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Approach. A Non-technical Survey with  
Applications to the Crisis and Future  
Scenarios for the New Economy**

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# The Endogenous Market Structures Approach. A Non-technical Survey with Applications to the Crisis and Future Scenarios for the New Economy

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## Abstract

The EMSs approach to macroeconomics introduces strategic interactions and endogenous entry decisions in the analysis of aggregate phenomena as business cycle, international trade and growth. This survey provides a non-technical discussion of the applications of the EMSs approach to positive and normative issues, and relates these with recent debates on the current recession, future scenarios for globalization, policymaking and the New Economy.

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The endogenous market structures (EMSs) approach to macroeconomics introduces strategic interactions and endogenous entry decisions in the analysis of aggregate phenomena. Its recent development took place in the theory of industrial organization (see Sutton, 1991, 1998, Etro 2006, 2008b), in the theory of business cycles (see Cooper, 1999; Bilbiie *et al.*, 2007, 2008a,b; Etro and Colciago, 2007), in the theory of international trade and finance and of trade policy (Peretto, 2003, Ghironi and Melitz, 2005; Sutton, 2007; Etro, 2010) and in the theory of Schumpeterian growth (Peretto, 1996, 1999; Etro, 2004, 2008a).<sup>1</sup>

The EMSs approach departs from the perfectly competitive environment, in the sense that firms do not take prices as given, but they do choose their entry and production strategies and they interact strategically. In general equilibrium, this leads to novel implications for the mechanism of propagation of supply and demand shocks, for the theory of the gains from trade and for the sources of the growth process. In this survey, we review the main results of the EMSs approach in a non-technical manner. For simplicity, we summarize them in ten principles, half of which have a positive nature, in the sense that they describe crucial aspects of the way the economy works, and half of which have a normative nature, in the sense that they provide policy implications. The discussion is going to be largely informal and try to link theoretical results to the current economic debates on macroeconomic issues and on relevant market structures, in particular of the New Economy.

The development of the EMSs approach relies on a general critique of the neoclassical approach: the main neoclassical assumption, perfect competition, is not only a bad approximation of realistic market conditions, but also a misleading one if we want to understand the aggregate behavior of the economy and derive correct policy implications. The first point is almost self-evident: large size of the markets and entry do not lead to market structures in anyway close to the perfectly competitive ideal. If we think about any major market of the global economy (automobiles, telecommunications, pharmaceuticals, computers, semiconductors, software, online advertising) we find high levels of concentration and sometimes only a few big players. Strategic interactions, variable mark ups and entry are crucial aspects of real world markets and they play no role in the neoclassical paradigm (or in the extensions to monopolistic behavior with constant mark ups and exogenous entry).

In real world markets, profitability is what attracts entry and investment. In turn, entry strengthens competition and reduces the mark ups through strategic interactions. The EMSs approach suggests that these factors lead to new mechanisms of propagation of the shocks over the business cycle, to additional consequences on the long run performance of the economy, to novel sources of gains (and losses) from trade associated with the globalization process, to a different role of market leaders in driving technological progress and growth, and

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<sup>1</sup>For wide surveys see Etro (2007,a) on partial equilibrium applications and Etro (2009,a) on general equilibrium applications.

to new forms of dynamic inefficiencies in the process of business creation.

Our hope is that the introduction of EMSs in the macroeconomic analysis can also shed new light on a number of policy issues. While our approach confirms the optimality of a countercyclical fiscal policy and a price stabilizing monetary policy, it provides alternative motivations for these policies. The former should optimize the process of business creation over the business cycle and requires a supply-based fiscal policy with countercyclical tax rates on sales and labor income. The latter should avoid the negative effects of nominal frictions on the process of business creation, and especially on the process of innovation driving growth. Finally, the EMSs approach provides new predictions for the optimal trade policy, for the role of exchange rate policy and for R&D policy, predictions that are often in radical contradiction with the traditional results. For instance, our approach shows the general optimality of unilateral export promoting policies as export subsidies, against traditional results which are typically in favor of export taxes.

In the rest of the paper we discuss these ten principles one by one, and associate them with digressions on related applied issues, with a special attention to the endogenous structure of global markets that are relevant for the macroeconomic analysis. We recommend the reader to focus directly on the digressions of his or her interest.

## 1 Short-run EMSs and the Competition Effect

The novelty of the EMSs approach to macroeconomics relies on its analysis of the structure of markets that populate modern economies. Perfect competition, which is the standard way to model competition in the neoclassical theory, requires that firms can be created at no cost, act as price-takers, in the sense that they do not perceive themselves as affecting market prices with their choices, and in equilibrium they sell goods at the marginal cost of production, obtaining always zero profits. In such a framework, the market structure is indeterminate, in the sense that we have nothing to say about how many firms should be in the market and how much each one should produce in equilibrium. Even the concept of (stock market) value of a firm as the discounted sum of its future profits has no sense, since expected profits are zero.

Contrary to the neoclassical approach, the EMSs approach departs from the perfectly competitive paradigm, and introduces more realistic forms of competition between firms choosing their prices or their production levels and interacting in a strategic way. Moreover, this approach takes in consideration that firms decide rationally whether to enter or not in a market according to the profitability conditions: in particular the technological conditions are generalized to include positive fixed costs of entry, so that only a few firms enter in each market and only if they foresee enough gross profits to cover the fixed costs. The combination of these ingredients leads to markets where the strategies of the

firms, their number and even their (stock market) value can be endogenously characterized in the short and long run as functions of the structural parameters of the economy.

Our approach can also depart from the neoclassical assumption that investment builds physical capital which is then rented by the firms and used as a factor of production together with labor. That was a good starting point to describe production in the industrialization phase, characterized by the dominance of the secondary sector based on the accumulation of physical capital (manufacturing) and by the social conflict between capital and labor. However, that assumption is not such a good one to describe production in the modern age, dominated by the tertiary sector (services) and by the New Economy. In this age creativity, know-how and innovations are the main inputs needed to bring new products to the market, and a well developed financial sector and protected IPRs allow smart ideas to become business activities and start up companies to reach easily a high (stock market) value without having built any stock of physical capital (yet). This is even more evident when we think of growth, a process driven mostly by capital accumulation during the industrialization phase, but largely driven by business creation and innovations in high-tech sectors in the current industrialized world.

On the basis of these considerations, the EMSs approach takes a different route from the neoclassical one in assuming that investment mainly creates new firms or new products which complement or replace the old ones. The mechanism of business creation works through a simple channel: the expectation of future profits induces entrepreneurs to invest in the creation of new products. However, this mechanism has already *in nuce* a counterbalancing effect. Entry of new firms increases the number of competitors, and these become more aggressive. They may actually compete in different ways, for instance by choosing their prices (Bertrand competition) or the quantity of production (Cournot competition) or in more complex ways in the presence of leaders, asymmetries, heterogeneity between firms and so on. In all these cases, entry strengthens competition, which reduces the mark ups and the profits that other firms can expect from entering in the same market. Ultimately, in equilibrium, each firm must choose the profit maximizing strategy given those of the other firms, and the number of firms must be such that there are no other firms with incentives to enter.

The characterization of the aggregate equilibrium with EMSs emphasizes a new mechanism of propagation of the shocks in the short run that can be relevant to explain the business cycle beyond the standard mechanisms emphasized by the neoclassical approach of Kydland and Prescott (1982). Consider a positive and temporary shock to the economy. The positive impact on consumption leads to an increase in profits for the active firms, which attracts subsequent entry of new firms. Entry is only gradual and temporary, but it strengthens competition between all the firms, which leads to a gradual and temporary reduction of the mark ups and, through a general equilibrium mechanism, to an

increase of the real wages. The temporary reduction of the mark ups induces agents to substitute future consumption with current consumption, i.e. to temporarily increase consumption. At the same time, the temporary increase in the real wage induces agents to increase labor supply. The consumption boom and the work boom, in turn, have a feedback effect on profits, entry, competition and mark ups, which magnifies the impact of the shock. Of course, this mechanism could not take place in situations where mark ups were zero (as in the perfectly competitive framework) or in situations where mark ups were positive but constant and entry was independent from the profitability conditions (as in the New Keynesian literature). We can summarize this novel mechanism with the following principle:

**PRINCIPLE 1. IN THE SHORT RUN, THE EMSs LINK DEMAND & SUPPLY CONDITIONS WITH ENDOGENOUS ENTRY AND MARK UPS. A POSITIVE SHOCK TO THE ECONOMY ATTRACTS ENTRY, STRENGTHENS COMPETITION REDUCES MARK UPS AND INCREASES REAL WAGES, WHICH BOOSTS CONSUMPTION AND LABOR SUPPLY AND PROPAGATES THE SHOCK.**

An important consequence of this principle, is that the economy is characterized by procyclical entry of firms and countercyclical mark ups, two patterns that are well documented in the data and that remain largely unexplained in the neoclassical theory or in its extensions to monopolistic behavior. The simulation of the simplest possible model calibrated on the U.S. economy has shown that the EMSs approach allows us to mimic the variability of the main aggregate variables as output, consumption, investment, labor supply and profits at least as well as a more complex neoclassical model in the Real Business Cycle tradition, and to do even better at replicating second moments of the U.S. data.

## **1.1 The boom of the 90s**

If the mechanism of propagation of the shocks suggested here represents an important component of the business cycle, it may allow us to reinterpret the reaction of economies to shocks, and in particular to clarify what is going on in the current recession. With this purpose in mind, let us first look at what happened during the 90s, when a positive and permanent technology shock hit the global economy: it was the beginning of the so-called New Economy, founded on new general purpose technologies associated with PCs and the Internet. When the impact of the diffusion of these technologies on the global productivity became evident, growth opportunities opened up and profit expectations gradually improved in many sectors, and not just in the sectors of the New Economy. In particular, most service sectors, which represent the large majority of business in the developed world, benefited from the cost-reducing impact of new software and hardware, and a heavy process of business creation and innovation took place in these sectors.

The expectations on profitability and growth, mirrored by the stock market have been positive for such a long period (during the years of the Clinton Administration) that they drove one of the longest period of sustained growth. Observers and economists started welcoming a “new era” in which business cycle fluctuations were limited and could be smoothed with the standard tools of fiscal and monetary policy, and the growth rate became the main interest of policymaking and economic theory. Growth was high not only in the U.S., but also in all those countries where the market forces (of business creation) were working freely. As a matter of fact, U.S. consumption and imports started driving foreign growth, and U.S. investments (in business creation and innovation) attracted capital from the rest of the world.

The American consumption boom went as far as to reach a rate of savings out of disposable income close to zero in 2000 and a rate of indebtedness out of disposable income at 140 %.<sup>2</sup> While a similar extreme behavior could be rationalized on the basis of high growth expectations, it persisted when these expectations changed at the turn of the century (with the stock market crash first, and then with the terroristic attacks of September 11, 2001), and turned into a pathological incapacity to save, leading to serious imbalances. These can be summarized in three main critical consequences of the consumption boom: 1) the excessive imports of foreign goods maintained a large deficit in the foreign accounts, 2) the excessive borrowing in terms of easy mortgages put upward pressure on real estate prices (see Fig. 1-2), and 3) the excessive leverage of equity capital<sup>3</sup> in the financial sector induced excessive risk taking and drugged stock market prices (see Fig. 1-2). Some commentators, led by Shiller (2005), have argued that the dot-com boom (peaking in 2000) and the real estate boom (peaking in 2006) could be explained only in part by structural factors,<sup>4</sup> but also by cultural and psychological factors associated with a sort of “irrational exuberance”. Whether a large part of these booms were “bubbles” or not, the American imbalances could only be corrected with a drastic depreciation of the Dollar, with the house price crash and with the financial crisis.

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<sup>2</sup>Total indebtedness of the U.S. economy surpassed 350 % of GDP in 2006, most of which owed by the private sector, while public debt was around 60 % of GDP (Di Noia and Micossi, 2009).

<sup>3</sup>The ratio assets/equity reached an average of 30 for U.S. investment banks (up to 33 for Morgan Stanley, 32 for Merrill Lynch, 31 for Lehman Brothers, 22 for Goldman Sachs) and of 33 for large European cross-border banks (up to 53 for Deutsche Bank and 52 for UBS).

<sup>4</sup>According to Shiller (2005), structural factors leading to the stock market boom included the cultural and political (fiscal) changes favoring business creation, the new information technologies, a supportive monetary policy, the expansion of defined contribution pension plans in the stock market, the growth of mutual funds and even the expansion in media reporting of business news and analysts’ over-optimistic forecasts.

## 1.2 The current global recession

During 2008, the global economy has entered in its deepest economic recession since the Great Depression of 1929.<sup>5</sup> Multiple factors have caused this crisis, including the rapid but temporary increase in the oil price during the first half of the year (a negative supply shock similar to those of the 70s, though shorter; see Fig. 3). However, there is a large consensus that the main source of the global recession was in the losses emerged from the subprime crisis associated with the bursting of the U.S. housing boom in 2006, and with the consequent stock market crash and the depression of consumer confidence (a negative demand shock similar to that of the Great Depression). What the debate is mainly about, however, is the mechanism that has propagated and deepened the crisis: is it revised expectations on future prosperity? or irrational depression? a collapse of consumer demand due to the wealth losses? a pure credit crunch? or bad or insufficient policy reactions? Before advancing our hypothesis, let us establish the facts.

For a decade before the real estate downturn in the U.S., loan incentives and a long-run trend of rising housing prices encouraged Americans to assume mortgages with the hope that they could refinance at more favorable terms later. However, once housing prices started to drop, refinancing became more difficult, and in front of a fall in prices by 25 % or more (especially in towns like Boston, Los Angeles or Miami), many borrowers ended up with negative equity, that is with a mortgage worth more than the house, and became insolvent. The number of borrowers in default kept increasing with the housing bust (and now with the crisis of the real economy), but the worst consequences were going to happen in the financial sector.

The so-called “subprime crisis” was exactly due to the high default rates on subprime and other adjustable rate mortgages made to higher-risk borrowers with lower income or worse credit history than prime borrowers. The market for subprime lending reached a fifth of total U.S. mortgage market. The potential losses in the event of a real estate downturn would have not been such a big problem if risks were properly taken into account by the mortgage brokers: this was not the case since they were able to repackage the returns on these mortgages, bundle them together and sell them in different slices to financial institutions, even under high ratings that had no relation with the underlying reality of the actual subprime mortgages. In a recent book on the role of animal spirits in driving the economy Akerlof and Shiller (2009) notice that, as long as housing prices kept increasing this was “an economic equilibrium that encompassed the whole chain, from the buyers of the properties, to the originators

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<sup>5</sup>The Great Depression started with the stock market crash on October 29, 1929, and was characterized by a sequence of bank failures, a tight monetary policy, and a long deflation, with U.S. GDP falling from \$ 103 bn in 1929 to \$ 56 bn in 1933, and unemployment increasing from 3 % to 25 %. Only with the New Deal of public spending by President Roosevelt, the recovery started.



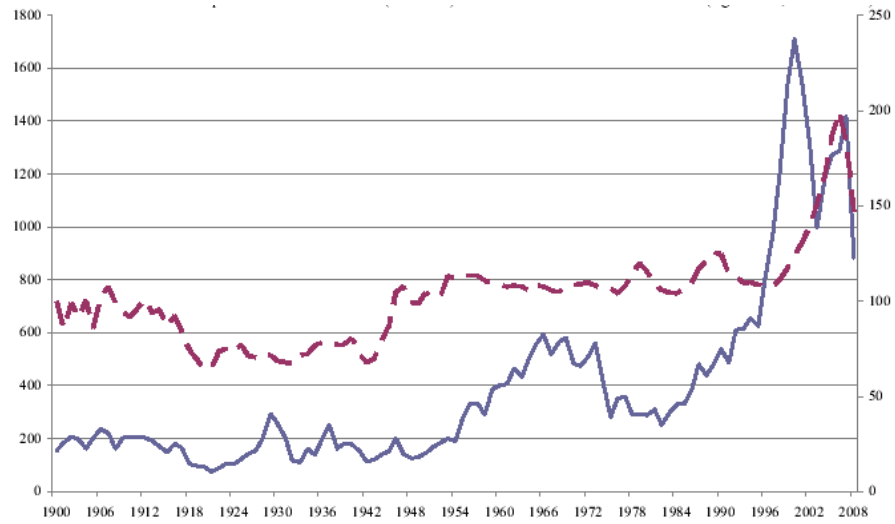


Figure 1: Real S&P 500 Composite Price Index (solid, left scale) and Home Price Index (dashed). Source: Di Noia and Micossi (2009).

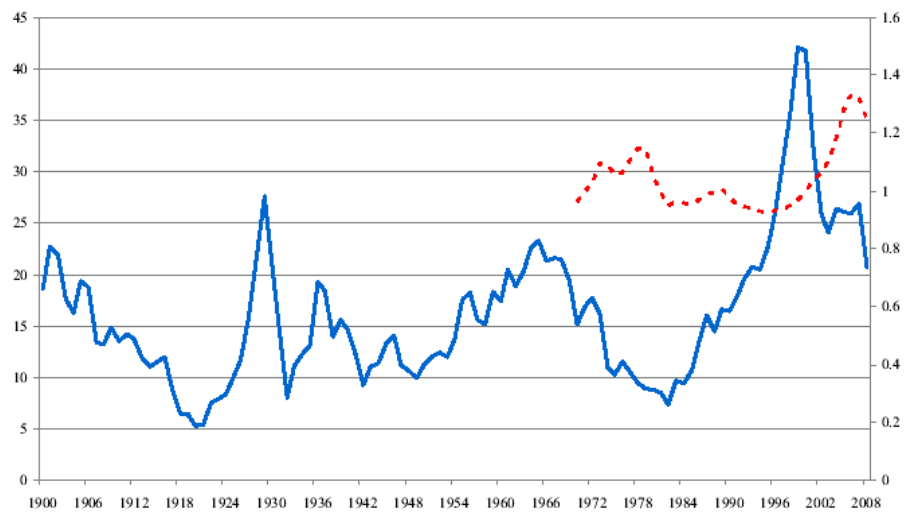


Figure 2: Real S&P 500 Price/Earnings, 10 yrs Moving Average (solid, left scale) and Home Price/Rent (dashed). Source: Di Noia and Micossi (2009).

of the mortgages, to the securitizers of the mortgages, to the rating agencies, and finally to the purchasers of the mortgage-backed securities. They each had their own motives. But those at the beginning of the chain - those who took on the mortgages and the houses they could not afford, and those who were the ultimate holders of the debt - were buying a modern form of snake oil.”

