

New Banks, New Currencies and New Markets in a Multicurrency World: Roadmap for a Post-Scarcity Economy by 2050

Melanie SWAN, *MS Futures Group*, presented at Create Futures IberoAmérica, Entusiasmo Cultural, São Paulo Brazil, October 14, 2009

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1. Near-term future: economy 2.0

The present state of economic affairs can be denoted as economy 2.0, as distinguished from the economy of a few years or decades ago. Technology has allowed economy 2.0 to develop from the traditional economy. Technology is several standalone industries, but more importantly, has become part of nearly every other industry, shaping and facilitating all aspects of production, distribution, and consumption. There have been several paradigm shifts in technology that have continually influenced other industries: the mainframe computer, the personal computer, the internet, and now social networking (Figure 1).

Figure 1. Paradigm shifts in technology.

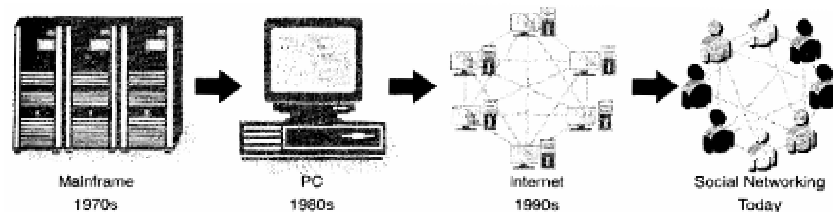


Image credit: Shih, Clara. The Facebook Era. Figure 1.1, March 2009.

The mainframe computer allowed routine tasks to become increasingly automated and facilitated the collection and analysis of data. The personal computer extended information access to masses of people in both professional and personal settings. The internet allowed people to find and create information. Social networking is now allowing people to interact with a much greater range of people and ideas on a global basis. In addition to the increasing degree of technological integration, the economy 2.0 can also be defined by the emergence of six key concepts: affinity capital, the multicurrency society, the proliferation of markets, automatic markets, the evolving role of banks, and abundance injection techniques.

1.1. *Affinity capital*

The first important emerging concept in economy 2.0 is affinity capital. Deeper levels of information about every economic transaction are starting to be available such that individuals, businesses, and communities

can be very specific in directing and democratizing their capital. In many cases, products can be chosen by attribute, for example, organic, recyclable, fair trade, fair labor, sustainable materials-sourced, or whatever the affinities or attributes of concern are. Affinity-directed capital can influence both cash inflows and cash outflows. Affinity inflows are monies earned. To a greater degree than was possible in the past, individuals can be more selective in choosing workplaces, checking Corporate Social Responsibility reports for large companies, or being entrepreneurs, finding projects on website marketplaces like TopCoder, odesk, 99 designs, hypios, or other [affinity capital marketplaces](#).

Affinity capital also influences capital outflows such as investing, donating, and purchasing. In investing, SRI (socially responsible investing) mutual funds have been available for several years, and now peer-to-peer lending and social venture capital platforms allow investors to direct their capital more granularly in these asset classes too. In some cases, new categories of investment have arisen such as philanthropy merged with investing (example: Kiva's peer-lending platform), where investors find that a lower or blended financial return is acceptable when social outcomes can be achieved too. Several hundred worldwide social entrepreneurs have been attending the annual [SocialCapitalMarkets](#) conference to discuss bringing about social change through economic transactions. The conversations are continuing at twelve worldwide [Hubs](#), a physical platform for social capital markets, essentially a combination of co-working and social venture incubators. Affinity purchasing is one of the strongest ways of voting with dollars based on product attributes. Capital can be democratized as individual and business consumers check [affinity capital marketplace](#) websites like ClimateCooler and GoodGuide to check affinities such as socially-responsible and environmentally-friendly before buying.

1.2. Multicurrency society

A second important concept in economy 2.0 is the multicurrency society. There are both monetary and non-monetary currencies. While there is some current exploration of alternative monetary currencies, there is much more activity in non-monetary currencies. Many individuals are trying to amass the non-monetary currencies listed in Figure 2.

Figure 2. Examples of non-monetary currencies.

