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Financial bubbles, crises and the role of government in unleashing golden ages

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Abstract:

This article holds that the recent financial collapse belongs to a family of major boom and bust episodes associated with the way in which successive technological revolutions are assimilated by the economy and society. This understanding would move policy thinking away from trying to regulate against further bubbles and, instead, towards actively shaping market conditions to enable the full flourishing of the newly installed technological potential into what can be a sustainable global golden age. Such an objective would also guide the necessary changes in taxation and the financial system in order to make real economy investment more profitable than casino finance. The article briefly describes the recurring historical pattern, discusses the nature of what can be seen as the recent double bubble collapse and examines the elements of a possible global golden age combining universal ICT, "green" growth and full global development.

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Introduction

Many analysts (in academic papers and books, in journalistic articles, in the news and in documentaries) have tried to identify the mechanisms that led to the 2007-08 financial crisis under the assumption that it was an unexpected "black swan" event.[1] The common idea is that there were extraordinarily risky and/or fraudulent behaviours that were induced or facilitated by regulation (seen as insufficient or excessive depending on the author). The implication is that, by bailing the banks out, punishing the most notorious culprits and changing the regulatory conditions, the world will avoid another bubble and will return to business as usual. This article will argue that, however useful those analytical efforts may be for improving regulation, they remain on the surface. It will hold that this was not an accidental collapse but that it belongs to a special family of major once-in-a half-century boom-and-bust episodes, which are endogenous to the market system (Perez 2002) and that they regularly happen mid-way along the diffusion of each technological revolution. If this is so, then its recognition changes the nature of the solution to be sought. The world would not be facing a problem in the financial system but rather in the real economy. It would not only be a question of creating conditions for healthy finance but rather of finding effective ways of reviving the economy, unleashing a new prosperity and making sure that the financial world plays a positive role in achieving that objective.

One of the reasons for the difficulty in seeing the underlying causes of the recent major bubble collapse is that standard economic theory is designed as a universal set of tools to function in the same manner at all times, assuming there is such a thing as "normal" circumstances. Yet, such an unchanging view of the workings of the market mechanism is based on a very narrow slice of social reality and on negating historical change. It is therefore unaware of the major upheavals that can be generated by specific technical changes and while it chooses to trust the wisdom of markets it tends to ignore the role of institutions, especially of governments.

To understand extraordinary times, however, one cannot do without interdisciplinarity. Only with a much wider framework, incorporating technology, institutions and their long-term historical interactions with the economy, is it possible to identify the fundamental regularities capable of explaining the causes and consequences of such major disruptions.[2] In the end, the adequacy of the solution to the financial crisis will depend on the adequacy of the explanation.

The recurring pattern and its causes

The causes of these major financial booms and busts are to be found in the way technologies evolve and are assimilated. Progress in market economies occurs by going through different successive Great Surges of Development driven by successive technological revolutions[3]. Human and institutional resistance to such radical changes results in capitalism experiencing pendular swings every two or three decades: from gilded ages to golden ages; from an initial installation period, through a collapse and recession, to a full deployment period.

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1 Two examples in this wide spectrum are Taylor's (2009) academic analysis, ascribing the boom and bust to loose monetary policy (excessively low interest rates) and Charles Ferguson's *Inside Job*, a full-length documentary concentrating on the bad practices of the financial world. From very different points of view, they both argue that the crisis was avoidable through policy action.

2 This much more encompassing sort of economic theory is what Evolutionary Economics proposes in order to enrich our understanding not only of such extraordinary times, but also of how the real economy works. See for example Dosi et al. 1988, Freeman and Louçã 2001 and Hanusch and Pyka 2003.

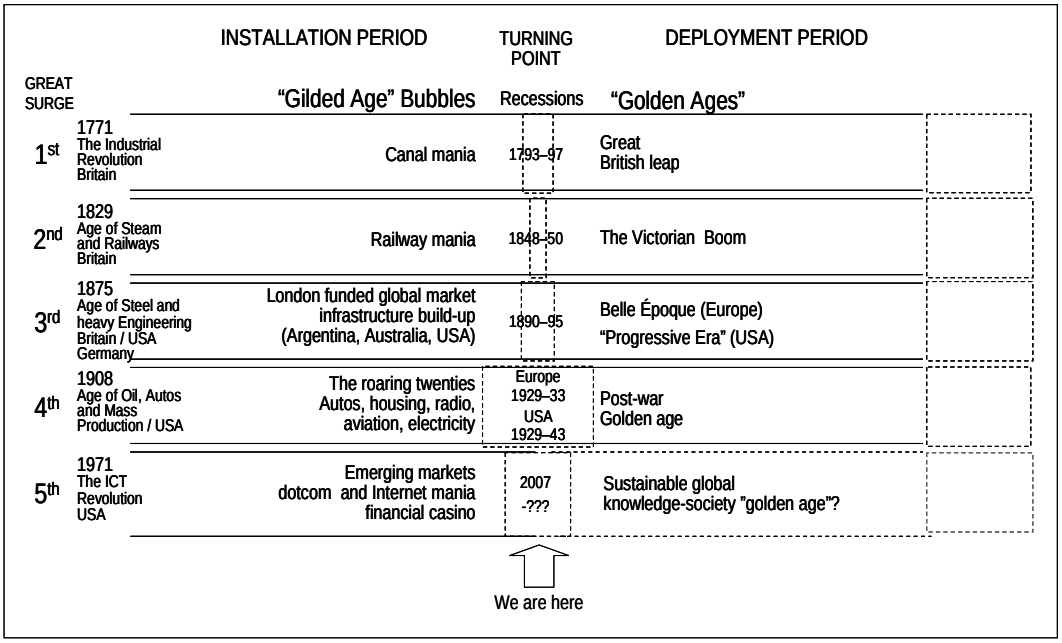
3 For technological revolutions as drivers of growth in capitalism see Schumpeter 1939. For a proposed explanation of such discontinuities in technical change see Perez 2002, pp. 27-32