The wide (and unregulated) diffusion of derivatives based on these risky assets spread the related losses throughout the American and international financial markets, with effects that were largely ignored by rating agencies and that emerged in their magnitude only later, gradually and everywhere.<sup>6</sup> In February 2008 a highly leveraged British bank, Northern Rock, had to be nationalized because of its heavy liquidity problems which triggered a bank run. Since then, a number of American and European financial institutions that were widely engaged in the securitization of mortgages started facing similar problems. In March 2008, Bear Stearns had to be acquired by JP Morgan Chase with the assistance of the Fed. In July, one of the largest mortgage lenders in the U.S., IndyMac Bank, collapsed. In September 2008, the U.S. Government placed the huge mortgage lenders Fannie Mae and Freddie Mac into federal conservatorship and bought 80% of the major insurance company AIG. On September 15, 2008, the investment bank Lehman Brothers filed for Chapter 11 (the largest bankruptcy in U.S. history) after the Bush Administration refused to bail it out (probably to avoid further moral hazard problems). In the meantime, Merrill Lynch was acquired by Bank of America (and Wachovia by Wells Fargo) and the two remaining large investment banks, Goldman Sachs and Morgan Stanley, were converted to traditional banks, concluding the era of investment banking, and maybe also the Anglo-Saxon dominance of the global banking sector.<sup>7</sup>

In the Fall 2008 the crisis entered an acute phase characterized by a stock market crash, the failure of prominent banks, efforts by American and European authorities to bailout distressed financial institutions, lack of confidence and further defaults. As Krugman (2008) has noticed, “the result of this self-reinforcing process was, in effect, a massive bank run that caused the shadow banking system to shrivel up, much as the conventional banking system did in the early 1930s. Auction-rate securities, in effect a banking sector providing \$ 330 billion worth of credit, disappeared. Asset-backed commercial paper, another de facto banking sector, dropped from providing \$ 1.2 trillion in credit to providing only \$ 700 billion.” The lack of confidence froze interbank lending

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<sup>6</sup>Already in February 2007 HSBC was the first bank to write down its holdings of subprime-related mortgage backed securities, by \$ 10.5 billion. The current estimates suggest that American financial institutions will have to write off at least \$ 1.5 trillion of their holdings of similar “toxic assets”.

<sup>7</sup>In 1999 only two American financial institutions had a market capitalization above \$ 100 billion, Citigroup (with \$ 151 bn) and Bank of America (with \$ 113 bn), followed by the British HSBC and the Lloyds. In March 2009, three Chinese banks lead the ranking: the Industrial & Commercial Bank of China (\$ 175 bn), China Construction Bank (\$ 129 bn) and Bank of China (113 \$ bn). At the time of writing, the market capitalizations of Citigroup and Bank of America are respectively \$ 14 bn and \$ 40 bn.

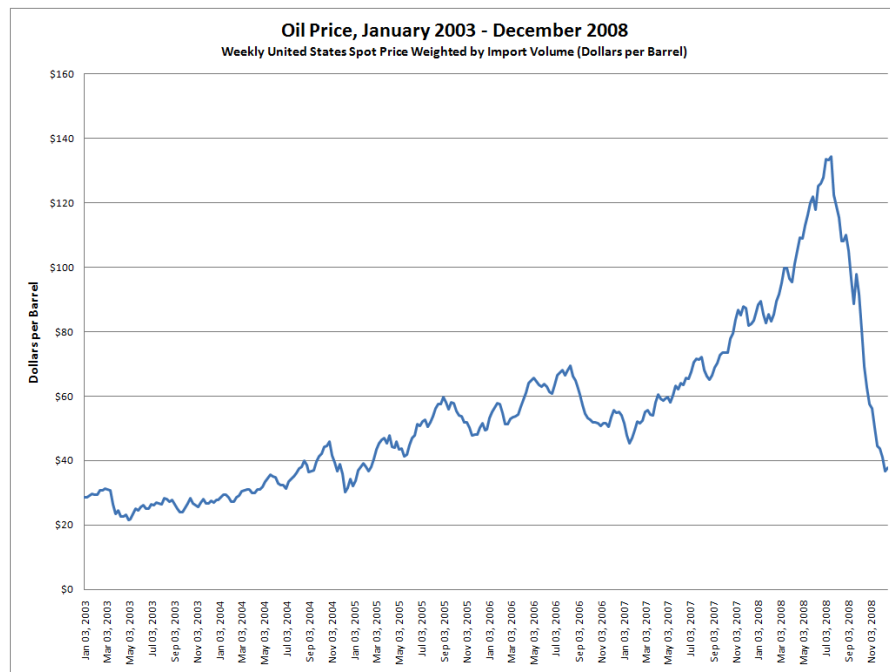


Figure 3: The 2008 Oil Shock

worldwide and induced a substantial reduction of lending to firms. Subsequent announced and implemented nationalizations<sup>8</sup> spread additional fear and lack of confidence in the markets and led to further stock market crashes at the beginning of 2009.<sup>9</sup> Larry Summers, Director of the White House’s National Economic Council, has calculated that worldwide wealth lost about \$ 50 trillion in the last year and half, more or less two thirds of global GDP.

The Obama Administration is reacting to the crisis with an unprecedented

<sup>8</sup>Temporary and partial nationalizations of European banks include in chronological order Roskilde Bank (Denmark), Fortis (Belgium, Netherlands and Luxembourg), Glitnir, Landsbanki and Kaupthing (Iceland), Carnegie (Sweden), Parex Banka (Latvia), Commerzbank and Hypo (Germany), Anglo Irish Bank (Ireland), RBS and Lloyds (U.K.).

<sup>9</sup>A clever proposal to reverse this process and revitalize the stock market and investment came from Ricardo Caballero (How to Lift a Falling Economy, *The Washington Post*, p. 19). His proposal was that governments should pledge to buy “up to twice the number of shares currently available, at twice some recent average price, five years from now. (Obviously the specific numbers are only an example). While the policy is about future (and unlikely) interventions, the immediate impact would be enormous. In particular, it would turn around the negative stock markets dynamics, and it would allow banks to raise private capital.” As all smart proposals, it has not received much attention.

expansionary fiscal policy (see Section 6) and with a plan by the Treasury Secretary Tim Geithner to deal with the “toxic assets” that are clogging up bank balance sheets,<sup>10</sup> while the Fed, led by the main academic expert of the Great Depression, Ben Bernanke, has implemented an equally unprecedented expansionary monetary policy (see Section 7). The rest of the Western world has followed a similar road adopting deficit spending and reducing drastically the interest rates. Meanwhile, the financial crisis has extended its disruptive impact from financial institutions to countries (in particular small European countries outside the E.U. or inside it but not in the Euroarea) whose financial accounts and currencies were (and will keep being) under heavy pressure, in particular Iceland, the Baltic Republics (Latvia in particular), Hungary, Bulgaria, Romania and Ukraine.

The melt down of stock market capitalizations reduced even more the incentives to invest and create new business activities. In the U.S., venture capital investment, a key source (and indicator) of innovation and business creation (amounting to 0.22% of American GDP in 2007), went down by a third in the last quarter of 2008 (compared to the previous year). Other traditional forms of investments in business creation collapsed as well, possibly limited by a credit crunch. This weakness of the investment process transmitted the financial crisis to the real economy. First, firms reduced their production levels, exhausted their inventories and stopped hiring new workers, then they started to close factories and fire workers. At the end of 2008, consumer demand in the Western world started decreasing as well, quickly for durable goods (as it always happens during recessions), and slowly for the other goods. In the last quarter of the year most Western countries were officially in recession. During 2009 we expect an impressive number of firms to go out of business: only in Europe two hundred thousand SMEs are expected to go bankrupt in 2009,<sup>11</sup> a third more than usual, and many others will drastically restrict their business or stop exporting. At the time of writing, the estimates for the growth of gross domestic product feature - 3 % for the U.S., - 4 % for the Euro area, -5/6 % for Japan, and + 6.5 % for China (everywhere with inflation rates very close to zero).

Markets have experienced two main phenomena. On one side investment has decreased, business creation and R&D spending have been often limited or

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<sup>10</sup>The plan provides mechanisms to price these troubled assets (whose real value is hardly known), and huge public subsidies (by the Federal Deposit Insurance Corporation and the Fed) to encourage on one side investors to buy them and on the other side banks to sell them. There are two problems with the plan. The first is an accounting problem: these transactions force banks to record losses on their portfolios, while they may prefer to carry loans at the original face value on their balance sheets and set aside only a percentage of the future losses. The public subsidy is aimed at solving this problem by overpricing the assets (with public money and risk), but it may not be enough. The second problem is economic: banks may try to sell only the truly worthless toxic assets, and this adverse selection may lead buyers not to bid for them. The cooperation of public authorities and banks in the choice of the assets to sell may solve this problem. Only the success of the Geithner plan may lessen the need for the U.S. government to recapitalize banks with temporary nationalizations.

<sup>11</sup>See the article by Guido Tabellini (*Le Scelte dei Governi*, *Sole 24 Ore*, February 1, 2009).

postponed, many multi-brand firms have reduced the number of brands supplied on the market, other firms simply stopped exporting to selected countries, some others have merged or are trying to merge with direct competitors,<sup>12</sup> and other firms have gone bankrupt. The consequent drop in net firms entry has led to a reduction in the number of firms or products within many sectors. On the other side, surviving firms have undergone a process of rationalization and job cuts. This process has been quite spectacular in certain global and highly concentrated sectors, starting with the automotive and electronic markets, where most of the leading manufacturers announced job cuts almost at the same time.<sup>13</sup> But of course, it is in smaller and local markets that business destruction leads to substantial reductions in the number of active firms. Likewise, many suppliers of large companies (for instance in the automotive and electronic markets) and downstream firms go bankrupt as a consequence of the problems of the leading companies. This is going to increase the levels of concentration in many markets, allowing the remaining firms to exploit the only ways to cover the fixed costs of production in the presence of a smaller aggregate demand: first, by reducing the remuneration of labor and real wages when it is feasible, or by reducing employment otherwise, and, second, by gradually increasing their mark ups.

The recession is generating a reduction of labor income and profits, but a relative increase of mark ups, and this has a crucial consequence: a further reduction in aggregate consumption (and total employment), generating an additional depression of the aggregate demand and a collapse of trade across countries. Surviving firms are reducing production and cutting jobs, contributing to the raise of unemployment. This is the competition effect of the EMSs approach in action, though of course it is working in reverse: in a recessionary context net business destruction deteriorates the division of surplus between input remuneration and mark ups and contributes to depress demand. In turn, this reduction in demand is going to exert a negative feedback effect on profits and stock market evaluations with an additional negative impact on business creation, competition and trade, so as to propagate the recession over time and space.

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<sup>12</sup>Beyond the banking sector, think of the pharmaceutical market, with the huge deals between Roche and Genentech, between Pfizer and Wyeth and between Merck and Schering-Plough.

<sup>13</sup>The CEO of FIAT, Sergio Marchionne envisions a global automotive market with only six major players, each one able to produce 5-6 million vehicles (one from U.S., Japan, Germany and China, plus a European-Japanese one and another European-American car maker). At the time of writing, General Motors is at the border of bankruptcy and could only survive thanks to government aid (and reducing the number of brands and selling Opel), Chrysler could survive only if bought by FIAT and Ford is barely in a better position, Toyota is suffering heavy losses, and all the European producers are asking for strategic state aids (already arrived for Peugeot and Renault).

## 2 Steady-state EMSs and Entry

Even if the number of goods and firms, the mark ups and all the aggregate variables as output, consumption, investment, labor force and profits are changing over the business cycle, in the long run their pattern must be determined by the structural parameters of the economy.

In the neoclassical approach (Solow, 1956), the wealth and growth of nations depend on the productivity of the workers (and their machines) and on the evolution of this productivity, on their propensity to work which determines the size of the labor force in the economy, and on their propensity to save which determines the sizes of investment and ultimately the stock of physical capital of the economy. Of course, there is not a unique path toward economic progress. Some countries have based their prosperity on the achievement of high levels of productivity, others have obtained prosperity by working more and others have reached the same prosperity through high savings rates (because their citizens were patient and available to give up to current consumption for the well being of the following generations). Moreover, as suggested by Acemoglu (2009), there are other factors that affect the long run performance of economies, including luck, geography, culture, and formal and informal institutions.<sup>14</sup>

Taking as given the long run impact of these fundamental factors on the production possibilities, we claim that there is a second order impact that these and a few other technological and behavioral factors exert on the market structures and consequently on the long run performance of the economies. The EMSs approach has characterized the average structure of productive markets in steady state (number of firms, individual production and mark ups) depending on a few structural parameters and on the form of competition.<sup>15</sup> The EMSs approach has emphasized five main determinants of the long run market structures and of the other aggregate variables.

The first determinant is given by scale factors as the level of productivity (or the size of the population): higher productivity (or larger population) leads to a larger size of the demand inducing more business creation, which in turn increases the steady state number of firms and enhances competition while reducing the mark ups. We have noticed that the relation between the size of the markets and the number of firms should be less than proportional, reflecting the strengthening of competition associated with more competitors: this hypothesis is strongly supported by preliminary empirical evidence.<sup>16</sup>

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<sup>14</sup>See the Intertic Lecture by Dixit (2008) for a wide discussion of this topic.

<sup>15</sup>For a given number of firms, competition tends to be stronger when the firms choose their prices against each other rather than when they choose their production levels. Nevertheless, stronger competition reduces the expected profitability and therefore attracts a lower number of firms, that in turn works toward less intense competition between the active firms. Which one of the two effects dominates in the long run is not obvious, but our investigation shows that, *ceteris paribus*, competition in prices leads to steady states with fewer firms and lower mark ups.

<sup>16</sup>See Czarnitzki and Etro (2009).

The second determinant of the steady state EMSs is the size of the barriers to entry: when these are high, the profitability of entry is low and the long run equilibrium is characterized by high concentration and high mark ups. Of course, markets characterized by high sunk costs of entry due to technological conditions naturally lead to equilibria with few active firms, and this does not represent a problem in itself. However, the introduction of a general purpose technology which reduces the fixed costs of entry is going to positively affect business creation and therefore competition and output production. Finally, to the extent that the entry barriers are artificial, in the sense that they are due to product market regulations, we can conclude that reforms leading to deregulation reduce concentration and mark ups in the long run, with a positive impact on the performance of the economy as a whole.

The third structural factor determining the nature of the EMSs in the long run is a behavioral factor, the way people discount the future. This degree of patience is what determines the propensity to save of the households, which in turn affects the equilibrium in the credit market. When agents are more patient, their large supply of savings reduces the interest rate, which means that the discounted sum of future profits is higher: this attracts more entry, strengthens competition and ultimately reduces the mark ups. Therefore more patient agents lead to a higher number of firms in the steady state.

The fourth element is the rate of business destruction due to exogenous reasons: when the risk of bankruptcy is high, the expected value of business creation is lower and business creation is limited. Therefore, in case of a high rate of default there are only few firms in the long run (but with a high rate of turnover), and they apply a high mark up to their goods.

The fifth determinant of the long run equilibrium emphasized in our framework is the degree of substitutability between goods. Higher homogeneity of the goods induces stronger competition between the firms and leads to lower mark ups, which in turn attracts a limited number of firms in the markets. On the contrary, when goods are highly differentiated, competition is relaxed and mark ups are higher, but this attracts more firms. Of course, markets with different levels of substitutability between goods coexist in the real world, and we should think of these relations only as general tendencies characterizing different markets.<sup>17</sup>

Summarizing the results obtained until now with a focus on the impact on the mark ups, we have:

**PRINCIPLE 2. IN THE LONG RUN, THE STEADY STATE EMSs ARE CHARACTERIZED BY MARK UPS INCREASING IN THE COST OF ENTRY AND IN THE RATE OF BUSINESS DESTRUCTION AND DECREASING IN LABOR PRODUCTIVITY, IN THE DISCOUNT FACTOR AND IN THE DEGREE OF SUBSTITUTABILITY BETWEEN**

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<sup>17</sup>A last structural parameter that can affect the steady state is the elasticity of labor supply. When this is larger, agents tend to work more, which tends to allow entry of a larger number of firms and to strengthen competition.

GOODS.

Notice that the steady state structure of the markets determines not only what is produced and at which price it is sold, but also how much of it is consumed, which is what matters for our understanding of the behavior of the economy and for its reaction to structural changes. The impact of the main structural parameters on long run consumption under competition in prices in the markets is the following: higher productivity, more substitutability between the goods and more patience ultimately lead to larger consumption bundles, while higher costs of entry and higher rates of business destruction lead to smaller consumption bundles in the long run.<sup>18</sup>

The following two case studies discuss the role of business creation over the business cycle (in the U.S. manufacturing sector), and in reaction to a technology shock (the introduction of a general purpose technology as cloud computing). The aim is to exemplify how EMSs can play a crucial role for macroeconomic analysis.

## 2.1 Entry and business creation in the U.S.

Our first two principles of the EMSs approach have characterized the role of entry of firms in the short and long run. Since the phenomena of entry, business creation and business destruction have been largely neglected by the neoclassical approach and by the related empirical research at the macroeconomic level, it is important to collect new evidence on their nature. In a recent fundamental work, Broda and Weinstein (2009) provide the first large-scale examination of product creation and destruction, documenting the nature, extent and cyclical-ity of product entry and exit in the U.S. manufacturing sector (and evaluating the elasticity of substitution within and between sectors). They use a unique dataset that contains the universe of products with barcodes in sectors that cover around 40 % of all expenditures on goods in the U.S. Consumer Price Index (therefore they do not refer to general business creation, which includes any kind of business or service, but to genuine product creation or innovation).

