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The inequality content of some of the Europe 2020 flagships

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GROWING INEQUALITIES' IMPACTS

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Executive summary¹

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The European Commission put forwards the strategy for the 2010-2020 period in the Europe 2020 Communication, an ambitious and modern programme of policies aimed at achieving smart, sustainable and inclusive growth. Inequality should be seen as a cornerstone of both sustainable and inclusive growth. In fact, unequal societies are also more unstable societies (i.e. unsustainable) and more polarized (i.e. exclusive).

The analysis of available data and the established consensus in the literature shows that:

1. Labour market effects of innovation are complex, but there is a consensus that technology increases inequality in labour market outcomes;
2. Technological output shows a high degree of persistence; organizational capabilities and accumulated knowledge are good predictors of innovativeness;
3. Financing of innovation is a bottleneck. However, innovativeness is not a good predictor of SMEs growth in terms of employees; although they play an important role in sustaining innovation, financial institutions may be driven and biased by stock market performances;
4. Although the single market is a strong asset, structural imbalances internal to the Euro Area are a serious problem that has not been solved yet.

Four main recommendations came out from this analysis:

1. The focus on the educational system is necessary to accomplish equity in the labour market. At the same time, it is not sufficient, since despite the recent massive reduction of educational inequality, wage inequality and the steepness of educational gradient of access to employment increased.
2. Smart specialization does not solve the problem of persistence of income differences across regions and countries, because there is a hierarchy of sectors in terms of productivity growth due to the difference in maturity across technological trajectories. At the moment, it

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is difficult to obtain results in terms of cohesion indicators unless strong public involvement in basic science is envisaged, with fully open and appropriable results;

3. Solving the problem of access to financing by innovative companies should go hand in hand with a careful implementation of regulatory checks to avoid the excesses which occurred in the US in the last twenty years, where new corporate governance based on short term targets have contributed to the increase of top income shares and the worsening of inequality;
4. Finally, structural imbalances inside the Euro Area are a serious fault line that should be taken into account. Cumulative external deficits drove massive inflows of capital, increase in asset prices that did not reflect fundamentals and financial crises. Although further scrutiny on causality is needed, this has been associated with increase in top income share.

Keywords: Inequality, top income, innovation

1. Introduction

According to the latest Eurostat data, the population at risk of poverty or social exclusion in Europe reached 119.6 million persons in 2011, up by around 300 thousand compared to 2007 (the last year before the crisis) but by almost 6 million compared to the trough in 2009.

The target defined in the Europe 2020 (European Commission, 2010c) strategy says that the number of people at risk of poverty or social exclusion should be reduced by 20 million. This is an ambitious target and it is certainly worth pursuing, in an area of the world where, despite recent turbulence, it has been possible to consolidate inclusive, less violent and more stable societies.

Inequality is a fundamental cornerstone of reaching this target. On the one hand, inequality is strictly intertwined with (relative) poverty. According to Eurostat data for 2011, the correlation between the at-risk of poverty rate and the Gini coefficient for net household disposable income is very high (0.75) and the correlation is very robust (it was around 0.70 in the 2007).

On the other hand, the fight against inequality should be seen as a key milestone of the Europe 2020 strategy, i.e. a fundamental instrument to reach a smart, sustainable and inclusive growth.

In fact, while inequality has been usually blamed for its societal effects, e.g. inducing higher crime rate, worse health outcome etc. (Wilkinson and Pickett, 2009), inequality has negative effects for the economy itself.

In the short run, higher inequality encourages higher access to debt, because the pattern of consumption tends to show much more inertia than income. As a matter of fact, the gap between the Gini coefficients of income and of consumption has increased in most of the countries in the pre-crisis period. In the USA, the gap between the two Gini coefficients was 0.01 in the 1980s and it has increased up to 0.05 in 2004.³ Access to debt, in the presence of difficulties to implement a correct screening, will result in a dangerous vicious cycle: unsustainable dynamics of assets prices, financial bubbles, weakening of the financial sector, the need for the State to take charge of it, pressure for financial consolidation, cut in expenditure and public services and subsequent further inequality increase.

³ Source: RED data, see Krueger et al. (2010). The pattern is generalized, as shown by Bogliacino and Maestri (2013).

According to Eurostat data, in the pre-crisis period (2000-2007), private debt has increased by 36 percentage points of GDP in Italy, by 49 points in Greece, by 93 points in Spain, by 67 points in Ireland (2001-2007), by 52 in Portugal, and by 60 points in Cyprus, all countries with a troublesome financial situation.