After a gestation phase, often driven by major government investments in the underlying new technologies (Mazzucato, 2011), an Installation Period begins. It is the turbulent process of creative destruction that replaces the old technologies with the new ones. It is a time of financial capitalism, characterised by unfettered free markets, intense competition and income polarization. The frenzied mood among investors and financial agents makes it possible to propagate the technological revolution and spread its new common-sense paradigm, but also to shift the excess funds that flood the market into a veritable casino, decoupled from the real economy. This culminates in a major financial bubble, the collapse of which marks the swing of the pendulum. What had been working for growth, profits and innovation until then is no longer effective. A recession in the real economy ensues.

The recessive interval lasts for a longer or shorter period depending on the capacity of governments — consciously or intuitively— to establish an institutional framework capable of unleashing the installed potential. Deployment is then a period of production capitalism, aided by government, in order to fully deploy the new innovation and growth opportunities across the economy and to spread the benefits across society. When that potential begins to reach maturity and to face limits to productivity increases, to markets and to innovation opportunities, the economy slows down. Conditions are then ready for the emergence of the next revolution and for the pendulum to swing back.

Before the current information revolution, the market system had experienced four similar technological upheavals, each diffusing in two periods with a panic and recession in between (see figure 1).

Figure 1
The historical record: bubble prosperities, recessions and golden ages



Source: Perez, Carlota (2011) Fig. 1 p. 107.

The first great surge of growth was driven by the so called "Industrial Revolution" in England from the 1770s. After canal mania and the canal panic of 1793 there was the great British leap in the first decades of the 19th Century. That was followed, from the 1830s by the Age of Steam and Railways, which, after the mania, brought the railway panic of 1848 and, soon after, the Victorian Boom. The advent of cheap Bessemer steel, from the 1860s and 70s, opened the way for a surge of innovation in the Age of Heavy Engineering —civil, chemical, electrical, naval— and for the first globalization. The panics that happened in Australia, Argentina and

other Southern hemisphere newcomers hit the promoters in the financial centres of London. The revival brought the Belle Époque in Europe and the progressive Era in the US. In 1908 in the United States, a decade before the third revolution had reached maturity in Europe[4], Ford's model-T inaugurated the Age of the Automobile and Mass Production. The great crash of 1929 ended the roaring twenties frenzy and led to the longest post-collapse recessive period to date: the 1930s. Resistance to the New Deal may be seen as one of the root causes of the prolonged stagnation. It took the experience of government-industry collaboration during World War II, to enable acceptance of the full Welfare State and the Keynesian policies and institutions that facilitated the greatest economic boom in history.

In the early 1970s, when the potential of the mass production technologies approached exhaustion and markets became saturated, conditions were set for finance to search for other opportunities in both the global space and with the new microelectronics technologies. Once more, the installation of a technological revolution required the State to be moved aside in order to let the markets do the choosing driven by high-risk finance. Now, after the double collapses of the NASDAQ in 2001 and the 2007-08 bust, the pendulum is ready to swing back. Enabling policies are again necessary to unleash the deployment of the innovation potential created by the diffusion of the information and communications revolution (ICT). Power needs to be returned to production capital and a more patient financial world must be induced and encouraged to support it.

