EMANUELA REALE AND MARCO SEEBER

DIFFERENCES IN THE ACADEMIC PERFORMANCE OF ITALIAN UNIVERSITIES

Exploring The Relationships With Market And Public Policies

INTRODUCTION

Large part of the literature supports the concept that market investment is a key factor of the research performance. Coherently to this idea, quasi-market policies aimed at stimulating entrepreneurial behaviours of Higher Education institutions (HEIs) have been introduced in many European countries (Jongbloed, 2003), which nevertheless are often characterized by economic imbalances between the regions. In our paper we want to investigate factors affecting inequalities between HEIs performance because of their localization in more or less developed regions; for this aim we test the relationships existing between public policies, market investment and inequalities in HEIs performance, according to three hypotheses:

1. Good scientific performance is related to the wealth of the economic context;
2. Public policies aimed at reducing inequalities may rather increase them, as they do not intervene on the real causes of inequality;
3. Market forces are correlated with inequalities: i.e. disciplines with higher share of private investment and more variance of private investment are those with stronger qualitative inequalities.

Here we adopt a broad definition of market, which is not limited to the production and exchanges of goods, services and resources with firms, but covers also other non-governmental actors interacting with HEIs on a research contract base. Thus, market may include both private, public and semi-public institutions, firms and non-for-profit organizations. In this perspective, funding coming from the market is a proxy on the one hand of the attractiveness of the HEIs and of their capability to put in place entrepreneurial behaviours characterized by efficiency and effectiveness; on the other hand, it is a signal of the wealth of the economic context. Nevertheless, we are not interested to establish causal connections between market and institutional performance, rather we are interested to detect the correlation of the market and the academic performance with respect to government policies aimed at overcoming imbalances linked to the localization in less developed regions, suggesting that the former may be less important than the latter producing regional imbalances.

As to institutional performance, we intend to focus on the capability of the HEIs to produce high quality scientific outputs, thus on their attitude to play a significant role as research universities in the national and international competition.

We consider Italy as a case in which the geographical inequalities were particularly strong, impacting the amount of resources available for research activity (Reale,

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1992), and they are still in place nowadays (Svimez, 2009; Reale, Pedron, Seeber, 2008). Government attempted to reduce differences between the Italian regions, paying a special attention to the HE sector, but it did not succeed. Public policies in the ’80 and ’90 were aimed at strengthening the southern public sector of research, by creating new universities in the South; nevertheless, the results of the last National Three-Year Research Evaluation process (VTR) showed strong gaps in research performance between the Universities largely due to the location.
The paper is organized as follow. The first and second paragraphs present respectively the theoretical and methodological framework. The paragraphs three to five test the hypotheses, and the last one presents concluding remarks.

THEORETICAL BACKGROUND

Literature devoted much attention to the contribution of universities to entrepreneurship and to knowledge spill over from universities to business world. Less attention was paid to the inverse relationship, i.e. the impact of the context on academic performance. Two recent papers indirectly dealt with this subject. Bonaccorsi and Daraio (2005), analysed the conditions under which patents and publications generate the highest spill over and identified when the government should invest to strengthen academic research and patenting. The authors developed a non-parametric analysis on publications and patents of Italian regions and found that they generate positive externalities when patenting is very intense (size - effect). Publications in technical and engineering disciplines produce the strongest externalities. Regions with strong industrial background gain more benefit from the knowledge produced by universities; in this case the company investment in university is profitable (Bonaccorsi and Daraio, 2005).
Dietz and Bozeman (2005) focused on contamination between universities and companies in the United States, and they identified factors increasing publications and patents. Their analysis found that patenting and publications are influenced by the scientific environment, especially in the scientific and technical disciplines. Publications are negatively correlated to industrial funding and the most productive researchers are those spending the entire career in the academia. Patenting is positively associated to industry-university exchanges, to private funding for research and to the number of publications. Dietz and Bozeman concluded that stable career and public fund increase publishing, while mobility and private financing increase patenting.
In some disciplines patenting and publishing mutually reinforce; Cohen showed that countries with highest scientific productivity are both the most active in patenting and those with the private sector most committed to R&D (Cohen, 1998). In sum, the context is likely to influence patenting, but the association with publishing is rather weak.
In some cases companies may not find good partners in local universities and decide to cooperate with other universities. This behaviour was found by Hanel and St-Pierre by analysing companies in France, as the most important collaborations are with foreign universities, while collaborations with local research institutions

aim at filling technological gaps (Hanel and St - Pierre, 2006). According to Bhidè, the national innovation capability does not depend on upstream scientific research, rather on downstream and enterprise investment to import new knowledge from other countries (Bhidè, 2006). Both studies show that the utility of the universities to the local context lies primarily in responding to daily needs, rather than in providing new ideas and innovation.

