in order to keep policy decisions focused on the real opportunity: helping industry make good-quality refrigerators and computers etc which retail at $100 or less.

The other enormous opportunity is tackling the megatrends: carbon footprint, food and water scarcity and ageing populations.

Politicians have to sell a moral and business-practical agenda to voters and companies. They need to be convincing in their arguments that doing the right thing – saving and improving the lives of millions of people in developing countries – will be extremely profitable.

And, of course, during our proposed workshops involving government and industry, the above slide will need to be continually re-examined as each investment proposal is brought to the table.

Unless a proposal truly benefits society in the ways we have just defined, it will need to be reconsidered.

CHINA'S BIG CHALLENGE

THE LEWIS CURVE

Here is our old friend the Lewis Curve, which we first introduced in chapter 2:

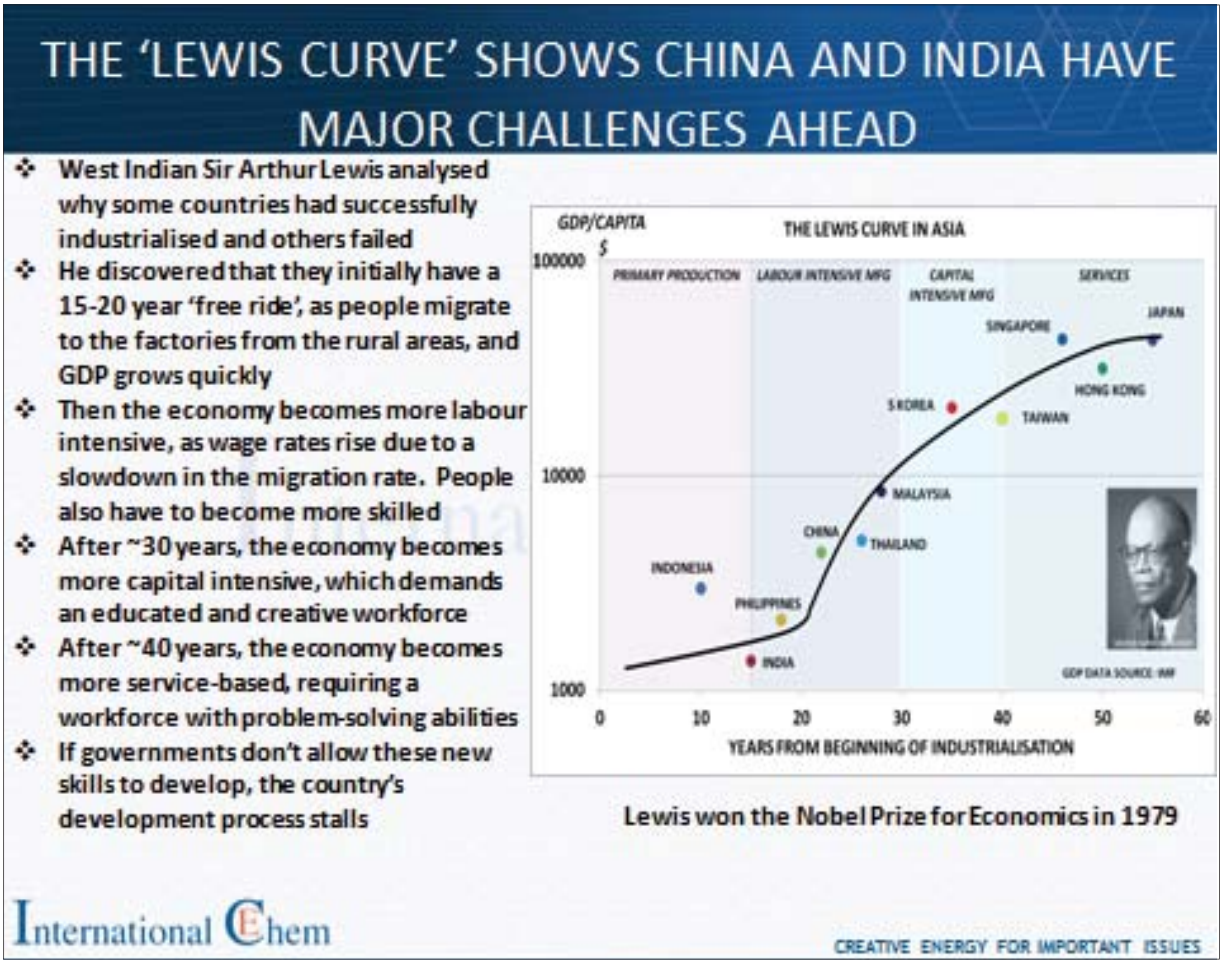


Chart 107: China and India face major challenges

The "free ride" referred to in chart 107 by Sir Arthur Lewis, the West Indian economist, is already beginning to come to an end in China as a result of government policies under the 12th Five-Year-Plan (2011-2015). These include:

- Raising income levels in rural areas. In February 2012, the effects of this policy were being felt to a major degree for the first time, as millions of migrants failed to return from their homes in the West to factories in the eastern and southern provinces. Manufacturers were, as a result, struggling to operate their plants.
- Increasing minimum wages across the entire country by 13% per year in 2011-2015 and encouraging greater collective bargaining during pay negotiations, in order to give workers more bargaining power. Higher wage costs have forced "low-end" manufacturers of cheap finished goods to relocate their plants either to western China, or to elsewhere in Asia, where labour costs are lower.

Demographer Kenneth Gronbach[xviii] predicts that in 10–15 years, the cost and supply of labour will be adversely affected by what he describes as the "country's disastrous one-child policy".

Central government policy under the 12th Five-Year-Plan, as we again discussed in chapter 6, recognises the scale of the challenge. And so, in addition to raising living standards through higher wages and investment in rural communities, the government is attempting to move up the "Lewis Curve" through investing in "value-added" industries, such as higher-value electronics and renewable energy.

Here is a reminder of the scale of the task facing China: it takes 50 consecutive years of 7% annual growth for a country to boost per capita income from $500 to $20,000, says Nobel Prize-winning economist Michael Spence. China's per capita GDP was only $4,382 at end-2010, according to the International Monetary Fund.

THE BATTLE AGAINST "VESTED INTERESTS"

A lot is made of China's state-driven investment in R&D, a sign of which is the doubling in the number of international patents it has registered since 2005.

Unfavourable comparisons are also often made with the West, such as the following[xix]:

- In 2009, for the first time, over half of US patents were awarded to non-US companies.
- China has replaced the US as the world's number one high-technology exporter.
- The World Economic Forum ranks the US 51st in the quality of maths and science education compared with China's 31st position.

And when Apple needed to find 8,700 engineers capable of supervising workers who would cut specially strengthened glass for its iPhones and iPads, it took just 15 days to assemble this workforce in China. The company estimates that it would have taken 15 months in the US[xx].

But beneath the surface of these statistics are several major shortcomings that, unless addressed, will leave China very firmly caught in the "middle-income trap" so well described by the Lewis Curve.

These include the dominant role that the state plays in the economy.

Some 85% of all bank lending went from the state-owned banks to the often slow-to-react "old industry" state-owned enterprises (SOEs) in 2011, resulting in warnings from academics that the state is smothering the private sector.

An important World Bank report, released in February 2012 and summarised in chart 108 on the following page, highlights the problem of how SOEs play far too big a role in China's economy, at the expense of entrepreneurship.

Misallocation of capital has already placed huge strains on the banking system, and as you can see from the slide above, the World Bank is worried that these strains could increase.

The World Bank recommends that asset-management firms should oversee the SOEs. The asset managers would try to ensure that the firms are run along commercial lines, not for political purposes. They would sell off businesses that are judged extraneous, making it easier for privately owned firms to compete in areas that are spun off.

The World Bank study was supported by the Development Research Centre, a think tank that reports to the country's top executive body, the State Council.

Chart 108: The World Bank's 'China 2030' report highlights risks to China's growth

And even more importantly, China's Vice Premier, Li Keqiang, who was expected to be named Premier later in 2012, endorsed the report when it was proposed in 2010.

But a political battle within China is inevitable over the recommendations of the study, and the whole direction of the 12th Five-Year Plan.

"Vested interests" have done exceptionally well out of the current economic-growth model.

These include local government officials, who have reportedly made vast sums of money from acquiring agricultural land at knock-down prices and selling the land on to developers.

Local government land sales are also vital for the revenues of the provinces and cities. So, if China does stick with its policy of reducing new investments in real estate and export-based industrial capacity, a new source of revenue will need to be found for the local authorities.

Incredibly, 16,000 to 18,000 government officials and executives from SOEs stole $123bn of public funds between the mid-1990s and 2008, says The Economist, quoting data from the People's Bank of China.

China is viewed by some as superior to the West. This is because the state plays such a large role in the economy through, for instance, providing ample funds for R&D and through guaranteeing a flood of new science and engineering graduates every year.

In the West, in comparison, as we discussed before, incentives work in the wrong direction because the brightest and best brains are attracted to the financial sector. Banks and other institutions tower over economies, distorting how politicians behave and threatening economic stability.

Incentives are clearly also wrong in China when you can make vast sums of money via corruption. And where is the incentive to work hard in a research lab, or in a new private-sector start-up, when those making the real money work for the SOEs and for local governments? Perhaps this is why of the 1.62m Chinese students who went abroad to study between 1978 and 2009, only 30% returned home, according to a study released in 2011 by China's Huaqiao University.

Further, "getting rich quick" in China, to quote Deng Xiaoping, has very often involved speculation in property and other assets. Again, why work hard in a private sector overshadowed by the state, when you can make easy money from running a trading business?

The story of Cathay Biotech Industries[xxi] illustrates how difficult it can be for an innovative, private-sector company to make it in the Chinese system.

Its chief executive, Liu Xiucai, earned a PHD in chemistry in the US and returned home in 1989.

He collaborated with a series of state institutions, including the Chinese Academy of Sciences, helping to get the country's vitamin C industry off the ground.

In 1997, when Liu founded Cathay, a biotechnology firm, he received government tax breaks and other incentives. But Liu made enemies by making public accusations of corruption and scientific fraud in state-run industries and of government meddling in private companies.

Cathay developed a process for fermenting nylon intermediates into lubricants and diabetes drugs.

But an employee stole its technology and a state-backed company set up production using this stolen technology.

Chances of legal redress seemed slim, given that legal decisions are influenced by the state.

Can innovation flourish without more openness?

China needs to go beyond making very good copies of Western technology, of making slight improvements on those copies, and of being superb at executing orders for companies such as Apple.

This is how it will move up the Lewis Curve.

A McKinsey study on China[xxii] concludes that several basic skills necessary for China to become more innovative "are at best nascent".

These include:

- **Lack of advanced understanding – analytical and not just intuitive – of what the customer really wants.** China is very good at the "push" approach, defined by the consultancy as the ability to take existing business models and apply them to fast-growth markets. Where it falls down is the "pull" approach of understanding, through analysis and intuition of what customers might want – or be made to want in the case of Apple and its iPads and iPhones - in the future.
- **Corporate cultures that do not encourage risk-taking.** Innovation is about not being afraid to fail, but McKinsey warns that in China, failure is looked down upon, as is "speaking your mind".

Chart 109: The Hyundai i30

Source: http://www.mynrma.com.au/

In order for real innovation to flourish, you also need full access to information, along with the confidence to speak your mind and a willingness to take risks. When the fear of the state still dominates thinking, and for older people with memories of the horrors of the Great Leap Forward and the Cultural Revolution still shaping how they think and behave, it is hard to see how China can progress.

An exceptionally brave new breed of politicians needs to come forward in China, as we said at the beginning of this chapter, in order to create a more open society.

Hopefully, this will happen as a result of the 2011–2012 leadership transition.

This new breed of leaders would need sufficient power and influence, unlike Cathay Biotech's Liu, to speak out against the system and achieve reforms, without being sidelined, or worse.

South Korea is a possible role model for success.

If you talk to South Koreans, they attribute this to the advent of democracy in 1987, when the country held its first free elections, and subsequent further reforms.

"We would never have achieved what we have achieved without opening up our society, and without free and fair elections," said a senior executive with one of the country's major chemicals producers.

From 1961 to 1979, when South Korea was run by the military dictator Park Chung- hee, the focus was very much on rebuilding the country through low-value manufacturing, after the devastation of the Korean War, writes Michael Schuman in the magazine, Time.

But then as wage costs rose, and as democracy developed, the country shifted into shipbuilding, steel, chemicals and basic electronics manufacturing.

The Asian financial crisis exposed flaws in the economy, most notably overcapacity in steel and chemicals as a result of the over-dominance of the Chaebol, the country's industrial conglomerates.