1	Reputation
2	Authority
3	Time
4	Attention
5	Intention
6	Ideas
7	Creativity
8	Health

The new concept of currency is less about owning resources and more about the ability to access resources on-demand (for example: people, capital, and information). Currency is an enabler of other things. The new currencies do not have all of the properties of traditional currencies. While value is being created, it may not be as fungible, transferable, and convertible as monetary currencies. For example, reputations cannot be ported from Amazon to eBay. Friends must be invited separately to different social networking platforms such as Orkut, Facebook, LinkedIn, Twitter, and FourSquare.

Measuring the new currencies is an important consideration. On the web, it may be possible to measure several currencies easily. Reputation and authority can be measured by the number of friends, followers, subscribers, fans, content links, citations, wikipedia page edits, and open source project participations, etc. Time and attention can be measured by what content is clicked when. Intention can be measured by what content is requested in search. For some web content, the quality of ideas and creativity can be measured by the number of bookmarks and retweets (RTs), the number of times favorited, and in lists and trending topics. Twitter, friendfeed, power.com, and Google Wave are examples of social communication tools, but perhaps more importantly, they are markets for ideas. Health is a currency which may have dramatically different measurement norms as it becomes possible to automatically collect hundreds of daily data points.

1.3. Proliferation of markets

A third important concept in economy 2.0 is that markets are proliferating. There are starting to be more and different kinds of markets. At least five types of markets are readily identifiable.

1. Traditional financial markets – including the development of new derivative instruments to help manage and speculate on uncertainties, for example: interest rate futures, weather futures, housing futures, wine futures, movie futures, and carbon credit trading. The instruments themselves are not inherently good or bad, but the transparency and regulation surrounding them can be, as the 2008 financial crisis showed.
2. Virtual markets – currency-based markets in online economies like World of Warcraft and Second Life, sometimes convertible to physical world monetary currencies such as USD.
3. Prediction markets - gathering information about predicted event outcomes like elections.
4. Gift economy markets – people do work for free in open-source software projects or the wikipedia, possibly motivated by the reputational and other non-monetary currencies earned.
5. Ideas markets - informally inculcated as Twitter and formally represented in [ideagoras](#) such as Innocentive and InnovationXchange for intellectual property, and Kluster and Zooq for crowdsourcing projects.

1.4. Automatic markets

Related to the last concept, not only are markets proliferating, but so too are market principles. Market principles could be at work in the background to a greater extent for effective resource allocation. The notion of automatic markets is that there could be a ubiquitous unobtrusive layer of market principles, for example overlaying the pervasive information layer that is starting to allow affinity-directed capital, and facilitating automatic transactions without human intervention. Automatic markets could be deployed in the increasing number of phenomena that are in the analogy of routing packets on the Internet. Some of these examples include the routing of electrons on a smart power grid, people in driverless cars, neurons in a brain, clean air and water molecules, disease management responses, and health care delivery. The basic activity is directing fungible quantized resources to where they are needed and requested. Since supply and demand varies, market principles can be used to allocate these resources. Users could specify value preferences and permissions via online profiles and markets could meet automatically, transacting at the unitary level with the truly invisible digital hand.

1.5. Evolving role of banks and other traditional financial institutions

The fifth important concept in the economy 2.0 is the evolving role of financial institutions. The traditional market model was one central institution serving many individuals. This was large-scale, impersonal, and uncustomized. Now innovative new market models are starting to emerge with one-to-one and many-to-many relationships (Figure 3). One example is the advent of payment network alternatives like PayPal and cell phone networks. In the cell phone example, a prepaid card may be purchased in one city and the access code given to a family member in a rural area who can then use the minutes as credit or currency.

Figure 3. Traditional and innovative market models in economics and finance.

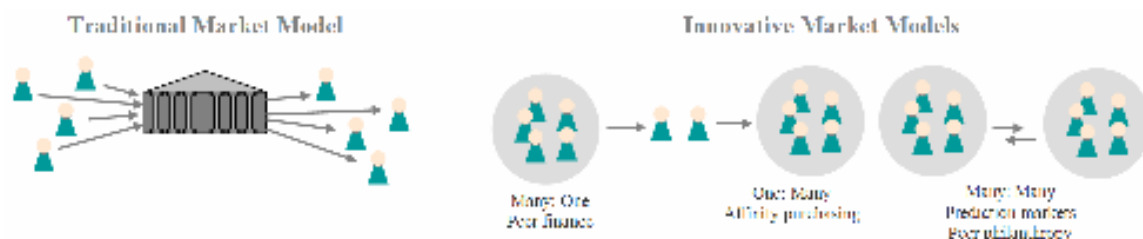


Image credit: Swan, Melanie. Markets 2.0: Social Finance. Affinity Capital. Page 1. April 2008.

