

Emergence of the Fusion Economy

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Abstract: From the birth of modern treasury-based economies in the 15th century until today, global power and wealth have been centered around, and measured by, manipulation of supply and demand. Seeds and land generate traded crops. Extracted minerals are refined into weapons, tools, machines, and infrastructure. Complex materials using proprietary formulae generate technology. Knowledge guilds create data and information to share with selected networks. However, the systems and metrics developed over the past half millennium have strained – many, to the breaking point. Global financial and knowledge fulcrum are being transported by economies and cultures that have been excluded from the seats of power at the world’s table since the “Age of Enlightenment”. Beginning with a modern-day parable of a Jesuit-trained Egyptian Muslim, Dr. Martin will explore the applications of the new levers upon which the world finds itself being moved and discuss the implications of Archimedes’ paradigm in the Next Ten Years.

Standing here before you today and embarking on an exploration into the paroxysm upon whose precipice we now stand, there is delightful convergence in knowing that today’s lecture is being given at a Catholic University – the University of Notre Dame – which owes its founding charter to a Methodist State Senator in 1844. In great ecumenical symmetry, my first interactions with Notre Dame came during the lauded tenure of past President Theodore Hesburgh whose speeches and writings inspired me, by lineage a Mennonite, while I was a student at a neighboring institution, Goshen College, just down the road in Elkhart County. At the outset, I will invoke his all too infamous, yet so temporally relevant admonition in 1969 calling for the repudiation of those who would substitute “force for rational persuasion.” Nearly 40 years later, these words continue to motivate me as their content – irrespective the debate on the context in which they were expressed – serve as a clarion call for the emergence of greater understanding and informed public discourse.

We will begin our journey in Dubai. On the first day of my first trip to the Emirates, I had the pleasure of making the acquaintance of Moustapha Sarhank, a Jesuit trained Muslim from Cairo. He knew that I was an opportunistic American businessman exploiting a social network for my own gain. I knew he was a mercenary deal maker who had access to the untapped wealth of the region. Within the first five minutes of our interactions at his suite in the Intercontinental Hotel I knew that he could never understand motivation beyond self-serving materialism. He knew that I was contentious, arrogant, and condescending. Neither of us knew the other at all. And then, in a moment of hostility, one of us mentioned the words “honor” and “integrity”. Thankfully, neither one of us knows who redeemed the train-wreck of our first interaction. Setting aside the stated purpose of our meeting, we began talking about faith, family, and a vision for the future and, in less time than it took for us to find animosity, we found a brotherhood sealed that Fall

when he invited me to celebrate the Fast of Ramadan – permanently binding our fraternity. Many of the insights that I share with you today are not mine alone but those that have emerged from the conversations we've shared and, to that end, I share this podium with my friend and brother, Moustapha. And while much of my message can be misheard as a prophecy of doom, I challenge each of you to sit long and talk much over these observations so that you can find the optimism that perpetuates my life.

We live in an era defined by Ignorance Arbitrage. By this, I mean that all of our implicit social constructs rely on the selective “knowledge consensus” among authorized network members. We explicitly communicate within archetypes constrained by presuppositions of awareness that may, or may not, be encoded for others to understand in part or in whole. As long as equilibrium, or the appearance thereof, is preserved, we're comfortable. However, when the preponderance of evidence no longer sustains our contrived realism, we despair over our impending obsolescence.

Let's review our modern credo of manifest destiny.

We begin with a resolute recitation of **Doctrine of Conquest**. Following World War II, a victor's conundrum emerged. You will recall that in 1945, the Soviet Union was our military ally together with Britain, France, Australia, Belgium, Brazil, Canada, China, Denmark, Greece, Netherlands, New Zealand, Norway, Poland, South Africa, and Yugoslavia. You will also recall that our enemies included Germany, Italy, Japan, Hungary, Romania, and Bulgaria. Four short years later, we were in the Cold War. From 1949 to 1989 the global economy was shaped by the dichotomies of the specter of Communism vs. the supremacy of Capitalism in a neat East vs. West model. It is worth noting that Socialism was largely ignored (albeit frequently invoked as Communism's evil cousin) despite its important contributions in Europe, India, and other “lesser developed countries”. The West embraced materialism at every level to overtly display social and economic supremacy and constantly contrasted it to the despondency of those living under the iron fist of “the others”. When the Soviets, in 1957, successfully launched the highly relevant technology – a satellite – the United States' response was to put a man on the moon! We, the country founded on conquest, reclaimed supremacy by conquest of a large dusty rock as though we didn't have enough dusty rocks on earth. While I would not suggest that our Space Race didn't have unintended benefits, it's comical that modern communication rides on the back of the “losers” of the Cold War. In short, to confirm our myth of our own divine right, we engaged in a conquest of an inert object. To the victor goes the re-writing of history.