Thanks to the election of the first president from an opposition party, Kim Dae-Jung, which occurred shortly after the 1997-1998 Asian financial crisis, the Chaebol and the financial sector were restructured and corporate governance improved.

"We have also, over the years, become more willing to accept foreign ideas – and have become more pre-

pared to challenge ourselves, and to challenge others," added the executive with the chemicals company.

"When I was a child, we used to follow foreigners down the street and stare at them. No kidding…."

The result has been a wave of genuinely original manufacturing[xxiii], including:

- Samsung and LG's dominance in the LCD-TV business.
- The strong possibility that Samsung will become a leading force in 4G telecommunications technology.
- Hyundai becoming one of the world's top five automakers, thanks to big improvements in design and engineering capabilities. A decade ago it was viewed as a joke manufacturer. The company now keeps winning awards, including for its Hyundai i30, which has been voted Australia's best mid-sized car three years in a row, and comes close to the top of the Australian government's fuel-efficiency ratings.

This chapter is not meant to be discouraging, but there is little point in hiding from the scale of the challenges we confront.

It is the job of Western politicians to be frank and open about these challenges, rather than pretend that a few quick fixes will get us back to where we were during the "Golden Era" of 1995-2007.

But they also need to encourage and to inspire companies and individuals to benefit from the transition to the new normal, as well as, of course, creating the policy framework to make this possible.

Only then can we make the products of the future. In our next chapter we will explore in more detail what these products might look like, with some examples of where manufacturers have already made the transition to the new normal.

SOURCES

i http://www.npr.org/blogs/money/2011/09/21/140643696/operation-twist-explained-in-4-easy-steps

ii http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1742463

iii http://www.guardian.co.uk/books/2011/dec/13/thinking-fast-slow-daniel-kahneman

iv http://en.wikipedia.org/wiki/Framing_effect_(psychology)

v http://www.sciencedaily.com/articles/c/confirmation_bias.htm

vi http://www.economist.com/blogs/schumpeter/2012/02/looking-closely-dodd-frank

vii http://www.icis.com/blogs/chemicals-and-the-economy/2012/02/financial-markets-correlation.html

viii http://www.amazon.com/gp/product/1422171647/ref=as_li_ss_tl?ie=UTF8&tag=stevdenndotco-20&linkCode=as2&camp=217145&creative=399373&creativeASIN=1422171647

ix http://chemengineeringposts.wordpress.com/2011/12/20/competitiveness-the-governments-role/

x http://www.booz.com/global/home/press/article/49740178

xi http://www.readysc.org/

xii http://www.guardian.co.uk/books/2011/oct/06/price-civilization-jeffrey-sachs-review

xiii http://www.theaustralian.com.au/national-affairs/holden-to-fail-without-government-help-car-company-warns/story-fn59niix-1226260414912

xiv http://www.nationmaster.com/graph/eco_gdp_per_cap_in_195-economy-gdp-per-capita-1950

xv http://en.wikipedia.org/wiki/List_of_countries_by_GDP_(PPP)_per_capita

xvi http://www.indexmundi.com/saudi_arabia/median_age.html

[xvii] http://www.indexmundi.com/united_states/median_age.html
[xviii] http://www.icis.com/Articles/2011/04/07/9450599/insight-china-on-the-verge-of-a-population-and-economic-crisis.html
[xix] http://www.forbes.com/sites/ciocentral/2011/01/20/danger-america-is-losing-its-edge-in-innovation/
[xx] http://www.nytimes.com/2012/01/22/business/apple-america-and-a-squeezed-middle-class.html?pagewanted=all
[xxi] http://www.nytimes.com/2011/12/08/business/an-entrepeneurs-rival-in-china-the-state.html?pagewanted=all
[xxii] http://www.mckinseyquarterly.com/Strategy/Innovation/A_CEOs_guide_to_innovation_in_China_2919
[xxiii] http://www.time.com/time/magazine/article/0,9171,2029399,00.html#ixzz1nAMzIosx

Chapter 11

A road map for success

This chapter maps out a path to success for companies in the new normal. Its aim is to highlight the key challenges and opportunities, and it identifies five key areas where major change is already underway.

The chapter starts by looking at the history of success within the chemical industry. It is the world's third largest industry (the others are agriculture and energy), and has a history of adapting to major change over the past two centuries. So we should not be worried about its ability to survive and prosper in the future.

However, we cannot underestimate the challenges ahead. They will create winners and losers among individual companies. This will be quite unlike the pattern of the past 20 years during the baby boomer-led supercycle. Successful companies in the future will be those who become:

- **Demand-driven.** Markets have essentially been supply-driven in recent decades, with growth being forecast on the basis of ratios to expected GDP growth. This led companies to focus on increasing their efficiency via a 'one size fits all' business model. As we transition to the new normal, companies instead need to focus on being effective. This will mean establishing local techno-commercial support, and developing a longer-term approach in R&D to deliver the products and services that will be required
- **Market focus.** There will still be a role for building bulk commodity plants on a world scale. But these opportunities will be mainly in the emerging economies, and only where there is good growth expected in the size of the 25–54 year old wealth creator cohort.
    - Companies operating in the West will need to reposition their businesses to focus on the needs of the ageing 55+ 'new old' generation if they wish to drive future growth, as the Western wealth creator generation will be smaller than in the past.
    - Those operating in the emerging countries will need to develop mechanisms to sustain growth in the domestic economy, particularly in the rural areas, as the opportunity for export-led growth will be much reduced.

- **Affordability.** The focus on 'needs' rather than 'wants' requires companies to take a different approach to their markets. It is a different way of looking at the world, and it requires the development of new offerings based on the megatrends of food, water, shelter, mobility and health. These must be affordable, as they are aimed at meeting basic needs, rather than ones that are focused on mere wants. They follow from changes in consumer markets, which are making life similarly difficult for companies focused on the middle ground.
- **Shared Value.** Consumer values are also changing quite dramatically, away from the materialism of the recent past. Concerns about sustainability and carbon footprint are rising up the agenda. Equally, companies in the emerging economies of the Middle East, Asia and Latin America no longer see profit as the only driver for business. Social stability is becoming equally if not more important for many. The former focus on shareholder value and financial metrics needs to change.
- **The VUCA environment.** The transition to the new normal is a sea change for the global economy. The full impact will take years, if not decades, to become clear. In the meantime, the world will face much greater uncertainty, as conflicting views of the world play out on a day-to-day basis. As a result, companies need to plan for a VUCA environment during the transition that is now underway. Volatility, Uncertainty, Complexity and Ambiguity will be the order of the day.

The scale of the changes now underway makes adaptation difficult, particularly in the current financial climate. But there is little we can do to reverse them. Demographics drive demand, and the ageing of the boomers is taking us down a new road.

Our aim in this chapter is to present a road map that will guide your company towards a successful future.

A HISTORY OF SUCCESS

The chemical industry has a strong record of success. Its origins go back many centuries, if not millennia. Some date its emergence to ~7000BC when alkali and limestone were first refined for small-scale glass production. Others date it to ~700BC when the Phoenicians produced soap.

For our purposes it is probably reasonable to begin nearly 200 years ago in 1823, when James Muspratt first tried to commercialise Nicolas Leblanc's soda ash process. This was followed by the Solvay process in the 1860s, which still supplies around 75% of the world's soda ash needs. As chart 110 from the American Chemistry Council (ACC)[i], shows, this was part of a wave of innovation between 1850 and 1910, based on the rapid application of chemistry to a wide variety of industrial activity.

Older industries such as textiles and paper were transformed by chemistry. It also enabled glass manufacture and fertilizers to develop into major industries. In turn, these developments led to the emergence of chemical engineering and organised research as scientific disciplines. One success built on another, and the chemical industry grew rapidly, particularly with the development of organic chemistry based on the use of coal.

A second 'wave' of innovation began in the 1930s, with the accidental discovery of polyethylene by ICI in 1933. This time, the initial commercialisation process received a major boost during the 1960s, following the arrival of oil and gas as abundant and cheap feedstocks. As before, the chemical industry succeeded by developing new products (this time, primarily plastics), which were both cost-effective and better than those they were replacing. And once again, it built upon advances elsewhere, particularly in chemical engineering and catalysis.

The First Wave	The Second Wave	The Third Wave
1850-1910	1935-1965	1990-2020?
Electrolysis, Synthesis, Solvay process, etc.	Ziegler Catalyst, High Pressure Reactions, etc.	Biotechnology, Nanotechnology Membrane Separations, Green Chemistry, etc.
Inorganics, Fertilizers & Dyes	Petrochemicals & Specialties	Life Sciences & Specialties
Coal & Mineral-Based Resources	Hydrocarbons (Oil and Natural Gas)	Microbes?
Soda Ash, Sulfuric Acid, Ammonium Nitrate, Rayon, Celluloid, Aspirin, Dyes, etc.	Polyethylene, PVC, Polypropylene, Nylon, Polyester, Other Polymers, SBR, Catalysts, Penicillin/ Other Antibiotics, Pesticides, etc.	Nanocomposites, New Functional Materials, Bio-Pharmaceuticals, Nutritional Supplements, Genetically-Modified Seeds, Biocatalysts, etc.

Chart 110: Waves of innovation characterise the chemical industry

Source: American Chemistry Council

Many important advances (such as the invention of polyethylene) during this period were the result of luck and 'blue sky' research, rather than planning. But this was not seen as a problem.

Instead, serendipity encouraged companies to invest in major research laboratories staffed by the 'brightest and best' scientists, who had a remit to explore whatever they thought might be of interest. The most famous example is probably Bell Laboratories, the R&D wing of the US telecommunications giant AT&T. Despite being within a telecom company, they developed the first solar battery in 1954, based on photovoltaics, among other revolutionary inventions[ii].

The argument for these research laboratories was simple and powerful – namely that 'it is impossible to plan ahead when investigating something that is unknown'.

Instead, rather like Columbus setting off across the Atlantic in 1492, scientists were given the freedom to explore whatever they found of most interest. The key to success was to employ brilliant scientists, who had lively imaginations and could identify exciting future possibilities from seemingly unpromising early experiments.

As shown in chart 111, this second wave naturally built on the successes of the first wave. But then the two 'oil price shocks' of the 1970s, and the consequent slowdown in global economic growth, led to a loss of confidence about what might be achieved.

In retrospect, the high point was clearly captured in 1967, in the famous moment in the film 'The Graduate' when family friend Mr McGuire advised a young Dustin Hoffman (Ben) about his future career:

Mr McGuire: I just want to say one word to you - just one word.
Ben: Yes sir.
Mr McGuire: Are you listening?
Ben: Yes I am.
Mr McGuire: **'Plastics.'**
Ben: Exactly how do you mean?
Mr McGuire: There's a great future in plastics. Think about it. Will you think about it?
Ben: Yes I will.
Mr McGuire: Shh! Enough said. That's a deal.

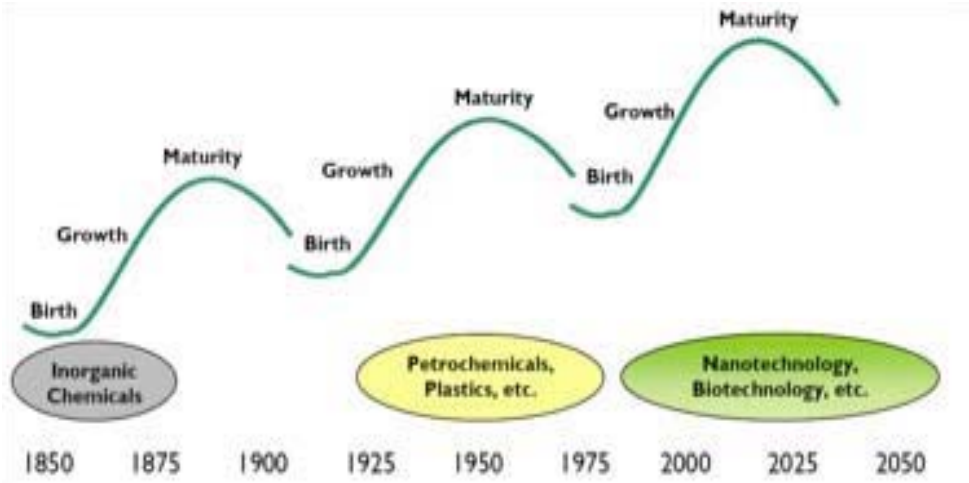


Chart 111: Each new wave builds on earlier activity

Source: American Chemistry Council

Rather surprisingly, however, the advent of the economic supercycle between 1982 and 2007 somehow failed to ignite a major new wave of innovation, despite promising beginnings. It is now clear that the scale of research and innovation activity has been too small in recent years. Sadly, companies and investors have instead chosen to prioritise the development of existing products on an evolutionary basis, as they search for quick and guaranteed results. Thus the potential third wave of innovation, described in chart 111, seems to have so far been relatively limited in scope, and mainly focused on the areas of biotechnology and nanotechnology.