What happens to the traditional banking system when the cell phone lady in the remote village has just become the new leader in banking? Many banks segment lower-income rural dwellers as ‘unbankable’ but

a smarter strategy might be to develop programs for these markets. Cell phone entrepreneurs could be enlisted as banking affiliates. These entrepreneurs will likely be continuing to expand the range of services, financial and otherwise, that they offer anyway. To adapt to the times in other ways, banks could start creating new distribution channels and new services like federated reputation management, identity verification and authentication, and multicurrency escrow services (i.e., a means of executing transactions that are both monetary and reputation-supported).

A second example of new market models is alternative financing structures such as peer-to-peer lending, crowd-sourcing, and the gift economy. Peer-to-peer lending (examples: Kiva, Prosper) is where many individuals provide small amounts of money that are aggregated into a loan for one individual. Crowd-sourcing is the same idea, many individuals all contributing small amounts of money, in this case, as a donation, where the crowd may or may not be the beneficiary of their financing, for example funding a band to give a concert or an independent film to have a showing in a particular city. The gift economy is when people provide work but do not obtain financial remuneration such as contributing to the wikipedia or an open source software programming project.

1.6. Abundance injection techniques

A sixth important concept in economy 2.0 is abundance injection techniques, using new tools to insert abundance into areas of former scarcity to make a difference. Some degree of scarcity is good as a market indicator of value but there is unnecessary scarcity that could be democratized. In academia, one successful technique has been expanding ways for scientists to earn reputations by having more places to publish content: more journals, open-access journals, open-notebook science, wikis, science blogs, and science.tv. In government, open data initiatives, government 2.0 programs and more transparency have been increasing abundance. Programs for citizens to participate by emailing GPS-tagged photographs of potholes is one example. Allowing software developers to make real-time public transit notification applications from open data is another example. The general principle of abundance injection techniques is to create more; more channels, more ways to do things, etc.

2. Longer-term future: a post-scarcity economy (PSE) for material goods by 2050

In the farther future, a compelling vision is that all of humanity will be living in a post-scarcity economy (PSE) for material goods by 2050. This would mean that substantially all material needs are met at low cost or for free. This could require a full automation of multiple sectors of the economy such that humans are freed from non-elective labor. The main dynamic that could make this happen is the same dynamic that has always driven human life, increased mastery over the physical world. There are several technologies under development that could facilitate the next steps in manipulating the world around us and the world within us, for example, genomics and molecular nanotechnology. A potential shift to an overall post-scarcity economy for material goods would likely occur gradually over time, sector by sector, where new waves of technology would fundamentally alter cost structures such that goods and services could ratchet to lower tiers, eventually becoming the equivalent of free.

2.1. Sector-by-sector progression to a post-scarcity economy for material goods

- **A post-scarcity economy already exists for many digital resources:** Moore's Law has already enabled several digital resources to be free such as VoIP internet telephony, email, photo-sharing, online storage, and other resources cited by WIRED editor Chris Anderson in his book "Free" (congruously available online for free).
- **Energy:** One of the next sectors could be energy. Alternative fuels and [synthetically-generated fuels](#) have the potential to fundamentally change the cost structure of energy. Electric vehicle deployment company Better Place estimates that at a battery cost of \$0.05 per mile, an electric car would become almost free. Unless they are part of the revolution, automotive-based economies could need a new business model overnight.
- **3-D printing:** 3-D printing could be a significant step in moving towards a post-scarcity economy for material goods. Imagine people upgrading their 2-D home and office printers to 3-D printers.

Today's 3-D printers such as the RepRap are limited in the type of materials, structures and designs that can be printed. However, subsequent generations could possibly allow any object to be printed on demand: clothing, auto parts, food, etc. 3-D printers are not limited to small items, the Contour Crafting machine prints smart infrastructure for housing. Eventually, it is possible that 3-D printing could significantly shift the market for all material goods manufacture and distribution, construction, housing, household items, and food.