Fig. 4 to 6 reproduce their main results. The first one reveals that almost 80 % of the products that existed in 2003 did not exist in 1994, and they comprised 64 % of expenditures in 2003. The value of the products that disappeared in the same period was much smaller, about 37 % of expenditure in 1994. This suggests that new products, mostly produced by previously existing firms from the same or another sector (innovation by leaders), and sometimes produced

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<sup>18</sup>Things are not that simple under different modes of competition because these may lead to persistent inefficiencies on which we will return below. Notice also that we are loosely referring to the consumption bundle of the agents, which is enhanced by the number of varieties available (to appreciate the difference, notice that more patience leads to richer consumption bundles because higher savings allow the economy to produce more goods, but the agents consume less of each good).



<b>Product Entry and Exit in the U.S.</b>			
Period	9-year	4-year	1-year
	1994 - 2003	1999 - 2003	Median
Entry Rate	0.78	0.50	0.25
Creation	0.64	0.37	0.09
Entrant Relative Size	0.49	0.56	0.30
Exit Rate	0.72	0.46	0.24
Destruction	0.37	0.18	0.03
Exiter Relative Size	0.23	0.23	0.09
Ratio Share Common ( $t/t-1$ )	0.57	0.77	0.93

Notes: Entry Rate = number of new products ( $t$ ) / total number of products ( $t$ )  
Exit Rate = number of disappearing products ( $t-1$ ) / total number of products ( $t-1$ )  
Creation = Value(new products,  $t$ ) / Total value ( $t$ )  
Destruction = Value(disapp. products,  $t-1$ ) / Total value ( $t-1$ )

Figure 4: Business creation. Source: Broda and Weinstein (2009)

Net and Gross Rates by Module, Size-Weighted Averages Ranked by SUM (over 1-year)					
MODULE DESCRIPTION	RANKING	CREATION	DESTRUCTION	NET ENTRY	TURNOVER
	(1)	(2)	(3)	(2) - (3)	(2) + (3)
VIDEO PRODUCTS PRERECORDED	1	0.56	0.09	0.47	0.65
CAMERAS	2	0.44	0.18	0.26	0.62
COMPUTER SOFTWARE	3	0.32	0.19	0.13	0.51
TELEPHONE AND ACCESSORY	4	0.25	0.11	0.14	0.36
VACUUM AND CARPET CLEANER APPL	5	0.25	0.14	0.11	0.39
CANDLE AND CANDLE IN HOLDER	6	0.30	0.15	0.14	0.45
DISPOSABLE DIAPERS	7	0.17	0.06	0.12	0.23
STORAGE AND SPACE MANAGEMENT	8	0.19	0.10	0.09	0.29
KITCHEN UTENSIL AND GADGET	9	0.18	0.10	0.08	0.28
NUTRITIONAL SUPPLEMENTS	10	0.14	0.06	0.08	0.20
SUGAR-GRANULATED	100	0.01	0.01	0.01	0.02
FRANKFURTERS-REFRIGERATED	99	0.01	0.01	0.00	0.02
BUTTER AND SPREADS	98	0.02	0.00	0.01	0.02
CHEESE - COTTAGE	97	0.01	0.01	0.00	0.02
SAUSAGE-BREAKFAST	96	0.02	0.01	0.01	0.03
SEAFOOD-TUNA-SHELF STABLE	95	0.02	0.01	0.02	0.03
EGGS-FRESH	94	0.03	0.01	0.02	0.04
DINNERS-FROZEN	93	0.04	0.00	0.03	0.04
MARINARA SAUCE	92	0.03	0.01	0.02	0.04
PIZZA-FROZEN	91	0.04	0.01	0.03	0.04

Note: Select top 100 MODs by average value and then rank top 10/bottom 10 by SUM

Figure 5: Business creation by sectors. Source: Broda and Weinstein (2009)

by fully new entrants, systematically displaced market share from the available products. This is an important indication that new products are of a higher quality and contain a component of innovation. Broda and Weinstein (2009) show that, in a typical year, 40 % of household's expenditures are in goods that were created in the previous four years, and 20 % of expenditures are in goods that will disappear in the following four years.

Moreover, market turnover is higher in innovative sectors. Fig. 5 reports the ranks of the top and bottom ten sectors (between a hundred main sectors) in terms of turnover, where Broda and Weinstein (2009) define turnover as the sum of creation and destruction in the sector. Pre-recorded videos, cameras, and computer software are characterized by high entry/exit process and this is not surprising given the high degree of technological innovations in these sectors.

More important for our purposes is the analysis by Broda and Weinstein (2009) on the cyclical behavior of entry. Their Fig. 6 shows that net business creation is strongly procyclical, with more products being introduced in expansions and in product categories that are booming: an additional 1 % growth in consumption of a particular sector is associated with 0.3 % increase in the share of new goods. Gross business creation is strongly procyclical and covaries more with demand in booms than contractions, while the opposite is true for business destruction, which is countercyclical, but responds more strongly in

recessions than in booms. However, most of the procyclicality of net business creation comes from the procyclicality of creation.

Other recent studies have analyzed empirically the cyclical nature of the timing of new product introductions in U.S. manufacturing,<sup>19</sup> finding that business creation varies more in nonseasonal frequencies than in seasonal frequencies, and responds more to fluctuations in aggregate demand than in market demand, and in business cycles than in seasonal cycles. All these results support the thesis that entry is an important procyclical phenomenon that brings new and better products in the market and that can have a crucial impact on the behavior of the aggregate economy.

The American economy is a friendly environment to business creation as few other economies around the world. In the last decade an average of 550,000 new small businesses were created in the U.S. every month. Since the beginning of the current crisis this number has been in free fall, and without doubts this is having a strong impact on market structures and on the aggregate production.

## 2.2 Cloud computing: the impact of a General Purpose Technology

The introduction of a general purpose technology (GPT) can provide a fundamental contribution to promote growth, competition and business creation. This was the case of the Internet in the 90s, but a new interesting example is now given by the introduction of “cloud computing”,<sup>20</sup> an Internet-based technology through which information is stored in servers and provided as a service (Software as a Service) and on-demand to clients (from the “clouds” indeed). Its impact will be spectacular on both consumers and firms. On one side, consumers will be able to access all of their documents and data from any device (the personal laptop, the mobile phone, an Internet Point..), as they already do for email services. On the other side, firms will be able to rent computing power (both hardware and software) and storage from a service provider, and to pay on demand, as they already do for other inputs as energy and electricity. The former application will affect our lifestyles, but the latter will have a profound impact on the cost structure of all the industries using hardware and software, and therefore it will have an indirect but crucial impact on business creation and on the macroeconomy.

The EMSs approach provides the tools to evaluate the economic impact of the introduction of cloud computing. Before showing this, however, we need to describe further the nature of this new GPT. Many hardware and software companies are currently investing to create new platforms able to attract customers “on the clouds”. These “cloud platforms” provide services to create applications in competition or in alternative to “on-premises platforms”, the

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<sup>19</sup>See Axaroglou (2003)

<sup>20</sup>This section is based on Etro (2009,a).

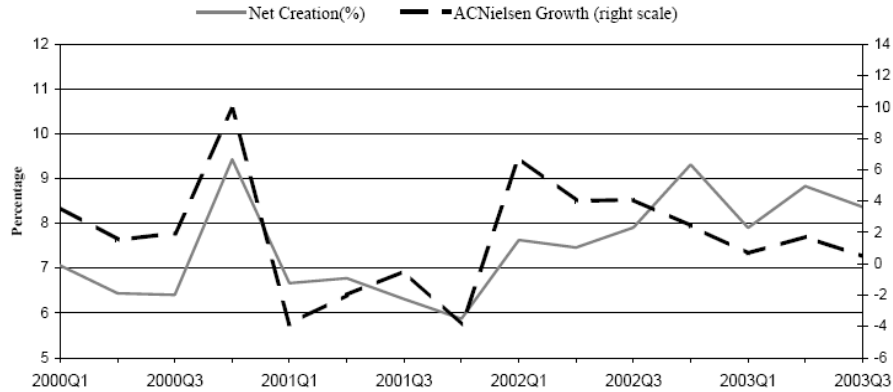


Figure 6: Sales growth and net creation (Q4/Q4growth rates). Source: Broda and Weinstein (2009)

traditional platforms based on an operating system as a foundation, on a group of infrastructure services and on a set of packaged and custom applications. The crucial difference between the two platforms is that, while on-premises platforms are designed to support consumer-scale or enterprise-scale applications, cloud platforms can potentially support multiple users at a wider scale, namely at the Internet scale.

Currently we are only in a phase of preparation with a few pioneers offering services that can be regarded as belonging to cloud computing. A recent study of the International Data Corporation has examined the role of IT cloud services across five major product segments representing almost two-thirds of total enterprise IT spending (excluding PCs): business applications, infrastructure software, application development & deployment software, servers and storage. Out of the \$ 383 billion that firms have spent in 2008 worldwide for these IT services only \$ 16.2 billion (4%) could be classified as cloud services. In 2012 the total figure was expected to be at \$ 494 billion and the cloud part at \$ 42 billion, which would correspond to 9% of customer spending, but also to a large part of the growth in IT spending. The majority of cloud spending is and will remain allocated to business applications, with a relative increase of investment in data storage.

Many large high-tech companies are building huge data centres loaded with hundreds of thousands servers to be made available for customer needs in the near future. The first mover in the field has been Amazon, that provides access to half a million developers by way of Amazon Web Services. Through this cloud computing service, any small firm can start a web-based business on its computer system, add extra virtual machines when needed and shut them down

when there is no demand: for this reason the utility is called Elastic Cloud Computing.<sup>21</sup>

Google is also investing huge funds in data centres. Already nowadays Google Apps provides word processing and spreadsheet applications online, while the software and data are stored on the servers. Even the search engine of Google or its mapping service can offer cloud application services. For instance, when Google Maps was launched, programmers easily found out how to use their maps with other information to provide new services.

Other software and hardware companies have been actively investing in cloud computing.<sup>22</sup> Social networks have moved in the same direction turning into social platforms for consumer based applications, with Facebook in the front road (with its 200 million or more subscribers and an impressive amount of information available). Yahoo! is developing server farms as well. Oracle has introduced a cloud based version of its database program. Microsoft has started later but with huge investments in the creation of new data centres. In the fall of 2008, the leading software company has introduced a cloud platform called Windows Azure, currently available only in a preview version. Azure is able to provide a number of new technologies: a Windows-based environment in the cloud to store data and to run applications, an infrastructure for both on-premises and cloud applications, a cloud based database, and an application tool which allows to synchronize and constantly update data across systems joined into a “mesh”. Moreover, Windows Azure provides a browser-accessible portal for customers: these can create a hosting account to run applications or a storage account to store data in the cloud, and they can be charged through subscriptions, per-use fees or other methods.<sup>23</sup>

The battle for the clouds between these companies is going to reshape the ICT market structure as PC distribution did in the 80s. But according to the Economist<sup>24</sup> “cloud computing is unlikely to bring about quite such a dramatic shift. In essence, what it does is take the idea of distributed computing a step farther. Still, it will add a couple of layers to the IT stack. One is made up of the cloud providers, such as Amazon and Google. The other is software that helps firms to turn their IT infrastructure into their own cloud, known as a

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<sup>21</sup>For instance, Animoto, an application that produces videos from user-selected photos and music, has been a successful business of this kind. When Animoto was launched on the leading social network Facebook, it was forced by exponentially increasing demand to bring the number of machines used on the Amazon Web Services from 50 to 3500 within three days, something that would have been impossible without relying on a cloud platform.

<sup>22</sup>Notice that cloud computing implies outsourcing of both software and hardware, therefore it should not be surprising that hardware producers like Dell, Hewlett-Packard, Cisco and IBM are investing in the field as well. Even producers of consoles for videogames may switch to games in the clouds in the near future.

<sup>23</sup>While many applications and services can perform well either on-premises or in the cloud, Microsoft is working on a wider range of combinations, which enables developers and customers to manage applications and data in the clouds, or on-premises, or via some combination of both (Software plus Services).

<sup>24</sup>2008, *Economist*, “Where the Cloud Meets the Ground”, October 25th, p. 387.

‘virtual operating system for data centres’ ... Will this prospective platform war produce a dominant company in the mould of IBM or Microsoft that is able to extract more than its fair share of the profits? Probably not, because it will be relatively easy to switch between vendors... Nor is it likely that one firm will manage to build a global cloud monopoly. Although there are important economies of scale in building a network of data centres, the computing needs of companies and consumers vary too widely for one size to fit all.” Moreover, the need of creating network effects in the development of a cloud platform will keep low the margins for a while and will maximize the speed of diffusion of cloud computing between firms at the global level.

In front of this rapid evolution, it is crucial to understand the economic impact of the introduction of this GPT. Its main economic benefit is associated with a generalized reduction of the fixed costs of entry and production, in terms of shifting fixed capital expenditure in ICT into operative costs that depend on the size of demand. This contributes to reduce the barriers to entry especially for SMEs and intensifies the business creation process. The consequences on the endogenous structure of markets with large needs of hardware and software is going to be substantial, with entry of new firms, strengthening of competition, reduction of the mark ups, and with an increase in average and total production.<sup>25</sup>

Etro (2009,b) employed an adapted version of the model of Colciago and Etro (2008) with accumulation of ICT capital (hardware and software) and fixed costs of entry in terms of the final good, to estimate the impact of a gradual diffusion of cloud computing. This is translated into a slow reduction of the fixed cost of entry, which endogenously generates further investments in business creation. The calculations based on a model calibrated on E.U. countries show a significative impact. Starting from conservative assumptions on the gradual reduction of the fixed entry costs due to the adoption of cloud computing, the exercise suggests that the diffusion of this innovation may induce the creation of 100-400 thousand new SMEs in the whole Euroarea, adding a few decimal points to the growth rate and about a million new jobs in the medium run.

Part of the positive effects of cloud computing are going to be positively

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<sup>25</sup>Another important benefit is associated with the creation of multidimensional network effects due to the new possibilities of product creation in the clouds, that is between companies exploiting in different ways the potentialities of cloud computing through the same platform or different ones. This is related to another new possibility, the rapid adoption of changes: it is not uncommon, that applications in the clouds are modified on a daily base (to accommodate new requirements, or enable new economic venues), which is impossible with on-premise solutions. It is important to notice that the aggregate role of these network effects can be relevant but it is extremely difficult to measure. Finally, cloud computing is going to introduce the possibility of a) sharing resources (and costs) among a large pool of users, b) allowing for centralization of infrastructures in areas with lower costs, and c) allowing for peak-load capacity increases (generating efficiency improvements for systems that are often only 10-20% utilised). These features will lead to additional savings in energy and to greater environmental sustainability, whose measure, however, is again subject to large uncertainty.

related to the speed of adoption of the new technology. For this reason, our investigation suggests that policymakers should promote as much as possible a rapid adoption of cloud computing. Concrete possibilities include fiscal incentives and a specific promotion of cloud computing in particular dynamic sectors. For instance, governments could finance, up to a limit, the variable costs of computing for all the (domestic and foreign) firms that decide to adopt a cloud computing solution. Moreover, they could introduce business-friendly rules for the treatment and movement of data between their country and foreign countries. These policies may be studied in such a way to optimize the process of adoption of the new technology and to strengthen the propagation of its benefits within the country.<sup>26</sup> International policy competition for the subsidization of cloud computing solutions would generate positive spillovers across countries, and some coordination at the E.U. level would be welcome.

As the Economist (*ibidem*) claims, “[I]nternet disrupted the music business; Google disrupted the media; cloud-based companies could become disrupters in other inefficient industries.” One of the few positive aspects of recessions is that the market selects efficient and innovative firms able to invest in new technologies to be exploited in better periods. This may turn out to be at the basis of the recovery from the current recession.

### 3 Gains from Trade and the Effects of Globalization

Globalization, defined as the increase in trade in goods and factors of production and associated with the reduction of natural and artificial trade barriers, is one of the main phenomena of the last decades, with implications and motivations that go far beyond economic factors. Understanding the impact of increasing (and decreasing) openness is one of the major aims of macroeconomic theory.

It is often claimed that globalization leads to lower prices for the consumers but also to business destruction at the local level. However, the new trade theory summarized by Helpman and Krugman (1985) has emphasized that opening up to trade leads mainly to other forms of gains and other forms of impact on business: it keeps prices at the same level and it does not affect the number of active firms, while it increases the total number of goods available for consumption at the local level. This generates what are usually called the “gains from variety” due to openness.

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<sup>26</sup>Moreover, in a context as the European one, smaller countries would be able to obtain larger gains from similar policies at least in the initial phase, because they would easily attract foreign investments from larger countries. In a period of increasing limits to other forms of fiscal competition, a policy of subsidization of cloud computing (without discrimination across firms of different member countries) could generate substantial capital flows toward countries with good general infrastructures. For instance, early adoption of these policies by small E.U. countries as Luxembourg or Malta could attract large investments and create wide effects in terms of output growth and job creation in these countries.

The EMSs approach emphasizes a related but more complex mechanism. When a country opens up to trade, say with a bordering country, the domestic firms start competing with the foreign ones for both the domestic and the foreign market (that become an integrated market in the absence of trade frictions). This strengthening of competition leads to a reduction of the mark ups and therefore of the prices of all the goods. Profitability and entry are affected in three ways: first, each firm serves two markets rather than one, which enhances profitability; second, each firm is sharing each market with a larger number of firms, which reduces profitability; third, stronger competition reduces mark ups and profitability. The net effect determines the impact on the number of firms active in each market. In the absence of asymmetries between the firms, the first two effects balance each other and the overall impact of opening up to trade is a reduction of the total number of firms, which implies business destruction at the local level. Of course, the number of firms active in the integrated market increases, but less than proportionally. The associated competition effect generates price reductions and what we called the “gains from competition”.

The extent of this mechanism crucially depends on the type of traded goods. At one extreme we have perfectly differentiated goods with competition in prices: for these goods, all the gains from opening up to trade derive from an increase in the number of consumed varieties and not from price changes, while business destruction is absent. This is the typical situation that Krugman had in mind when talking about the gains from intra-industry trade: globalization makes different brands of cars available for all consumers, which enlarges their options.