Viewed together, the two charts also highlight how scientific innovation is quite separate from, and precedes, the commercialisation of the new products that are developed. This is another aspect of the '30 year rule' identified by Shell CEO Peter Voser[iii], which suggests that it generally takes 30 years for a major innovation to capture 1% of the potential global market. This timescale is thus quite different from the product development function, where commercialisation usually takes place on an iterative basis, in parallel to the technical activity.

The reason is that it takes considerable time to understand the true market-place potential of any new technically-based discovery. It also takes a long time to build the necessary manufacturing equipment required to supply the needed product in the right quantities and at an acceptable price. For

example, as Voser noted, it has taken around 30 years for new technologies such as wind (which began in 1980) or nuclear (1950–1980) to achieve a 1% share of global energy markets.

Similarly, the growth of the internet[iv] began with the development of packet-switching in the 1950s. In turn, this led to the development of protocols for 'internetworking', which joined different networks. It then took 30 years of research and innovation until the standardisation of the Internet Protocol Suite (TCP/IP) led in 1982 to the concept of the internet itself. And it then took until 1995 to turn the concept of an open internet into reality, with the launch of Netscape, the first internet browser.

This is quite different from the product development process, where the latest version of an iPad can be unveiled within 6–12 months. Apple is effectively building on work that began 60 years before, and its success today builds on a long history of innovation by many earlier pioneers.

At the moment, it is therefore not at all certain that the technical developments of the past 20 years have been sufficient to position the industry for a further burst of sustained volume growth in coming decades.

One way of assessing the strength of development is to measure the discussion underway in the mainstream chemical media. In principle, more activity and greater success should lead to increased coverage. Journalists will become more aware of the subject, and readers will be keen to follow developments in more detail. Chart 112 thus summarises coverage of the two major new technologies highlighted in the ACC chart – nano-technology and biotechnology – by looking at the number of mentions, year by year, on the ICIS news service between 2005 and 2011.

The chart confirms that activity is indeed underway, and on a relatively larger scale for biotechnology (red line) than nano-technology (blue), as one would expect given the relative novelty of nano-technology development.

But it also seems to suggest that growth has recently stalled. This may be due to cutbacks caused by the financial crisis, a tighter regulatory regime that makes it harder to bring a new product to market, or due to a diversion of resources to other areas such as compliance and site security. Or it may be due to a combination of all three factors.

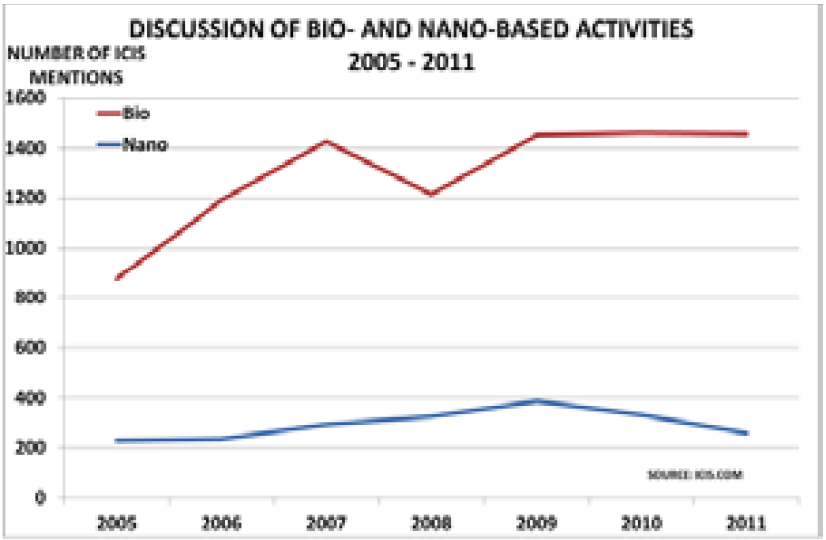


Chart 112: Discussion of bio- and nano-based developments on ICIS.com, 2005-2011

But it does suggest that current levels of spending on innovation and research are below the levels required to drive major future growth. The chart certainly does not give the impression that large-scale commercialisation activities in these two key areas are just around the corner. It also suggests that if we are looking for growth, we may need to develop a new approach, rather than just assuming that if we are patient, either the future will eventually resemble the past supercycle or that new technologies will come to the rescue.

This rather depressing view is also supported by funding evidence. A report from PwC and the US National Venture Capital Association shows that companies gained funding of $4.7bn in 2011, compared with $5.4bn in 2007. Equally, only 98 companies received start-up funding, compared with 141 in 2007, and the actual funding received was down 17% at $842m.[v]

THE OPPORTUNITY TO BECOME DEMAND-DRIVEN

Fortunately, there are ways to bridge this potential growth deficit. The key is to look at the issue from a new viewpoint, namely that of being demand-driven. This is quite different from the approach of the past 20–30 years, which has tended to be much more supply-driven. In this period, companies assumed that demand 'would grow with the market', generally in a ratio to GDP. This fostered the incremental approach to product development.

Planning and forecasting approaches were thus usually based on an estimate of likely GDP growth, which was then multiplied by an agreed factor representing the ratio of product growth to GDP. This methodology made seemingly good sense during the supercycle period between 1982 and 2007. The size and wealth of the Western baby boomer generation meant that any slowdown in demand was only temporary, and was followed by a period of catch-up based on the 'pent-up demand' accumulated in the intervening period.

Companies thus focused on the wealthy and growing markets in the West, with high levels of GDP/capita. Chart 113 highlights how annual chemical sales/capita in a country (Y-axis) have been closely linked to GDP/capita (X-axis).

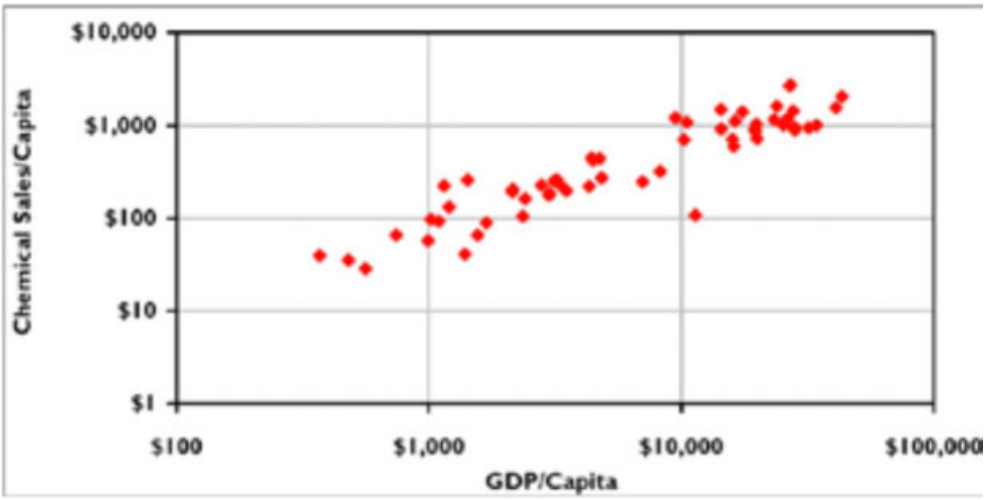


Chart 113: Relationship between chemical sales and GDP/capita

Source: American Chemistry Council

Per capita chemical sales in India are only ~$65 and just ~$310 in China, compared with $2,200 in the USA[vi]. Prioritising the boomers instead gave companies a strong platform for future growth.

But today, this growth engine has run out of steam. There are many fewer boomers joining the wealth creator generation in the West. Instead, this cohort is actually shrinking as the boomers join the 'new old' 55+ cohort, leading to the growth slowdown now underway. Companies may well find themselves forced into more and more 'fire-fighting' and cost-cutting. This could, in the worst case, lead to them further reducing resources in those development areas that are now becoming critical for future growth.

The issue is that, as we transition to the new normal, GDP growth is once again becoming more volatile and uncertain. The world is beginning to resemble previous eras, where recessions occurred every three to five years, whereas the supercycle saw just 16 months of recession in 25 years. Thus companies are going to have to once again become more pro-active in seeking out new markets and encouraging their development.

This is the logic behind our argument that a more demand-driven approach is now required. Our two high-potential target sectors, the 'new old' 55+ generation in the West and those emerging from poverty in the emerging economies, both represent relatively unknown markets. It is therefore unlikely that their demand patterns will simply follow those established by the Western baby boomers as they entered their wealth creator phase.

A more proactive approach, based on understanding their potential needs, therefore seems to be essential because:

- The new old hardly existed as a commercial proposition until recently. People over the age of 54 were instead assumed to 'drop off the map' as they entered their so-called declining years.
- The focus during the supercycle was on the relatively small number of affluent people in the emerging economies. This means that little is known about the 90%+ of those in these countries who usually earn less than $20/day.

A demand-led approach creates its own issues with regard to implementation. Chief among these is that we have very little recent experience of generating genuinely new demand. The focus has instead been on increasing efficiency. Many companies have deliberately reduced commercial and technical support in local markets, preferring instead to concentrate resources on large-scale opportunities which can be accessed via smaller regional centres.

The above is not meant as a criticism. It is simply a factual statement of the implications of the previous focus on cost-cutting and streamlining of operations. This also led many companies to stop serving smaller accounts directly, as instead they focused on working with the large accounts that provided most volume. Increased efficiency provided important benefits, as it helped companies to reduce their costs and keep their prices competitive, thus boosting volume and profitability.

By design, these teams have very little contact with companies that maybe only operate on a national or even provincial basis. And so they have very limited understanding of the customer base that could drive future sales.

There is therefore a clear danger that a continuation of the supercycle approach would effectively blind companies to the opportunities that could potentially be developed for sales within our two target sectors.

This could easily result in them falling into a 'chicken and egg' position, where they assume that there is no demand potential, because historically no demand has come from these areas.

MOVING FROM PRODUCT TO MARKET FOCUS

A move to a demand focus will require a change of mindset within the industry. The key shift required is to move from what has been largely a product focus, towards more of a market focus.

Taking this new approach may prove uncomfortable at first, because of its unfamiliarity. But as they become more used to it, companies will find that it is a powerful tool for identifying major new opportunities. They can then map these onto their own capabilities and aspirations, and develop into a comprehensive programme for future growth.

Our suggestion is that they should focus on developing new product offerings for the new major demographic opportunities we have identified, which are the over 55s in the West and the wealth creator 25–54 age group in emerging economies.

These offerings should be based on core needs – water, food, health, shelter and mobility – and developed with sustainability in mind.

This approach will enable companies and consumers to 'do more with less'. It reduces carbon footprint and maximises the affordability of new products. Equally, we can reduce the level of potential discomfort by better understanding the implementation issues associated with being demand-led. This can also give us valuable pointers for the process of developing the necessary offerings.

The obvious place to look for such examples is among the consumer products companies, as they are taking a demand-led approach every day of the week. And usefully from our perspective, Unilever's Sustainable Living Plan is highly relevant to the challenges we face.

UNILEVER'S 10-YEAR SUSTAINABLE LIVING PLAN

As we have seen, consumer products companies such as Unilever are necessarily in close touch with developing consumer trends. The company would be at risk if it failed to spot, or ignored, changes in the landscape. Thus Unilever CEO Paul Polman argues[vii]:

"If you look out five or 10 years, which is my job, the power is in the hands of the consumers and they will not give us a sense of legitimacy if they believe the system is unfair or unjust. Some companies that miss the standards of acceptable behaviour to consumers will be selected out. What I want is a sustainable and equitable capitalism. Why can't we have that as a model?

"We have increasing income disparity within the developed world. We have a political system that barely functions after the economic and financial crisis. So continuing the way we are going is simply not a solution and increasingly consumers are asking for a different way of doing business and building society for the long term together."

