



## IN THIS ISSUE: FAVORABLE MACROTRENDS AND THEIR COUNTERWEIGHTS

- 1 – FAVORABLE MACROTREND: MULTIPLE TECHNOLOGICAL REVOLUTIONS
- 2 – COUNTERWEIGHT: INNOVATION WILL NOT SAVE US
- 3 – FAVORABLE MACROTREND: MERITOCRACY STILL RULES
- 4 – COUNTERWEIGHT: A KNOWLEDGE AND SKILLS-BASED ECONOMY INCREASES INEQUALITY

## 1 – FAVORABLE MACROTREND: MULTIPLE TECHNOLOGICAL REVOLUTIONS

Nadeem Walayat, Editor of *The Market Oracle*, writes that quantum leaps in technological developments in computing, molecular biology and material sciences are converging, and will spark great economic and social advances over the coming decades. He speculates that the coming time will be known as the Graphene Age, as this wonder material becomes the building block for everything we use today and will use tomorrow (including new life forms). He lists the prime growth areas he foresees:

### COMPUTERS

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Moore's law continues to play out as processing power continues to double almost every 18 months, which translates into computing devices 20 years from now being about 16,000 times as powerful as today's same-cost devices. Powerful cheap processors will be in everything; today's desktop processing power will have shrunk all the way to chip level, which will allow us to interact in a truly digital world, i.e. we will access most of our data from the cloud, wherever we are. Increasing computing processing power (as well as memory/storage) will dramatically boost worker productivity.

### ARTIFICIAL INTELLIGENCE

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We will see AI impact every aspect of our lives long before we arrive at thinking robots. Manned call centers will disappear during the next 10 years; similarly, many retail shops will start to feature more intelligent self-service ordering and payment

technologies, and fewer sales staff. At the high end of the AI market we will eventually start to see whole high-cost professions, such as doctors, being put out of business as their knowledge is learned by sophisticated neural networks.

### ROBOTICS

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The work force of the future will be increasingly robotic.

### INTERNET INDUSTRIALIZATION

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The Internet has revolutionized our work, education and leisure over the past 20 years. The next 20 years are going to be just as revolutionary as bandwidth expands exponentially. The greatest impact of the Internet so far has been in terms of the flow of information and social interaction. The greatest impacts of the next 20 years will be in business, industry and education.

### BIO-TECH

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DNA mapping now takes less than a day and at infinitely less cost; just as super computers that were once the realm of giant corporations and government institutions are now available to smaller players, so is bio-tech technology falling into the price range of virtually anyone. Millions of labs are set to sprout up across the western world. It is increasingly likely that many future discoveries will not be made in expensive big pharmaceutical or government funded labs, but in small independent bio-tech startups.

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Walayat believes the following areas will also be engines of growth:

- The Home Solar Energy Revolution
- Health and Aging
- Healthcare Diagnostic Revolution Could Be Imminent
- Augmented Reality
- E-Paper
- Home Use 3D Printers
- Waste Recycling 3D Printers
- Graphene
- Nano Technology
- Home Fitness

## 2 – COUNTERWEIGHT: INNOVATION WILL NOT SAVE US

Robert Gordon, Social Sciences Professor at Northwestern University, [writes](#) that social and economic gains from innovation, so dramatic over the past 100 years, must inevitably slow down in decades to come. He is not forecasting an end to innovation, just a decline in the usefulness of future inventions in comparison with the great inventions of the past (such as electricity, the internal combustion engine, running water, indoor plumbing, the telephone, phonograph, radio, television, motion pictures, air conditioning, the jet plane, the interstate highway system, computers, the Internet).

The profound boost that these innovations gave to economic growth will be difficult to repeat, writes Gordon. They are all one-time phenomena. Innovation continues apace today, of course, but cannot lead to the same type of quantum improvements in our standard of living.

This might sound like the infamous (and apocryphal) quote that “everything that can be invented has been invented,” but it is not. Gordon backs his claim by showing that technological advances in health care, pharmaceuticals, energy, manufacturing and transportation are reaching phases of diminishing returns.

Even if we assume that innovation produces a cornucopia of wonders beyond his expectations, writes Gordon, the economy still faces formidable headwinds. The retirement of the baby boomers and the continuing exodus of prime-age males from the labor force, sometimes called the “missing fifth,” are reducing hours worked per member of the population. American educational attainment continues to slide ever-downward in the international league tables, due to cost inflation at our universities, \$1 trillion in student loans, abysmal test scores and large numbers of high-school dropouts.

And inequality in America will continue to grow, driven by poor educational outcomes at the bottom and the rewards of globalization at the top, as American CEOs reap the benefits of multinational sales to emerging markets. From 1993 to 2008, income growth among the bottom 99% of earners was 0.5 points slower than the economy’s overall growth rate. If future output grows at a rate of just 1% a year, as Gordon expects, that means the overwhelming majority of Americans will see their incomes grow just 0.5% annually.

The future of American economic growth is dismal, concludes Gordon, and policy solutions are elusive.