In the long run, inequality may hamper the incentives to invest in education and in other assets, lowering growth potential. It has been recently argued that the persistence of poverty might be due to internal constraints summing their negative effects to the external ones (Mookherjee, 2003). In other words, more unequal societies are also polarized societies, where the poor not only lacks access to credit and public services, but also may lack *the capacity to aspire* (Appadurai, 2004) since social mobility becomes less and less easy to accomplish. Indeed, according to OECD (2008), the ranking of countries in terms of intergeneration mobility mimics that of inequality.⁴

Finally, pointing out the importance of inequality means also addressing its various dimensions. While Gini coefficient is fully able to capture the change in distribution affecting the middle class, it is less sensible to changes occurring at the two tails. A recent data gathering on top income shares (Atkinson et al. 2011) has shown that in many countries the increase of inequality at the top has been sizable. As pointed out in Bogliacino and Maestri (2013), in the last three decades, the same increase occurred even in countries in which the Gini coefficient is stable or declining.

The possibility to appropriate a larger share of income may distort the incentives, inducing rent seeking activities by those at the top, putting pressure on the democratic system. The waste of resource in lobbying activities to promote changes in regulations and legislations has been denounced by many scholars (Stiglitz, 2012; Krugman, 2012; Reich, 2007).

⁴ See OECD (2008), Fig. 8.1. The data refer to the intergenerational elasticity of earnings, a measure of persistence across generations.

2. The policy instruments

Europe 2020 (European Commission, 2010c) created seven flagship initiatives, as channels towards accomplishment of the main targets of the strategy. Smart growth is pursued through initiatives oriented towards research and innovation (Innovation Union, Youth on the move, A digital agenda for Europe). Sustainable growth is pursued through competitiveness and resource efficiency (Resource efficient Europe, An industrial policy for the globalization Era). Finally, inclusive growth is pursued through the initiative in the labour market and on social exclusion (An agenda for new skills and new jobs, European platform against poverty).

The main communications identify priorities and actions and define intermediate steps and a very detailed strategy of measurement.

The key instruments can be summarized in the following basic points:

1. Improvement of enablers of innovation (human capital, financing and various specific forms of infrastructure);
2. Strengthening protection of intangible assets (research and development and patents);
3. Pursuing further the single market;
4. Emphasis on industrial modernization, though
 - a. New sectors;
 - b. Knowledge intensive activities;
 - c. Highly innovative Small and Medium Enterprises;
 - d. Resource efficiency;
5. Smart specialization as an instrument to improve cohesion and spread benefits of growth across regions.

These activities are complemented through the actions taken on the labour market and social exclusion fronts.

With regards to the former, the main emphasis is posed on the creation of new skills and on a more *fluid* matching between skills and tasks.

The strategy against social exclusion is based on a life cycle approach, with specific initiatives for children, working age population (oriented towards the access to employment) and elders. Additional effort is envisaged for the specific needs of migrants and minorities.

3. Expected consequences

3.1 The labour market effect of innovation

There are various channels through which innovation impacts on the distribution of income.

First of all, in the economic literature there has been a very large debate on the employment effect of innovation. Unemployment is a factor contributing to inequality, thus the possibility of technological unemployment may worsen the distribution. The likelihood of technological unemployment has been studied with specific emphasis on process innovation: firms introducing new machineries are pushed by the need to save on the most expensive factor (i.e. labour). At firm level, the impact on employment is positive since each company can grow at the expense of competitors, but at more aggregate level the impact is in principle uncertain (Van Reenen, 1997; Bogliacino and Pianta, 2010).

However, this is a direct effect: once the innovation has been introduced prices will move downwards, contributing to the expansion of demand (both of the good itself and of labour); moreover, those who enjoyed extra-rents will increase expenditure or investment, contributing to the reabsorption of the workforce expelled. The functioning of these compensatory mechanisms is complex and the final outcome is essentially an empirical issue, although for most of the literature the estimated impact is positive (Chennels and Van Reenen, 2002).

We should mention that the Innovation Union is more focused on generation of new technology (new products, R&D etc.), rather than on adoption (as in the case of machinery) and in this case the impact is deemed to be positive (Bogliacino and Vivarelli, 2012).