Scarce personnel exchange and lack of joint training programs of young researchers may indicate weak links between universities and local companies. These are common elements in Italy; few companies activate post-doctoral positions or fund industry-university doctoral courses (such as the CASE program - Cooperative Awards in Science and Engineering in the UK) (Feldman, 2007).

The market as source of efficiency needs few adjustments when it is applied to HEIs, because of the non-profit nature of these institutions (Massy, 2004). Hansmann (1980) identified the legal and economic rationale that makes non-profit firm preferable to for profit firm in situation in which, because of asymmetries of information, the buyer is highly vulnerable to sellers' opportunism. As a result, nonprofits are frequently found in the markets for things like nursing homes, day care and education. Markets like these are sometimes referred to as "trust markets" because of that vulnerability. By reducing incentives for the opportunistic behaviour, nonprofits become the preferred suppliers in certain settings: they increase the probability that clients are getting what they are paying for (Winston 1999). This is the case of the HE sector. Research activity and education outcomes may be esteemed as public goods: the private investment is under optimal because of the positive externalities they produce. Thus, various form of subsidy and public support are justified. Moreover, HEIs activity must not be oriented to satisfy only the market's needs. On the contrary, HEIs' activities should also focus on those niches that are usually neglected by the market.

Other arguments can be outlined in order to highlight the specificities of the HEIs as organisations.

Musselin (2007) points out that until few decades ago, the universities were depicted as organization with peculiar characteristics, which moreover followed national patterns. Though, since the 80s the specificity of the universities has been increasingly denied, new managerial tools have been introduced and they should have reduced the influence of the national models. There is a trend transforming universities into organizations but this evolution seems to have little impact on universities, because two main specific characteristics of universities complicate change process. First, both teaching and research activity are functionally loosely coupled, they require low level of cooperation and coordination within HEIs (Weick 1976); second, teaching and research are rather unclear technologies, because they are complex processes difficult to grasp and there are ambiguous causal links between tasks and results. These specificities affect the efficiency of policies and tools used to reform universities, they must not be challenged rather they should be understood and used as lever for change.

More recently, an analysis of the implementation of the New Public Management paradigm within the HEIs of different Western European countries shows that the

process toward modernisation and occurs with different rate and pace. Universities become more intense organisations, but not always stronger in terms of competitive and management capabilities. (Paradeise et al., 2009)

The quoted literature suggests that the policies that aim at improving the contribution of the HEIs to the wealth of the economy and the society must take into account the specific features of these organisations.

Dill and other colleagues (Dill et al., 2004) evidenced few characteristics of the policy framework that might facilitate markets in HE to contribute to the wealth of society. Among these, transparency and accountability, information on performance and quality of academic programs, measures for improving allocation efficiency are necessary rules to assure academic integrity. Policies can fail when their interference have the effects of impeding incentives for quality, efficiency, differentiation and innovation (Wolf, 1993).

Jongbloed (2004) points out that regulations addressed by the Government can be of two kinds: interventions aimed at stimulating market behaviour of the institutions, or interventions aimed at pursuing the equity of the system and the interest of the whole society by correcting the effects of the market on HEIs and diffusing the benefits of education and research produced by the Universities. The paper analyses the second set of Government policies, and specifically those aimed at setting up incentives and resources in order to counterbalance the weakness of income and wealth of the local economic context.

Government policies can fail due to different reasons, for instance: the policy devices are not adapted to a receiver such as universities, unexpected and unintended effects emerge, policy costs of applying the regulation have been underestimated, because of combined effects coming from different regulations (Jongbloed, 2004). The paper develops tests to put into evidences that inequalities of HEIs localized in poor economic contexts are more correlated with Government policies than with the market behaviour; we do not aim at understanding the specific reason of policy failure.