From Conquest, our Catechism teaches the **Doctrine of Colonization**. In the 1980's, the steel of our cars and guns and the copper of our electronics conveniences provided little solace when Japan out invented the United States in a number of critical technologies – challenging a doctrine of intellectual supremacy that was significantly built on the backs of the German engineers relocated to the United States after the end of World War II. After all, the MacArthurian utopia was supposed to cooperate with our global economic policy but something had gone terribly wrong. Japan learned from the excesses of the industrial West during the 1970's and started beating us at every turn. You will recall our response in the 1980's was:

- Slashing domestic industrial manufacturing to “build competitiveness” thereby unemploying 2.8 million Americans;
- Doubling of Foreign Direct Investment into the U.S. nearly making up for the job cuts in American businesses by employing Americans in foreign owned enterprises;
- Pumping billions of dollars into state-sponsored research kicked off by the Stevenson-Wydler Technology Innovation Act of 1980 in which the following doctrine was elucidated. “It is the continuing responsibility of the Federal Government to ensure the full use of the results of the Nation's Federal investment in research and development. To this end the Federal Government shall strive where appropriate to transfer federally owned or originated technology to State and local governments and to the private sector... ***including plans for securing intellectual property rights in laboratory innovations with commercial promise and plans for managing such innovations so as to benefit the competitiveness of United States industry.***”
- Malcolm Baldrige, U.S. Secretary of Commerce, architected the “Trade War” doctrine as a matter of national economic response to Japan – a policy strikingly similar to that deployed today against the Chinese;
- The Capitalist Victor of the Cold War minted the oxymoronic phrase “unfair competition” to level against any country that happened to outperform U.S. economic execution.

Colonization, under the moniker of “Free Trade”, means that U.S. and European policy reserves the right to define “Free” and “Fair” and the litmus test to apply to measure the relative pH of the system is how the behavior of others impacts U.S. and European industry.

When fully bloomed, we achieve the transcendence of the **Doctrine of Eminent Domain**. In this final incarnate step, we see the emergence of the unholy trinity of creator, purveyor, and manipulator. If we say that we create all things that are innovative and valuable, and we convince others that they want and must have the things we create and allege to be innovative and valuable, and finally, if we actively insist that only that which we say is valuable can achieve value, we have achieved bliss. When white collar jobs followed the blue collar exodus to India,

Vietnam, Korea, Singapore, China, and Thailand, the American people were reassured by policy makers and the media that all was fine because, after all, all the innovations come from America. The assumption followed, therefore, that as long as we created all that is new and valuable, the rest of the world would "need" us. However, this assessment never fully calculated the fact that, since 1987, the majority of foreign students being educated in the programs created under the 1980 – 1983 national research competitiveness programs came from Taiwan, China, India, and South Korea. By 1994, the U.S. Department of Education reported that over 50% of all doctoral degrees awarded in computer science and engineering were awarded to foreign students. A subtlety in that report (published in 1996) was the observation that while Taiwanese and Indian students were more biased towards computer science and engineering, students from the People's Republic of China were more focused on the natural sciences. One early indicator of pending transformation can be drawn from this statistic – namely that the PRC has millions of basic scientists from whom the next new "new thing" is likely to emerge as their training has not merely prepared them to out-engineer and optimize but to understand the basics of discovery. Just because we educated masters and doctoral students doesn't mean that they all returned to their home countries with a permanent sense of loyalty to their academic progenitors. The assumption that eminent domain applies to the landscape of the mind, while a wistful aspiration, has not held true in the past and will not hold this time. The Stevenson-Wydler Act inadvertently has educated and enabled the GDP growth of others while we preside over a flat or decreasing GDP on our shores. Since we've educated the world, we should be cooperating with it rather than vilifying those whose intellects we've shared.