## 3 – FAVORABLE MACROTREND: MERITOCRACY STILL RULES

Victor Davis Hanson of the Hoover Institution [writes](#) of America’s big fat advantage – meritocracy:

The world now wakes up to iPhone communication, Amazon online buying, social networking on

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Facebook, Google Internet searches, and writing and computing with Microsoft software. Why weren't these innovations first developed in Japan, China, or Germany – all wealthy industrial countries with large, well-educated, and hard-working populations? Because in such nations, young oddballs like Jeff Bezos, Bill Gates, or Steve Jobs more likely would have needed the proper parentage, age, family connections, or government-insider sanction to be given a fair shake.

Even in its third century, America is still the most meritocratic nation in the world. Unlike under the caste system of India; the class considerations of Europe; the racial homogeneity of China, Japan, or Korea; the tribalism of Africa; or the religious orthodoxy of the Middle East, in America one can offer a new idea, invention, or protocol and have it be judged on its merits, rather than on the background, accent, race, age, gender, or religion of the person who offers it.

Businesses evaluate proposals on the basis of what makes them lots of money. Publishers want writing that a lot of people will read. Popular culture is simply a reflection of what the majority seems to want. In the long run, that bottom line leads to national wealth and power.

If history is a guide, the most savvy Chinese citizen of Japanese descent would not make it as a high official in Beijing's Communist Party – no more so than a brilliant Japanese citizen of Chinese descent would run Toyota or Honda. A white Croatian of enormous talent could not end up as president of Sudan.

Mexico has a word, *Raza*, that conflates race and nationality, in the way that the German word *Volk* used to suggest not just being German, but looking German, as well. I doubt

that either country would ever elect a black head of state.

It would be virtually impossible for the most talented Christian or Jew to be allowed to head contemporary Egypt, or for a brilliant four-star Buddhist general to run the Iranian military. For the immediate future, don't expect a female business-school valedictorian to manage Saudi Arabia's national oil company. Note that in all these cases, such exclusions derive from criteria other than innate talent, character, and industriousness, and can result in the lesser qualified being considered the only qualified.

The mixture of consumer capitalism and constitutionally protected free speech – and all sorts of races, religions, and ethnicities – sometimes means that America can be a wild place with a popular culture that appears crass and uncouth to those abroad. Our generation's \$17 trillion national debt, unfunded entitlements, and nearly 50 million people on food stamps might convince the Founding Fathers that they had spawned license rather than guaranteed liberty.

Yet the upside to the wild arena of America is that almost anyone is free to enter it. Oprah Winfrey, an African-American woman, reinvents the genre of daytime talk shows and builds a media empire. Warren Buffet outpaces New York's Wall Street – from Nebraska. A one-time five-and-dime owner from Arkansas, Sam Walton, refashions the way an entire planet buys its stuff. A Russian émigré, Sergey Brin, co-founds Google, perhaps the most indispensable site on the Internet.

Just when we read obituaries about an unruly nation of excess, unlikely nobodies pop up to pioneer fracking, the Napa wine industry, or Silicon Valley. Why? No other nation has a Constitution

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whose natural evolution would lead to a free, merit-based society that did not necessarily look like the privileged – and brilliant – landed white-male aristocracy that invented it.

The end of American exceptionalism will come not when we run out of gas, wheat, or

computers, but when we end the freedom of the individual, and, whether for evil or supposedly noble reasons, judge people not on their achievement but on their name, class, race, sex, or religion – in other words, when we become like most places the world over.

#### 4 – COUNTERWEIGHT: A KNOWLEDGE AND SKILLS-BASED ECONOMY INCREASES INEQUALITY

Brink Lindsey, senior scholar at the Kauffman Foundation, is author of [Human Capitalism: How Economic Growth Has Made Us Smarter – and More Unequal](#).

What explains the growing class divide between the well educated and everybody else? Lindsey argues that it's because economic expansion is creating an increasingly complex world in which only a minority with the right knowledge and skills – the right “human capital” – reap the majority of the economic rewards. The complexity of today's economy is not only making these lucky elites richer – it is also making them smarter. As the economy makes ever-greater demands on their minds, the successful are making ever-greater investments in education and other ways of increasing their human capital, expanding their cognitive skills and leading them to still higher levels of success. But unfortunately, even as the rich are securely riding this virtuous

cycle, the poor are trapped in a vicious one, as a lack of human capital leads to family breakdown, unemployment, dysfunction, and further erosion of knowledge and skills.

Why haven't poor people been more successful? Lindsey suggests two main reasons. The first is skills-based technological change. The second reason is the persistent divide between “elite” culture and that of the bottom 70 percent. “Culture is trumping economics,” writes Lindsey. This is not a new insight; see [“Coming Apart,”](#) by Charles Murray, and Jonathan Rauch at [National Journal](#).

Culture, of course, is less susceptible to manipulation by public policy than economic behavior. This makes the problem of inequality more intractable. I have to conclude that these favorable macrotrends mean the future is bright for those with human and cultural capital, but that these counterweights mean the future is not so bright for those without.

The Consumer Demand Index is a monthly survey of American households' buying decisions for the next 90 days. Unlike other measures of consumer “confidence” or “sentiment,” the CDI measures what percentages of US households HAVE MADE DECISIONS to purchase in the next 3 months across a wide range of durable

and non-durable goods, including cars, white goods, PCs, TVs, home furnishings, kitchenware, clothes/footwear, and food/groceries. We therefore also uniquely measure, as a residual, what percentage of households WILL NOT be making purchases in ANY of the product categories surveyed, from cars to toys.

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