At the other extreme, however, we have homogenous goods with competition in quantities: for these goods, all the gains from trade derive from lower prices, but business destruction is heavy.<sup>27</sup> This is probably what happened in most markets during the phase of intense globalization of the last years, and it is not surprising that many supporters of the globalization process have constantly emphasized the price-reducing impact of openness while associating the business destruction effect with a healthy reallocation of labor across firms and sectors. Nevertheless, when the labor market works imperfectly, the social costs associated with this process of job reallocation can be quite relevant. Summing up the main insights, we have:

**PRINCIPLE 3. GLOBALIZATION BRINGS GAINS FROM TRADE BY STRENGTHENING COMPETITION, REDUCING MARK UPS AND PRICES, AND INCREASING THE NUMBER OF AVAILABLE GOODS, BUT IT INDUCES BUSINESS DESTRUCTION AT THE LOCAL LEVEL.**

Finally, globalization strengthens the interdependence between economies, and leads to faster propagation of the shocks across countries. In a global world, we can re-examine the impact of shocks and their international propagation through the EMSs approach. Imagine that the domestic economy is hit

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<sup>27</sup>Of course, in intermediate situations the gains from trade derive from both lower prices and more varieties, and business destruction is partial.



by a temporary positive productivity shock. Such a shock increases domestic consumption and profits, which attracts entry of new firms in the domestic economy and strengthens competition. Domestic entry increases labor demand at home compared to abroad, and exerts upward pressure on the domestic wages, which causes the relative price of non-traded goods at home to increase relative to foreign. As a consequence, the increase in domestic productivity generates a real exchange rate appreciation due to higher prices of domestic non-tradables and imports and to a larger demand for domestic goods, which leads to persistent deviations from the purchasing power parity (in line with the evidence). Meanwhile, the positive impact on the profits of the foreign firms and the temporary price reductions do exert an indirect expansionary effect abroad, which contributes to propagate the boom across countries. The opposite mechanism works in case of a negative shock, and the rapid diffusion of the 2008 crisis from the U.S. to the rest of the world has been one of the most dramatic examples of the deep interdependence of the modern economies.

Looking at these phenomena in a global perspective, it emerges quite clearly that macroeconomic policy at the national level is always less effective when it is not coordinated at a supra-national level, but also that there are large gains from coordinating policies within international unions or global agreements. The recent financial crisis has urged the coordination and the tightening of financial regulation at a global level to reduce the systemic risks associated with the tendency of unregulated financial intermediaries to overleverage their capital and to undertake excessive risk). Since only few countries would give away their sovereignty on this matter, it is at least important that most countries could agree on a number of basic principles (maybe through the Financial Stability Forum currently directed by Mario Draghi) and allow stricter regulation on a unilateral or bilateral basis. More or less as the W.T.O. has done to coordinate the process of tariff reductions toward free trade.<sup>28</sup> The future of globalization is deeply related with the willingness and the ability of developed and developing countries to coordinate properly their policies.

### 3.1 Globalization, income distribution and inequality

Our investigation of the impact of openness has emphasized a competition effect, for which globalization strengthens competition and reduces the prices, and a business destruction effect, for which an endogenous increase in the equilibrium size of international firms leads to the foreclosure of smaller local business. In the absence of labor market imperfections, this business destruction effect is inconsequential for the workers: they switch jobs reallocating their work between a smaller number of larger firms that have a larger share of the global markets.

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<sup>28</sup>More generally, Alesina, Angeloni and Etro (2005) have shown that such a two-level system is politically viable and can improve the outcome of international coordination. For a similar proposal on financial regulation see Dani Rodrik (2009, *Economist*, “A Plan B for Global Finance”, *Economic Focus*, March 14th, p. 72).

Nevertheless, job destruction due to globalization can have dramatic effects in the presence of labor market rigidities, both in terms of unemployment and income inequalities. When labor market frictions are relevant, some of the workers hit by globalization may find it hard to switch to different jobs in different sectors and when social insurance and unemployment benefits are limited they would bear substantial losses while looking for a new job. Meanwhile, the economy may suffer heavily because of the reduction and misallocation of the labor force.

Our distinction between different cases above can help us to understand better the consequences of globalization. One could think of sectors producing highly differentiated goods with competition in prices as sectors where innovation and design are the fruit of skilled labor (characterized by higher human capital): in these sectors business destruction due to globalization is limited. On the other side, sectors with homogenous goods and competition in quantities can be seen as sectors characterized by standard production processes employing low-skilled workers: for these sectors, we have seen that business destruction due to globalization is radical.

Therefore, in the presence of labor market imperfections, the consequences of globalization can be worse for the low-skilled workers and can potentially lead to their unemployment and to larger income disparities between them and the skilled workers. For this reason, the gains from trade due to globalization and associated with lower prices are often criticized for their consequences on income distribution and for the increase in the inequality between low productivity workers and high productivity workers.

The EMSs approach provides further insights on issues of income distribution that we should emphasize in this context. Contrary to the neoclassical approach, our approach is able to generate an interesting evolution for the distribution of income between extra profits (in the form of dividends and capital gains) and labor income (or remuneration of the inputs in general). In the short run, a boom is associated with an increase of both forms of income but with a larger increase for the latter due to the stronger competition between firms. *Vice versa*, in a downturn, the mark ups tend to increase and the fraction of income accruing to the factors of production shrinks (the procyclicality of the labor share would require further empirical investigations).

In a long term perspective, the process of globalization may generate a positive effect on labor income, since the associated increase in competition may shift part of the surplus from profits toward labor income. Again, in the presence of labor market frictions, it may take time before globalization exerts its benefits on the workers, but the ultimate impact is going to be positive. For these reasons, the protectionist tendencies that are emerging during the current crisis may have negative consequences in the medium-long run for the global economy.

## 4 Growth Driven by Leaders

Understanding the determinants of growth and the reasons for which differentials in growth rates are so large is fundamental to foster economic progress around the world. While growth in developing countries is largely associated with the process of industrialization through established technologies and with the accumulation of physical and human capital in the neoclassical sense, growth in the Western developed countries is largely driven by the continuous process of expansion of the technological frontier.

Technology-driven growth is mainly due to the innovations of firms investing in R&D to create new or better products and replace the existing ones (Romer, 1990, and Aghion and Howitt, 1992). Profits, associated with innovations and temporarily protected through IPRs, provide the incentives to invest in R&D for firms in high-tech sectors, and the structure of the competition between these firms is a crucial element of the engine of growth. The EMSs approach has widely examined this structure, endogenizing strategic interactions in the investment choices and the entry process, and it has been also focused on the peculiar role of market leaders.

Entry of firms in the competition for the market is primarily driven by the size of the expected profits from innovations, and therefore it is directly related to the strength of IPRs protection. This protection, as the legal enforcement of contracts and the protection of the same physical property rights, is one of the founding elements of the free market economies,<sup>29</sup> and possibly the most important, since dynamic growth (rather than static wealth) relies on it. Of course, entry changes the nature of the strategic interactions between investors, increasing aggregate investment and reducing the expected profitability (per firm) at rates that depend on the substitutability or complementarity between the investments of the firms. The entry process is exhausted when the expected return on R&D investment is the same as the return on alternative investments, and this equilibrium determines the aggregate rate of technological progress.

The endogeneity of entry plays a crucial role in the decision of technological leaders to invest in R&D to perpetuate their status: leaders tend to invest less than their rivals and to reduce the aggregate investment when they face an exogenous number of competitors, but they tend to invest more and to increase the aggregate investment when they face an endogenous number of investors trying to replace the leading technology. For this reason, it can be highly misleading to evaluate the competitiveness of a dynamic market on the basis of its concentration level or of the market share of its leader without concern for the entry conditions (this is a common mistake done by antitrust authorities).

The hypothesis for which leaders invest more in R&D if and only if they face a strong entry pressure has been tested in Czarnitzki, Etro and Kraft (2008)

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<sup>29</sup>See the Intertic Lecture by Dixit (2008) on this topic.

on a unique dataset of the German manufacturing sector, the Mannheim Innovation Panel, which includes a wide number of firm level data and answers to a survey with a special focus on innovation.<sup>30</sup> A novel aspect of this research is given by the fact that the same firms provide a subjective view on the key determinants of R&D intensity, the entry pressure and the leadership. Rather than determining arbitrarily the size and composition of a market, assigning a degree of entry intensity in a discretionary way, and assigning a status of leadership on the basis of predetermined variables, the questionnaire of the Mannheim Innovation Panel allows one to ask the same firms to identify the size of their main market, the existence of an endogenous threat of entry in the market and the identity of the leader in the market. Using standard control variables as employment, capital intensity, stock of IPRs and sector dummies, the econometric investigation provides interesting results. Apparently, incumbent leaders invest slightly less than the average followers, with a difference that is not significant. However, this apparently uniform behavior hides a very different reality, which emerges when we control for endogenous entry pressure. The presence of such an entry pressure leads the average firm to invest less, but when the firm is an incumbent leader in its main market, this leader increases its investment in R&D above the investment of the average firm.<sup>31</sup> This confirms the main predictions of the EMSs approach, for which market leaders are more innovative if and only if they are pressured by endogenous entry.

In the presence of sequential innovations, the consequence of the impact of the entry pressure on the investment of the leaders is somewhat paradoxical: the likelihood of persistence of leadership is high exactly when there is endogenous entry in the competition for the market (and not when there is high market power of the leader). Therefore, growth is mainly driven by the investments of the market leaders to perpetuate their positions under the pressure of rival firms. We can summarize this result with:

**PRINCIPLE 4. GROWTH IS DRIVEN BY THE PROCESS OF BUSINESS CREATION AND ENHANCED BY A STRATEGIC LEADERSHIP OF PATENTHOLDERS IN THE COMPETITION FOR THE MARKET, WHICH CREATES ENDOGENOUS PERSISTENCE OF THEIR TECHNOLOGICAL LEADERSHIP.**

As we have seen, the New Economy is key to the engine of world growth because it is often associated with GPT innovations that spread their benefits in other sectors. For instance, this is the case of innovations in hardware, software, online business and advertising. Moreover, we have suggested that the leaders of these sectors contribute to drive global technological progress. Etro (2007,a, Chapter 6) provides a wide discussion of the software market in the perspective of the EMSs approach, with particular attention to the role of Microsoft as a

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<sup>30</sup>See Czarnitzki, Etro and Kraft (2008).

<sup>31</sup>For a fascinating introduction to the discriminating power of econometric analysis see Levitt and Dubner (2005).

leader forced by endogenous entry pressures to invest a lot in R&D. The software market is not only characterized by endogenous entry at the global level in the competition *for* the market, but also in the competition *in* the market, which forces the leader to implement aggressive strategies (low pricing, bundling) with competitive purposes: for this reason, the large market share of Microsoft should not be necessarily seen as a consequence of market power.

Leaving that reference to the interested reader, here we want to present a microeconomic digression on a related market of the New Economy, whose structure is characterized by endogenous entry in the competition *for* the market (through investments in innovation), but not in the competition *in* the market (not through prices). This market will probably play an important role in future economic scenarios.

#### 4.1 Online advertising: market structure and innovation

Advertising is at the basis of any process of business creation and diffusion, and its efficiency is crucial for all sectors. It is calculated that worldwide spending on total advertising is currently around \$ 600 billions, of which at least 40 billions are spent in the online field, half in the U.S., a third in the E.U. Since 1994, when HotWire sold the first banner for advertising, and 1995, when Infoseek introduced search-based advertising, online ads have been constantly growing in all of their different forms: search advertising associated with search engines (40 % of online advertising), display advertising (30 %), classified listings on web sites (20 %), email advertising (2 %) and others. The current crisis has stopped only temporary the growth of the online market. This is destined to increase its share in total advertising for the following reasons: the Internet is rapidly growing and the large majority of websites generates revenues from advertising; other devices as mobiles and televisions will be always more often connected to the Internet; software innovation allows more efficient mechanisms to reach targeted consumers on the basis of the characteristics of search through the keyword bidding system and of the websites visited (contextual advertising), and in perspective on the basis of the characteristics of the Internet users (behavioral advertising).

Advertising in general is a two-sided market, in the sense that there are platforms that attract viewers and sell their access to the advertisers. These typically multi-home and pay for access based on the amount of space they obtain and who they reach. Online advertising provides new ways to attract viewers, and new and better ways to link advertisers to their targets. This happens in the two main sub-markets of online advertising, search and display advertising, whose structures will be the focus of our attention.

Let us start with *search advertising*, which accounts for about 40 % of online advertising. Many search queries on the Internet are a potential source of business transaction, therefore advertisers place their ads next to search engine results through second price auctions on the keywords that match the content

of their ads and lead Internet users to click on their advertisement: charges are typically for each click on the ad (*PPC*, price per click), and the highest bid for each keyword association wins, but the price is given by the second highest bid. Therefore, the revenue per search, *RPS*, on a particular platform is given by  $RPS = APS \cdot CPA \cdot PPC$ , where *APS* is the Ads per search and *CPA* is the clicks per Ad.<sup>32</sup>

The market is characterized by strong network effects in the sense that the search engine that reaches most Internet users is more valuable to advertisers. Consequently there is a strong competition for the market to develop the leading search engine, which leads the dominant firm to invest a lot in R&D and maintain its leadership, but a limited competition in the market between the main search engines, which allows these, and the dominant one in particular, to apply substantial mark ups. As well known, Google is currently the leading search engine, with about 60 % search traffic in U.S., against almost 20 % of Yahoo! and less than 10 % of Microsoft's Live, but with even higher market shares, often above 90 %, in other parts of the world.<sup>33</sup>

Competition *for* the market is strong and crucial since access to search engines is free and simple, and most users employ the search engine that is regarded as the most valuable (for the quality of the search results and ad relevance), even if they often use more than one. In the absence of substantial product differentiation (limited to search tools and page layouts), network effects and lock in effects naturally lead to a single dominant player in the market for search advertising. Today Google dominates this lucrative business and the lack of genuine entry pressure in the competition *in* the market allows it to apply higher mark ups to advertisers than its main competitors. Google AdWords (launched in 2000) charges double prices than its two main rivals (Yahoo! and Microsoft) and accounts today for about 70 % of search advertising revenue worldwide.

Let us move to the second main field of online advertising, *display advertising*. Part of this market concerns the direct placement of banner ads on third-party publishers, which represents the direct (or reserved) channel, the valuable ad inventory that large web publishers directly negotiate with the advertisers (through their direct sale forces). However, most of the advertising space available on large websites and typically all of the space available on small and medium size websites cannot be sold in direct negotiations. Therefore, most of it is sold through indirect intermediaries that buy the so-called "remnant" ad inventory from publishers and sell it to advertisers. This can be seen as a separate market from the direct channel. Google and its recent acquisition DoubleClick

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<sup>32</sup>Google adopts a sophisticated quality scoring technology that displays and orders ads based on expected revenue ( $CPA \cdot PPC$ ) to maximize *RPS*; Yahoo! and Microsoft have introduced sophisticated quality scoring algorithms more recently.

<sup>33</sup>The exceptions are Japan where Yahoo! is the leader, China with Baidu, South Korea with NHK, and Russia with Yandex. Notice that Yahoo! has been the leader in the U.S. until 2002. Before 2000 Yahoo! was followed by Altavista, in 2001 by Microsoft and in 2002 by Google, which subsequently took the lead.

play a major role in the market for intermediation services for remnant ad inventory. Google provides vertically integrated intermediation platform between online web publishers and advertisers: Google's AdSense, which publishers use to dedicate ad space to Google contextual ads, reaches more than 80 % of the ad revenue in the indirect channel with integrated ad networks. The Google platform targets advertising to the relevant websites, and pays the web publishers with a large percentage of its revenues; meanwhile advertisers buy inventories from the platform. DoubleClick offers an ad serving and ad management product, DART, for publishers and advertisers. Such a publisher tool manages the inventory of a website, receives the ads from ad networks and delivers them in the relevant inventory (according to the behavioral history of Internet users), usually at a fixed cost per thousand impressions which is a small percentage of the price that the web publisher charges on the advertisers. The market share of ad revenue served by DoubleClick in the indirect channel with non-integrated ad networks is around 75 %. Since almost 60% of online advertising taking place through the indirect channel adopts integrated intermediation, after the 2007 merger, Google with DoubleClick controls about 80 % of the worldwide market.

As the market for search advertising, also the market for display advertising is characterized by endogenous entry in the competition *for* the market, but not in the competition *in* the market, with Yahoo! and Microsoft providing the only alternatives to Google in the short-medium run.<sup>34</sup> In this scenario, the merger between Google and DoubleClick substantially relaxed price competition and allowed them to increase their mark ups on publishers and advertisers. As a reaction, in February 2008 Microsoft made an offer to buy Yahoo! and create a stronger search platform with the size and the network effects needed to compete with Google. Yahoo!'s board has stopped this attempt by exploring strategic alternatives, including a commercial deal with the market leader (to deliver relevant Google ads alongside Yahoo!'s own search results), which would have reduced competition even further. After the withdrawal of that deal in November 2008 under the pressure of the U.S. Department of Justice, the position of Yahoo! in the market has become even weaker, and Google has remained dominant and unconstrained by endogenous entry threats.

Future alliances and technological advances will crucially shape the structure of this crucial market for the global economy. Competition and innovation (by the leader and the followers as well) in a sector like this will exert a positive impact on the other sectors and on the aggregate economy, especially in a time of crisis as the current one. For this reason it is important that a strong innovative

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<sup>34</sup>Switching to a different tool involves high sunk costs in terms of substantial investments in software, in training the staff, coding all of the publisher's web pages, creating novel datasets, transferring ad campaigns to the system and so on, with all the associated business risk. For the same reason, multi-homing (with multiple non-integrated ad networks) is highly inefficient in this case. These high switching costs and the difficulty of building alternative high quality intermediation services represent a substantial barrier to entry of new firms in the short and medium run, which is the relevant time frame in such a rapidly evolving market.

pressure on Google remains in the competition *for* this market, and that a stronger competitive pressure emerges in the competition *in* the market of online advertising.

## 5 Dynamic Inefficiency

How much a country should save? By saving a lot a country can invest a lot and substantially improve the conditions of the future generations, but meanwhile consumption of the current generations is penalized. By saving less, a country privileges current consumption over growth. Apparently the right choice is just a matter of preferences, but this is not always true. There is a limit beyond which a country should never go: excessive savings may create such a large potential production that the country will not be even able to absorb it in the long run (Phelps, 1961). In these situations, the country could make current and future generations better off by simply reducing the rate of savings (this would expand current consumption without penalizing future consumption). Dynamic inefficiencies of this kind are only a theoretical possibility in the neoclassical framework, but they become a concrete chance in a world where markets are characterized by more realistic EMSs.