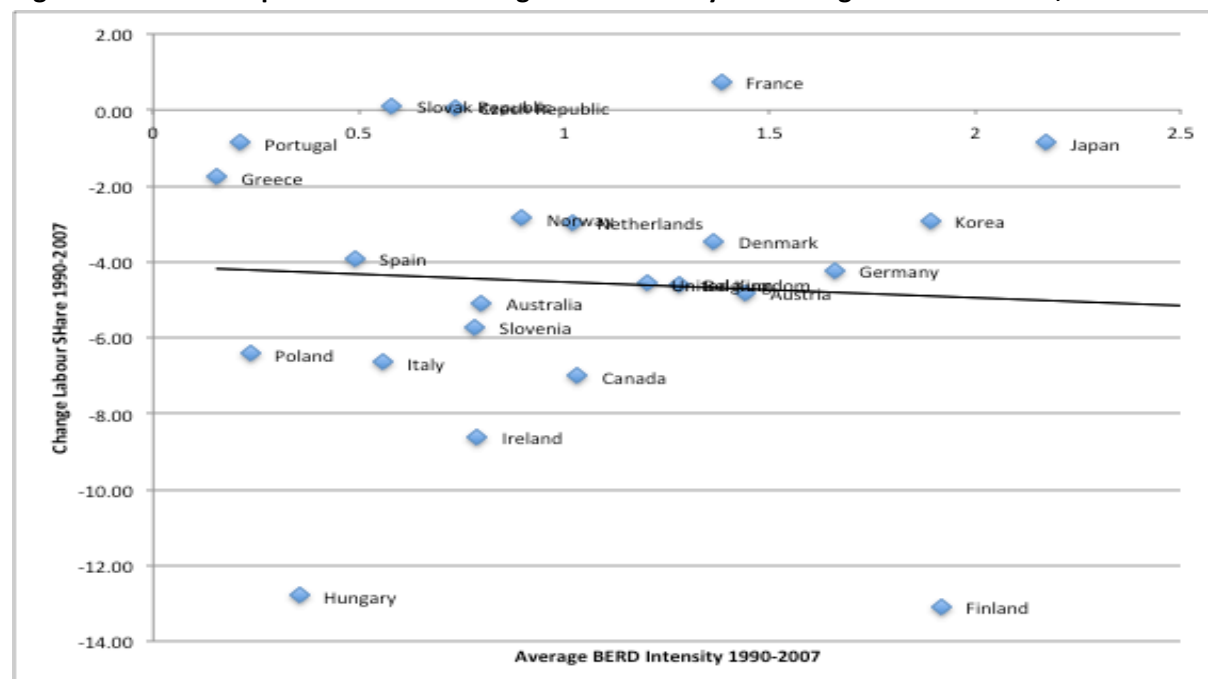
However, innovation is also related with other distributive variables: rents accruing to the individual firms will contribute to the enlargement of the capital share, which has been one of the main forces behind the increase of inequality in the decade between the mid-Nineties and the mid-2000s (OECD, 2011). Nevertheless, the relationship between Labour Share and R&D intensity is flat and non-significant at the aggregate level, as shown in Figure 1.

Finally, there is a sizable literature investigating the role of innovation in shaping the distribution of wages. The consensus in the academic circles is that technical change has determined an increase of the demand of skills. OECD (2011) estimates a positive effect of R&D intensity on the differential between the 9th and the 1st decile of earnings, after controlling for a number of other determinants. Various theories have been proposed to justify this stylized fact (Acemoglu, 2002; Acemoglu and

Autor, 2011). Using data from Eurostat it can be seen that countries with higher R&D intensities tend to have a reduced share of low wage jobs (Figure 1 and Figure 2). However, the graph shows a large cluster of countries for which R&D intensity is low and the labour market structure is very much different, suggesting that the main determinant stands elsewhere. Chennels and Van Reenen (2002) discuss the econometric evidence on the impact of technology on the relative demand for skilled workers concluding that the evidence of an inequality effect of technology is a robust cross country stylized fact.