Moreover, we want to take into account the Putnam's argument that the performance of the Region institution in Italy is better explained by the level of civic-ness of the citizens rather than by the wealth of the economic context (Putnam, 1993). The author founded that even high civic individual behaviour may be negatively affected by the social un-civic context; path dependency tends to reinforce the negative impact of the lack of civic traditions. This evidence suggests that the imbalances between regions may be increased rather than reduced by policies that increasing available resources but do not address the issue of the context where fund will be spent.

The Italian case

The rationale of the Italian Government interventions from the half 80s onward was to reduce existing gaps between the regions in terms of Higher Education personnel, number existing institution and resource allocation. These interventions have had mixed effects on the economically poorer regions.

On the one hand, between the half of the 80s and half of the 90s, the government supported the growth of the Higher Education system in the regions of traditionally low economic development by creating new universities, thus increasing the number of researchers and professors located in the South.
On the other hand, in late 90s the government introduced a new mechanism for the allocation of core funding that was linked to the real costs and performance of the universities. This mechanism showed that southern universities were over funded compared to their productivity and resulted in a reallocation in favour of the other regions.
Also the reform of Italian Basic Law (Constitutional L. 3/2001) is supposed to impact and rather enlarge the imbalances between rich regions, mainly located in the Centre-North, and poor regions, located in the South. The Law adopted the subsidiary principle as a rule for government, introducing a new relationship between State, regions and local government levels. Regions became fully responsible of the scientific research and have recently began to elaborate multi-year research investment plans within the broad frame of the National Research Program (PNR). The plans aim at developing a regional research and innovation system that is supposed to facilitate the interaction between public and private companies, and take advantage of territorial proximity (spill over and network-based capital). The investment in research will increasingly depend on the activism of the local political actors, but also on the local innovative players exploiting applications arising from research activity.
Government intervention can be ideally divided in two phases. The first implemented from mid 80s until mid 90s was specifically referred to the Universities in the South, and it was aimed at setting up new public universities, with the hiring of new professors and researchers. These universities were generally small in size, generalist, but shared the same mission and objectives as well as they were recognized with the same status of the other universities in the country, and were granted by the same level of autonomy. The second phase went from 1998 until nowadays, it was direct to all the universities of the country and consisted in the introduction of a mechanism – the *quota di riequilibrio* - for balancing the Government core funding allocation among the universities, according to their effectiveness in education. In the same period of time, European Structural Funds have assured a substantial flux of financial resources to the regions Objective 1 and to the Universities located therein, for research, infrastructures, and training.
In sum, the content of government policies for compensating inequalities linked to the geographical localization were in a first phase mainly based on the increase of the available resources and the rebalancing with respect to other universities in the country, rather than on the setting up of incentives and regulation aimed to promote virtuous behaviours of the HEIs. From mid 90s, universities in the South went under the same conditions and the same reform processes of other universities, and suffered the same drawbacks (Reale and Potì, 2009). Reforms tried to address the professional self-government from national - discipline to individual universities, in order to stimulate cooperation within each institution and inter institutional

competition. Universities became more important, for instance they were granted large autonomy in the recruitment process and they gain much administrative and expenditure freedom. Though, the implementation of the policy has been incomplete, given the lack of effective evaluation process, weak funding leverage, some limits to university autonomy which are supposed to assure the equity of the system were not removed (i.e. thresholds in the level of tuition fees and in the cost of personnel, central regulation of the status and the salaries of the professors, same legal value of the graduation degree for all the public universities), no adequate connection between powers and responsibilities of the management (Seeber, 2009, Reale, 2008). Thus, autonomy has been often misused: there have been many scandals and some universities now suffer severe financial problems.

METHODOLOGY

We test the three hypotheses on the relationship between market forces and academic performance by using indicators of research performance deriving from the national research evaluation process (VTR 2001-2003). VTR was promoted by the Ministry in early 2003 and developed by CIVR in 2004. Each university submitted one article for each four researchers, thus, considering co-authorships, about one third of researchers have seen judged at least one of their outputs. The aim of the VTR was to provide the Ministry information about the excellence of research produced by the institutions. The evaluation procedure was based on a blind peer review; each product was evaluated by two peers, and was rated either excellent (1), good (0,8), acceptable (0,6) or limited (0,2)[i]. The VTR peer review process has been positively accepted by academia and the evaluation process has been esteemed to be reliable (Reale et al., 2007; Schiantarelli, 2006).