When we depart from a perfectly competitive world to introduce imperfect competition, we can expect that some forms of inefficiencies emerge. Nevertheless, it is not obvious in which directions they should go in general equilibrium: in the competition in the market, should we expect excessive concentration and mark ups? or too many firms and too small mark ups? Likewise, in the competition for the market, should we expect a number of firms and an aggregate investment in R&D above or below the efficient levels? The general answers to these questions are much more clear-cut than what one could expect on the basis of casual intuitions. It turns out that under fairly general conditions, the number of firms is excessive both under competition in the market and for the market and, under more restrictive conditions, this form of excessive entry may lead to persistent negative consequences, namely dynamic inefficiency.

The excessive entry result is related to the fact that, whenever there are few firms, entry of a new one exerts a strong negative externality on the profitability of the incumbents, but this externality is irrelevant for the actual choice of entry. This phenomenon is well known in the theory of industrial organization as the business stealing effect, but it makes its appearance in a general equilibrium context with implications for long run consumption levels exactly when we introduce EMSs, that is strategic interactions and endogenous entry.

The dynamic inefficiency result emerges in the presence of competition in quantities in the market when the agents are extremely patient. In such a case, agents save a lot, which leads to excessive investments in business creation and to the proliferation of too many small firms. Consider the particular case of firms producing homogenous goods: the creation of new firms is a poor way to



increase production (relative to an increase in the individual production of the existing firms), since it requires a pure waste of resources in fixed costs of entry. Because of this waste, consumers could be better off reducing their savings to increase current consumption without reducing long run consumption. A similar phenomenon takes place in the competition for the market: savings are wasted in excessive creation of firms duplicating investments in R&D to replace each other, and a reallocation of resources could increase current consumption without penalizing long run growth. Of course, when investment creates steady growth, the damages of the inefficiency of the market structure are quite dramatic. Countries characterized by excessively small firms could grow at higher rates if they experienced a process of concentration leading to larger firms. Summarizing, we have:

PRINCIPLE 5. IN THE LONG RUN, THE EMSs CAN BE CHARACTERIZED BY DYNAMIC INEFFICIENCY IN TERMS OF EXCESSIVE SAVINGS AND TOO MANY SMALL FIRMS ACTIVE IN THE COMPETITION IN THE MARKET AND FOR THE MARKET.

### 5.1 Italian SMEs: too much of a good thing?

While the problem of the size of firms may appear a theoretical curiosity rather than a concrete threat, a possible example of this pathology in the mechanism of business creation has emerged in a country traditionally characterized by a high savings rate and whose growth performance has been quite poor in the last two decades: Italy. The industrial structure of this country has been traditionally characterized by a large number of SMEs whose innovative capacity is quite limited (compared to larger corporations) and whose focus, in the last two decades, has gradually moved away from the top high-tech sectors (at least relative to other developed countries). The reasons for the lack of growth in the size of Italian firms have been usually associated with the family-based structure of Italian capitalism or with credit rationing problems, but the endogenous tendency toward small innovative firms suggested here may be part of the story (also because one of the possible solutions, that is R&D subsidization, has been always limited in Italy compared to other Western countries).

It is probably not by chance that the Italian endogenous response (without proper equivalents around the world) to this problem has been the coordination of some innovative activities through “*industrial districts*”, that is organizations of multiple SMEs from the same sector, typically located in the same geographical area, to invest in R&D and other productivity enhancing activities on a larger scale.<sup>35</sup>

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<sup>35</sup>Notice, however, that the lack of large corporations in high-tech sectors is also a problem in other European countries compared to the United States.

## 6 Fiscal Policy

The departure from a perfectly competitive environment and the emergence of inefficiencies lead naturally to a new role for fiscal policy in the EMSs approach. For instance, as a consequence of the dynamic inefficiency emphasized in the previous section and due to excessive investment in business creation, our theory suggests that it would be optimal to correct this steady state distortion with a production subsidy that leads firms to increase their individual production, and an R&D subsidy that leads firms to invest more in innovative activities. The former instrument should be associated with a wage subsidy to implement the optimal allocation of resources (investment and labor) in the competition in the market. The latter instrument should be associated with an appropriate capital income or profit taxation, or with an appropriate entry fee/subsidy to target the right number of firms active in the innovative activity and reach the optimal growth rate.

However, fiscal policy plays a more interesting role outside of the steady state (Bilbiie *et al.*, 2008a). The reason is that, contrary to a New-Keynesian environment where firms behave as independent monopolists, strategic interactions and endogenous entry lead to a complex impact of the fiscal tools along the transition path to the steady state. In particular, fiscal policy needs to change along the gradual process of entry because the inefficiencies in the allocation of resources are deeper when the number of firms is low and they are smaller when the number of firms is closer to the efficient level. The same efficient number of firms trades off the advantages of increased product variety and quality with the disadvantages of the costs of business creation. When competition in the market is still characterized by a small number of firms it is optimal to subsidize production and labor supply, or to reduce sales taxes and wage taxes. Since the number of firms is positively correlated with output along the transition path and over the business cycle, this implies that fiscal policy and also the optimal tax rates should be countercyclical.

Apparently, the result on the countercyclicity of the optimal fiscal policy is in line with a wide consensus in both the neoclassical and Keynesian approaches. However, here it derives from different reasons and it has more radical implications.

In the Keynesian approach it is the stabilizing role of government intervention on the demand side that leads to a countercyclical fiscal policy implemented with deficit spending in recessions and budget surpluses in boom (Keynes, 1936). In the neoclassical approach, a countercyclical fiscal policy is the result of the principle of tax smoothing, for which constant tax rates are optimal to minimize the tax distortions on the supply side, so that the public deficit increases in recessions and decreases in booms (Barro, 1979).

In the EMSs approach the distortions are endogenously induced by the strategic interactions and by entry choices in decentralized markets, they get worse in recession when competition is weaker, and they are reduced in boom,

when competition is stronger. Therefore, the optimal fiscal policy minimizes these market distortions with an expansive role that must be stronger in recession and weaker in boom (under both lump sum taxes and distortive taxes). In other words, the optimal fiscal policy has to minimize the market distortions rather than the tax distortions, and it has also to stabilize the economy through the supply side rather than the demand side. Finally, the optimal tax rates on sales and labor income should be reduced during recessions and increased during booms: this result on countercyclical tax rates is in contrast with the traditional tax smoothing principle and in favor of an active policy on the supply side. We can summarize these results as follows:

**PRINCIPLE 6. THE OPTIMAL FISCAL POLICY REQUIRES COUNTERCYCLICAL TAXES ON PRODUCTION AND LABOR, R&D SUBSIDIES AND CAPITAL INCOME TAXATION.**

The general necessity of capital income taxation or profit taxation emerges in an endogenous growth context, where fiscal policy has to target both the efficient EMSs and the efficient long run growth rate. This result is in radical contrast with one of the main policy prescriptions of the neoclassical model, for which steady state capital income taxation should be zero. In the neoclassical framework the taxation of the return on capital affects the marginal productivity of capital and distorts capital accumulation, therefore it is optimal to avoid it in the long run. In the presence of EMSs, the taxation of capital income affects the net return of investment in business creation, and a reduction of this return obtained through this form of taxation is beneficial when decentralized entry is excessive and needs to be limited.

## **6.1 Fiscal policy in the U.S. and the E.U.**

In the last decades U.S. fiscal policy has been often used in a countercyclical way, leading to surpluses during booms and deficits during recessionary phases. The most recent examples were the tax cut adopted by Bush at the beginning of 2008 and the recovery plan adopted by Obama at the beginning of 2009, the largest American fiscal stimulus package of all times.

At the beginning of 2008 the widespread dispersion of credit risk and the unclear effects of the subprime crisis on the financial institutions reduced the incentives to invest and to demand (and obtain) credit. Commercial papers for the finance of corporate business (mainly firms' working capital) collapsed,<sup>36</sup> leading to negative implications for business and job creation. The risks of further impact on the real economy and the real estate downturn were primary determinants of the Economic Stimulus Act signed by the Bush Administration. This \$152 billion package introduced tax rebates to low- and middle-income

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<sup>36</sup>Between the third quarters of 2007 and 2008 U.S. nominal GDP was still growing by 3.4 %, but commercial paper outstanding was decreasing by 25 %.

U.S. taxpayers and tax incentives to stimulate investment, and it relaxed prudential controls over government-sponsored mortgage lenders with the purpose of keeping real estate finance flowing. Unfortunately, the margins to stimulate aggregate demand were quite limited. Given the high current account deficit of the U.S. and the weak Dollar of the time, the only chance for such a fiscal package to stimulate the economy was by gradually restoring the incentives to create new business or to export. This did not happen because, as we have seen, the financial crisis got worse in the second half of 2008.

In front of such a dramatic scenario, the new President Barack Obama has launched a massive Recovery Plan of \$ 787 billion spread over 2009 to 2013, including mainly new public spending in education, health care, energy and infrastructures, a tax cut, an expansion of unemployment benefits and other social welfare provisions. The American Recovery and Reinvestment Act is clearly inspired by a Keynesian philosophy and aimed at raising aggregate domestic demand at the cost of increasing the public deficit (and adopting some protectionist measures, as “Buy American” policies). The problem is that given the already high propensity to consume of the American citizens, an additional stimulus to private consumption may be partially ineffective: rather than spending, most Americans will simply repay their debts or start saving. It is true that a plan of additional public spending may increase aggregate demand, but on one side the associated additional burden of public debt may crowd out part of this increase, and on the other side the marginal return of additional public spending may be quite low in terms of business creation (relative to the return of private spending). Finally, it takes time before a fiscal stimulus exerts any impact on the economy, especially when largely based on long run public investments.

The IMF estimates that the size of the U.S. stimulus directly active in 2009 should be at least 2 % of GDP: together with the rescue packages financed by the government, this expansionary fiscal policy is expected to increase the U.S. public deficit beyond 13 % of GDP in 2009, and to substantially increase American public debt toward 100 % of GDP for the years to come. In spite of such an impressive and unprecedented policy of deficit spending, we doubt that this will be the key factor to trigger a quick recovery. Even if the financial crisis has not eroded the physical capital or affected productivity, we believe that an expansion of the aggregate demand alone is not going to bring production back to its full-employment level in a short time (contrary to what both the Keynesian approach and the neoclassical approach may suggest). The reason is that the structure of the aggregate supply changes during a recession: when net business creation falls, when firms restrict production, when market structures become more concentrated and mark ups tend to increase, then the supply side is not going to satisfy anymore the same full-employment level of production as before. It takes time and further investments to recover the earlier supply levels, and a simple demand-based fiscal policy cannot succeed alone in the short term: there is the need for a supply-based fiscal policy.

Under the current conditions, we believe that it would have been better

to focus the stimulus more on private investment, in particular enhancing the incentives to create new business. The U.S. have been consuming more than they were producing for more than a decade thanks to substantial imports: this imbalance needs to be cured by increasing production and exports (and not by decreasing imports with passive protectionist measures). Fiscal incentives for new enterprises, lower sales taxes and corporate taxes, export subsidies and R&D subsidies would have a better chance to promote the recovery in this moment.

As well known, continental Europe is characterized by a larger role of the government compared to the U.S., a richer (but sometimes less efficient) welfare state, stronger automatic stabilizers and more rigid labor markets with stronger unions. For this and other reasons, including differences in the political systems, the role of discretionary fiscal policy for stabilization purposes has been sometimes more limited. Moreover, the creation of the E.U. has set additional limits to the discretionality of national governments in adopting countercyclical fiscal policies (even if their rigid implementation has been avoided in the last years). The same E.U. has a limited spending capability and a limited role in coordinating fiscal policies, a role that would have been precious during the current crisis, as many observers have noticed. The reaction of European governments to the recession has been weaker than in the U.S., with small stimulus packages in France and Italy (respectively 0.7 % and 0.2 % of GDP) and larger ones in Spain (1.1 %), United Kingdom (1.4 %) and Germany (1.5 %), but this does not take into account the role of automatic stabilizers:<sup>37</sup> therefore, also the European fiscal expansion has been in line with traditional Keynesian prescriptions of a substantial deficit spending.<sup>38</sup>

Most European packages are mainly focused on supporting aggregate demand through new investments in domestic public infrastructures and support to domestic firms in bad conditions. Also in this case, limited attention has been given to the support of business creation and we are not aware of any attempt to reduce tax rates on the supply side even temporarily.

The IMF has calculated that more than a trillion Dollars will be concretely invested in stimulus packages worldwide during 2009 - much more has been (and probably will be) promised for the following years also in a coordinated manner. To have an idea of the size of these efforts, notice that 2008 worldwide nominal GDP is estimated in \$ 78 trillion, of which 18.9 produced in the European Union, 14.3 in the United States, 4.8 in Japan, 4.2 in China, 1.7 in Russia

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<sup>37</sup>Data are from the IMF and refer to planned interventions directly aimed at stimulating the recovery in 2009. Large stimulus packages have been implemented also in Saudi Arabia (3.3 % of GDP), China (2.0 %), Canada (1.5 %), South Korea (1.5 %) and Japan (1.4 %) but with more to come, in spite of the world largest debt-GDP ratio, above 170 %. Of course, additional (coordinated) efforts may emerge during the rest of the year.

<sup>38</sup>Overall, public finances are going to largely deteriorate since 2009, with public deficits expected well beyond the Maastricht limit of 3 % of GDP: around 10 % in U.K., Ireland and Spain (where, however, initial debt levels are low compared to the Maastricht limit of 60 % of GDP), and on average above 5 % in the Euroarea.

and Brasil, 1.6 in Canada, 1.2 in India, 1.1 in Mexico and one trillion Dollars in Australia.<sup>39</sup> This means that from a global perspective we are in front of a stimulus package of more than 1 % of world GDP, a percentage that may increase in the next months, possibly through international fiscal coordination. However, we believe that the large size of this unprecedented global stimulus is not a sufficient condition to trigger the recovery. What matters is the way this money will be spent, whether to push aggregate demand and public investments only (as now seems to be the case), or also to boost aggregate supply, business creation and trade.

## 6.2 A supply-based fiscal policy

The EMSs approach suggests exactly the necessity of an intervention on the supply side rather than on the demand side during recessions. According to the conventional wisdom, when the market activity declines one can stimulate the aggregate demand by artificially augmenting private and public spending, so as to force firms to produce more. This is the typical recipe given by (Keynesian) economists, but there is an alternative way to look at the problem and find solutions. Loosely speaking, market demand increases not only when available income is higher, but also when prices are lower (relative to the wages), that is when the mark ups are lower. In a world of constant mark ups (as the neoclassical one with perfect competition or the New-Keynesian one with monopolistic firms) a mark up reduction can never occur, but in a world with endogenous mark ups and entry this can happen whenever policy stimulates business creation. Any policy aimed at promoting entry and innovation is going to strengthen competition, reduce the mark ups and increase the real wages. This increases the aggregate supply and attracts demand. In front of the limited success of policies aimed at supporting aggregate demand to promote the recovery, we may start thinking seriously about policies aimed at supporting aggregate supply.

Fiscal policy can promote business creation acting either on expected profitability or on the fixed costs of entry. On the first element, one can act on corporate taxes, capital income taxation and other taxes whose incidence is born by the production side, including production and labor taxation. In particular, a heavy but temporary reduction of the indirect taxation on sales and direct taxation on profits could generate substantial positive effects on consumption and profits, and therefore on entry and production, and could induce significant reductions of the mark ups. Moreover, the impact on the economy of these tax

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<sup>39</sup>Data are from CIA World Factbook updated on March 19 at the official exchange rate. Within Europe, Germany has an estimated GDP of \$ 3.8 trillion, France 3, U.K. 2.8, Italy 2.4 and Spain 1.7. The differences are smaller after adjusting for PPP: the E.U. remains the largest world market with \$ 15 trillion, followed by U.S. with 14.6, China with 7.8 and India with 3.3 (as a consequence of the current crisis, we expect that the catch up of China on U.S. will occur at the beginning of the twenties, at least in PPP terms).

cuts could be quite rapid, as opposed to the slow impact of increases in public spending (especially for infrastructures) and of cuts on general income taxes. On the second element of the supply side, the fixed costs of business creation, one can act on subsidies for business creation, on temporary reductions of regulatory constraints to new business activities, especially in key sectors (as the construction sector), on temporary tax exemptions for new SMEs, on R&D subsidies aimed at promoting new and innovative products and on export subsidies aimed at extending business activities abroad.

The need for a supply-based fiscal policy is by no means new. However, it has been largely neglected in macroeconomic theory, which has been often biased toward a demand-based fiscal policy in the Keynesian tradition (which assumes a flat aggregate supply equation) or toward a neutral tax smoothing policy in the neoclassical tradition (which assumes a fixed aggregate supply and limits the scope of fiscal policy to the minimization of tax distortions). In front of the policy ineffectiveness of repeated plans of fiscal stimulus based on support to the aggregate demand, it could be useful to point out the opportunity of a larger, and maybe complementary, support to the aggregate supply.

## 7 Monetary Policy

The neoclassical approach to monetary policy in a frictionless economy generates the neutrality of inflation for the real economy and suggests the optimality of a zero nominal interest rate associated with a negative inflation rate and a negative growth rate of money supply (Friedman, 1968). The New-Keynesian literature has shown that in the presence of monopolistic behavior by an exogenous number of firms and nominal rigidities in price-setting, the real allocation of resources is affected by inflation (see Mankiw, 1985, and Blanchard and Kiyotaki, 1987). In this environment, the optimal policy requires monetary authorities to actively manage the nominal interest rate committing to a rule that links the latter to inflationary expectations and the output gap, as in the Taylor rule (see Taylor, 1993, and Rotemberg and Woodford, 1997).

When the structure of the markets is endogenous, inflation and monetary policy have new roles compared to those emerging under monopolistic behavior by an exogenous number of firms. In particular, nominal rigidities affect the real profits of each firm with consequences both on the strategic interactions between them and, most of all, on the process of entry of new firms. The EMSs approach has emphasized static and dynamic consequences of this, studying the role of monetary shocks on the economy and revisiting the characterization of the optimal monetary policy.