To understand why the assimilation process takes this shape and requires at first unfettered finance and then market-shaping by government, we need to ask why these constellations of radical new technologies warrant the term "revolution". Each of these Surges of Development encompasses and transforms the whole economy and is not limited to the new industries. Each can be called a revolution because it has a double character. On the one hand it is a set new products, new dynamic technologies and infrastructures with increasing productivity and decreasing costs that are therefore capable of explosive growth and structural change. Those are what most people will see as a technological revolution. On the other hand, each of them provides a new techno-economic and organizational paradigm that, together with the all-pervasiveness of the new technologies and the widening of markets by the new infrastructure, offers a quantum leap in productivity for all other activities and sectors. In practice, therefore, it will enable a massive process of rejuvenation. But for the majority of existing companies the acceptance of such transformations is quite difficult. It is a complete change of "common sense" for competitiveness and a radical shift in best engineering and managerial practice. The natural resistance of all those that had been successful with the previous paradigm will require Schumpeterian "creative destruction" not only in products and processes but also in the behaviours and institutions. It is an intense process of learning the new and unlearning the old, by producers and consumers.

The inertial forces resisting such profound transformations are at the root of the pendular swings. It is because the market system operates with two functionally distinct agents – financial and production capital-- looking for profit in dissimilar ways that technological revolutions are assimilated in a sequence involving two different periods.

Production capital is the agent for accumulating wealth-making capacity. It is represented by the entrepreneurs and managers engaged in the production and distribution of goods and non-financial services. It is specific, fixed and knowledge-bound. By contrast, financial capital is

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[4] Such overlaps as well as the dating of the revolutions differ from that of Schumpeter (1939) because the notion of "great surges of development" (Perez 2002) focuses on the irruption and gradual assimilation of each technological revolution rather than on the long upswings and downswings in GDP that Schumpeter defined as "long waves".

infinitely flexible and mobile and is mainly moved by short-term criteria. It is the agent for reallocating and redistributing wealth, represented by investors, their banks and all financial intermediaries. It is in order to force the paradigm shift that financial capital takes over from production capital in controlling the direction of investment.[5]

The process that leads to the major technology bubble

When the surge of development and growth driven by a particular technological revolution approaches maturity, incumbent production capital becomes conservative: The most powerful companies and their managers are tied to their previous investment in fixed capital; to the specific knowledge of their markets, clients and suppliers as well as to the technologies and strategies with which they had been successful until then. So even if innovation possibilities are drying up and market growth and productivity are slowing down, production capital is complacent and unwilling to face radical change. Financial capital then becomes restless and impatient for opportunities. In its search, it ends up in a tacit alliance with the new entrepreneurs to engage in a battle against the old paradigm. In doing so, the financial world will make a massive displacement of funds towards the new industries, while using all its power to remove the obstacles posed to its freedom of movement by government and by the established institutional framework. This behaviour establishes a huge market experiment to define the contours of the new –and renewed-- industries and of the new paradigm through survival competition. It sees the astonishing growth of the new products and companies as well as the rejuvenation of the mature industries with the new paradigm (breaking the resistance through competitive pressures in unfettered free markets). The process eventually results in the emergence of new powerful companies and to the new sectors replacing the old giants as engines of growth in the economy.

The excitement of the extraordinary gains from innovation in the real economy leads to excess funds flowing into the stock market hoping to participate in the easy profits game. This produces the rapid inflation of the desired new stocks and initiates a major episode of Minskian instability (Minsky 1982). The extraordinary bounty induces the financial world to engage in all sorts of innovations to mobilise it: some good, some doubtful, some even fraudulent and illegal. Thus finance soon completely decouples from the new economy and adopts a casino-like behaviour. As Galbraith (1990:1993) remarks, this is all done with great confidence in what is seen by the financiers as their new power to “create wealth” by the strength of their genius. The result is a major bubble and its inevitable collapse.

Nevertheless, the consequences of these particular bubbles that occur at mid-surge driven by a radically new set of technologies are not all negative. By the time the collapse happens, the new industries and infrastructures will have been fully installed in the territory and the new paradigm will have become the new common sense for innovation and competitiveness. By then, the new and renewed production capital will be better able to lead the economy and to decide on investment. Installation has been achieved; deployment can now be enabled; finance capital must cede the leading role to production capital.

In essence, the sequence installation-bubble crash-deployment describes the process of assimilation of a technological revolution and the full reaping of its fruits. Installation is a

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[5] In the current crisis, an additional problem is that production capital has been losing its traditional identity by adopting the short-termism and some of the other practices of financial capital, so that in this case part of the solution would be to re-establish a clear division of functions between the two (Mazzucato and Shipman, 2012). The over-emphasis on short term stock prices was such that production companies often sacrificed their human capital as well as their R&D spending in order to do stock repurchases to boost share prices (Lazonick and Tulum, 2011)

period of creative destruction, wielding the power of the new, that can be seen as "supply-push", while Deployment is a time of expansion, growth and innovation across all industries – aided by the new technologies and their paradigm—and driven by "demand-pull". In the first, innovation is concentrated in the new industries and finance; in the second it is the whole world of production and the institutional sphere where the innovative forces are at play. The first is typified by income polarisation; the second tends to reverse that process and lead to a better distribution of well being. Finance must make the difficult shift from the self-serving casino to funding the expansion of the real economy and sharing in its profits; from putting pressure on production companies to yield short-term gains, to serving their needs and longer term projects; in other words: from impatient to patient capital.