Those who would be optimists may retreat to the final high ground which insures our global supremacy – our economy. After all, we have the most recognized currency on the planet, we have the most liquidity in our markets and, since 2001, we poured that liquidity, in record amounts, into financial products that the rest of the world doesn't always fully appreciate or, in some cases, in which they are precluded from participation. It's important to note that the growth of hedge funds, derivatives markets, and related financial instruments has out-paced all other investment structures and products. In 1987, the International Swaps and Derivatives Association reported less than \$1 trillion in interest rate and cross-currency swaps. By 2006, that number has grown to over \$250 trillion including credit default swaps and equity derivatives. This number, while staggering, should be clearly understood by the average consumer as acceptable as, according to Allen Greenspan in May of 2003 he provided the following reassurance stating that, "derivatives market participants seem keenly aware of the counterparty credit risks associated with derivatives and take various measures to mitigate those risks." Isn't it reassuring to know that the largest financial instrument class in the world exists under the rigor

and discipline implied in the preceding comment? Isn't it ironic that the world's cumulative GDP in 2004 was estimated by the World Bank to be 1/6 of that number at a meager \$40.2 trillion?

Well, folks, while we were walking through this wonderful illusion, a series of clearly identifiable factors began to warm the seas into what promises to be the economic *El Niño* that bodes for a transformational 10 years hence.

- In 2006, one third of all international IPO's were from China with proceeds growth of 87% in a single year.
- The total proceeds from global IPO's has not yet returned to 1998 levels though the average deal size has grown by almost 20%. The companies that are raising money are hardly at the innovative edge of future technology and business models – credit cards, airplanes, real estate, hotels, and car rental to be precise - concerning the top 5 grossing deals in 2006. It is troublesome to be reminded that one of the common reasons for the slowdown in IPO deals is the requirement for compliance under Sarbanes Oxley – an unwanted burden of accountability and oversight which leads me to my observations about the future.
- The “strength” of the U.S. economy is measured with metrics which systematically under report: unemployment and under-employment; the consumer contribution to the economy that is increasingly representing new debt (much of which has been supported by hyper-inflation in perceived real estate value); national entitlement programs including Social Security, Medicare, Medicaid, together with the grossly overlooked actual financial position of the FDIC, Fannie Mae and Freddie Mac and their attendant solvency risks which are nowhere to be found in Federal fiscal transparency; and, the *actual* contribution and double counting of Federal underwriting of government spending on both consumable products and services as well as the perpetual abuse of the in-process research and experimentation tax credit which is supposed to finance our future GDP.
- Industrial stalwarts such as General Motors, General Electric's plastics division, pharmaceutical giants, and consumer electronics increasingly see global competition catching and surpassing them with little or no option than to option off their futures.
- James Wilsdon's critique of the British investment in science, and the underlying presumption that this is linked to what I refer to as Gross Innovative Output in the November 3, 2006 *Financial Times*, in which he illuminated an industrialist paradigm at the public policy level which has become unmoored. The notion that investing in laboratories, academia, and industrial research and experimentation will somehow positively correlate to the next new thing may have worked in a more industrial society. However, in a world where proprietary value – that which protects goods or services

from commoditization and minimal profitability – is increasingly based on knowledge franchises, this public policy and financial prioritization is outmoded.

- According to the FDIC, the total of past due and nonaccrual assets in 2006 were predominantly (82%) in real estate-secured and consumer credit (51% and 31%, respectively). A closer look reveals that a potential double exposure exists driving the remarkable increase in these statistics from 2004 to 2006 of over 20%. Leading the increase in non-performing obligations were debts for the 1-4 family residential real estate sector and the credit card debt non-performing sector which are tracking each other very closely supporting the concern that the seven consecutive quarters of negative savings in the U.S. is impacting not only wealth accretion but is also beginning to adversely impact long-term credit rating foundations.
- One of the largest financial innovations of 2005 and 2006 was the creation of the *sukuk* – an Islamic finance product originated in the Gulf States and subscribed from Indonesia to Germany. This novel finance vehicle, in two year's time, raised close to 10% of the global total financing proceeds compared to all funds raised through IPO's in the traditional markets. While the rest of the world was learning about, and investing in *Shari' a*-compliant investments, U.S. policymakers were protesting port security provided by one of our allies who floated a *sukuk* offering.

In short, our love affair with our domestic ever-expanding consumption without transparency and accountability has resulted in a financial and social bankruptcy the import of which has not been lost on the rest of the world.