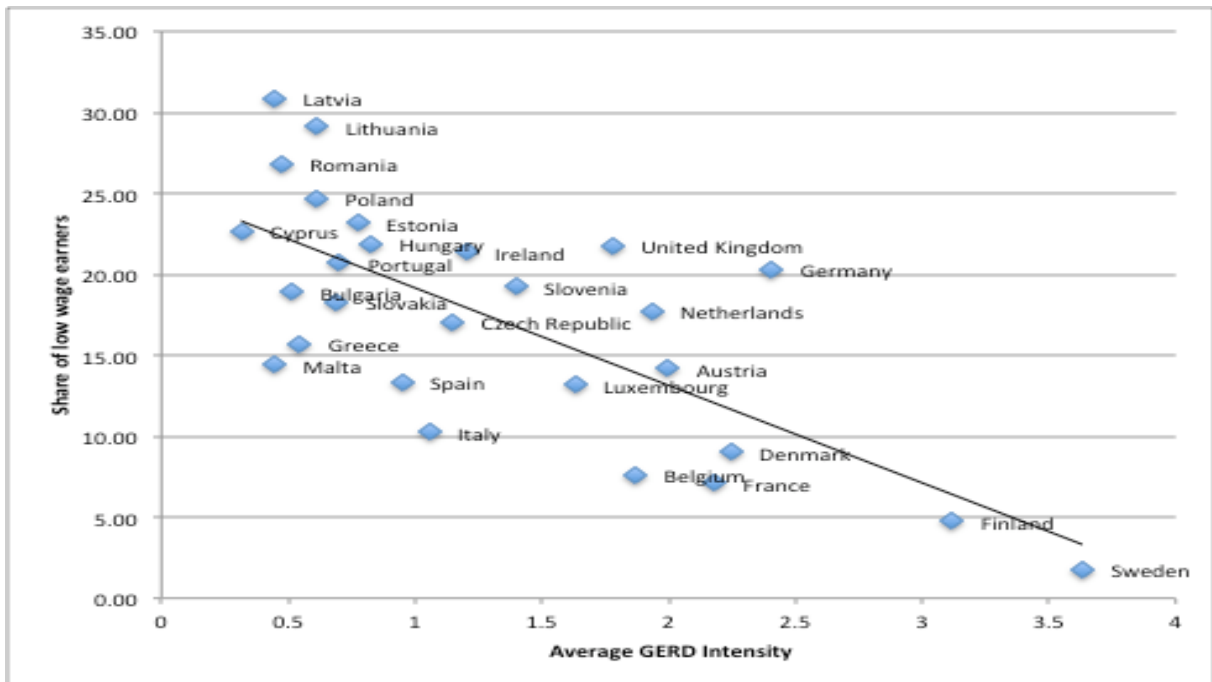
The Europe 2020 strategy is identifying the increase in the supply of skills as a fundamental instrument to contain disequilibrium on the labour market (European Commission, 2008). The rationale is that this increase will contain the effect of technology on wages. However, across OECD countries inequality in educational attainment has decreased and the output of the educational system increased everywhere (Ballarino et al. 2013), without being able to contain the dynamics of increasing wage inequality. In Figure 3 we plot data from Eurostat for the change in the tertiary education graduated (ISCED 5-6) per thousands population aged 20-29, and from OECD for the change in D9/D1 of earnings. As can be seen, when we calculate the relationship between the two variations, the coefficient is slightly positive (and most likely not statistically significant), confirming that education alone cannot be enough to offset the demand shift operated by research and innovation.

Figure 1: Relationship between the Average R&D intensity and change in labour share, 1990-2007



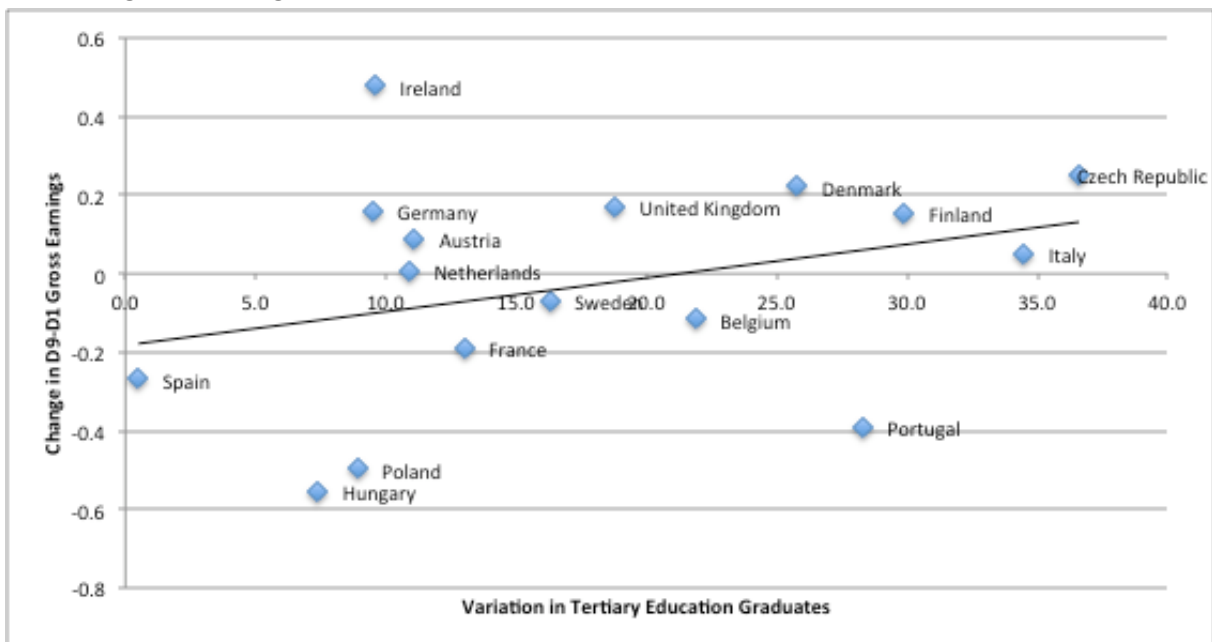
Source: OECD MSTI and OECD calculations based on OECD STAN and EUKLEMS. Note: Germany and Hungary: 1992; Czech Republic, Estonia, Greece, Poland, Slovak Republic and Slovenia: 1995. Canada: 2004; Korea and Portugal: 2005; Japan, Poland and Slovenia: 2006.