Obviously, that change of attitude and transfer of power is never easy. It requires government intervention to radically modify market conditions, incentives and regulation to reorient financial capital towards supporting the real economy, by making it more profitable to do so than to continue in the casino mode. This entails extraordinary political leadership to confront the *entente* between financiers and politicians that is usually woven during the fantastically profitable times of the bubble. It also involves confronting the market fundamentalism that accompanies Installation and makes unfettered free markets appears as the reason not only for the bubble prosperity but for prosperity in capitalism at any time.

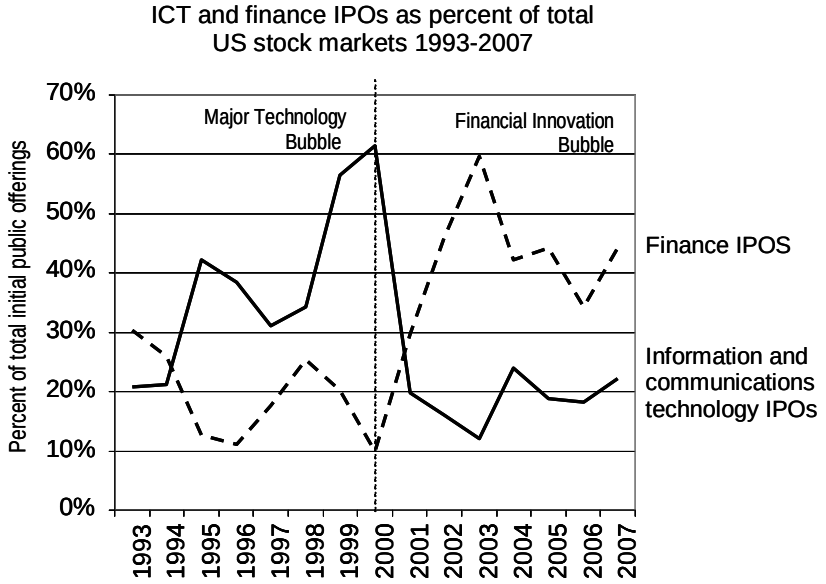
In fact, both pendular shifts are times of political and ideological confrontations. At the end of Deployment, stagnation has to be deep and long enough to bring back the dynamics of the market and eliminate the institutional obstacles to the diffusion of the new paradigm. At the end of Installation, the financial collapse and its consequences have to be big enough to weaken the power of finance and bring back the regulatory power of the State, the long-term interests of production capital and the welfare interests of the public.

The double bubble at the turn of the Century

A unique feature of our time is that the major mid-surge panic happened in two episodes: First, there was the collapse of the NASDAQ at the end of the Internet mania in the 1990s. That bubble was driven by technological innovation in ICT. Second, there was the 2007-08 meltdown. In this case it was the massive wave of financial innovation with ICT that drove the easy credit bubbles with high-risk shadow banking and the sub-prime madness in the housing market. Understanding the continuity of the double bubble is crucial for identifying the nature, the consequences and the solution of the current crisis (Perez 2009).

The bubbles of the 1990s and the 2000s are at the same time linked and different. They both concentrated innovation and asset inflation in technology and finance, but they did so in opposite proportions. Together, technological and financial innovation represented more than half of initial public offering (IPO) activity in US stock markets (See figure 2), reaching as much as 70% at the peak of the major technology bubble. Yet it is clear that, in the nineties, the technological offerings prevailed by far, while it was finance that was the more active in the noughties.

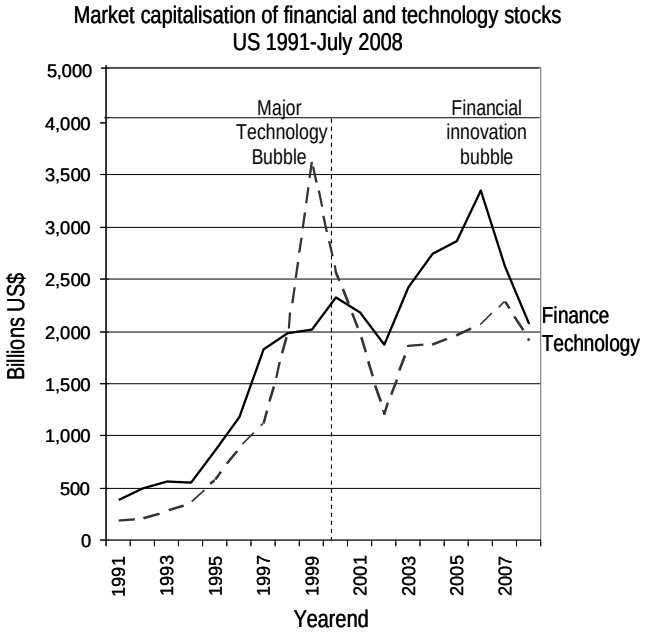
Figure 2
The 1990s and 2000s: a switch in the composition of the new offerings