Thus Unilever launched its 10-year Sustainable Living Plan in November 2010. This contains over 50 concrete targets aimed at:

Reducing water use in agriculture
We will develop comprehensive plans with our suppliers to reduce the water used to grow our crops in water-scarce countries.
Reducing water use in the laundry process
We will reduce the water required in the laundry process by making easier rinsing products more widely available, and by providing 50 million households in water-scarce countries with detergents that deliver excellent cleaning but use less water by 2020.
Reducing water use in body and hair washing
By 2015 we intend to reach 200 million consumers with products and tools that will help them to use less water while washing and showering. Our goal is to reach 400 million by 2020.
Reducing water use in our manufacturing process
By 2020, water abstraction by our global factory network will be at or below 2008 levels, despite significantly higher volumes.
Future challenges
A large part of our water footprint (44%) is associated with showering, bathing and hair washing. We have some ideas as to how to minimise this, but to meet our target we will need to develop new approaches.

Chart 114: Unilever's Sustainable Living Plan for Water

- Helping 1bn people improve their health and well-being.
- Halving the environmental impact of its products.
- Sourcing 100% of its agricultural products sustainably.

And Polson is very clear about the business case for the initiative:

"If we can develop products today that help people adapt to the changing environment tomorrow, it will help us grow faster in future."

Unilever has chosen to focus on three of the five megatrends that we have identified – water, food and health. Chart 114, showing their Sustainable Living Plan for water, thus provides an excellent example of how thinking can be developed within companies, and clear business-related objectives defined. It also implicitly confirms our view that the future is not necessarily about producing more water, via expensive and inefficient civil engineering projects. Instead, Unilever's plan focuses on reducing waste and 'doing more with less'.

The basis of Unilever's plan is very traditional, in that it seeks to double sales and halve the environmental impact of its products over the next 10 years. But its mechanisms for achieving this are not at all conventional.

Thus in its food plan, which focuses on nutrition, the company aims to link 500,000 smallholder farmers and small-scale distributors in developing countries to its supply chain.

Partnership therefore becomes a key mechanism for achieving the required results. Polman has stated publicly that he is keen to encourage other companies to follow Unilever's example, and thereby help to convince the investment community to move away from its obsession with short-termism. As he notes: "If we hit all our targets on this plan, but no-one else follows suit, we will have failed miserably. We are trying to show that you can be successful as a business and at the same time show the financial community this should be one of the better drivers for their investments."

THE IMPORTANCE OF AFFORDABILITY

Chemical companies, particularly those in the West, also face a further issue when they come to think about designing the new products and services that will be needed in the emerging economies. This is the myth that has grown up around the concept of 'middle class' in these countries.

Every country, by definition, has a group of people with an income that ranks in the middle versus the rest of society. This happens whether the country is rich or poor. These are the people with 'middle incomes'. Equally, it is understandable that some may seek to translate the phrase 'middle income' to 'middle class', as this has more meaning for most people.

The danger is that this drive to encourage broader understanding and build awareness can create more confusion, rather than less.

For example, the Asian Development Bank (ADB) published a major report in February 2011 titled 'The Rise of the Middle Class in the People's Republic of China (PRC)[viii]'. This highlighted how "as a consequence of rapid economic growth, we see the rapid emergence of a burgeoning middle class, and more recently, a super-rich subpopulation whose wealth rivals that of their counterparts in developed countries". And it adds that "due to its sheer size, the PRC is home to the majority of the middle class population in developing countries".

Most people reading this would assume that by 'middle class', the ADB means people with Western standards of living. They would also assume that the 'super-rich' are millionaires and billionaires, as in the West. Nothing, unfortunately, could be further from the truth.

In fact, the ADB's definition of 'middle class' is not even meant to describe the group of people with 'middle incomes' in China. Instead, as the bank makes clear in its opening sentence, it is "using $2-$20 (purchasing power parity) per capita daily income as the definition of middle class".

This is quite spectacularly misleading for anyone who does not have access to the report itself and relies on media reports. This is because this definition actually covers 89% of China's entire population, according to the ADB's own data in the report.

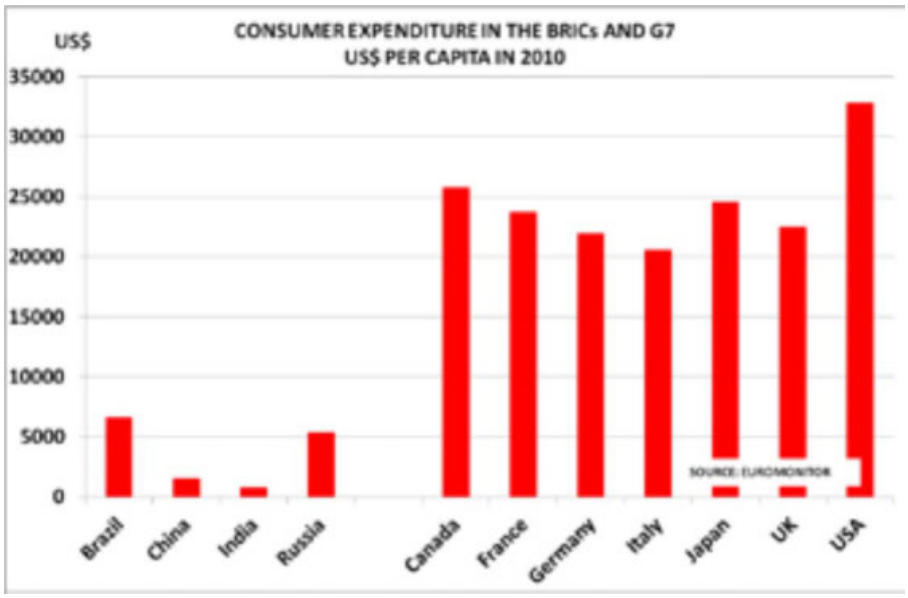


Chart 115: Consumer expenditure per capita in the BRICs and G7

They estimate that only 4% of the population earn more than $20/day, while 7% earn less than $2/day. Equally, the definition of the "super-rich subpopulation" is those with incomes of $100/day. But $100/day is only $36,500/year – around average annual earnings in the major Western countries.

Meanwhile, the government's National Bureau of Statistics estimates that even by 2015 there will only be 17m urban households with an income above $12,500/year. Even this income level is still below average earnings in the West.

It is no wonder, therefore, that many people and companies are confused about market potential in China. Chart 115 aims to clarify the position, which is not just a problem that relates to China, but to the whole question of relative wealth in emerging and developed countries.

It shows per capita consumer expenditure in US$ in the emerging economy BRICs (Brazil, Russia, India, China) and the wealthy G7 countries (Canada, France, Germany, Italy, Japan, the UK and the US), based on official data as reported by Euromonitor[ix] for 2010:

- In the BRICs, total expenditure ranged between $804/capita in India and $6,619 in Brazil. China's consumers spent just $1,518 each per year.
- In the G7, expenditure ranged between $20,598 in Italy and $32,851 in the US.
- Thus the average Italian (the poorest G7 country) spent three times more than the average Brazilian (the wealthiest of the BRICs).
- Italians also spent 14 times more than the Chinese, and 26 times an Indian's spend.

Another measure of the gulf between the two societies is to note that the average Chinese consumer spent a total of $764 on food, housing, health and transport in 2010. In comparison, the average American spent $760 on communications (television, internet, telephone etc).

This comparison highlights another important issue, which is that rich and poor people also have different priorities for their spending. Chart 116 illustrates the divergence in relation to consumer

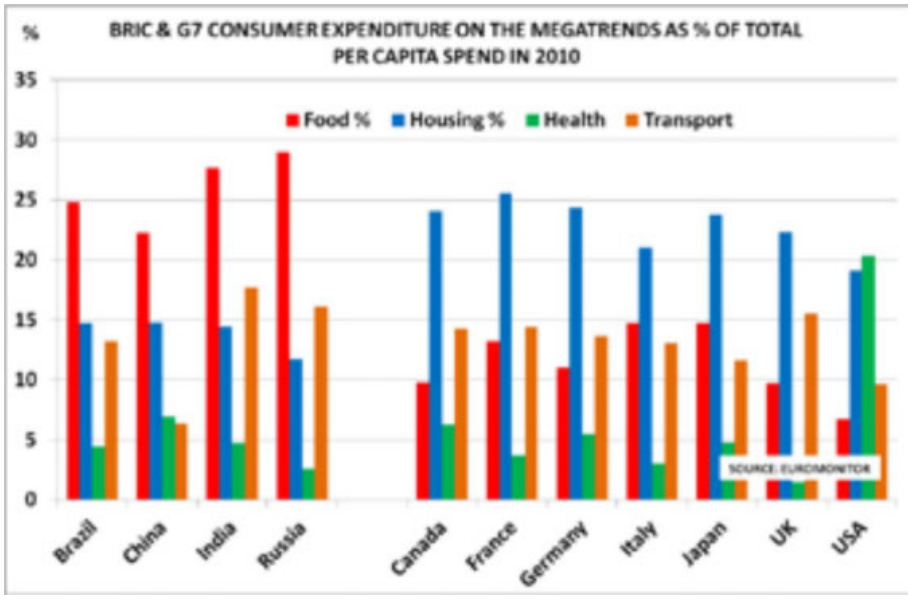


Chart 116: Consumer expenditure on the megatrend areas in the BRICs and G7

spending on four of the megatrend areas (we have excluded water charges as these are often either non-existent, or widely avoided, in the BRICs):

It illustrates that:

- People in the BRICs spend ~25% of their income on food (red column), twice the percentage in the G7.
- The reverse is true on housing (blue), where G7 consumers spend twice as much (~25%) as BRIC consumers.
- Health spending (green) is relatively similar in both groups at ~5%, with the exception of the US, where it accounts for 20% of expenditure.
- Transport spending (brown) is also similar in both groups at ~13%, with the exception of China, where it accounts for 6% of expenditure.

These four megatrend areas account for ~60% of all consumer expenditure in the BRICs, and for ~55% in the G7. Of course, absolute spend in terms of US$ is far higher in all areas in the G7, due to consumers' much greater wealth. But even in the West, incomes are likely to come under pressure as the boomers move into retirement. As we showed earlier in chapter 7, an American retiring today on median earnings of $39,000 would find themselves with a pension of less than $10,000 – even if they had saved 10% of their income for 30 years and achieved the full stock market performance without charges.

Affordability must therefore be the prime consideration when designing products and services for the markets of the new normal. Chart 117 therefore highlights the process we suggest that companies use to ensure they are focused on meeting real 'needs' and are not diverted into developing products and services that supply only 'wants' – which will be much lower down the priority order for most consumers as we transition to the new normal.

Chart 117: Companies need to focus on basic needs, adding functionality where affordable

The idea is that:

- The great majority of the potential consumers in the world live in the emerging economies (blue band), where incomes and expenditure are lowest on a per capita basis. So products targeted for these markets should have very basic functionality, and the lowest possible cost. A refrigerator selling for $50–$100 is a sensible target, for example.
- Some additional functionality can then be added in products targeted at developing countries (green), as these can afford slightly higher prices.
- Western countries (purple) can have more functionality and higher prices – although the example of Renault's Dacia car sales highlights how items targeted for more affluent consumers in the BRICs are becoming equally attractive for many European consumers. The Dacia's $10,000 price tag gained it 250,000 European sales in 2010.
- Finally, there are the global luxury markets (orange), where consumers do not have to think about the cost of their purchases, and so will still be highly receptive to 'value-in-use' pricing.

DIFFERENT VALUE STRUCTURES

Competing on the basis of affordability will not be easy, especially when companies also find themselves operating on the basis of different value structures. A Western company expecting to find its competitors prioritising profit margins will find the going particularly tough when up against state-owned or state-supported companies whose aim is to secure jobs and social harmony. Equally, those based in the emerging and developing worlds will not understand why the rich Western countrives have decided to reverse the supercycle trend towards outsourcing jobs, and are instead becoming far more protectionist in their approach.