I would propose that the disintegration of 2007 actually has its roots in the Napoleonic conquests – a notable component of which we celebrate in bicentennial this year. Our present situation has haunting similarity to conditions that existed in Europe when, in 1807, Napoleon promulgated the Swamp Decree. To fund his burgeoning ambition for hegemony, Napoleon needed to fund far-flung military campaigns and so he innovated a taxation system that birthed the modern intangible asset economy – in short, he created a national economy built not on tangible productivity but rather on what could, in theory, be made productive by municipal fiat. Explicitly, the Swamp Decree took the C.E. 800 Holy Roman Empire property valuation paradigm in which property was valued and taxed based on its alleged productivity and improved upon it by imputing the value land *would have* if it was drained. In short, the value wasn't there but, by extrapolation, if the State determined that it could be valuable, it was deemed so. This creative – some would argue, rather sinister – approach to valuation was the birth of the modern economic optionality. More importantly, transactional imputed value was not the exchange of

value between a willing buyer and seller but was superseded by the whim of the realm for the calculation of taxation whereby the State could fund its affairs and excesses.

Eight short years later, another dynastic emergence vaulted onto the then-known-world stage. The Rothschild family, in 1815, took control of the Bank of England in what amounted to one of the all time most creative derivatives deals surrounding interests in the East India Trading Company and some fascinating timed trading following the Battle of Waterloo. Having amassed control of much of Europe's financial power by the 1830's, notable members of the family were said to have boasted that they cared not what puppet monarch sits upon the throne of England as he who controls the money controls England and they controlled the Central Bank. The dissociation of the sovereign from the monetary authority, unthinkable before, created a vacuum filled on both sides of the Atlantic by a few very influential families who, in some instances, hold sway to this day. Despite the convulsions of two World Wars in the following century, linkages between the monetary authority and the mercantile industrial complex were such that, while nation-state fortunes rose and fell, the financial players rode out the storms with relative ease.

At the end of World War II, we find ourselves setting the stage for this present penultimate act.

Again, we are a nation at war. As enemies have evolved from territorially defined states, to ideologies, to the modern euphemism of "terror", we know that vast armies of those who feel marginalized, compromised, or disenfranchised now operate in cells ranging from Idaho and Oklahoma City to London, to Beirut, to Bali. All christen their causes invoking a divine impetus. However it is important to note that Chaucer's adage that "Idle hands are the Devil's workshop" enjoys a corollary – perceptions of disempowerment foster ideological (and religious) extremism. While I would not simplify present geopolitics into a sound-bite, I would argue that the strain of perceptions of global economic imbalance may very well be the catalyst that finally collapses the foundation. With the President's call this week for increased funding for the war with a concomitant reduction in domestic spending priorities, it is clear that the economic forecast for GDP growth over the next 5 years will rely on Americans who have less financial resilience than at any time in the past 70 years and on companies increasingly unable to adapt to the global transformations in economic powers save those directly supporting the military infrastructure. We are at a tipping point.

So then what?

The Silk Road is coming back. For over two thousand years, stretching from the Eastern Mediterranean to the Sea of Japan, southward through the Indian Ocean, the Silk Road was the

nexus for the emergence of knowledge transfer and international trade networks which rival, in diversity and value, modern conventions. While the U.S. and Western Europe prosecute military campaigns in Iraq and Afghanistan, the Silk Road is emerging as a literal and figurative power reminiscent of its earlier glory. It was after all, on this network, that one of the most compelling technology transfers was facilitated. Between C.E. 300 and 1168, Chinese and Muslims developed and applied the core technology for potassium nitrate, arguably one of the most explosive technologies that has shaped two millennia of human endeavors.

To set the context, it is helpful to picture the Silk Road Economic Block in the following way. Starting in Alexandria, Egypt and terminating in Beijing, China, draw your latitude line angling from N30° to N40°. Then look south of that line to the Equator. This region holds close to ½ of the world's population; is home to most of the world's religious and cultural progenitors; enjoys unprecedented GDP growth forecast to represent over 20% of the world's GDP in the next ten years; and, is actively building cross-border economic cooperation at the corporate and national level. The strength of the Silk Road Economic Block poses a number of compelling arguments for a global shift in power within 10 years hence.

First, the U.S. dollar. In 2006, 47% of the U.S. Treasury securities were held by foreign interests while the U.S. Monetary Authority retained 17.8%. The Federal Reserve estimates that two thirds of U.S. currency is held outside the country amounting to over \$700 billion. While the U.S. dollar represents 47% of the world's official foreign exchange reserves, it is helpful to consider that with that exposure comes certain risks. In June 2005, the Bank for International Settlements warned that countries would need to act "together" to deal with the burgeoning U.S. trade deficit and went so far as to suggest that the U.S. should consider cutting expenditures and raising taxes. Failure to address this issue could lead, they suggested, to disorderly decline of the dollar and trigger significant global market perturbations. As we all know, the appetite for this medicine has not yet created the impetus for change.