Source: Thomson

And the IPO activity of these two sectors was followed by rapid market asset inflation. Indeed, in terms of market capitalization, these two sectors had a very pronounced bubble-like behaviour. As a consequence, at the peaks of the two bubbles they jointly represented over five trillion dollars in market value (See figure 3), which was about 35% of the total stock market. It should be noted, though, that the two sectors had different rhythms of inflation, the ICT stocks were valued at more than $3.5 trillion with the financial ones being just over half of that. In the financial innovation bubble, the proportions were reversed.

Figure 3
The 1990s and the 2000s: a switch in differential asset inflation



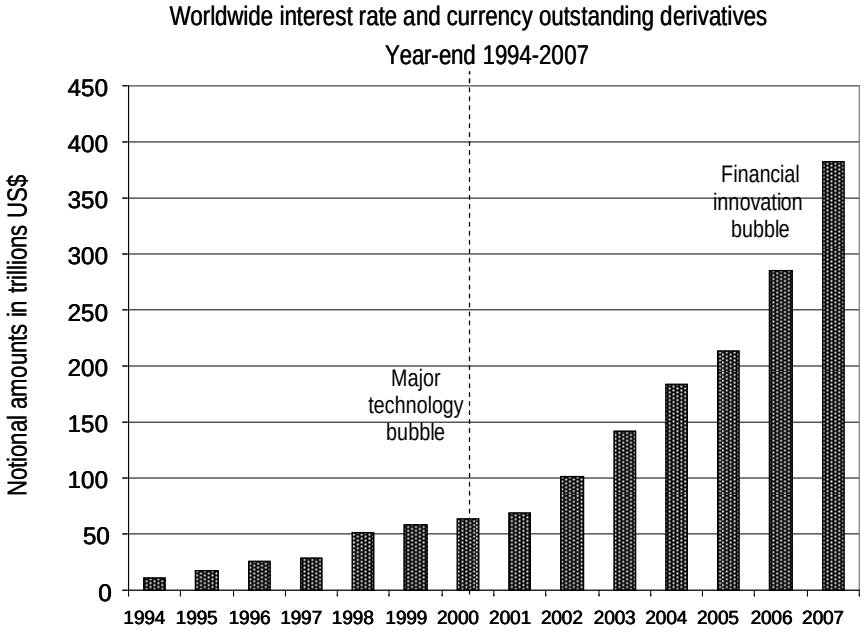
Source: Thomson

It must be emphasised that ICT and finance have been intensely interdependent throughout these bubble times. The setting up of the global telecommunications infrastructure for internet would not have been possible from the 1990s without capital gains in the stock market to foster

major fibre optics projects for full coverage without dividends or profits. In turn, the housing bubbles could not have been so intense without securitization (which depended on information technology) and without the possibility of trading them globally (which depended on Internet). The same can be said about derivatives, credit default swaps and all the other high-risk synthetic instruments developed in this period with the help of sophisticated computer software.[6]

So, in spite of their differences, the two bubbles are intertwined and were fundamentally continuous. In fact, several of the casino practices of the 2000s were an intensified continuation of those of the 1990s. The derivatives market, for instance, increased at the same rhythm in both bubbles and by 2007 had reached a notional amount of about 380 trillion dollars (see figure 4). This astonishing figure represents seven times the GDP of the whole world. But already by 2000 derivatives were built upon values equivalent to global GDP.

Figure 4
The 1990s and the 2000s: continuity in the instruments of casino-type speculation