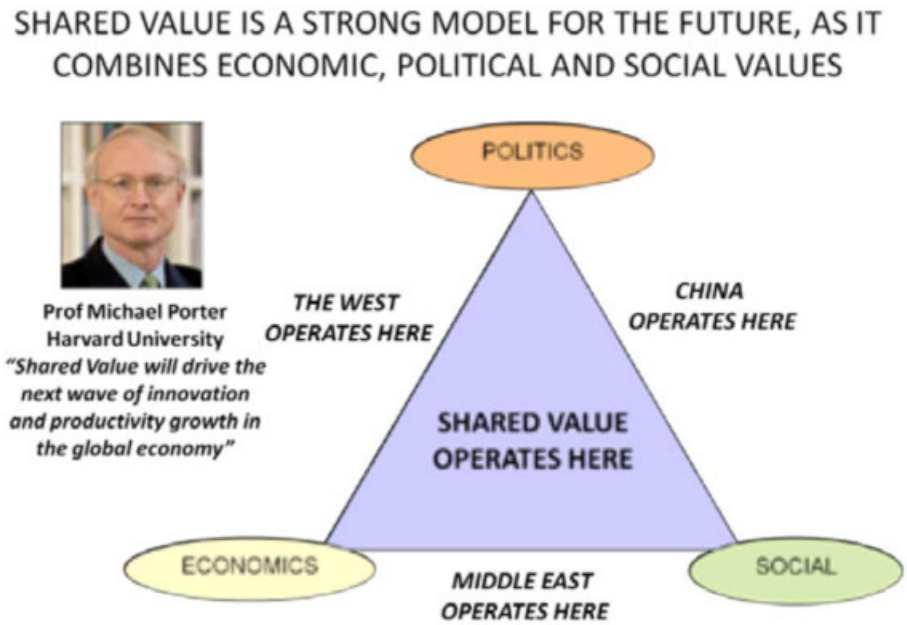


Chart 118: The shared value approach could reconcile different value systems

Chart 118 highlights the different value structures at work today, which in our view are as follows:

- Broadly speaking, the West operates with a focus on economics and profitability, although politics can also often play a part.
- The Middle East also has a focus on economics and profitability, but its relatively young population means it also seeks to prioritise job creation to preserve social order following the Arab Spring.
- China, however, has very little interest in profitability. Its key driver is the implicit agreement between the governing communist party and the wider population, under which living standards continue to increase and the party remains in power.

Chart 119 summarises China's position via the example of Sinopec, which is China's largest chemical company, as well as its main refiner and a leading energy company. Sinopec is 76% owned by the government, and has invested heavily in chemicals as a building block for China's development. It shows that between 1998 and 2010:

- Sinopec invested Rmb166bn ($25bn) in chemical manufacturing plants and Rmb176bn in refineries.
- Its total earnings over this period, before paying any interest or taxes (EBIT), were just Rmb84bn in chemicals, while it lost Rmb33bn in refining.
- Overall, it therefore spent around $50bn on capital equipment (capex), while earning around $7.5bn at EBIT level.
- Effectively, therefore, on a Western accounting system, Sinopec would probably have lost money in these two areas – although, of course, it did make money upstream in the energy area.

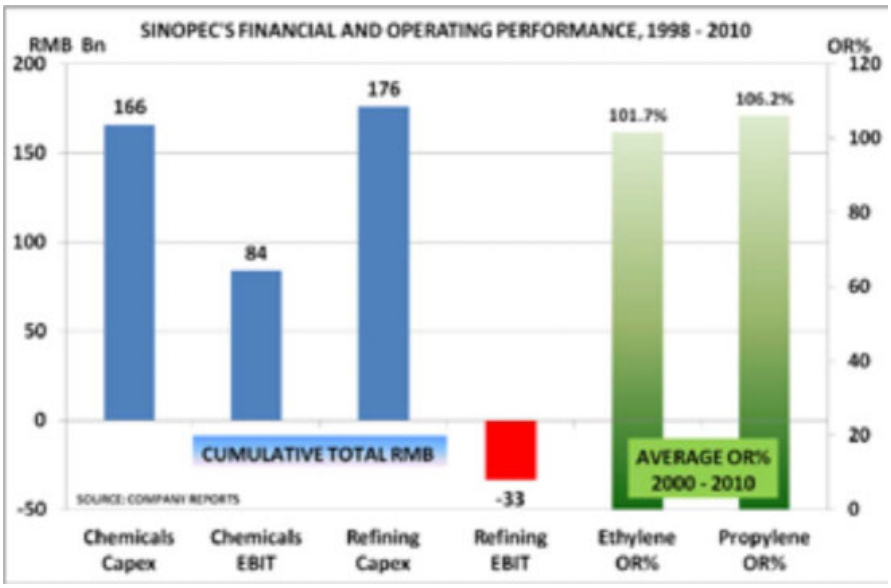


Chart 119: Sinopec's financial and operating performance, 1998–2010

Chart 120: Protectionist pressures are increasing (source: Comstock Partners)

This highlights how Sinopec's role is effectively to support China's economic development, rather than to earn a profit. It operates in the chemicals market as a utility, providing supplies of critical raw materials to China's factories, so helping to maintain employment.

This remit is, of course, quite different from that of a Western company, whose directors would probably have been quickly replaced by the main shareholders if they had even thought of trying to operate a business on this effectively non-profit basis. And it is likely to lead to increasingly major disputes as growth rates continue to slow.

For as the chart also shows, Sinopec does not reduce its operating rates when demand slows or margins come under pressure. This would create problems for factories that depend on it. Instead, it continually expands capacity beyond the formal 'nameplate' number, and so runs at operating rates above 100% on its major product areas such as ethylene and propylene (green columns). This creates problems for Western and Middle Eastern companies, as it means Sinopec ignores normal 'market signals' about developments in the wider supply/demand balance.

It is not going to be easy for these three quite different value systems to operate alongside each other as we transition to the new normal. The potential for conflict, and a move towards protectionism, could clearly increase quite dramatically. In turn, this highlights the potential benefit of the shared value approach, which could help to enable companies from these three quite different value structures to talk to each other and find common ground.

Chart 120 highlights the alternative path, whereby slower sales growth leads to weakness in pricing power and then to competitive devaluations by the major trading nations, finally ending in protectionism. Worryingly, we are not far from this endpoint. Brazil's finance minister, Guido Mantega, warned in September 2010 that "an international currency war is underway". And he went on to add that "these competitive devaluations were effectively a trade war"[x].

The concept of shared value offers, by contrast, a more constructive and prosperous way forward. Western companies, for example, have a lot to offer those in China by virtue of their advanced technologies and market knowledge. They can make a real difference in enabling the government to

Chart 121: Bayer MaterialScience's EcoCommercial Building Programme

deliver the rising living standards expected by the population. But as chart 120 reminds us, they can also help to make life quite difficult for China's companies in export markets, if such a dialogue does not take place.

There is also a bigger picture issue that needs to be remembered. This is, as Harvard's Professor Michael Porter noted when introducing the shared value concept in January 2011[xi], that a shared value approach is essential to "drive the next wave of innovation and growth in the global economy".

Bayer MaterialScience (BMS), part of the German Bayer AG company, has established an 'EcoCommercial' building programme as part of Bayer's €1bn investment in climate protection.

This involves providing consulting and other support to a large interdisciplinary network of construction- industry experts around the world.

The aim is to help them to construct buildings that contribute to climate protection while also raising profitability.

Chart 121 highlights the complexity of the task. It illustrates the wide range of technologies and expertise that have to be harnessed. These include architects themselves, those involved in engineering services and building technologies, and those with expertise in detailed design elements such as floor coatings, lighting and insulation. In addition, the banks and others funding construction developments need to be brought on board with the concept, while planners also need to be made aware of the methodology and key benefits.

One of BMS's first reference buildings is in India (pictured). It was formally opened in February 2011. In its first year, this successfully delivered a positive energy balance, having generated 72,000kWh via the photovoltaic system on the roof, while the energy-efficient building only used 64,000kWh[xii]. In addition,

it has reduced CO_2 emissions by 67 tonnes, equal to the output of 20 vehicles.

This success is now leading to the establishment of a common platform for the pooling of know-how and concepts for energy- and cost-efficient building in India. It supports Porter's argument about shared value being the key driver for future innovation. And it also highlights the way in which this enables companies and countries operating under different value systems to co-operate in achieving their own goals.

IT'S A VUCA WORLD

Volatility, Uncertainty, Complexity and Ambiguity are clearly increasing as we transition to the new normal. Some companies, governments and individuals are already targeting the opportunities it will create. But many are still waiting for government stimulus programmes to return us to the supercycle world. And many more are simply confused and frustrated.

This major divergence of views is all a long way from the previous certainties, where key trends such as globalisation were taking Western value systems into new geographies via the processes of offshoring and outsourcing.

As recently as 2005, many still believed along with New York Times columnist Thomas Friedman that, as he titled his well-known book, 'The Earth is Flat'[xiii].

Friedman accepted that "economic stability is not going to be a feature". But he describes a future where "service sector activities will be further outsourced to countries in the English-spoken aboard", such as India. Equally, "manufacturing will continue to be off-shored to China". He argues that "these developments are desirable and unstoppable". Today, many would now question this formerly widely accepted analysis.

Instead, Paul Polman of Unilever argues that:

"I use the term VUCA to describe the world – volatile, uncertain, complex and ambiguous. It is very difficult for people to get a total picture.

"The food, water, energy nexus is so inter-related that it is, for most people, too difficult to know where to start and where to end."

Polman also argues that shareholder thinking has become too short term. He notes that shares in FTSE100 companies (the main UK companies) are held for just eight months on average, and adds:

"Most of the trading is done in nano seconds by people that you call my shareholders, but who would move anywhere if they can make a quick return. Governments need to think about frameworks to encourage longer-term thinking."

Polman's conclusion is that for Unilever, the key to understanding and successfully managing the future is to focus on its 2bn customers.

Already, Unilever is seeing clear behavioural changes. Thus consumers are no longer happy to pay a premium for "green" products, or to accept reduced performance versus traditional products. Instead, Polman believes we are "entering a new era when consumers will stop buying products from companies they see as not behaving properly".

Thus Polman notes that the question is no longer "are consumers prepared to pay for sustainable tea or not? We have gone past that at 100mph. The question now is whether they are prepared to buy from companies that are not being responsible. Consumers recognise they can drop a company instantly."

The VUCA world is essentially about the transition to a new set of values, as shown in chart 122, which tells us that:

- Consumers no longer define themselves by the size of their car, house or new kitchen.
- Instead, their focus is in five key areas:
    - **Value for money** – they are highly price sensitive
    - **Simplicity** – they are looking for less complex lifestyles
    - **People, not things** – family and friends are increasingly important
    - **Values** – they value trust, and they are concerned about their carbon foot print
    - **Convenience** – they want products to last, and to be available locally

Chart 122: Changing consumer values in the West (source: Euromonitor)

These represent quite dramatic changes from the materialist values espoused by the boomers when they were in their peak consumption years.

This VUCA landscape will create winners and losers. No longer will the rising tide of affluent Western boomers provide an obvious route to increased sales and profits. Instead, companies need to create their own VUCA as they develop strategies and implementation plans for the transition to the new normal. Vision, Understanding, Clarity and Agility will be their road map to success.

Next, in our concluding chapter, we will look at how the changes we have described so far are likely to affect individuals, companies and countries.

SOURCES

i Guide to the business of chemistry, 2007
ii http://www.nytimes.com/2012/02/26/opinion/sunday/innovation-and-the-bell-labs-miracle.html?scp=2&sq=bell%20&st=cse
iii www.shell.com/home/content/media/news_and_library/speeches/2010/voser_wbejing_21032010.html
iv http://en.wikipedia.org/wiki/History_of_the_Internet
v For Biotech firms, gravy days are over, Wall Street Journal 16 March 2012
vi Guide to the business of chemistry, 2008
vii http://www.guardian.co.uk/sustainable-business/unilever-ceo-paul-polman-interview
viii The Rise of the Middle Class in the People's Republic of China, Asian Development Bank, February 2011
ix World consumer income and expenditure patterns, 2012
x BBC news, 'Currency War warning from Brazil's finance minister', 28 September 2010
xi Harvard Business Review, January 2011, 'The Big Idea'
xii http://press.bayer.com/baynews/baynews.nsf/ID/E85A082CA2564D10C125799E004A7388?OpenDocument
xiii 'The Earth is Flat', Thomas Friedman, Farrar, Strauss & Giroux, 2005

Chapter 12

A call to action

INTRODUCTION

Elisabeth Kübler-Ross' Paradigm of Loss model

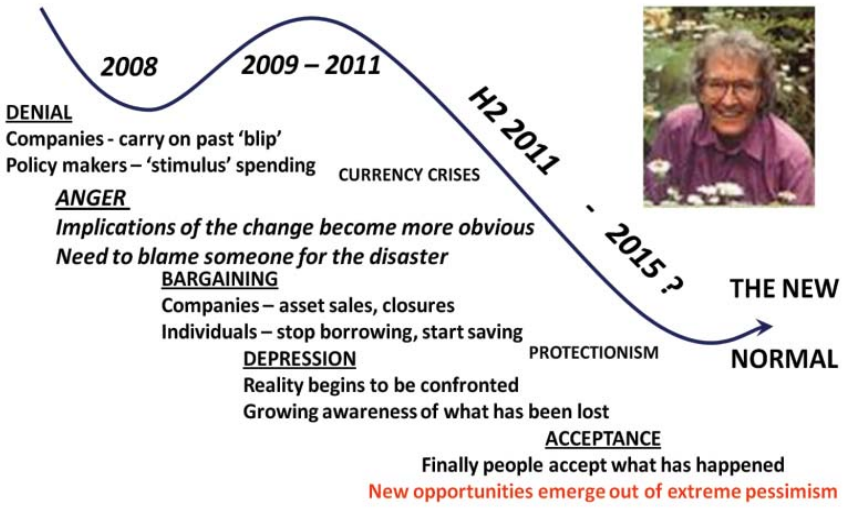


Chart 122: Elisabeth Kübler-Ross, the Paradigm of Loss model, and how it applies to the New Normal

Source: International eChem

Elisabeth Kübler-Ross[i] became extremely disturbed by the lack of a curriculum in medical school that addressed death and dying.