As we see our country slip in its influence on the foreign policy front, we cannot ignore a maelstrom of our own creation. While we've leveraged our nation in our pursuit of energy consumption, insatiable material acquisition, and protection of our way of living, we've actually mortgaged our economic fulcrum in shaping global policy. When China elects to build energy alliances with Iran, paid for in U.S. dollars and financed on U.S. Treasuries, precisely what leverage have we retained. Given the fact that U.S. consumption has provided vast wealth to those in the Middle East and Asia who now are cast as "emerging threats" to our national

security and “sponsors” of terror, what incentive have we provided to engage in constructive dialogue?

Increasingly, innovations of global consequence are emerging from the Silk Road Economic Block. In Singapore, Malaysia and China, biofuel technology is being funded and deployed. In China, near-zero emission transportation and municipal systems are being developed. In Iran, low-fire glass ceramics are being developed to safely dispose of highly radioactive nuclear waste. In India and Iran, transgenic tomato plants are being developed to produce vaccines for biological warfare agents. In Singapore, a global surprise anticipation center is being built to fundamentally change national and international policy from reactionary to proactive and anticipatory. In Saudi Arabia, Kuwait, and the United Arab Emirates, novel energy and water municipal systems are years, if not decades, more advanced than the municipal systems in much of the U.S. and Europe. Islamic financial products – based on fundamental ethical requirements for transparency and risk-sharing – are attracting capital market participation for funds that have never been liquid in the global economy. National treasuries are adopting policies for foreign direct investment within the Block realizing that economic gain is inextricably linked to domestic and regional security. In short, the region is emerging the “Fusion Economy”.

Why Fusion? First, because it accurately describes at the physical sciences level the imperative driving the emerging reality. In the fusion reaction, the application of an external nuclear force overcomes the naked repulsive electrostatic force that keeps nuclei repelled. When one nucleon is added to a nucleus, it attracts others and, by doing so, adds mass while emitting energy.

What’s coming? The Fusion Economy.

Highly divergent, one could argue polar, forces exist in the cultures of the Silk Road Economic Block. Nowhere are the divides between wealth and poverty; progress vs. preservation; theism and modernism more brightly illuminated. Nowhere is there a more concentrated aggregation of wealth denominated in U.S. dollars. Nowhere are markets so entirely dependent on the consumption of energy, goods, and services demanded by, but out-sourced from, the West. However, in spite of these conditions, a single catalyzing event (triggered by war on an economic or corporeal level) could serve to unite those who appear so woefully segregated. Who would have imagined that Chinese restaurants would become commonplace in Tehran? Who could imagine that China could evolve an intellectual property regime that would actually begin successfully invalidating presumptive monopolies that other nations feared to challenge? Could it be possible that ½ the world could create a self-sustaining resiliency that would be denominated on a non-U.S. treasury / currency platform? Could a new paradigm integrating compulsory,

ethical innovation licensing be paid for in “virtual value units” that entitle the bearer to water or energy rather than a call option on a Central Bank? Is it possible that we’ve actually placed in motion sufficient antipathy to forge Atheist, Buddhist, Hindu, Muslim alliances that embrace more common values than the Anglo-Saxon values we seek to purvey?

Ten years hence, Chinese won’t be buying IBM computer businesses – they will be engineering nanotechnology autonomous appliances. While we debate how to deal with global warming in the U.S., New Delhi and Cairo may very well fund emission free public transport. While our aging population finds itself under increasing financial burden to pay for medicine, Abu Dhabi Organics may be feeding the Gulf States medicament plants engineered at that National Research Center for Genetics and Bioengineering. And, yes, my dear friends in the Kashmir may finally have the traditional herb compound that grows back my hair.

Today, we can choose the path that allows us to participate with those for whom we’ve had exclusionary practices for years. We can begin to unwind the pejorative archetypes defining those like us as developed and those unlike us as aspirants. We can participate in the financial accountability of ethical investing. We can enter into dialogue with those we’re sure seek to do us harm. Can we sit and objectively listen to former President Khatami quote the great Persian poet Sa’di’s words, “With devotion I will take that poison as the cure has been created by the Almighty,” and understand that this riddle contains not only the key to understanding those we find so foreign but a gentle echo of the admonition from the very Bank for International Settlements with whom no Silk Road voice conferred? We have before us the paradox left by our Greek progenitors – to choose an Odyessian or Orphean destiny for the sirens are singing. I choose the sweeter sound.