Some have disputed the capacity of VTR to represent the quality of the institutions, the main argument being that one publication every four researchers is not enough for taking into account also productivity of the institutions. Moreover, the analysis of institutional performance carried out by using ISI dataset shows positive though weak correlation with peer review, as productivity is taken into account by bibliometric methods (Aksnes and Taxt, 2004). Nevertheless, some main counterarguments may be mentioned. The well known Pareto principle states that roughly 80% of the effects come from 20% of the causes: also in research it can be reasonably argued that a significant share of the best publications contribute to the largest part of knowledge advancement. According to ISI data, Italian publications produced in 2001-2003 period were about one hundred thousands; around 17,3 thousands scientific publications were submitted by HEIs and public research organisations, reasonably among the best ones[ii], and evaluated in the VTR[iii]. Moreover, no university received only excellent ratings for their products in no discipline[iv]; and the share of products rated excellent was 30%. Thus, the VTR publications can be regarded a good sample for representing the performance of the institutions and to sufficiently cover the best scientific production.

One of the main strengths of the VTR results is that they homogenously represent performance in all the disciplines, while ISI database has been often criticized

because it does not represent socio and humanistic disciplines as well as hard science: it only includes scientific articles while excluding monographic works and many important journals written in national languages (Figà Talamanca, 2000; Seglen, 1997). Last, but not least, VTR results provide qualitative evaluations across all disciplines while the mere count of ISI publications does not provide any qualitative differentiation and Impact Factor and Citation Indexes are approximation of the impact rather than quality (Weingart, 2005).

The analysis makes use of synthetic indicator (UQ_y – "excellence indicator"), which represents the capability of a university to produce high quality outputs and with the majority of the authors affiliated to the university. This indicator built on the base of outputs rated as excellent was preferred to indicator based on the average rating because it better highlights difference of research quality among universities and the existence of research groups with scientific leadership.

Box 1 - Indicator of the Quality of University y - UQ_y

$$UQ_y = \frac{\sum_{x=1}^{14} (\%PEERx / \%PRODx)}{N}$$

$\%PEER_x$ = University ownership of excellent products as share of the total ownership in discipline x.
The ownership is given by the ratio between the number of authors working in the university who submitted articles and the total number of authors.
% $PROD_x$= Products submitted by the University as share of the total products submitted in discipline x.
N = Number of disciplines in which University y has a significant % $PROD_x$: %PRODx>0.2% for each 500 university researchers (ex.: $Univ_y$ 700 researchers => %PRODx>(700/500)*0.2=0.28%)

GOOD SCIENTIFIC PERFORMANCE IS CORRELATED TO THE WEALTH OF THE ECONOMIC CONTEXT

According to the first hypothesis, we expected that the scientific performance would be higher in rich economic context because of the larger amount of funding from the market. The capability to attract funding from the market is very different across disciplinary areas, thus, the existence of this link has been investigated by analysing two sets of disciplines. A group of disciplines that benefit most from the interaction with a rich economic context, because they can gain a much significant share of their total funding from industry and other companies, namely physics, biology, geology, agriculture, medicine, civil and industrial engineering. A second group that collects seven disciplines that do not receive a major share of funding from the market: mathematics, chemistry and socio – humanistic disciplines (see Table 5)[v]. From an economic point of view: North-West and North-East are the

richest parts of the country, Centre Italy is in a mid position while South and Islands are the less developed macro regions.

Table 1 shows, for each macro region and group of disciplines, the number of disciplines in which performance is higher than the national average, and the average gap between regional performance and national performance.
Given the previous assumption, we expect that the northern macro regions will perform better than the South, especially in the first group of disciplines. Performance is measured by the UQy indicator of excellence, calculated for the overall macro region.