Thus, after working with terminally ill patients, she developed a series of seminars and ultimately a book, On Death and Dying, which identified five stages of grief – her Paradigm of Loss.

She stressed that these five stages were not meant to be complete or chronological. Everyone's experience of loss is unique, and we can get permanently stuck at one stage or other in the grieving process.

The diagram above uses her insights to understand where we are today in the transition to the New Normal. We have added our thoughts on how the various stages may impact companies and individuals.

Companies and governments are in Denial, as they think that we can carry on past this "blip" in the old model of growth through fiscal stimulus or tax cuts.

"If we can just get the Western consumer to start buying again" is the argument of policymakers. But the problem is that the demand isn't there anymore to fuel the kind of growth we saw in 1982–2007, because of the retirement of the baby boomers.

In Greece we are already seeing the first signs of the next stage, Anger. For instance, riots on the streets of Greece in the summer of 2011 – and the Occupy movement that flourished briefly later in 2011 – along with 2012's rise in the demonization of immigrants as the cause of the problems. This Anger causes investors to take fright, and currency crises – manifested by a refusal to lend – start to develop. This is clearly the stage that is starting to develop in the eurozone, where some countries' interest rates have reached 30–40%, and Spain and Italy are close to the 7% level that makes repayment almost impossible.

The Bargaining stage is still to come. It will mark the point when Old Normal companies start to deal with the new economic reality of lower demand (and no more stimulus spending or tax cuts) by asset sales, plant closures and by cutting back on spending. But they will often be selling into a weak market, so the benefit of the spending cuts will often be only short-lived. A key reason for this weakness will be that individuals will also be cutting back their spending – and saving more – in panic at what is happening around them.

The Bargaining stage is a belated reaction to what has happened in the past. It isn't forward-looking and won't solve the underlying problem – namely, that we need a new approach to growth to achieve a sustainable economic recovery.

Working through these first three stages will likely take an extended period of time.

Eventually, however – if the parallel with Kübler Ross' work holds true – they will be followed by Depression, derived from a sense of hopelessness at the scale and difficulty of the tasks ahead, and a growing awareness that the economic Golden Era of 1982–2007 is never going to return.

It is at this point, as in the 1930s, that we could see a return to protectionism. This would happen as populations and policymakers lose confidence in their ability to compete in a seemingly hostile world.

Next, but again only after a possibly lengthy period of time, will come Acceptance, and the solutions phase. People will start to assess what has really happened – and its causes.

Creativity will begin to flourish once again, and confidence return. New opportunities will emerge and people will reorient themselves to the New Normal.

As Kübler-Ross said, this process is not strictly chronological. Some people will move forward quickly through the various stages.

Others will remain stuck at one stage or another for a long time, particularly if they are amongst those who lose out badly from the changes underway.

During every day, hour, or even minute, some of us are likely to swing between the first four stages of the grieving process.

In this final chapter of our book, we will try to describe how individuals, companies and politicians can successfully move on to the fifth and final stage of this process : Acceptance.

SOME NEW ADVICE FOR CHILDREN (AND THEIR PARENTS)....

GETTING RID OF CYNICISM

We began chapter 4 with two imaginary parents addressing their children during the late 1990s, one in Britain and one in China.

As a reminder, the British parent told his child not to bother taking a degree that would enable him or her to do something productive for the world, but to instead buy several properties in London.

In China, the advice was to take a degree in engineering in order to help make the products Westerners were buying in abundance from China, thanks to the credit bubble.

What advice should parents give their children today? One option is to remain as cynical as our imaginary 1990s parents and look for new opportunities to make a quick buck.

Sure, your children might be brilliantly successful, but the chances of failure are far greater than in the recent past. Volatility, Uncertainty, Complexity and Ambiguity (VUCA) make reading the direction of asset prices, and of economic growth, perilously difficult.

It is far better to take a more refreshingly positive view because, by so doing, each of us can help shape a better future.

Does this sound a little trite, hollow and unrealistic, like some corny mission-statement from one of those companies you instantly mistrust?

Yes, in the context of the cynicism that many of us have grown up with. The 1980s and 1990s were cynical decades, and so too the "noughties" (2000–2010), when it was fairly easy to make good money from asset bubbles and from booming exports to the West of low value, poor quality consumer goods. The way that financial markets, companies and politicians behaved reinforced this attitude.

But because of the VUCA world in which we live, doing the right thing – in this case giving the right kind of advice to your children – is more likely to make them money, AND to make them feel good about themselves.

THE WORLD CONVERGES

And so what advice should parents give in 2012?

The world has converged, and so we make no distinction between a British parent, a Chinese parent or, indeed, any parent in the West or in the emerging world. The same broad challenges apply whether you live in San Francisco, Sao Paulo, Shanghai or Stuttgart.

And so, we suggest: "Go and take a degree that will allow you to work for the right kind of company. This type of company will be constantly innovating to make products which meet the needs of the future: The 55+ generation in the West and those emerging from poverty in the developing world. The firm that you work for must also be mindful of the megatrends – food and water scarcity, demographics in general and carbon footprint – in everything it does and everything it makes."

Mission statements might make the cynics who grew up the 1980s–early 2000s cringe, but the above paragraph should be printed out, or turned into a poster, and pinned to every teenager's bedroom wall (just as the three big societal changes that we identified in chapter 9 need to be printed out and pinned on every factory or control-room wall).

Parents should also stick the statement to their bedroom walls as, unlike previous generations, they can look forward to 20 or so active and fulfilling years after they've reached their mid-50s.

Advances in medical science and diets have created a tremendous opportunity for individuals, for companies and for governments to redesign lifestyles, products and work around longer life-spans.

The problem is that we are conditioned to thinking that once we reach our mid-50s our careers are virtually over, with little or no hope of career-progression or job fulfilment. Anybody who has been made redundant in their fifties is probably even more acutely aware of the feeling of being at the end of the employment cycle.

Confronted with the challenges we have outlined in this book, it is very easy to succumb to fatalism and malaise, and to believe that as individuals there is nothing we can do to change the future.

But every small incremental step in the right direction will help.

And so when it comes to companies, and the world of work, here are a few practical steps that all of us can take:

- Search for companies that already live by the principles of the New Normal.
- If you are working for one of the companies that have not yet woken up to the changes underway, try and change your company.
- If you are a minority shareholder, go to annual general meetings and put your point across firmly and politely – until boards of directors listen.

First of all, though, of course, we need a clear idea of what an Old Normal company looks like compared with a New Normal one. That is the subject of our next section.

CHANGING CORPORATE DIRECTION

TOO MUCH COMMODITISATION

Michael Porter, the management thinker, in an article in the Harvard Business Review (January 2011) neatly summarised the kind of company we need to watch out for – the type still welded to the Old Normal – when he wrote of firms that have "focused on enticing consumers to buy more and more of their products.

"Facing growing competition and shorter-term performance measures from shareholders, managers resorted to waves of restructuring, personnel reductions and relocating to lower-cost regions, while leveraging balance sheets to return capital to investors," he said.

"The results were often commoditisation, price competition, little true innovation and no clear competitive advantage… Companies have overlooked opportunities to meet fundamental societal needs… Our field of vision has simply been too narrow."

He, as you can see, writes in the past tense – but there is ample evidence of companies across many industries that are still stuck in the old approach.

Chief executive officers often know what's really going on, but are constrained by politics from speaking the truth.

"If a CEO comes out and says, 'I don't agree with the Chinese government that the country's economy will grow by 8% this year,' his or her company might not get approval to build a petrochemicals plant

in China," a source from that particular industry said.

"And as with the financial analysts, it is better to hunt with the pack. If you are an outlier and are wrong, you are in big trouble. But if everyone is wrong, you can always blame unforeseen circumstances and cut costs to hit your quarterly-results target."

MISLEADING SIGNALS

And a danger for all corporate leaders, both good and bad ones, is that the VUCA world in which we live means numerous misleading signals.

It will sometimes seem as if we have returned to the economic Golden Era of 1982–2007 because of frequent mini-recoveries in financial and commodity markets.

This will not mean that by some miracle of nature, those over 55 in the developed world have become 10–15 years younger.

It will equally not mean that the 96% of people in China, who live on $20 a day or less, are all at once so rich that they can afford BMWs and McMansions, thus replacing the demand lost as a result of the ageing baby boomers.

Here is an example of the huge gap, in terms of per capita wealth, between the developed and the developing world.

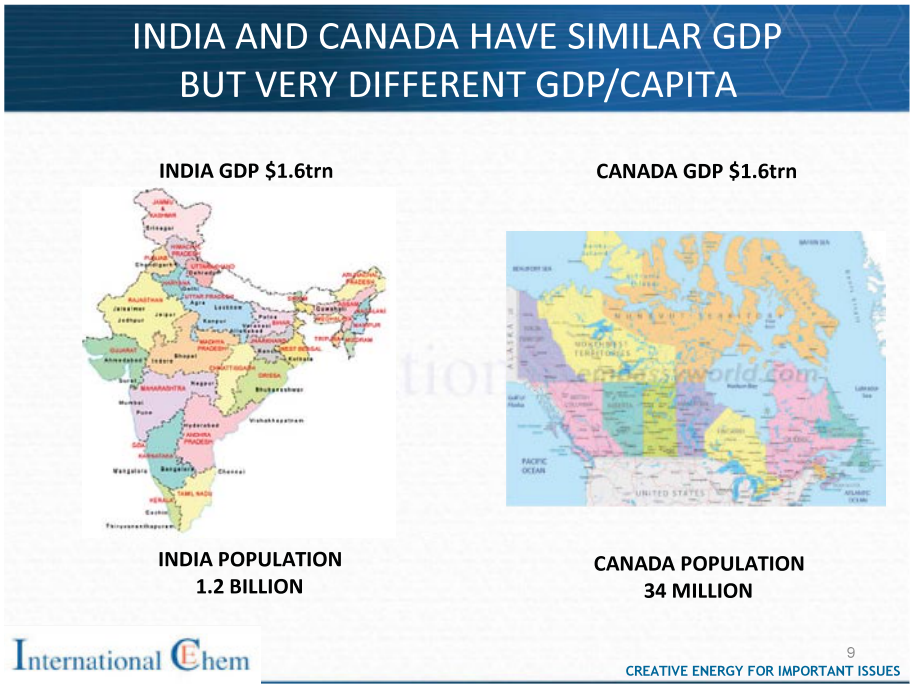


Chart 123: India versus Canada GDP

The danger is that all will feel temporarily right again when stock markets and commodity prices enjoy these frequent rallies. But this could often be thanks to the harmful influence of financial speculators that we discussed in chapter 3.

Recoveries will be short-lived and relatively weak, as the financial speculators cannot change the fundamentals.

But the difficulty is that at the end of one of these rallies, it might be too late for the companies to do anything about an over-optimistic forecast for the next quarter, leading to the tried and tested method of hitting targets when economic conditions turn bad: The cost cutting that we have already mentioned.

PLANNING FOR THE LONG TERM

The key for companies to avoid this trap is to break away from the tyranny of the focus on short-term financial metrics as they, once again, start planning for the longer-term.

ICI, once the UK's largest company – and the world's second-largest chemical business – used to plan for the long term, before it was broken up during waves of corporate restructuring until it finally disappeared altogether.[ii]

Sir Maurice Hodgson was chairman of the former UK chemicals giant during the 1978–1982 economic downturn. He also pioneered strategy planning in the global chemicals industry after his appointment in 1965 as ICI's first strategic planner.

He suggested there were "three very specific questions" that boards needed to address, which were:

- Where are we going if we don't change?
- Where would we rather be going?
- How do we need to change to get from one to the other?

The answer to the first question has already been party outlined above: Frequent mini-recoveries, followed by downturns and waves of cost cutting.

This will leave wrong-headed companies with a shortage of funds for innovation, and a shortage of time and intellectual space, as a sense of panic takes hold.