Source: International Swaps and Derivatives Association, Inc

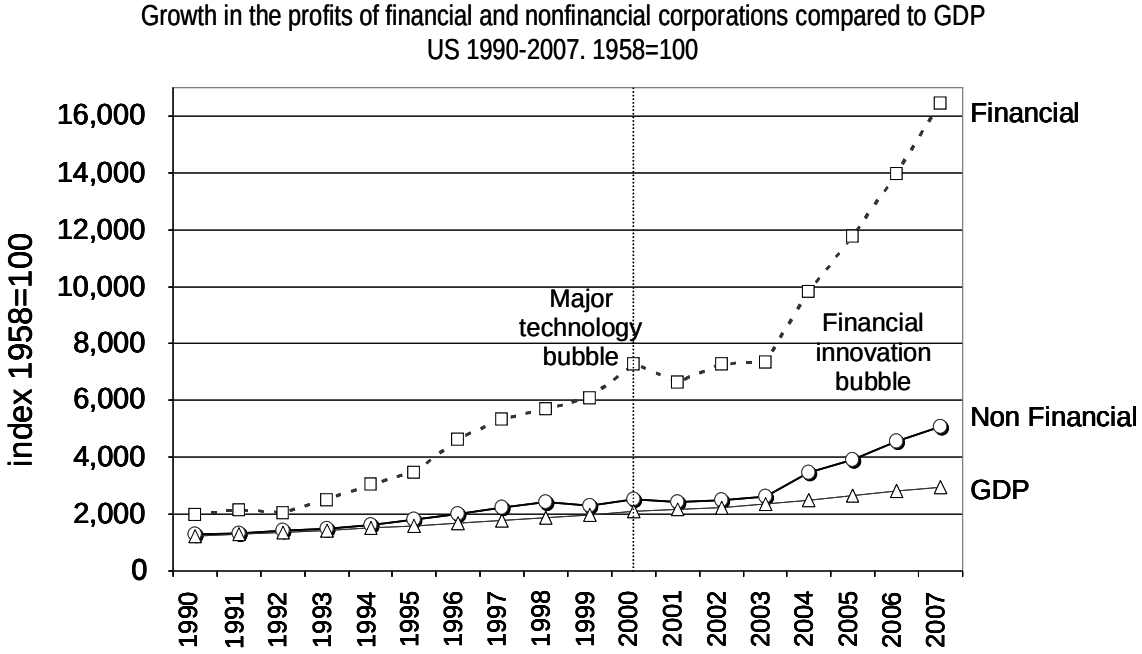
Another aspect of the continuity between the two bubbles is the intense bias towards financial profits in the corporate sector. Whereas still in the early 1990s the financial and non-financial corporate sectors saw their profits increase apace with each other and with GDP, from the mid-1990s on, profits in both sectors outpaced the growth of the economy, but with a much more pronounced increase in those of financial companies (see figure 5). This phenomenon that was already significant at the peak of the NASDAQ bubble reached extreme proportions in the 2000s.

It is interesting to note that the profits of non-financial corporations --that could be taken to represent the real economy-- grew pretty much at the same rhythm as GDP throughout the nineties and until 2003. From then on they seem to decouple from the economy and grow as fast as the financial sector profits (which had decoupled from the rate of growth of GDP in the early bubble). The result is that they both more than doubled their benefits in the four years between 2003 and 2007. However, this may not be a reflection of an outstanding performance

[6] As Kregel and Burlamaqui (2005) noted, "financial innovations that facilitate the financing of innovation in business tend to decrease transparency concerning the risks being borne in the system, raising the possibility of ever-increasing financial risks and ever-decreasing understanding of the extent of these risks."

of the production companies in sales and productivity. Unfortunately what it indicates is probably the "financialization" of the real economy. According to Krippner (2005), it was the financial arm of the non-financial corporations that was the source of such extraordinary profits. Thus, what we have witnessed is a complete decoupling of profit-making from real production of goods and services. It is the setting up of a massive casino operation encompassing not only the stock market and the banks –shadow or otherwise—but also the agents of the "real" economy (Lazonick 2010).

Figure 5
The intensified bias towards financial profits



Source: Bureau of Economic Analysis

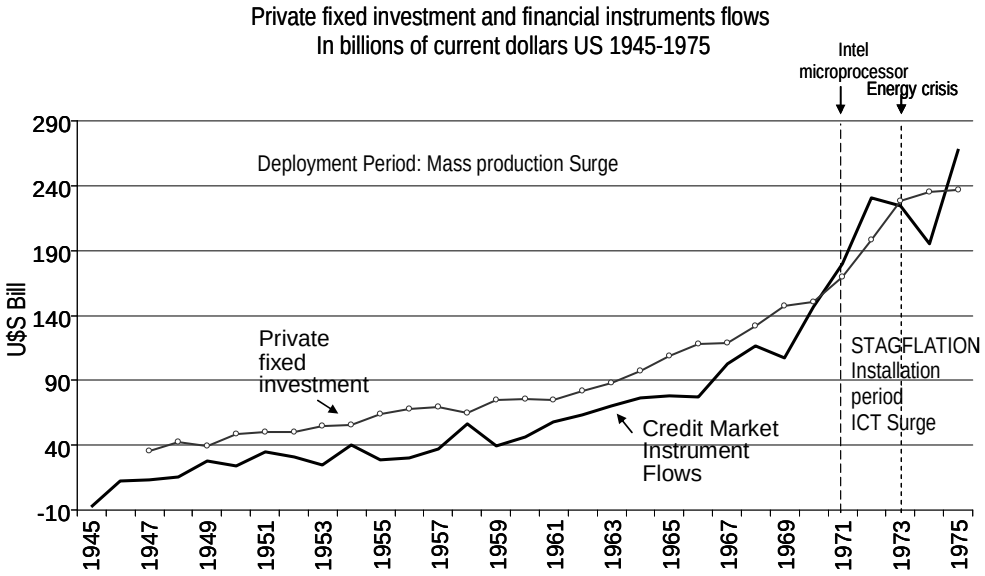
From Installation to Deployment

The world is now at the turning point. The crash of 2007-08 has plunged the real economy into a recessive mode and has revealed the decoupling of finance from real wealth creation as well as the polarisation of income and the illusory growth that was hidden behind the frenzied bubble years. The time has come to move from the gilded prosperity at the end of the installation period to the truly golden prosperity of the deployment period. This will require a very substantial shift in the market context to orient the behaviour of the investment agents.