The basic principle can be summarized as follows:

**PRINCIPLE 7. THE OPTIMAL MONETARY POLICY HAS TO IMPLEMENT THE INFLATION RATE WHICH MINIMIZES THE DISTORTIONS ON THE PROCESS OF**

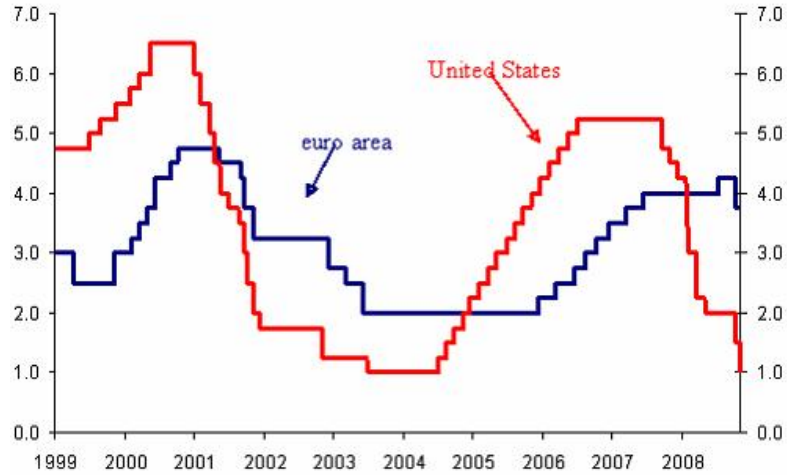


Figure 7: Official interest rates of Fed and ECB (January 1999 - November 2008).

BUSINESS CREATION DUE THE NEGATIVE EFFECT OF NOMINAL RIGIDITIES ON THE EXPECTED PROFITS.

The new role of inflation and, consequently, of monetary policy emerges in a basic general equilibrium framework where inflation acts as a distortionary tax on firms profits and biases the allocation of resources between production of goods and business creation against the latter (Bilbiie *et al.*,a, 2008b). Under these conditions, as long as fiscal policy can take care of the inefficiencies in the market structures, the optimal monetary policy should simply avoid mark up non-synchronization by implementing producer price stability (while leaving the mismeasured consumer price index to fluctuate because of the endogenous entry process).

Moreover, the EMSs approach could be useful also to study optimal monetary policy along the business cycle in the absence of optimal fiscal policy. Then, during recessions monetary policy should stimulate entry (which is below the optimal level) through reductions of the nominal and real interest rates aimed at increasing the (stock market) value of firms and promoting investments in business creation, and during booms it should limit excessive investments in business entry with a tight monetary policy. In practice, since output stabilization requires the stabilization of the entry process and, therefore, of the (stock market) value of the firms, we suggest that including equity price stabilization in the targets of the monetary authority could be useful (indeed many central



banks have been occasionally active in the stock market with this purpose in the last years).

When growth is endogenous and depends on technological progress, inflation plays a similar role in distorting the business creation process, but it now leads to more radical consequences. In a Schumpeterian world, what drives the aggregate investment of the firms in R&D is the profitability of the future innovations, which depends on the level of protection of the intellectual property rights, but also on the appropriability of the rents from innovation through profit maximizing strategies. When nominal price changes are costly, profit maximizing strategies cannot be implemented in a systematic way. Firms choose mark ups that are increasing in the expected rate of inflation between the current price adjustment and the next one, but their profits are gradually eroded until that adjustment occurs. Even if the negative impact on the real profits is small because price adjustments are frequent, this impact affects negatively the incentives to invest for all the firms, reducing long run growth. Of course, this induces a non-negligible impact on the aggregate economy over time: accordingly, non-zero inflation decreases the rate of technological progress with permanent consequences on welfare. Therefore, when the objective is simply to maximize growth, price stabilization is optimal.

More generally, the distorsive role of inflation on the incentives to invest in R&D induces an inverse-U relation between inflation and growth: in particular, and in line with the evidence, for moderate and high levels of inflation, the growth rate is decreasing in the inflation rate because the incentives to invest in innovation are reduced. Notice that, when the decentralized rate of growth under price stabilization is not optimal (as typically is the case), and there are distortions that cannot be fully eliminated through the fiscal incentives, a non-zero rate of inflation can be welfare maximizing. This outcome is more realistic since Central Banks around the world, including the Fed and the ECB, target low but positive inflation rates, and not zero inflation.

## **7.1 Monetary policy in the U.S. and the E.U.**

In the last two decades most monetary authorities have formally committed to anti-inflationary policies, often adopting explicit inflation targets. Nevertheless, some of them have been also engaged in policies that were clearly aimed at output stabilization. These policies have been typically implemented through increases in the nominal interest rates in front of inflationary expectations and reductions of the same rates in front of reductions of the inflation. According to the leading view, when the reactions of the nominal interest rates are strong enough (according to the Taylor rule, a 1.5 % change of the interest rate for a 1 % change of the inflation rate), they affect the real economy through the impact on the real interest rate (which is the difference between nominal rates and expected inflation). For instance, in front of increased inflationary expectations, a temporary increase of the nominal interest rate, which increases the real

interest rate as well, is expected to reduce current consumption (and investment in business creation), which slows down the economy and tends to reduce the inflation. On the other side, in front of a slowdown of the economy, a reduction of the interest rates is expected to promote consumption (and business creation) so as to trigger the recovery.

With the Chairman Alan Greenspan and his follower Ben Bernanke, the U.S. Federal Reserve has been quite active in the stabilization of the American economy,<sup>40</sup> implementing a tight monetary policy in booms and an expansionary one in recessions. For instance, a drastic reduction of the interest rates has been implemented in the aftermath of September 11, and another one during the last two years to contrast the current recession, arriving to nominal rates close to zero (see Fig. 7). After reaching this lower bound of the interest rate policy (nominal interest rates cannot be negative), a further expansionary policy requires a direct increase of money supply. Therefore, the Fed has implemented a form of “credit easing” by pumping new liquidity into markets. In the last months, it has expanded its discount operations in particular with the creation of special loan facilities (as the Term Asset-Backed Loan Facility), has issued direct injections of capital into the main banks,<sup>41</sup> some of which are still in troubles, has promoted direct lending from government-sponsored enterprises and has bought corporate debt. The hope is that this aggressive intervention will manage to re-start the process of investment and business creation, and with it the recovery.

Following the Fed, all the main central banks have reduced their nominal interest rates. The Bank of England, led by Mervin King, has been the first monetary authority to announce a policy of “quantitative easing”, that is to buy long-term government bonds (for planned £ 75 billion) and, at the beginning of March, it launched a reverse auction with investors as sellers, rather than buyers, of U.K. “gilts” to the central bank. In mid March, also the Fed announced it would buy long term U.S. Treasury bonds (starting with \$ 300 billion). The European Central Bank, led by Jean-Claude Trichet, has reduced the interest rates in a less aggressive way (see Fig. 6.7), and has not adopted forms of unconventional monetary policy until now. In particular, the European monetary authority has not been engaged in outright purchases of private securities or unsecured lending to the private sector<sup>42</sup> or in purchases of public debt, but has adopted a different approach: it makes available unlimited credit to banks at the official rate (at 1.5 % at the time of writing) with short term maturities (up to six months at the time of writing). This credit is provided

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<sup>40</sup>See Greenspan (2007) for a fascinating account of his reaction to the stock market crashes of 1987, 1998 and 2001.

<sup>41</sup>Bank of America, Citigroup, JP Morgan Chase, Goldman Sachs, Morgan Stanley, Bank of New York Mellon and Wells Fargo.

<sup>42</sup>The rationale behind this has probably to do with the different structure of the European financial system compared to the Anglosaxon one: European firms and households rely more on banks than on capital markets, so it is better to lend freely to banks so as to help capital lending rates rather than to lower the cost of capital in securities markets.

against eligible euro-denominated collateral defined in a very liberal way, so that there is a large short-term liquidity in the Euroarea and the unsecured overnight interbank rate is quite close to the American one. As a result, money supply has been growing at substantially high rates, especially for the Dollar and the Pound. Nevertheless, at the time of writing monetary policy appears to have no traction at all on the real economy.

In front of the apparent resistance of the real economy to react to these forms of monetary stimulus, two are the possible motivations. The simplest one is that after all monetary policy is not as effective as New-Keynesian theory would claim, for instance because the reactions of the monetary authorities are by now fully expected and already discounted, and therefore cannot be effective (Lucas, 1972; Sargent and Wallace, 1975): if this is the case and the real economy follows its path in a way that is largely independent from monetary actions, central banks should focus on controlling the inflation rate around a favorite level, rather than taking the risk of creating undesired inflation in the medium run. The alternative hypothesis is that a suboptimal policy has been implemented. According to many economists,<sup>43</sup> during the last decade the Fed set excessively low interest rates compared to the optimal Taylor rule, and did not contrast the equity boom at the end of the 90s with a properly tight policy. This would have been at the roots of the current crisis inducing excessive debt and risk taking within the economy and generating the well known problems of the financial sector. Moreover, the low interest rates kept penalizing savings and postponing a solution to the current account deficit problem, which remains a critical aspect of the American situation. On the top of this, the Fed is now increasing money supply at a very high rate, which may create substantial inflation and depreciation of the Dollar in the medium term (see Section 9), and may also change the role of the central bank in harmful ways in the absence of a quick recovery. According to John Taylor, “the success of monetary policy during the great moderation period of long expansions and mild recessions was not due to large discretionary interventions, but to following predictable policies and guidelines that worked.”<sup>44</sup>

Contrary to the Fed, the European Central Bank has traditionally followed a less aggressive management of the interest rates to stabilize the economy, paying much more attention to the control of inflation in the Euro area. Even at the beginning of the financial crisis, European rates remained above the American rates for a while. Only during 2008, when residual inflationary pressures were over, the European monetary authority has started reducing the interest rates to contrast the recession, and a policy of quantitative easing has not been adopted yet. This is not surprising for a more heterogenous area where opposite shocks often occur in different member countries and where the monetary authority is largely independent (and not even backed) from fiscal authorities. The European

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<sup>43</sup>See Taylor (2009).

<sup>44</sup>*Financial Times*, “The Threat posed by Ballooning Federal Reserves”, March 24th, 2009, p. 9.

Central Bank may contemplate following the Fed and the Bank of England to buy private securities or even government bonds (and it would be politically hard to decide which member countries' bonds to purchase), but only in case of a further deterioration of the recession and concrete possibilities of deflation.

Many economists have claimed that the current recession undermines the relevance of the neoclassical approach to macroeconomics and can only be explained within the (New-)Keynesian approach. However, we believe that the real test of the Keynesian approach will emerge from the success or the failure of the demand-based policies that are currently implemented to trigger the recovery, both on the fiscal and monetary front. As of now, the results are poor, exactly as they have been during the "lost decade" of ineffective expansionary fiscal and monetary policies in Japan. Time will give its verdict.

## 8 Trade Policy

The implications of the EMSs approach for trade policy are against many forms of passive protectionism, including import tariffs and quotas, which are aimed at restricting trade volumes. However, under certain conditions, they are in favor of what could be called an active protectionism, based on strategic export promotion, which may distort trade, but does not restrict trade volumes.

Our analysis of trade policy confirms that positive import tariffs represent the optimal unilateral policy for the domestic market both in the traditional case of an exogenous number of firms and in the case of an endogenous number of firms competing in the domestic market. In both cases, the optimal tariff tends to zero under perfect competition, that is when the (exogenous or endogenous) number of firms increases. In this sense, the qualitative predictions of the neoclassical trade policy are not changed by the endogeneity of the market structures. Neither are the standard critiques to these predictions: import tariffs often lead to retaliation, and equilibria with multiple countries adopting tariffs and quotas end up reducing the gains from trade. Passive protectionism ultimately hurts global welfare.

In spite of this, under certain conditions, the EMSs approach supports active forms of promotion of domestic firms in the international competition, as export promotion, export subsidies, R&D subsidies and protection of intellectual property rights for the exporting firms. It is interesting to focus on this novel aspect starting from the rationale for export subsidies.

What is the optimal trade policy with respect to exporting firms? How much should we invest to promote international demand of domestic products? There is a lot of debate about these questions between policymakers. This is not surprising since also at a theoretical level there are not clear or unambiguous answers. Common wisdom on the benefits of export subsidization largely departs from the implications of trade theory. While export promotion is often seen as welfare enhancing at least in the short run and often supported

by governments, theory is hardly in favor of its direct or indirect implementation. In the standard neoclassical approach with perfect competition, the scope of trade policy is to improve the terms of trade, that is the price of exports relative to the price of imports, and, as long as a country is large enough to affect the terms of trade, it is optimal to tax exports (since this is equivalent to set a tariff on imports). In case of imperfect competition, a second aim of strategic trade policy is to shift profits toward the domestic firms. Therefore, a large body of literature, started by Brander and Spencer (1985) and Eaton and Grossman (1986), has studied international markets with a fixed number of firms to determine the optimal profit-shifting policy. Also in this case the optimal unilateral policy is an export tax under price competition, because the tax induces the domestic firm to increase its price and relax competition, which augments its profits more than enough to compensate for the social cost of the subsidy. Under quantity competition, an export subsidy could be optimal, but only under restrictive conditions (on demand and on the number of domestic firms).

Even if the World Trade Organization forbids export subsidies (except for agriculture), different forms of direct or indirect export promotion are widespread. Governments strongly support exporting firms, they often hide forms of export promotion behind nationalistic pride, and consider the conquer of larger market shares abroad as a positive achievement in itself. The E.U. coordinates trade between its members and the rest of the world in a similar spirit, and subsidizes exports of agricultural products and the aircraft industry (Airbus is probably one of the main examples of strategic trade policy). France supports its “national champions” with public funding. Italy has a long tradition of public support of the “Made in Italy”. Japan has adopted a policy of targeted export promotion through its Ministry of Economy, Industry and Trade. Korea and other East-Asian countries have implemented export promoting policies for decades. Heavily protected South-American countries have tried to subsidize manufactured products in which they could develop a comparative advantage (and not only those). Even U.S. has implemented strong forms of export subsidization through tax exemptions for a fraction of export profits, foreign tax credit and export credit subsidies.

The EMSs approach provides a new theoretical argument for the general optimality of export subsidies whenever the domestic firms compete in international markets where entry is endogenous (notice that free entry is a realistic assumption since a foreign country without a domestic firm in the market can only gain from allowing entry of international firms). Under EMSs, export subsidization becomes the best unilateral policy under quantity and price competition. The intuition is simple. While firms are playing some kind of competition in the foreign market, the government can always give a strategic advantage to its domestic firms with an appropriate policy. When entry is endogenous, an export tax would lead the domestic firms to increase their prices or to reduce their production levels. On impact, this would induce the other firms to increase their

prices or production levels respectively, so as to increase their profits. However, the increase of these profits would attract entry *ex ante* until any extraprofits were eliminated. As a result of this, the domestic firms would end up worse off and the policy would fail. To the contrary, it is optimal to adopt a policy that induces the domestic firms to be aggressive, that is to expand production or (equivalently) reduce prices. This behavior limits entry of international competitors and increases the market shares of the domestic firms. Such an outcome can only be induced by subsidizing exports. Etro (2010) has derived the optimal unilateral subsidy under different market conditions. It turns out that the optimal subsidy is inversely related to the elasticity of foreign demand: ironically, when goods are homogenous the optimal export subsidy is identical (but with an opposite sign) to the optimal export tax emerging in the neoclassical trade theory. In both cases, the distortions due to the policy increase with demand elasticity, therefore high elasticity recommends lower intervention. However, the neoclassical policy is aimed at increasing the price of exports, while the policy recommended by the EMSs approach is aimed at decreasing the price of exports.

The general lesson about trade policy can be summarized as follows:

PRINCIPLE 8. THE OPTIMAL UNILATERAL TRADE POLICY HAS TO PROMOTE DOMESTIC FIRMS COMPETING WITH FOREIGN ONES THROUGH EXPORT SUBSIDIES UNDER ANY FORM OF COMPETITION (WITH THE OPTIMAL EXPORT SUBSIDY WHICH IS INVERSELY PROPORTIONAL TO THE ELASTICITY OF FOREIGN DEMAND).

### 8.1 Against passive protectionism, in favor of export subsidies

As we have seen, the EMSs approach does not provide support for passive protectionism in the form of import tariffs or other trade restrictions, but it is in favor of export subsidies (and not generic state aid) because they do not restrict trade volumes, but they actually tend to increase them. The same argument can be applied to other forms of indirect export promotion, as policies which boost demand or decrease transport costs for the exporting firms: as long as these policies increase the marginal profitability of the domestic firms, there is a strategic incentive to use them unilaterally. Ultimately, the scope of export policy is just to conquer market shares abroad and shift profits from firms of other countries towards domestic firms. If we interpret globalization as the opening up of new markets to international competition we can restate the main principle as follows: in a globalized world, there are strong strategic incentives to conquer market shares abroad by promoting exports and adopting forms of active protectionism. The positive aspect of the latter is that it does not restrict trade, but it actually promotes it.

According to the World Trade Organization, the volume of world trade in merchandising is expected to fall by 9 % during 2009, the largest decline since

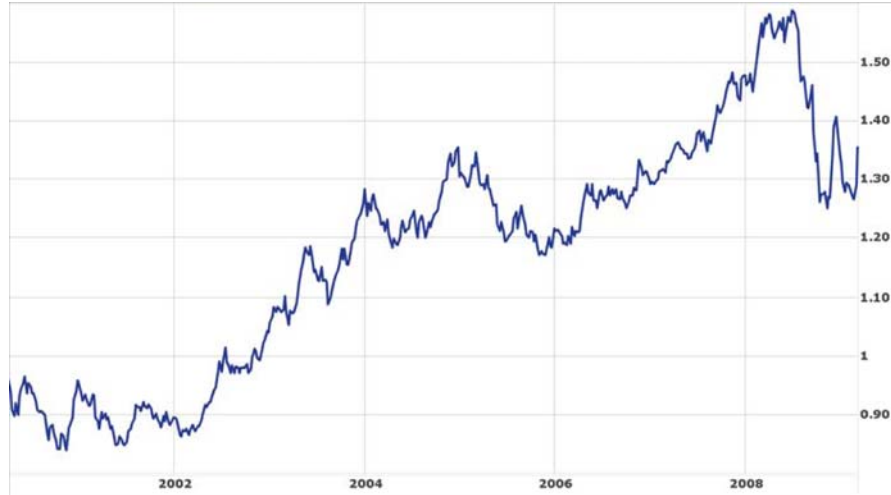


Figure 8: Euro-Dollar nominal exchange rate (January 2000-March 2009).