Ultimately, a company that follows this approach could end up in bankruptcy, as it will not be able to innovate sufficiently to create the products and services needed in the future.

The first step in addressing Hodgson's second question is to change mission statements, or what Porter calls "purpose statements".

He suggests that purpose statements should be built around "shared value, not just profit per se. This will drive the next wave of innovation and productivity growth in the global economy."

Doing the right thing – i.e. being constantly mindful of what Porter describes as "societal needs" – will make you money. Indeed, it will be the only way to achieve good returns in the New Normal.

Companies need to establish, and stick by, a set of values that enable them to meet the needs of society and be successful.

THE NEW NORMAL VALUES

Unilever is an excellent example of a company that already lives by New Normal values.

But the application of these values needs to constantly evolve, as this extract from the Guardian's Sustainable Living blog[iii] illustrates:

In November 2010 Unilever announced its Sustainable Living Plan, which sets out its sustainability commitments and targets for the next decade. This plan is not just central to the company's business strategy but, in the words of CEO Paul Polman, is a "new business model". It aims to decouple business

growth from environmental impact, so that while the company increases in size it will reduce its total environmental footprint across the value chain.

"Growth at any cost is not viable," said Polman. "We have to develop new ways of doing business which increase the positive social benefits arising from Unilever's activities, while reducing our environmental impacts. We want to be sustainable in every sense of the word."

Unilever's plan has three distinctive features: It covers social and economic, as well as environmental challenges. All Unilever's products and brands are included, not just a few. It also covers the company's entire value chain, from sourcing raw materials to consumer use of its products and their disposal. With thousands of products that are used 2 billion times a day in more than 280 countries, this represents a massive undertaking.

The company has also set itself some stretching targets. By 2020 it aims to help more than a billion people take action to improve their health and wellbeing, halve the environmental footprint of its products, source 100% of its agricultural raw materials sustainably, and link more than half a million smallholder farmers and small-scale distributors to its supply chain.

Halving the greenhouse gas footprint of Unilever products across their life cycle by 2020 represents an equally big challenge. Only 5% of these impacts come from manufacturing and transport. By far, the largest contribution comes from consumer use which accounts for 68% of the total, most of it caused by people showering, washing their hair and doing laundry. To achieve its goal Unilever will have to provide consumers with more products that use less water.

Unilever is the first to admit it doesn't yet know how it will achieve this target.

Companies such as Unilever are thus pointing the way towards the type of new thinking that will create the opportunities and sustainable thinking of the future.

The fact that Unilever does not yet know how to meet its targets is not an admission of failure. Rather, it highlights the opportunities ahead, as long as the company remains able and willing to devote time and effort to genuine innovation, rather than "me too" innovation.

The problem for many companies is that they are ill-equipped to even begin the hard task of innovating into the unknown.

These firms have closed-down their R&D laboratories and sacked their scientists because it was a great deal easier to make money in the Golden Economic Era of 1982–2007, when demand was buoyed by the baby boomers.

R&D departments need to be reopened, scientists re-employed – and at every level in every company, problem-solving and innovation must be encouraged.

And once the right investment priorities and corporate culture has been established, innovation needs to measure up to the five stress tests.

THE FIVE "STRESS TESTS"

They are:

- Societal value. This provides the essential motivation to attract potential stakeholders and value-chain partners and thus drive fast adoption.

- Value for money. The market for products that require long-term subsidy, or high margins to recoup development costs, will be much smaller than in the past.
- Local market presence. A centralised organisation will almost certainly either fail to notice the new opportunity, or regard it as being too small to matter.
- Up-front investment in developing the initial offering. Companies have to be prepared to develop new products and services, rather than just following a "me-too" process.
- Long-term ambition. The focus should not be on "cute technology" products, but on those that have genuine major growth potential.

On the subject of "societal value", the challenges faced by society need to be seen as opportunities. Here are some examples:

- More than 50% of young Spaniards are out of work and youth unemployment across much of the eurozone is high. This is a tremendous pool of eager, young people who want to work, and who will work long and hard hours – if the work that they are given is meaningful.
- Two-thirds of the people who have ever been 65 are alive today. By 2020, an unprecedented 33% of the developed world's population will be over 55. This is a tremendous resource of experience and knowledge that can benefit companies as working lives are extended.
- India is a food surplus nation but, according to the International Food Policy Research Institute's 2011 Global Hunger Index, ranks 67th out of 81 countries – and has more than 200m food-insecure people, the most in the world.[iv] This is a great opportunity to develop technologies for better irrigation of crops, and for delivering more food to the people who need it before the food goes bad. Around half the food produced in India goes bad before it arrives where it is needed.

But innovations need to be "fit for purpose". For example, a new refrigerator must be cheap enough so that it can be afforded by the average Indian farmer. This will often require a radical rethink of manufacturing processes and supply chain costs – hence the importance of being aware of value for money.

Local market presence will also be essential to better understand pricing versus quality pressure points in emerging markets.

Working with governments is going to be another ingredient of success, as governments have to deal with societal needs if they want to survive.

China is a good example.

Its 12th Five Five-Year-Plan (2011–2015) is a blueprint for economic and social development for the next 20 years – not just the next five years.

One of the key challenges identified by the plan is boosting energy efficiency. As a result, chemicals and polymer manufacturers such as Bayer MaterialScience and BASF have been engaging with the central and local governments in China in order to promote the value of their products in improving the insulation of buildings.

China is also confronting a major water shortage. Bayer MaterialScience thus promotes the use of a

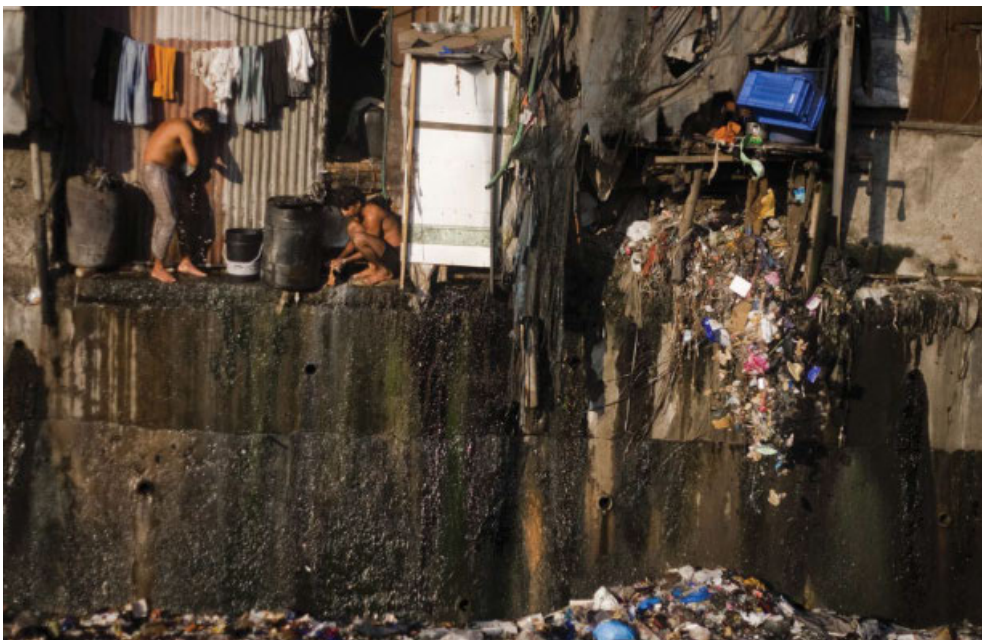


Chart 124: Men have bath next to huge drain in the Daharavi slum, Mumbai, India.

Source: Rex Features

polyurethane solution that can be sprayed on to the interior of leaking water pipes as a low-cost alternative to digging up the pipes and replacing them.

"There is little point in trying to sell to China something it can produce itself, and that also doesn't help solve its major economic, social and environmental problems," commented a senior executive with a global plastics producer.

But, of course, individuals and companies cannot achieve all of this on their own. They need the support of the policymakers. This is what we discuss next.

CHANGING POLITICAL DIRECTION

THE BEVERIDGE CURVE

The chart on page 216, from a speech made by the vice-chair of the US Federal Reserve, Janet Yellen, in the first quarter of 2012, is hugely important.

It describes the so-called Beveridge Curve, which highlights the relationship between unemployment (horizontal axis) and the job vacancy rate (vertical axis). It shows this during the past three major downturns:

- 1973–1976 (black line). Unemployment rose from 5% to 9%, but then reduced to 7.5%. Job vacancies fell from 5.0 to 3.4, but recovered to 4.0.
- 1979–1983 (light blue). Unemployment rose from 6% to 11%, but then reduced to 8.5%. Job vacancies fell from 5.5 to 2.8, but recovered to 4.0
- 2007–2012 (darker blue). Unemployment rose from 4.5% to 10%, but then reduced to 8%. Job vacancies fell from 3.2 to 1.8, and are now at 2.5

The Evolution of the Beveridge Curve

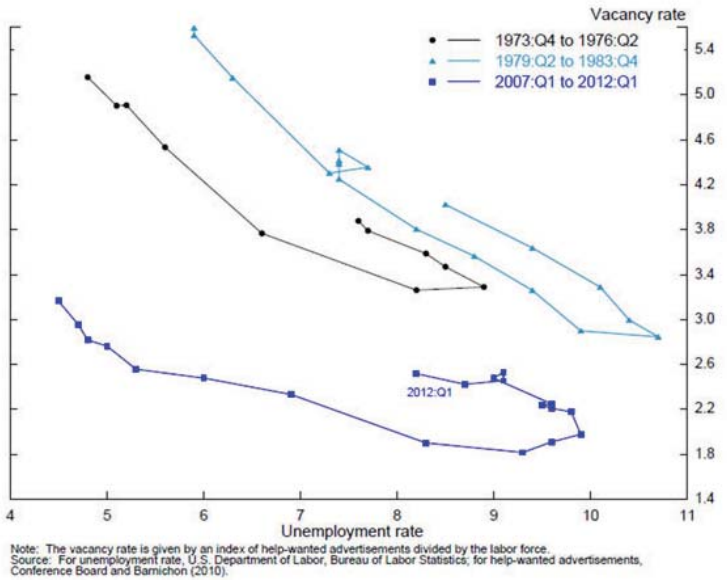


Chart 125: Unemployment and the jobs-vacancy rate in the US

Source: US Federal Reserve

Ms Yellen said that the chart illustrated how "an exceptionally large fraction of those now unemployed – more than 40% – have been out of work for six months or more. My concern is that individuals with such long unemployment spells could become less employable as their skills deteriorate and as they lose their connections to the labour market."

This is a problem across the Western world. It has the potential to create repeated waves of social unrest that could bring governments down and wreck economic growth.

And as skills atrophy – and as people lose the energy to learn new skills – it would become much harder to make the products and services of the future.

The first step that governments need to take towards solving the unemployment crisis is the same as the corporate sector: THINKING LONG-TERM.

This won't be easy because of the links between the world of finance and governments and "sound bite" politics. So, what needs to be done?

REDEFINING THE AGENDA

Policymakers need to realise that over-reliance on the financial sector is not good for economic and social well-being, as was amply demonstrated by the 2008 financial crisis, because of:

- The danger that the financial sector could cause a repeat of 2008.
- Skewed incentives, leading to some of the best brains in the world being drawn to the financial sector because of high compensation. These brains are needed to rejuvenate manufacturing sectors in the West, and to invent and develop the products needed to deal with the megatrends of demographics, carbon footprint and food and water scarcity.

- Governments being over-reliant on tax revenues from financial sectors. This has lessened the appetite for investments needed in infrastructure, education and R&D necessary to create meaningful – as well as financially rewarding – work.
- The unpredictability of tax revenues from the financial sector, as 2008 again demonstrated. Government finances have been placed under further strain by the need to bail-out financial institutions seen as "too big to fail".

The first bold step would involve breaking-up financial institutions to get rid of the moral hazard of being too big to fail.

Other measures include changing rules on stock-based compensation for executives, in order to get rid of the obsession with Shareholder Value. If executives are allowed to own shares in their own companies, then they should be made to hold on to their shares until they leave, thus removing the incentive to constantly push for quarter-on-quarter earnings growth.

In the US, the "revolving door" between Wall Street, the White House and lobbying companies needs to be broken. If governments remain heavily staffed by former executives from the financial sector, making this type of legislative change will be extremely difficult.

Good economic policy is indivisible from good social policy, as without a healthy society you cannot have a healthy economy.