Figure 2: Average R&D intensity (1995-2006) and share of low wage earners in 2006 as a percentage of total employees.



Source: Eurostat.

Figure 3: Variation in Graduates (ISCED 5-6) per 1000 population (2000-2008) versus change in D9/D1 of gross earnings



Source: D9/D1 from OECD database, ISCED 5-6 graduates from Eurostat. Note: Austria (2004-2008), Spain (2004-2008), Netherlands (2000-2005), Poland (2005-2008), Portugal (2004-2008).

3.2 The risk of concentration

The strengthening of protection for intangibles assets is one of the core actions of the smart growth strategy. European Commission (2010a; 2010b) stress the need for a single market for ideas and a harmonization of national rules that include also a stronger enforcement of Intellectual Property Rights Rules (IPRs). “More effectively assignment, management, and use of intellectual property rights are the key to unleash the R&D and innovation efforts that are crucial for lasting competitiveness. Moreover, the assignment of these rights must go hand in hand with effective enforcement.” (European Commission, 2010b).

Although harmonization is necessary for a common business environment, the further strengthening of IPRs protection may in fact prevent cohesion among different areas. Intangibles assets are also tools to build barriers to entry (a patent is a monopoly) and the evidence of innovation persistence is overwhelming.

As a matter of fact, the correlation across years of patents application is extremely high, as shown in Figure 4.

. The reason why such persistence is observed is what in the economic jargon is called “increasing returns”. Technological trajectories are shaped by the accumulation of capabilities by individual agents and organizations. Entry and leapfrogging are likely in activities where the innovative domain is simple, whereas in sectors where the scientific content is significant they are very rare. In most of the case the innovative trajectories are built across the years and show a robust cumulative pattern (Cimoli et al. 2008).

In Table 1 we report the results of an econometric regression where the R&D intensity at sectoral level for 15 European countries is regressed over a measure of capabilities (estimated as the distance from the productivity frontier).⁵ The Table shows two main results: A one percent point increase in the distance from the frontier reduces the R&D intensity by 0.1%. The coefficient is similar to that of internal sources (operating surplus) that captures the problem of access to finance for innovative activities. As a result, countries and sectors that lag behind end up trapped in a dynamics of poor innovative performance, instead of catching up.