A world in deployment is very different from a world in installation. The experience of the previous deployment in contrast with the recent installation can serve to illustrate the difference between the two periods. In particular, one can observe the change in the relative behaviour of direct investment and financial flows as a proxy for the leadership in investment,.

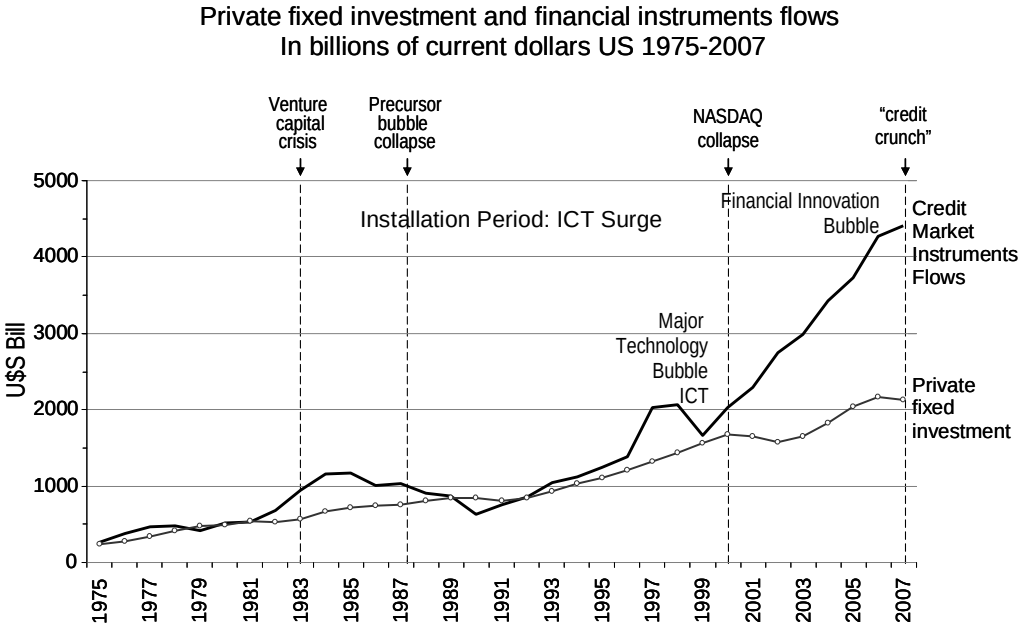
In the deployment period of the previous surge: 1947-1974 fixed investment consistently outpaced financial credit flows (see figure 6); whereas during the Installation of the current fifth surge 1970s to 2000s, finance increasingly decoupled from investment in the real economy (see figure 7).

Figure 6
In the deployment period of the previous surge: 1947-1974
Fixed investment outpaced financial credit flows



Source: Data from BEA and Fed, period indications by the author

Figure 7
During the Installation of the current fifth surge 1970s to 2008
finance increasingly decoupled from investment in the real economy



Source: Data from BEA and Fed, period indications by the author

Yet these major bubbles have historically played a crucial role in the market economy: they enable the installation of the bases for the future. In their wake, there is generally in place enough of the new infrastructure for a decade or more; new production and consumption models have been established; the new paradigm is accepted by all as common sense and the

economy counts with new entrepreneurial giants as leaders of the new industries, which can act as the new engines of growth for the next period. Essentially, there is a vast new potential for using the ICT paradigm to innovate across all industries and activities and this would have been difficult to achieve without the capital gains and the financial excitement of bubble times.

In other words, these major boom and bust periods prepare the economy for full expansion with the new technologies and their new common sense paradigm. However, as discussed above, the unleashing of a healthy deployment period requires shifting the control of investment from financial to production capital; from short-term to longer-term decisions; from quick capital gains to patient capital. Achieving this power transfer demands an active come-back of the State to radically reshape market conditions and profit opportunities away from casino activities and in favour of the real economy. That implies a clear understanding of the problem at hand and bold institutional creativity.

At the turning point, after each of these major crashes, governments face three main tasks: The first is to rapidly perform “intensive therapy” for the financial world. The second is to thoroughly examine and redesign financial regulation and architectures. The last --and very far from least—is the induction of a structural shift in the real economy that will reshape market conditions to fully exploit the installed innovation and growth potential for the benefit of all.