- **Personalized health monitoring, preventive medicine and next-generation health care:** In health care, automated health monitoring devices and diagnostic robots could replace general doctors. A computer was the size of a room in 1970, now most of us have the same processing power on our mobile phone. In another 30 years, computers could be smaller than the eye can see and circulating in our bodies.
- **Services:** Initially the market for services such as haircuts would be unchanged, but over time, nearly all services could also be replaced by zero-cost advanced technology alternatives. Nanobots could provide daily hair-trimming and nano-foglets could create new hairstyles on demand. Robots are already starting to be available for lawn-mowing. Automated telemedicine could be used for medical diagnosis and treatment. Artificial intelligences may be consulted for legal and financial advice.

Eventually, public services such as police and fire protection could be provided by automated surveillance. The presence of wireless sensor networks and video cameras may shift the nature of crime and change the type of policing activity required. One can easily imagine that in the future, more police will probably be devoted to cyber crime than physical crime. Future building materials may be completely resistant to fire and self-protect or self-reconstruct following earthquakes or other damage. Lawyers, judges, and politicians could be superseded by technology the same way that the elevator operator and the stock broker were in the past.

- **Next-generation goods and services:** The new post-scarcity economy technologies will probably drive demand for new goods and services. The ability of anyone to generate any physical object suggests that there could be demand for structural and aesthetic design expertise. With work schedules dropping to part-time and less, expanded leisure time would increase the demand for entertainment, hobbies, learning and productive activities. Social competition, self-actualization, reputation enhancing and increasing other non-monetary currencies could be the reasons that people would engage in productive activity in the post-scarcity economy.

2.2. Business models for zero-cost goods and services

One idea is for zero or low cost goods and services to be utilities. Consumers would pay for metered or flat-rate usage in the familiar electricity, telephone, and internet model. Payment could be monetary or via another resource, such as behavior or goodwill, by signing the community covenants for example. To some extent, campgrounds, motorhome parks, and hotels have this type of arrangement now, providing water, electricity, waste removal and other services as long as visitors pay a daily fee and abide by the facility rules.

PSE Utilities could be publicly or privately owned and governments could have whatever degree of regulatory oversight is deemed necessary. Currently water, electricity, gas and heating oil are utilities in many countries. Internet access is or is becoming a utility. Electric charging stations may replace gasoline and become part of the electrical utility. Home-delivered CHON streams (carbon, hydrogen, oxygen and nitrogen) to supply 3D printers for on-demand food and goods production could be another utility.

2.3. Implications of a post-scarcity economy for banks, currency, and markets

Taxes based on income, consumption (sales tax), and property would make little sense in a world where people have a minimal need to work and can build and recycle objects and buildings at will, perhaps including land, so an alternative means of taxation such as a poll tax or residence fee could support whatever public services are provided.

Demand for loans, one of the biggest activities of banks, could disappear if people can construct their own houses and office buildings. However, the new industries may need debt and equity financing, for example, the feedstock companies delivering 3-D printers and CHON cartridges. The economy as a whole will be experiencing significant change and the banking sector, as an enabler of the economy, will need to support these changes, probably evolving both in structure and in services offered.

2.4. Specific plan for realizing a post-scarcity economy (PSE) for materials goods by 2050

The vision for a post-scarcity economy for material goods by 2050 could be implemented in the following ways. With regard to the overall strategic management, 'black swan' principles could be used. As discussed by Nassim Taleb in "The Black Swan," the goal would be to maximize exposure to upside discontinuity (i.e., exponential investment growth, the value of an educated and computer-literate populace), minimize exposure to downside discontinuity (i.e., bioterror, computer security issues). A discontinuity in this context would be anything that has the ability to displace a significant piece of the economy. In managing the future economy, a four-tier investment plan could be structured:

1. Build a strong foundation by providing free wifi and free mobile phones. This could enable millions of people to access any available information on the internet, interact with each other, and think about life-improving ideas with these technologies.
2. Develop a skilled workforce in critical areas like computer programming, medical tourism, or contract research manufacturing for pharmaceuticals. China is following this strategy in genomics and supercomputing, for example.
3. Develop global expertise in key industries like energy (which is already underway in both traditional and new markets in some countries such as Brazil). Other areas could be smart infrastructure like 3-D house printing, computer security, cloud computing, and cleantech.
4. Invest in or be an early adopter of core singularity technologies (e.g., transformative technologies) that could dramatically change what the world and economy is like: artificial intelligence, molecular nanotechnology, genomics, synthetic biology, nanomedicine, and life extension.