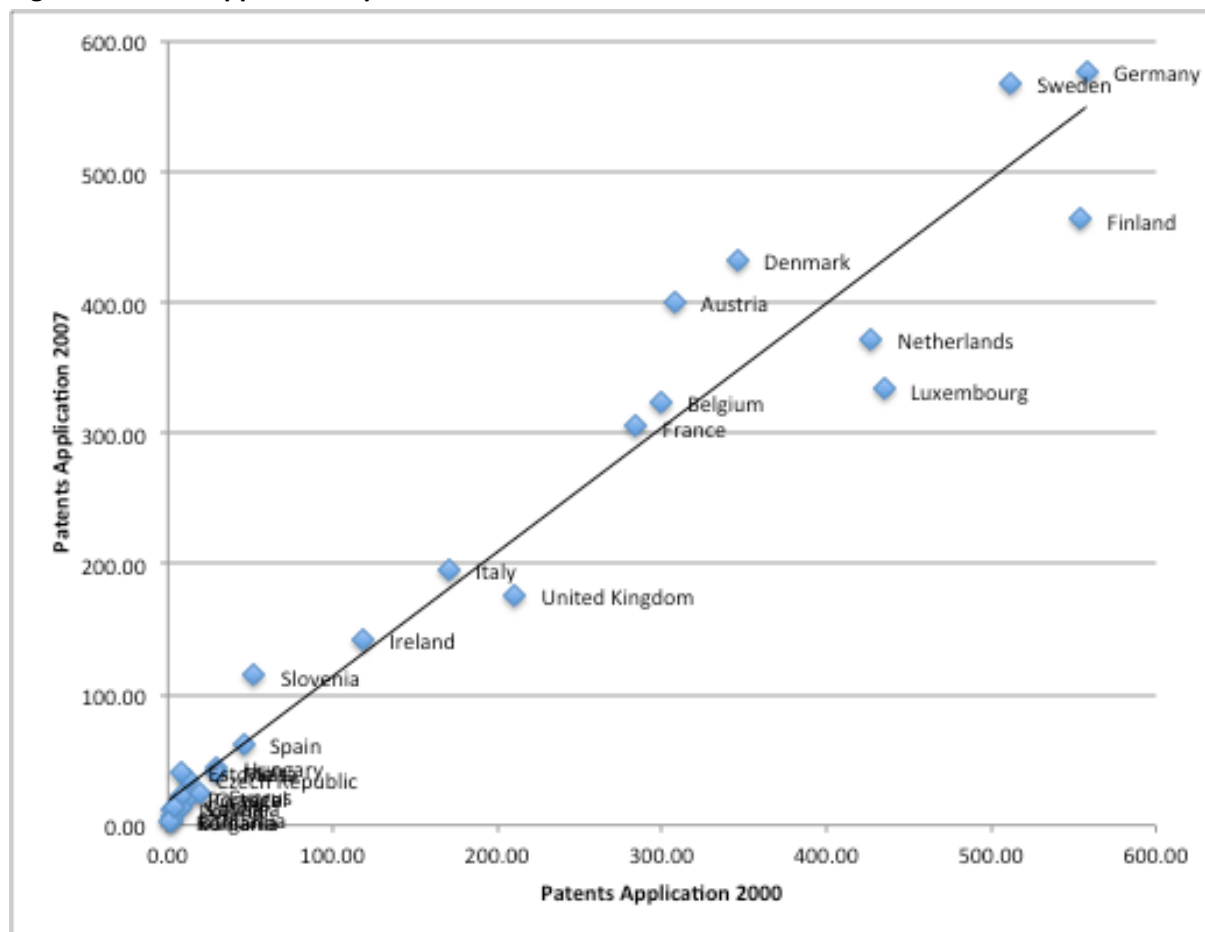
⁵ This is a replication exercise from Bogliacino and Gómez (2010). For a discussion of robustness of data, methodology and further results, the reader can see the original paper.

Table 1: Dependent variable: R&D per employee in log scale

	(1)	(2)
	GMM-SYS	GMM-SYS
First Lag	0.907 [0.036]***	0.907 [0.036]***
Distance from the frontier ^a	-0.100 [0.058]**	
Distance from the frontier ^b		-0.133 [0.060]**
Operating Surplus per employee in log scale	0.105 [0.046]**	0.107 [0.046]**
const.	1.098 [0.519]**	1.128 [0.523]**
Time dummies	Yes	Yes
N Obs	1793	1793
Hansen	32.74	32.99
p value	0.624	0.613
AR(1)	-3.90	-3.90
p value	0.000	0.000
AR(2)	0.13	0.13
p value	0.894	0.893

Source: OECD ANBERD and STAN, data at 2 digits ISIC code. Countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Netherlands, Portugal, Spain, Sweden and United Kingdom, 1996-2005. Notes: robust standard errors in brackets. GMM-SYS indicates the technique of estimation (Generalized Methods of Moments). First Lag stands for the lagged value of the dependent variable, ^a and ^b: distance to productivity frontier estimated through two alternative econometric formulations, respectively as a residual from a Cobb Douglas production function and a Translog production function. One, two and three stars indicate significance respectively at 10, 5 and 1 percent.

Figure 4: Patent applications per million labour force, 2007 and 2010.