The last time around —in the 1930s— many mistakes were made that led to the depression. But in the end, the revival was engineered by a bold set of policies: bank regulation (including the Glass-Steagall Act in the US, the separation of savings and investment banks almost everywhere, exchange control measures in many countries and so on) as well as a radical reshaping of economic and market conditions from 1943 with the Bretton Woods agreements and the international institutions. But most importantly, the combination of the measures of the Welfare State and the Keynesian demand management mechanisms, guaranteed that there was growing demand for the goods typical of mass production and consumption. Growth and innovation followed suburbanisation and government spending (in education, health, defence and other areas). It took a long time after the major crash and, at first, the New Deal proposals were confronted with ferocious resistance. Yet, after the experience of government-induced growth during the war, business was ready for letting the State become involved in the economy. Thus North America and Western Europe experienced the greatest boom in history, with two uninterrupted decades of growth and of increasing wellbeing for their populations.

This time, after the 2007-08 crash, saving the life of the financial world was so overdone that it transferred the crisis to governments, changing the nature of the problem without providing a sustainable solution. Worse still, the power and the arrogance of finance have been left intact by not making the banks suffer enough of the losses warranted by their irresponsible risk-taking and even wrongdoing. This power makes them ready and able to block the necessary measures involved in the other two tasks.

In the current globalized world, the task of redesigning regulation and financial architecture cannot be a national matter. This time global finance needs both better national regulation and a global regulatory “floor” that will avoid competition to the bottom. The great difficulties experienced by the regulatory attempts in every country are witness to the expectation of the over-rescued financial world to maintain its unreasonable claims to high profits in the midst of stagnant economies as well as to block any attempt at supranational regulation.

As to the needed structural shift in the real economy, the basic problem is that it is not even on the table. There is a general belief that since the crisis was created by finance, it is enough to save the financial world to go back to “business as usual”. In addition, the way in which government deficits are being confronted is with a view to rescuing the banks at any cost. However, “healthy” banks in a sick and languid economy inevitably become --or remain--

casino banks. The real solution to the problems of growth, employment and finance at the present turning point is to revive the production economy by radically reshaping market conditions in order to encourage innovation, investment and employment creation with healthy profit prospects. If this were achieved, the financial world would reap its profits, not from manipulations and gambling, but as a share of the real wealth created by the production world with the support of finance. The task of reshaping the market through a modern sort of industrial policy is rarely being considered as the role of governments at this time, but recovery will be very difficult without it.

A global sustainable golden age ahead?

The post-war Golden Age was unleashed by leaving behind the free market policies of the roaring 1920s and the recessions of the 1930s. Finance was regulated favouring real investment and income was redistributed to improve demand profiles for suburban living and mass consumption. It was the achievement of Western democracies to set up a positive-sum game between business and the great majorities (as workers and consumers).

Is a new positive-sum game possible today? Our answer is yes. But it will have to be both global and national; it will need to be sustainable in environmental and social terms and it will involve making the best use of the all-pervasive innovation potential provided by the information and communications technologies (ICT) and their techno-economic paradigm. In a few words, the formula would be combining ICT with "green" growth and full global development.

Full internet access at low cost for all is equivalent to electrification and suburbanisation in terms of facilitating innovation and investment as well as widening demand. This time, access to ICT serves also to educate the future labour force and to shape the patterns of consumption towards intangibles and creativity.

"Green" growth (not zero growth) entails revamping the transport, energy, products and production systems to make them sustainable and is equivalent to post-war reconstruction and suburbanisation in terms of job creation. It can provide employment for those who have lost manufacturing jobs not only in the new green products but also in maintenance and recycling while it can multiply the productivity of scarce natural resources.

Full global development involves incorporating successive new millions into sustainable consumption patterns and is equivalent to the Welfare State and government procurement in terms of demand creation. If products are to be made durable, upgradeable, reusable, maintainable and recyclable, producers will need constant waves of new consumers. Those waves would be provided by the emerging and the lagging countries as they develop. Moreover, it is not feasible to incorporate such masses of new consumers without "green" patterns of consumption (we only have one planet).

The technological revolution and the global boom have provided the wealth creating potential for a sustainable Global Golden Age. The challenge is to collectively build positive sum games between business and society, between the advanced and the advancing countries and between humanity and the planet. But the goals of policy need to be clear for all the agents

The goal of new regulation is not to constrain finance but to reorient it: It should become more profitable to fund expansion and innovation in the real economy than to "play" in the casino of synthetic instruments and derivatives. The goal of stimulus is not just to put money into the economy, but to shape the demand opportunity space making it profitable to innovate in agreed convergent directions. We need a modern industrial policy in a global context

Market fundamentalism (and the sort of narrow economics theory that supports it) is one of the main obstacles for unleashing a healthy deployment. But invoking Keynes is not enough we also need Schumpeter, together with a disposition to make bold institutional innovation on local, national and global spaces.

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