World War II. Meanwhile, passive protectionism is rising and the fear is that it may aggravate the crisis, as it happened in the Great Depression, when the American Smoot-Hawley Act of 1930 increased U.S. import duties and provoked widespread retaliation, which reduced global trade by a quarter. Notice that at that time trade was less developed and was mainly inter-industry trade, while today it represents a larger fraction of GDP and it is mainly intra-industry trade: this leads to a deeper interdependence of economies and worse consequences of import tariffs and other forms of passive protectionism. We believe that in a period of crisis and globalization backlash as the current one there is an additional reason why certain forms of export promoting policies for high-tech and differentiated products could be welcome.<sup>45</sup> They would redirect the protectionist tendencies away from the adoption of import tariffs and quotas, toward a form of intervention (export subsidies) that can revitalize intra-industry trade and help the recovery.

The typical argument against foreign export subsidies is that subsidized foreign firms exert unfair competition against unsubsidized domestic firms. This sounds quite similar to the typical argument in favor of passive protectionism: since more cost-efficient foreign firms exert unfair competition toward less cost-efficient domestic firms, we should adopt import tariffs. We believe that both

<sup>45</sup>Notice that the WTO allows export subsidies for agricultural goods, that are usually homogeneous goods traded under perfect competition. We recommend the opposite policy: forbid (or at least reduce gradually) export subsidies in inter-industry trade and allow those in intra-industry trade.

arguments are flawed. In both cases, subsidized or more efficient foreign firms end up selling goods at lower prices with clear gains for the domestic consumers. The only difference is that in the former case foreign governments are paying for those gains, and in the latter case foreign workers are receiving lower wages to provide those gains: ultimately the costs are abroad and the gains are at home. Therefore, adopting import tariffs or forbidding export subsidies simply reduces consumer welfare to protect domestic profits. It is quite surprising that many economists and the same World Trade Organization keep condemning both import tariffs and export subsidies as if they were equivalent policies.

## 9 Exchange Rate Policy

In a fixed exchange rate regime, governments undertake occasional devaluations with the specific aim of supporting the competitiveness of domestic firms in international markets: for this reason we talk about competitive devaluations. In a flexible exchange rate regime this is not possible, but for the same reasons a depreciation of the nominal exchange rate, due for instance to an expansionary monetary policy, is expected to support the competitiveness of domestic firms exporting abroad.

In spite of this common wisdom, economic theory has been rather ambiguous on the role of the nominal exchange rate. In the frictionless neoclassical macroeconomic approach, exchange rate policy is neutral just like monetary policy, and it cannot affect real variables. In the Keynesian approach, as long as the devaluation improves the trade balance in the medium-long run, it boosts aggregate demand with an expansionary effect on the domestic country and possibly a negative effect on the trading partners. The result is confirmed within the modern approach of the New Open Economy Macroeconomics (Obstfeld and Rogoff, 1996), but not even under all circumstances (a devaluation could be even welfare decreasing when the reduction in the purchasing power of the domestic agents is strong enough). Finally, partial equilibrium models of competition in international markets with firms engaged in pricing to market (Dornbusch, 1987) show that devaluations can start price wars between firms active in different countries, which ultimately leads to lower profits for all of them. The intuition for the last mechanism is simple: after a devaluation, exporters reduce their prices in foreign currency thanks to the better exchange rate, but this induces their rivals to do the same in order to defend their market shares and profitability, with the consequence that all the firms end up with reduced prices and profits.

In front of these contrasting theoretical positions it is difficult to make sense of the common wisdom according to which devaluations provide a positive strategic advantage on the international markets with net benefits for the devaluating country. However, the EMSs approach provides a consistent rationale for this common wisdom by evaluating the strategic incentives to implement



exchange rate devaluations in a scenario where the incidence of exchange rate variations on prices is endogenous.

To obtain a comprehensive understanding of the impact of exchange rate variations on market structures, we need to briefly review the role of exchange rates in affecting market competition. Imagine first a market in a foreign country in which international firms produce and compete with independent production units. This is typical of multinationals which are directly active in other countries where they sell their products. Under price competition, this case of local currency pricing with market power implies no pass-through of nominal exchange rate variations on prices. In this situation, a devaluation is not going to affect the equilibrium in the foreign market. All firms would choose the same prices in foreign currency after a devaluation, but the profits of the domestic firm would be artificially increased in the domestic currency. The same would happen under quantity competition, since production decisions abroad would be independent from the exchange rate again, but profits in domestic currency would be inflated by a devaluation. From a welfare point of view, the gains in profits from such a devaluation should be compared with the losses for the society in terms of higher prices of the imports. More importantly, in this situation there is not a strategic incentive to implement a competitive devaluation: this policy does not give a real strategic advantage to the domestic firm in the foreign market but just artificially increases its profits.

A totally different situation occurs when all firms produce in their domestic country, bear production costs in domestic currency, choose their strategy taking into account the exchange rate and then export abroad (under price competition this corresponds to the case of producer currency pricing). Such a case is typical of SMEs which are active at a national level, often producing typical domestic products and exporting some of them abroad, but also of larger firms which are not directly active in the foreign market under consideration but sell their goods to distributors of this market. In this situation competitive devaluations are always desirable to provide a strategic advantage to domestic firms as long as entry in the international market is endogenous. The reason is that devaluations induce an aggressive behavior (lower prices or larger production) of the domestic firm in the international market, and this is the only way to shift positive profits at home when entry in those markets is endogenous. The domestic firm ends up with a larger market share and positive profits compared to the unsubsidized competitors. Finally, we need to remember that the competitive devaluation can be effective only in the short run, while inflation differentials tend to re-establish the situation pre-devaluation in the long run.

In a world where exchange rates fluctuate freely, our results need to be reinterpreted. In such a world, a depreciation of the domestic currency, due to any international or monetary reason, has a strategic impact on the exporting firms. Consider the likely case in which these firms export in foreign markets whose access is open to any international firm. As a consequence of the depreciation, the domestic firms are always led to reduce their prices in foreign currency, because

the prices earned in domestic currency have been artificially increased and these firms can always earn more profits by reducing mark ups a bit to gain a larger market share. Some international firms will try to follow this price cut and the average mark ups in the industry will go down, with a consequent reduction in the number of firms able to remain in the market. Nevertheless, the domestic firms manage to earn larger profits in domestic currency thanks to the increase of their market shares.<sup>46</sup> The same identical result follows if firms compete in quantities: the domestic firms increase their production because the marginal revenues in domestic currency are higher, they gain market shares and earn more profits. More generally, depreciations provide a strategic advantage to the exporters under any market conditions as long as entry in the international markets is endogenous, and they always increase exports and market shares of the domestic firms in these markets. Of course, this has a positive effect on the trade balance and on the current account, at least in the short run, before inflation differentials neutralize the impact of the depreciation.

We can summarize our results as follows:

**PRINCIPLE 9. IN THE SHORT RUN, A DEVALUATION OR A DEPRECIATION OF THE EXCHANGE RATE INCREASES MARKET SHARES AND PROFITS OF THE DOMESTIC FIRMS COMPETING IN INTERNATIONAL MARKETS WITH ENDOGENOUS ENTRY AND INCREASES ALWAYS DOMESTIC WELFARE.**

## 9.1 The depreciation of the Dollar

An immediate application of our discussion on exchange rates concerns the effects of the depreciation of the Dollar between 2002 and 2008 (see Fig. 8). This started in the aftermath of the terrorist attack of September 11, 2001 and was strengthened by the expansionary monetary policy implemented first by Greenspan and later by Bernanke to contrast the downturn of the economy, especially during the first part of 2008, when the reduction of the U.S. interest rates compared to the European rates (Fig. 7), and a general tendency of the international central banks to diversify their monetary reserves contributed to weaken the Dollar in favor of the Euro.

The initial consequence of the depreciation of the Dollar was that U.S. firms could reduce their prices in foreign markets and gain market shares, sometimes inducing the exit of other firms from those markets. Meanwhile, European firms were forced to increase their prices in the U.S. and loose market shares, or to maintain similar prices and reduce their effective mark ups. In markets where firms price to market, price differentials between the same goods sold in Europe

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<sup>46</sup>The reader should keep in mind that in the absence of endogenous entry, the opposite result occurs: a depreciation leads the domestic firms to reduce their prices, which induces a price war in the foreign market. As long as entry is exogenous, the ultimate effect is simply to reduce profits for all the firms. Therefore, a depreciation would hurt exporters.

and the U.S. became substantial.<sup>47</sup>

At the aggregate level, the depreciation of the Dollar was slowly contributing to promote U.S. exports and reduce the huge American current account deficit, from a high of 6% of GDP in 2005 to 3.3% in the third quarter of 2008. However, the process of depreciation of the Dollar was inverted in the second half of 2008, when the ECB started reducing the interest rates to face the crisis.

The current global scenario is characterized by a dichotomy between two groups of countries. On one side U.S. and U.K. (with few other European countries including Spain) running current account deficits that are driven by trade balance deficits and now also by huge public deficits. On the other side, countries as Germany, China, Japan and other energy-exporting countries running large surpluses, led by trade balance surpluses and now only partially reduced by larger public deficits (see Fig. 9). The first group of countries has been characterized by low (or negative) saving rates of the private sector that only now are increasing, the second group by consistently high saving rates. This dichotomy has worked fine until recently, with net savers/exporters on one side financing net investors/importers on the other side, but such an unbalance may create sustainability problems now. Especially if deficit spending is stronger in the group of countries running current account deficits, as it appears to be the case.

To have an idea of the substantial difference between these groups, notice that in the last years U.S. household consumption was above 70 % of GDP, while Chinese consumption was about 35 % of GDP. There are good reasons for which the largest country (U.S.) can specialize in technological investments and import final goods from the rest of the world while running a current account deficit. However, this cannot go on forever, in particular while another country (China) is growing at a much higher rate through excessive saving rates (probably beyond the border of dynamic inefficiency), and is expected to become the largest economy in the near future.

In front of the current situation, we need further international policy coordination (possibly with a bigger role for a reorganized IMF) or even rethinking the international monetary system. However, without substantial policy changes, the main correcting factor could be the exchange rate. As of now, U.S. and U.K. are implementing a massive monetary expansion, much stronger than in Europe. While the recession is now depressing prices and in the short run prices are expected to be stable, in the medium run this policy may create heavy inflationary

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<sup>47</sup>This is the case of luxury cars. In the summer of 2008, a new Porsche Carrera Convertible sold in the U.S. at about 94,000 \$, could be bought in Europe (where it is produced) at about 106,000 €. At the exchange rate of 2002 the two prices would have been approximately equivalent, but at the moment of maximal depreciation of the Dollar, the differential was about 45,000 €! The same happened for other cars sent from the other side of the Atlantic: the price differential was 56,000 € for an Aston Martin DB9 and 40,000 € for a Maserati Gran Turismo. European car makers could have increased their U.S. prices, but they would have lost market shares: their best option was to sacrifice profits temporarily and wait for the depreciation of the Euro.

pressures in both the U.S. and the U.K. This may lead to further depreciation of the Dollar and the Pound, which in turn may finally increase U.S. exports and reduce the global unbalance. In such a case, two scenarios are possible for the medium and long term, and they are equally likely as of now.

In the first (positive) scenario, we will arrive at inflationary pressures with an ongoing recovery of the real economy and of the stock market, which will boost both investment in business creation and consumption: this may be an easy way out from the recession because interest rates and taxes could be gradually increased to avoid excessive inflation and to keep public finances under control. However, notice that we may end up in a quite different world from the one we are used to: without U.S. imports driving foreign growth, but possibly with a pro-active role for Europe, which is now the largest integrated market in the world, and, mainly, with a new role for the emerging China, and especially for Chinese consumption and for Chinese investments in the Chinese economy (rather than in the American one, as in the last decade).

In the second (negative) scenario, the stock market will fail to recover and investments and consumption will remain weak while inflationary pressures emerge, leaving the monetary and fiscal authorities with two options. The first one will be to fight inflation back (and increase taxes to keep debt under control) so as to fall in another recessionary phase before recovering. The second one will be to inflate the economy and reduce both private and public debt by means of inflation. Also in this case, the growth model based on U.S. imports from the rest of the world will have to change drastically.

However, there is a third scenario for the medium term, which is less likely, but that we need to take into account. This is a scenario with an appreciated Dollar and a recovering stock market, with an American demand-based fiscal policy that artificially sustains a weak boom while increasing U.S. public and foreign debt, and with European and Chinese economies unable to drive global growth (respectively through innovations or expanding consumption rates). However, it is unlikely that such an unstable scenario could last for long.

## 10 Innovation and Competition Policy

The main message of the EMSs approach to the macroeconomy is that the structures of the markets and their determinants (of technological, behavioral, strategic and policy nature) are crucial for the evolution of the aggregate economy. For this reason industrial policy, including 1) innovation policy affecting competition *for* the markets and 2) antitrust policy affecting competition *in* the markets, must be taken in consideration when evaluating the general macroeconomic policy. This becomes more important for markets whose efficiency has a direct impact on other markets and whose technological progress is a main driver of the entire economy, namely high-tech markets.

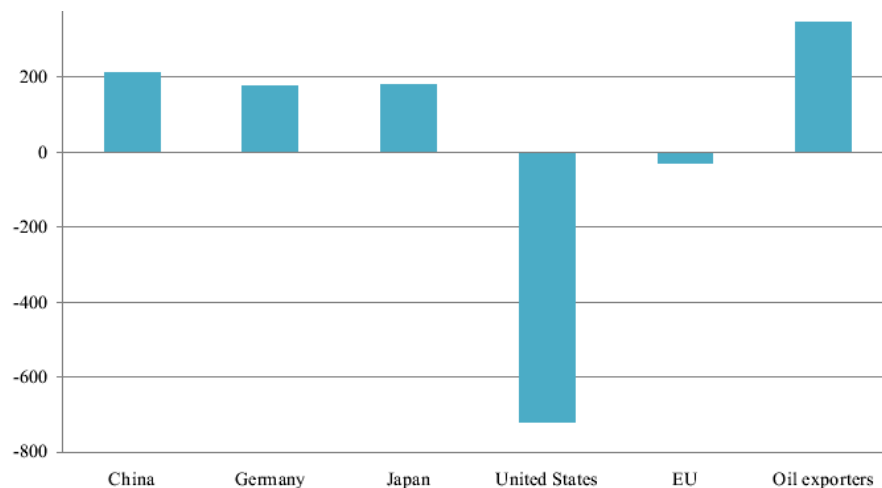


Figure 9: World payment imbalances in Billions of U.S. \$ (Average 2004-2007). Source: Di Noia and Micossi (2009)

We have already encountered a number of results concerning industrial policy. It is now time to put them together and draw the implications for the policies aimed at enhancing efficiency and growth in the global economy. The basic principle emerging from the EMSs approach can be stated as follows:

**PRINCIPLE 10. THE OPTIMAL INDUSTRIAL POLICY HAS TO PROMOTE ENTRY IN THE COMPETITION IN AND FOR THE MARKETS, SUBSIDIZE R&D AND PROTECT IPRs.**

In the following subsections we will briefly comment on innovation and competition policy issues, topics on which we have extensively discussed in Etro (2007,a, Ch. 5) and on which we return here.

## 10.1 Innovation policy and coordination

The general need to subsidize R&D and to protect IPRs departs from the ambiguous results of the traditional theory of Schumpeterian growth and derives from a result that we have emphasized repeatedly: in the presence of EMSs, firms tend to invest too little in innovation and they tend to be engaged in excessive duplication of their investments. This result is independent from the aggregate size of the investment in innovation, which could be above or below the efficient level: in either case, the organization of R&D could be made more efficient concentrating it in larger firms that invest more in innovation. R&D

subsidies and a stronger protection of the IPRs can achieve the same outcome, but they do it in a different way and they should both be used.

A second implication of the analysis of EMSs in the competition for the market is that incumbent leaders tend to invest more than their rivals when they face a strong entry pressure. This leads them to innovate more frequently, to persist in their leadership position and to drive the growth process. Understanding the nature of this phenomenon is crucial to implement the proper industrial policy toward market leaders of dynamic sectors. Contrary to a populist ideology, the EMSs approach has shown that the protection of IPRs is fundamental to promote sequential innovations, because it strengthens the incentives to invest by both the incumbent leaders and the followers. Therefore, a policy discriminating against the IPRs of persistent leaders can have deleterious consequences on the aggregate incentives to invest in R&D.<sup>48</sup>

R&D policy becomes even more important in a global perspective. When firms compete for international markets, their investments generate global growth, but each country tends to free ride in the implementation of the optimal R&D policy. This happens because each country subsidizes unilaterally its domestic firms with the purpose of shifting expected profits toward home and not with the purpose of promoting global growth. Alternatively, countries tend to protect more the IPRs of the domestic firms than those of the foreign ones, sometimes with a discriminatory use of antitrust policy. These tendencies lead to suboptimal investments in new technologies at the global level.

International coordination for the protection of IPRs and the coordination of fiscal policies to promote R&D are required to improve the allocation of resources at the global level. While some countries have been trying to coordinate the support of R&D activities at a supra-national level, heterogeneities in policy views and lack of binding commitments have undermined these efforts (in the case of the European Union, think of the Lisbon Agenda or the attempts to harmonize patent protection between the member states). Nevertheless, further coordination for the protection of IPRs could enhance the global incentives to invest in R&D in a substantial way. Additional delegation to an international organization may be difficult because there are still different views on innovation policy (with the U.S. much more in favor of the strengthening of IPRs protection than the E.U.). However, as in the case of other forms of coordination, it would be efficient to establish international standards for R&D promotion and subsidization, probably at the level of the TRIP agreements, leaving individual countries to do more.