Source: Eurostat

In presence of this persistence, further strengthening of Intellectual property Rights is likely to induce even higher persistence of innovative ranking across regions and countries. If this is the case, inequality will increase as a result of deepening of product per capita differences.

The Commission anticipated this risk and proposed a counterbalancing strategy based on *smart specialization*, a way to promote cohesion and to level up the playing field. However, implicit in the idea of smart specialization there is an assumption of symmetry across sectorial activities. This is not necessary the case, given that different sectors are associated to technological trajectories at different level of maturity, different pace of productivity growth and, inevitably, different time profile of wage growth.

In accordance with this principle, policies oriented towards enablers are certainly necessary, but given the time needed for private sectors to catch up, it is very unlikely that a less uneven landscape is reached in a reasonable time window, unless strong commitment by the public sector is guaranteed (e.g. in public research with freely available results).

3.3 The Financing Conundrum

Financing of innovation is a fundamental bottleneck. The high level of risk of innovative activities and the likelihood of failure complicate the access of the companies to adequate collateral or to financial agents willing to bear (part of) the risk (Hall, 2002). Moreover, Innovative SMEs are usually hit harder by credit crunch and other financial turbulence that increase risk aversion of lenders (FINNOV, 2010). Table 1 above suggests that availability of internal resource significantly increases the likelihood to invest in innovation and the evidence is confirmed by Cincera and Ravet (2010) with robust econometric techniques based on company level data.

The “dot com” bubble and the Silicon Valley success story contributed to create the consensus that venture capitalists (VCs) - and other financial innovative instruments - and high level engineer departments are the only ingredients for the success of innovative clusters. Nevertheless, the engagement of the public actor in the establishment of the basic technological breakthroughs on which the high tech clusters were generated has been substantial (Mazzucato, 2011). It is certainly confirmed that the US R&D growth of the 1990s has been driven by stock market boom (Brown et al. 2009), but this is not a generalized stylized facts: (a) indeed, using data from European R&D Scoreboard it is shown that listed SMEs are not more research intensive than unlisted one (Bogliacino and Lucchese, 2011); (b) despite huge tax breaks and other financial support, the VC market in the USA had a rapid reorientation of business in the post 2011 and a collapse in post 2008, suggesting that rather than a pure problem of financing it may be due to structurally limited niches (FINNOV, 2011).

From the inequality point of view, the emphasis on financial deepening and financial innovation raises a number of worries. First of all, firms’ growth seems to be correlated with a complex array of factors, and neither innovation alone nor stock market performance is a good predictor (Demirel and Mazzucato, 2012). As a result, given the focus of VCs on stock market returns, this channel of financing is not necessarily promoting employment creation and reduction of inequality.

Besides, the strong involvement of investment banks, VCs and other powerful financial actors may induce orientation towards value extraction, e.g. maximization of shareholders value and other forms of short termism. The establishment of this corporate governance philosophy has paved the way to massive use of stock buybacks and executive compensation practice that significantly contributed to the increase of top income shares and the worsening of the distribution (Atkinson et al. 2011; Lazonick, 2010).

3.4 The single market: opportunities and risk

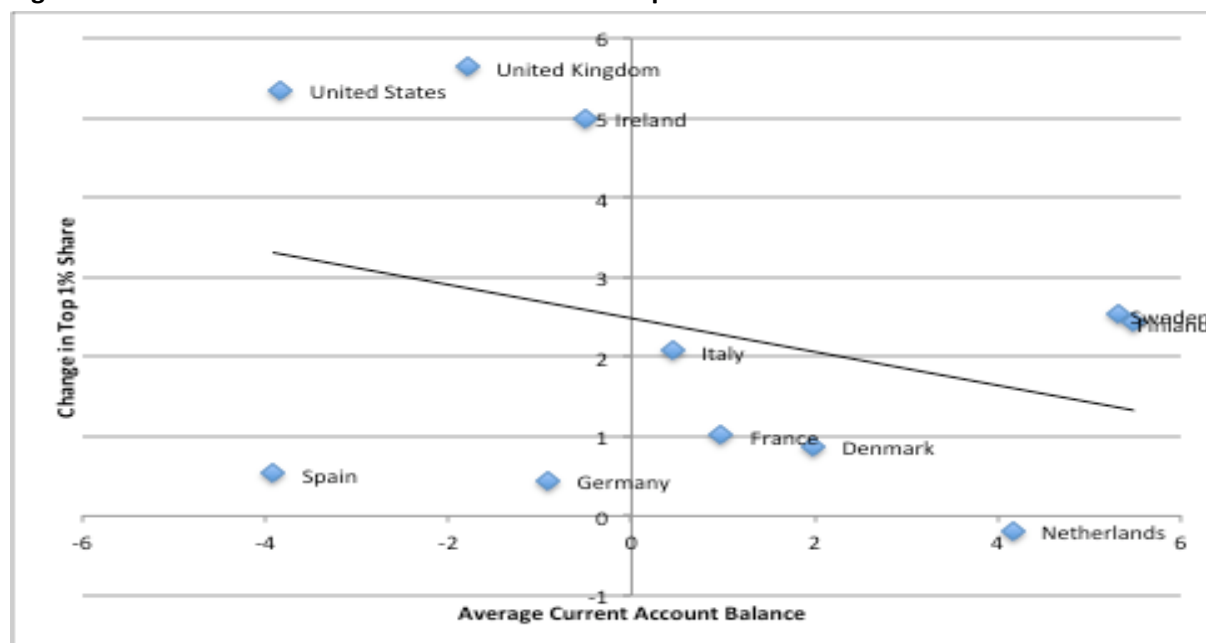
It is stressed throughout the main documents that the single market is the main asset of Member States and that further steps towards effective integration are necessary.