SOCIAL POLICY

SOME PRACTICAL STEPS

Western governments in particular need to:

- Increase government spending on R&D. Some of the greatest scientific and technological breakthroughs of the last 50 years, such as the internet, were the result of government investment.
- Invest more in education to create the skills necessary to make the products of the future. This will involve partnerships between governments and industry that will provide the right type of education and retraining programmes.
- Develop business clusters – geographic concentrations of interconnected companies, suppliers, service providers and associated institutions, such as university research laboratories. Examples in the US include Silicon Valley and the aerospace cluster in Wichita, Kansas; and the auto and engineering clusters in Germany.
- Be realistic about the un-level playing field confronting many manufacturers. Many developing countries, for example, have skewed the competitive environment in favour of their state-owned manufacturers. In China, for example, this has been through subsidised land, cheap energy, cheap labour and great investment incentives.

There is a danger that developed countries' governments will adopt the wrong "industrial champions" for social and political reasons. But given the billions of dollars spent in recent years on rescuing the financial sector, more well-targeted support for struggling industries with good potential is clearly merited.

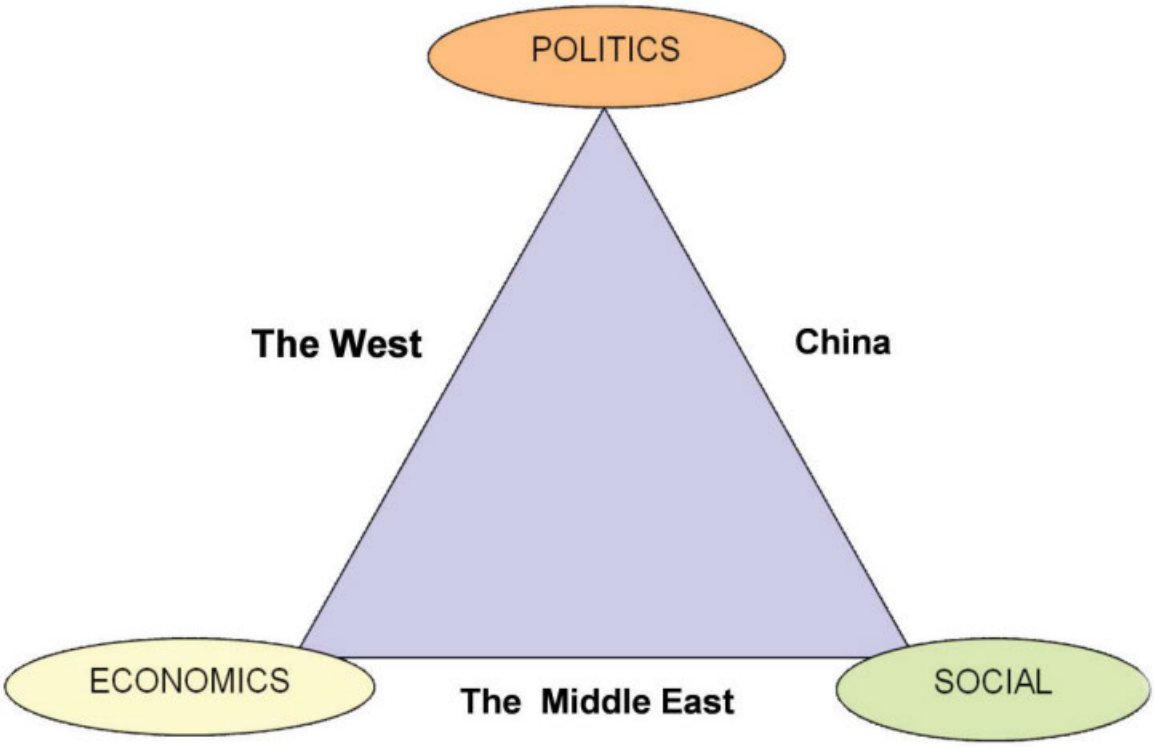


Chart 126: Differing economic, social and political priorities

Source: icis.com

For governments in developing countries, the challenges are very different.

They too though have to deal with skewed incentives if they are to make the progression to developed nation status.

"VESTED INTERESTS"

The right hand side of the triangle above tells us that in China, politics and social stability go hand-in-hand.

State-owned enterprises (SOEs), which have benefited from cheap and ample finance, often lose money.

Until now, this hasn't mattered because the SOEs have been job-creation machines. Creating jobs has helped keep the Communist Party in power.

But the new economic model, outlined under the 12th Five-Year-Plan, requires less of a role for the SOEs and more for private companies.

Greater innovation and creativity also need to happen in China, if it is to produce the internationally recognised branded goods necessary for it to achieve developed-country status.

The SOEs are, however, one example of the "vested interests" that have made excellent returns – often through corruption – out of China's existing growth model. They will fight tooth and nail to maintain their status.

In the West, the definition of a "brave" politician is someone who is unafraid of tackling the financial sector.

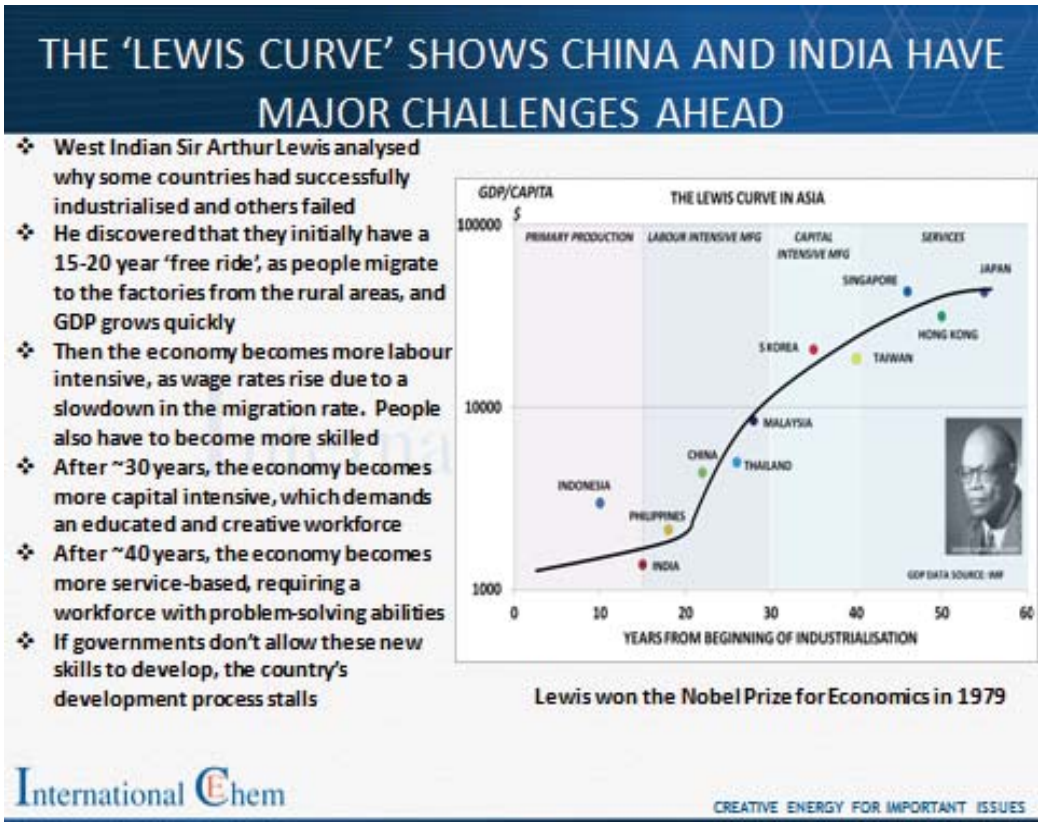


Chart 127: The Lewis Curve

The downside risk from this bravery amounts to little more than a failed political career.

But in China, taking on the forces of the establishment could lead to your financial ruin, the financial ruin of your family, imprisonment and even worse.

The above chart is based on the work of Sir Arthur Lewis, a West Indian economist.

He discovered that developing countries enjoy a 15–20 year "free ride", as people migrate to factories from rural areas, leading to a rapid growth in GDP.

But then wages start to rise due to a slowdown in migration. In order to justify these higher wages, people have to become more skilled.

After about 30 years, economies become more capital-intensive, which requires a more educated and creative workforce.

Economic history is littered with examples of countries that have failed to make this transition.

One has to question whether the creativity and innovation necessary for China to move up the Lewis Curve is possible under a one-party state.

India has plenty of innovation and creativity, and with it plenty of democracy – but vested interests also threaten its economy.

Hundreds of millions of Indians could be left trapped in extreme poverty, if again, political challenges are not overcome.

The country is mired in corruption scandals and economic reform has stalled.[v]

There are tens of thousands of brave individuals in China who are trying to change the system, including blind legal rights activist Chen Guangcheng.

Chart 128: Chinese rights activist, Chen Guangcheng

Source: Wikipedia

And, hopefully, reformists will win this year's struggle for control of the Politburo.

In India, too, there is always the opportunity for a new breed of politicians to emerge who will successfully tackle the country's difficulties.

But there are no guarantees, and so a key part of the New Normal thinking is a rejection of the oversimplified financial market view of emerging markets: That their rise will inevitably replace lost demand in the West.

A CALL TO ACTION

All of us have nothing short of a moral responsibility to confront the biggest economic and social changes in the West since the Second World War. It also – we believe – makes economic common sense.

Our suggested words of wisdom, with which we began this chapter, must therefore be backed-up by action.

We must reshape our own lives, and we must help reshape the corporate and political world.

We are about to set out on a great journey.

It is frightening, yes, we will face many challenges and setbacks on the way, that is true – but we have to make this journey a success.

Failure could be nothing short of a social and economic catastrophe.

SOURCES

[i] http://en.wikipedia.org/wiki/K%C3%BCbler-Ross_model

[ii] http://en.wikipedia.org/wiki/Imperial_Chemical_Industries

[iii] http://www.guardian.co.uk/sustainable-business/unilever-sustainable-living-plan?INTCMP=SRCH

[iv] http://blogs.wsj.com/indiarealtime/2012/04/09/starving-in-india-the-forgotten-problem/

[v] http://www.icis.com/blogs/asian-chemical-connections/2012/03/india-muddling-through-wont-do.html

BOOM, GLOOM AND THE NEW NORMAL

About the authors

PAUL HODGES is chairman of International eChem and a trusted adviser to the global chemical industry and its investment community. He has worked in the chemical industry for 30 years. Initially he spent 17 years at ICI – one of the world's leading companies – working in both the UK and the US. He held senior positions in petrochemicals and chlor-alkali, and was executive director of a $1bn ICI business.

He founded International eChem in 1995 and has strong professional relationships with the leading players. He follows developments on a detailed day-to-day basis. He writes the ICIS Chemicals & the Economy blog (www.icis.com/blogs/chemicals-and-the-economy) and has been recognised in the *Financial Times* and elsewhere for his success in forewarning readers of the global financial crisis.

Paul is a Freeman of the City of London. He is a graduate of the University of York, and subsequently studied with the IMD business school in Switzerland.

JOHN RICHARDSON is a journalist who has been covering the chemical industry for more than 15 years.

Based in the Asia-Pacific region, John has deep knowledge of the companies and people who have transformed the region into the world's major production and consumption region.

His aim is to provide insightful, factually based analysis of the key issues facing the industry and his views are highly valued by senior executives.

Since 2006, John has been director of ICIS training Asia, which provides a range of courses covering petrochemicals, oil refining, fertilisers and base oils.

He also writes regularly for ICIS Insight and *ICIS Chemical Business*. Previously, John was editor of *Asian Chemical News* (2000–2005) and deputy editor (1997–2000).

Before joining ICIS in 1997, John had roles working for both the BBC and the UK national press.

About ICIS

ICIS provides price information, news and analysis for the global chemical, energy and fertilizer industries.

We publish independent, unbiased pricing and market reports covering a broad range of products - from petrochemicals and base oils to fertilizers, gas and power.

Our global news service delivers breaking news, up-to-the-minute product pricing and market intelligence, bringing you the information you need as it happens.

ICIS

©2011 Reed Business Information.
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission in writing of the publishers.

Cover images: Rex Features and iStock

Printed by Short Run Press Ltd, Exeter, UK

Reed Business Information

ICIS

ICIS is the trusted information provider for the chemical and energy industries. ICIS aims to help companies in global commodity markets improve their revenues and profits by providing high quality, timely, commercially useful information, business leads and brand positioning across the globe.

www.icis.com

International eChem

Creative Energy for Important Issues

International eChem (IeC) are trusted commercial advisers to the global chemical industry and its investment community. Our team has an in-depth understanding of the issues, and of the 'real world' in which clients operate, due to our experience in working with many of the world's major companies and financial institutions.

www.iec.eu.com