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<sup>48</sup>Nevertheless, a major economist as Stiglitz (2006) keeps being in favor of firm specific policies, claiming that a solution to the “problem” of the persistence of the leadership of Microsoft in the software market “might involve limiting Microsoft’s intellectual property protection for its operating system to, say, three years. That would provide strong incentives for it to provide innovations of the kind that users value and for which they would be willing to pay. If it failed to innovate, others could innovate off its old operating system - it would become a free platform, on top of which innovations in applications could be built”. It can be extremely dangerous to neglect the aggregate consequences of this kind of policies.

## 10.2 Competition policy in the U.S. and the E.U.

The promotion of competition in the market and the reduction of entry barriers are crucial elements for the proper functioning of market economies and become particularly important in a period of crisis, when tendencies to relax competition and increase mark ups emerge naturally.

Antitrust policy plays a fundamental role in this sense, especially with its action to deter collusive behavior aimed at increasing mark ups and to stop mergers that can be detrimental to future competition.<sup>49</sup> On this front both the American and European antitrust authorities have adopted a similar and wise approach, focusing on markets characterized by barriers to entry and not on markets where endogenous entry forces can neutralize attempts to exercise market power. It is important to notice that the borderline between price-fixing and merger cases that do and do not require intervention is not an absolute one, but it depends on the macroeconomic conditions: in times of crisis, especially when dealing with failing firms, antitrust intervention should be reduced.<sup>50</sup>

The main differences between U.S. and E.U. industrial policy emerge in the general approach to market dominance and in the antitrust treatment of monopolization issues, which are extremely important not only for their impact on the effectiveness of competition, but also for their possible interference with aggressive competition (which is often borderline with abusive practices) and with innovation policy (which must protect some degree of market power to guarantee the proper incentives). The different approaches are well illustrated by the report issued by the US Department of Justice in September 2008, “Competition and Monopoly: Single-Firm Conduct under Section 2 of the Sherman Act”, and the “Guidance on the Commission’s Enforcement Priorities in Applying Article 82 to Abusive Exclusionary Conduct”, issued by the European Commission three months later. These documents contain the general principles that guide the two authorities in deciding which cases to pursue and how to deal with specific types of conducts.

The American approach emerging from the Report is aimed at the defense of the competitive process both in principle and in practice, reflecting “a national commitment to the use of free markets to allocate resources efficiently and to spur the innovation that is the principal source of economic growth.” The analysis of dominance pays a lot of attention on the limits imposed by endogenous entry, emphasizing the role of entry pressure in disciplining market leaders in spite of their large market shares. The Report provides an enlightening exam-

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<sup>49</sup>European coordination involves an additional aspect which is quite important in a period of crisis, the control of government intervention that limits competition in the European markets.

<sup>50</sup>Nevertheless, the crisis has made clear that there is a particular market, the financial market, where deregulation has been excessive. This market requires new rules at the global level, at least to coordinate general principles of micro-prudential regulation (concerning capital requirements, management incentives, and information disclosure) and a proper supervision of the international financial markets.

ple which is in perfect accordance with the implications of the EMSs approach: “Suppose a large firm competes with a fringe of small rivals, all producing a homogenous product. In this situation, the large firm’s market share is only one determinant of its market power over price ... if the fringe firms can readily and substantially increase production at their existing plants in response to a small increase in the large firm’s price (that is if the fringe supply is highly elastic), a decision by the large firm to restrict output may have no effect on market prices.”

More in general, the Report recognizes the poor correlation that can exist between market share and market power, especially in high-tech sectors: “in markets characterized by rapid technological change, for example, a high market share of current sales or production may be consistent with the presence of robust competition over time rather than a sign of monopoly power. In those situations, any power a firm may have may be both temporary and essential to the competitive process.” As a consequence the U.S. Department of Justice adopts a non-intrusive role for antitrust policy in the competition in and for the markets. For instance, predatory pricing can be established only when recoupment is likely, that is only when entry is difficult once the market is monopolized. Moreover, the efficiency role of tying is recognized as a primary role (against a long-lasting hostility), especially for technological tying, “an area where enforcement intervention poses a particular risk of harming consumers more than it helps them in the long run. Technological tying often efficiently gives consumers features they want and judicial control of product design risks chilling innovation.” Finally, the Report marginalizes also the need for intervention in case of a refusal to supply, because “forcing a competitor with monopoly power to deal with rivals can undermine the incentives of either or both to innovate” and because “judges and enforcement agencies are ill-equipped to set and supervise the terms on which inputs, property rights, or resources are provided”. In conclusion, the U.S. approach is based on the belief that competitive entry forces are the main constraints on the exercise of market power and when they are present antitrust intervention should be a marginal or residual necessity.<sup>51</sup>

The European approach is more interventionist.<sup>52</sup> The cited Guidance of the European Commission states the adoption of an “effect-based” approach that is aimed at maximizing consumer welfare and protecting an effective competitive process, and not simply competitors. There is an important new aspect in the Guidance, the emphasis given to the role of entry in determining whether a dominant position exists or not. The key element in the Guidance definition

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<sup>51</sup>The Report largely reflects the Chicago approach to antitrust that was prevailing during the Bush Administration. It is not entirely clear that the Obama Administration will adhere fully to the approach laid down in the Report. However, for a related point by a moderate leader of the so-called Harvard approach to antitrust, see Hovenkamp (2005).

<sup>52</sup>The rest of this section is based on the Opening Speech to the International Conference on the Recent Developments on Antitrust Policy and the Enforcement of Art. 82, organized by Intertic at the Autorità Garante della Concorrenza e del Mercato (Rome, March 6, 2009).



of dominance is the extent to which the firm can behave independently of its competitors, customers and consumers, which relates to the degree of competitive constraints exerted on this firm by the supply of actual competitors, by the threat of expansion of competitors and potential entrants and by the bargaining power of customers. Therefore, entry plays a crucial role and dominance should be incompatible with the presence of a threat of endogenous entry. In particular, a leader “can be deterred from increasing prices if expansion or entry is likely, timely and sufficient”, but it would be also important to recognize that the same entry can induce the leader to decrease its prices below those of the rivals, or to adopt other aggressive strategies, without any anti-competitive purpose, as the EMSs approach has made clear.

Beyond this, we have a strong concern on the way the positive premises of the Guidance are carried through its details. The defense of consumers is strongly emphasized in theory but not in practice: most of the focus of the Guidance is on the foreclosure of competitors and not on the relation between this and the harm to consumers, which is what should matter.

A related concern is about the nature of the foreclosure effects under the “effects-based” approach. The Guidance indicates that a key element of abuse is anti-competitive foreclosure, defined as “a situation where effective access of actual or potential competitors to supplies or markets is hampered or eliminated as a result of the conduct of the dominant undertaking” which is likely to profitably increase its prices with harm for the consumers. However, it is not entirely clear which facts are going to prove foreclosure and which not. For instance, consider a situation in which new competitors enter in the market and some competitors increase their market share to a significant extent: one would expect that this proves that the dominant company’s practice is not abusive, but not even this can be taken for granted on the basis of the E.U. Guidance (we provide an example below).

Another issue is about the standard of undistorted competition. As regards pricing abuses, the European approach introduces the “as efficient competitor” test: “the Commission will normally intervene where the conduct concerned has already been or is capable of hampering competition from competitors which are considered to be as efficient as the dominant undertaking”. However, the document introduces several exceptions to this principle (for instance, a dynamic view for which less efficient competitors may become as efficient in the future through network or learning effects), and the test does not apply to non-pricing abuses. This means that companies are left without a clear standard.

As a last issue we welcome the confirmation in the Guidance of an efficiency defense: a dominant firm may justify a conduct leading to foreclosure on the ground that efficiencies are sufficient to guarantee that consumers are not penalized. Now, while the consideration of efficiencies generated by a conduct is extremely important to re-direct antitrust policy toward the maximization of consumer welfare, in our view the Guidance appears to adopt a too vague approach and to make it hard, if not impossible, for dominant companies actually

to avail themselves of the efficiency defense. The main reason is that their verification appears to be postponed after the establishment of an anti-competitive foreclosure that harms consumers, and not during the decision on whether the same foreclosure harms consumers. Moreover, there appears to be a bias against the possibility that efficiencies can occur: for instance, technological tying is not even mentioned as a source of efficiency in tying cases, but it is actually considered a source of greater risk of anticompetitive foreclosure (because more costly to reverse).

Notice that, to assert a successful efficiency defense under the European framework, dominant firms will be required to show that there are no other less anticompetitive alternatives to achieve the claimed efficiencies. Does the current rule mean that a defense must be rejected if the conduct creates more efficiency gains than other conducts but is more restrictive on competitors? In other words, is it the size of the efficiencies that matters or what matters is the amount of restrictions imposed on competition to obtain those efficiencies? Imagine the dominant company trying to manage these various imponderables: it is much easier just to forego the conduct and, possibly, deprive consumers of an important benefit. Is that what competition policy is supposed to do?

Last, it is not clear why the possibility of an efficiency defense (and with it the possibility to enhance consumer welfare) is to be off-limits for an entire class of companies, as the Guidance makes clear when it states that an “exclusionary conduct which maintains, creates or strengthens a market position approaching that of a monopoly can normally not be justified on the grounds that it also creates efficiency gains”. It is positive that the Commission eliminated the reference to firms with a market share above seventy-five per cent which appeared in its 2005 document, but still, in our view, efficiencies should be assessed in the same manner in all cases, regardless of the defendant’s market share.

Finally, the new guidelines do not seem to reduce the amount of uncertainty that is associated with the move toward the rule of reason approach. For instance, the potential conflicts between IPRs protection and antitrust policy remain entirely unsolved: while the U.S. have taken a clear position against the possibility of compulsory licensing of IPRs, the E.U. approach still contemplates this possibility under vague conditions. This kind of uncertainty can be a source of inefficiency and distorted behavior, especially when decision rules are imperfect and subject to errors.<sup>53</sup> More in general, antitrust uncertainty on exclusionary strategies may deter genuinely competitive or innovative strategies to be adopted by leading firms, and therefore it may exert negative consequences on consumer welfare. Leading scholars of competition policy have noticed that “the welfare cost of this lack of clarity and excessive caution must be enormous to the E.U. economy as a whole - something the E.U. can ill-afford given its lack of competitiveness relative to other international blocks and the stated

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<sup>53</sup>The lack of legal certainty is particularly regrettable in a context of increasing punitive fines and important efforts by the Commission to increase the scope for private enforcement to complement public enforcement of E.U. competition law.

objectives of the Lisbon Agenda in this regard.”<sup>54</sup>

In conclusion, the E.U. competition policy remains largely linked to a naive version of the post-Chicago approach which is biased against market leaders and in favor of their competitors in a way that is largely unrelated to the real protection of consumers. The U.S. approach, closer to the principles of the Chicago school, has proved to be much more useful in promoting competition, business creation and innovation, especially in high-tech sectors.

### 10.3 Entry and competition in the browsers’ market

Elsewhere we have discussed a symptomatic example of the perverse E.U. approach to abuse of dominance issues, the Microsoft case on the tying of Windows MediaPlayer to the Windows operating system and the refusal to supply interoperability information protected by IPRs.<sup>55</sup> Since the Microsoft “saga” appears set to continue with an ongoing preliminary investigation by the European Commission on the bundling of the browser Internet Explorer (IE) with Windows, we return to this important issue for the evolution of the New Economy.<sup>56</sup>

For twelve years, Microsoft has distributed its operating system with IE and for eight of those twelve years, this has been done under a Consent Decree issued by the U.S. antitrust authorities. Alternative browsers can be easily installed on every PC and competition in the field is on the basis of quality and functionality, at least since the introduction of IE in the mid 90s led to a drop of the price to zero. In the recent years Mozilla’s Firefox has seen considerable success, with the gap between IE and Firefox’s respective market shares narrowing with every passing month (see Fig. 10 for world market shares). Opera and Safari have consolidated their market positions, while Google’s new Chrome quickly picked up a few percent of the global market following its launch in autumn of 2008. This tendency is even stronger in Europe, where the most recent data (from AT Internet Institute) show a large drop of IE’s market share, from about 80 % a few years ago to 66 % in January 2008 and 58 % in January 2009, while Firefox has been growing up to 28 % in January 2008 and 33% in January 2009, Opera reached respectively 3.2 % and 4.1 % and Safari 2.1 % and 3 % (with Chrome at 1.5 % in January 2009). Notice that the access to the Internet is now a fundamental component of any PC and it has promoted the rapid development of all the Internet markets, starting with online sales and online advertising. These kinds of markets represent the main engine of innovation, and in times of crisis they contract as well, though they remain crucial drivers of the economic recovery.

It is odd, to say the least, that the European Commission has decided at

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<sup>54</sup>O’Donoghue and Padilla (2006, xi).

<sup>55</sup>See Etro (2007,a, Ch. 6). On September 17, 2007 the Court of First Instance concluded the Appeal of the case and essentially upheld the 2004 Commission decision.

<sup>56</sup>This section is based on an article for the Italian newspaper *Libero* (“La Commissione UE ci Riprova con Gates. A Che Pro?” by F. Etro, *Libero Mercato*, January 23, 2009, p.11).

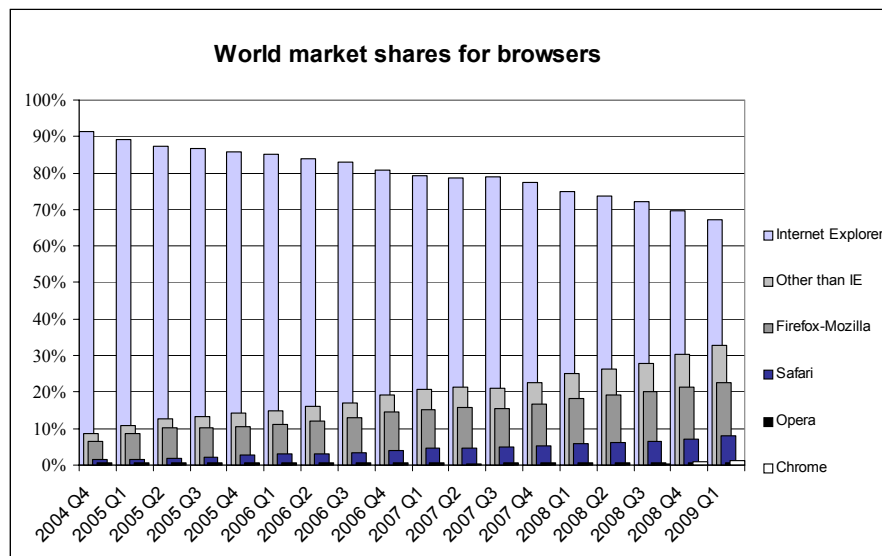


Figure 10: Market structure in the browser market (2004-2009). Source: our calculations on Net Applications data

this moment to pursue an investigation of Microsoft for abuse of dominance in connection with the integration of IE into Windows.<sup>57</sup> It is an issue already raised and solved in the U.S. Clearly, the Commission is applying the judgment rendered by the Court of First Instance in the earlier European case. In that case, Microsoft was accused of excluding competition in the market for media players and was forced to commercialize a new operating system without its media player - which, by the way, was not bought by anybody, except for a few hundred collectors. Today, the issue emerges with IE. As with media functionality, a domain that has seen a flourishing of competitors' products such as Apple's iTunes, despite the alleged anticompetitive conduct, the market for web browsers is marked by lively competition and a wide and easy diffusion (rather than foreclosure) of rival products. The market can be read as extremely competitive, with a leader in a primary market (Microsoft for operative systems) pressured by entry and innovation in a secondary market (browsers) to adopt aggressive strategies. These include tying of the two products to be sold at a very low price and heavy investments in R&D to preserve the leadership. The consequence has been a strong competitive and innovative pressure from other browser producers, with Firefox as the main alternative to IE, and important benefits accruing to consumers in terms of price, quality and product variety.

Moreover, there do not seem to be solid economic motivations in support of the Commission's thesis. It seems unlikely that Microsoft's strategy can have a predatory purpose because any increase in the price of IE is now unrealistic (meaning recoupment is impossible). Moreover, Microsoft mostly gains from the introduction and the diffusion of other browsers because this increases the quality of PCs and therefore the demand for Windows, its main product. Many users try different browsers before choosing their favorite one, and it is hard to imagine a more competitive scenario than this.<sup>58</sup> Finally, there are clear (technological) efficiencies from the design of an operating system including a browser, which, as a matter of fact, can be substituted with another one in a few seconds and freely. In conclusion, there are no reasons for which the tying of Windows and IE could harm consumers, whose interest (not the interest of the competitors) should drive antitrust policy.

If the Commission is going to pursue this direction, most likely it will fine Microsoft and force it to commercialize a new operating system without IE (which, as it happened for the one without media player, will not be bought by anybody) or with the option to install other browsers (saving few seconds of free download). Apparently, such an outcome would not have any impact on consumers, but the uncertainty on the freedom of innovation and efficient product integration could reduce the incentives to invest in R&D for Microsoft, for all the software companies producing applications for Windows and IE, and for

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<sup>57</sup>The original complaint was by the competitor Opera, later backed by Firefox and Google.

<sup>58</sup>Notice that the new version of Windows allows users to turn off applications such as Media Player and IE, avoiding any limit to the exclusive use of competing applications.

many other firms in similar situations, with harmful consequences for the future consumers. Moreover, a “must-carry” remedy would strengthen the dominance of Google as a search engine, since Mozilla and Opera are currently paid to pre-set Google as the default search engine, and original equipment manufacturers would be paid to do the same in the future, so as to limit competition in the market for online advertising even more.<sup>59</sup>

These results are not what we expect from policymaking aimed at promoting consumer welfare and growth, especially during a crisis that should suggest other priorities for policymaking.

## 11 Conclusions

In this survey we have applied the main principles of the EMSs approach to discuss three broad topics: the evolution of global markets of the New Economy and their endogenous structures (as for cloud computing, online advertising or browsers), the evolution of macroeconomic phenomena (as business creation, long run growth, globalization and innovation), and the prescriptions for policymakers (on macroeconomic policy, trade policy, innovation policy and competition policy).

With this mix of applications we want to make a key point: there is no way to understand the macroeconomy that does not start from the structure of the markets that belong to it, especially the high-tech and global markets whose shocks, innovations and exchanges are at the basis of economic fluctuations, growth and trade.

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<sup>59</sup>For this reason, Google is heavily supporting the investigation on Microsoft, while advertisers and content providers fear such a bonanza for Google.

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