EU 27 is the largest world market in terms of GDP, and it is true that regulatory differences across Member States are substantial, as stressed by European Commission (2010a, 2010b, 2010c).

Nevertheless, structural imbalances inside Europe are deep, especially in the Euro Area. Resilient differences in competitiveness among Central European Countries such as Germany and the “periphery” (e.g. Spain, Portugal, Greece, Ireland) created an unsustainable path in the latter Member States. In fact current account deficits caused massive financial inflows, cheap and easy credit and asset price bubbles. Instead of financing innovation to restore future current account surplus, the inflows of capital inflated asset prices, putting the financial system under pressure.

Asset price inflation represents a valid substitute of risky and costly innovative investment, distorting incentives. As shown in Figure 5 below, massive inflows of capital (driven by current account deficits) are associated to an increase in top income shares.

Figure 5: Current Account Balance and Increase in Top Income Shares



Source: Top Income Database and Eurostat. 1990-2008. Note: Germany, 1992-1998 and Netherlands 1990-1999.

Given low mobility of resources, rigidity of prices and absence of fiscal insurance mechanism, at present the Euro Area is not an optimum currency area (Mundell, 1961). As a result, only three policy options are possible:

1. Allowing Euro countries with resilient competitive gaps introducing control of capital flows, reducing mobility of capital inside the common market;
2. Further increase of the integration, with definition of a common fiscal policy and a debt guarantee scheme;
3. End of the common currency.

In absence of any of the above rebalancing mechanisms, capital inflows driven inequality at the top and competitiveness driven unemployment are likely to increase even further, compromising the possibility to achieve sustainable and inclusive growth.

4. Conclusions and main messages

Europe 2020 is a credible strategy of industrial policy for the future of Europe and has the merits of presenting clear actions, clear targets and a detailed measurement strategy to monitor implementation.

Inequality should be considered as an instrumental target for both sustainable and inclusive growth. At the moment, the distributive consequences of the strategy adopted are not fully taken into account and may hamper the realization of the third pillar (inclusive growth).

Four main conclusions can be drawn as take-home messages from the discussion of the existing empirical evidence from the literature:

1. The focus on the educational system is necessary to accomplish equity in the labour market, which is a main driver of inequality in income. At the same time, it is not sufficient, since despite the recent massive reduction of educational inequality, wage inequality and the steepness of educational gradient of access to employment increased.
2. The strengthening of IPRs protection may contribute to consolidate the actual ranking of regions and countries, increasing inequality across Europe. Smart specialization does not solve the problem, because there is a hierarchy of sectors in terms of productivity growth due to the difference in maturity across technological trajectories. At the moment, it is difficult to obtain results in terms of cohesion indicators unless strong public involvement in basic science is envisaged, with fully open and appropriable results;
3. Solving the problem of access to financing by innovative companies should go hand in hand with a careful implementation of regulatory checks to avoid the excesses occurred in the US in the last twenty years, where new corporate governance based on short term targets have contributed to the increase of top income shares and the worsening of inequality;
4. Finally, structural imbalances inside the Euro Area are a serious fault line that should be taken into account. Cumulative external deficits drove massive inflows of capital, increase in asset prices that did not reflect fundamentals and financial crisis. Although further scrutiny on causality is needed, this has been associated with increase in top income share.

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