Table 1 – Economic context and scientific performance: discipline sensitivity

	Group 1: **more funds** from economic context		Group 2: **less funds** from economic context	
Macro Region	Number of disciplines (out of 7) with performance better than the average	Average performance gap (on a 0.2 – 1 scale)	Number of disciplines (out of 7) with performance better than the average (on a 0.2 – 1 scale)	Average performance gap (on a 0.2 – 1 scale)
North	6	+ 0.23	7	+0.18
Centre	4	-0.07	5	+0.08
South	0	-0.27	0	-0.31

Source: designed by the author on Civr-VTR data

The result is counter-intuitive: the gap is very wide even in the disciplines where the influence of a rich economic context is weaker. We may than conclude that scientific excellence tends to be homogenously distributed over all the disciplines irrespectively to the market, and that there are no evidences that the economic context is the sole factor affecting imbalances in the institutional performance. This seems to confirm that the functioning of the institutions is correlated to factors beyond the local economic wealth, as pointed out by Putnam (1993).

PUBLIC POLICIES AIMED AT REDUCING INEQUALITIES MAY RATHER INCREASE THEM

For long time, southern universities were burdened by high teaching load and underweighted personnel compared to its population. Governmental policies have been oriented to fill the gap by increasing the number of universities. Between 1990 and 1998 six out of ten new universities were established in the South (there are now 22 universities in the North, 12 in the Centre and 24 in South and Islands). This produced a large increase of research personnel in southern universities: between 1997 and 2009 research personnel in southern universities grew 36%, compared to 25% in the North and 22% in the Centre. Funding policy was rather

oriented to award efficiency and, indirectly, to rebalance expenditure for each full time researcher (Table 2).

Table 2 – Italian public universities: variation in government lump sum allocation, the number of researchers and allocation/researcher per macro region[vi]

	FFO - government lump sum allocation Δ 97 - 08	Full time research personnel Δ 1997/8 - 2008/9	Thousands € of FFO per researcher		
			1998	2003	2009
North	53%	25%	98	107	120
Centre	31%	18%	107	107	119
South	38%	36%	118	119	120
Italy	42%	27%			

Source: designed by the author on MiUR data

From 1989 onward, the autonomy principle has granted universities large autonomy in the recruitment policy. Recently established universities experienced a fast expansion, while growth was moderate in traditional universities. Thus, a good test of the policy success can be the comparison of the performance of recent and traditional universities, in the South and in the North. The public policy has been successful if recent universities in the South have a good performance and the gap with the North is reduced. On the contrary, the creation of new universities in the South and the increase of personnel have further broadened the qualitative gap with northern universities. in terms of UQy indicator, recently established universities in the North have a performance of 1,13 compared to 0,53 of the southern (115% gap), while traditional universities in the North perform 1,16 compared to 0,76 of traditional ones in the South (53% gap). The data are roughly the same considering northern and southern universities with high growth rate of personnel (88% gap), and northern and southern universities with low growth rate of personnel (+42%). This means that the public policy did not succeed, because increasing the number of universities and researchers alone does not represent the solution. Which important factor was not considered by the policy? Can the lower performance of southern universities be explained by less public funding? Rather, table 2 illustrates that southern universities have received a larger amount of general public funding per full time researchers until recent years: only in 2008 the average allocation is similar all across Italian macro regions. So, also on the public side, funding is not the main point.

We can identify three traps that may have affected the government policy:

1 – Localism: personnel is recruited in the local context.

2 – A fast growth exhausts the capital of excellent researchers.

3 – Lack of meritocracy in the system delete any incentive to recruit the best researchers.

As to the first trap, the recruitment process of the Italian universities is heavily affected by the trend to hire people within the university[vii], which often were born and studied in the city were the institution is located; table 4 regroups a sample of Italian universities and points out the share of professors that was born in the same province of the university (column A - source: Perotti, 2008). A 'localism coefficient' is computed, by taking into consideration: the share of professors born in the Province were the university is located and the population of the province[viii]. Localism is higher in the South (0,54 average localism coefficient for southern universities of the sample) than in Centre (0,42) and North (0,33).

Moreover, Italy is indeed characterized by high internal inequality in the skills of students. PISA survey (Oecd, 2006) shows great gap between science skills of the students in the North and the South of the country: for instance, Friuli has the same score of Canada, that is the second among OECD countries, while Sicily is just above the result of Turkey, the second worst. In table 4, to each university is assigned the PISA science result of the region in which it is located, for instance: Lecce and Bari have the value of Apulia (447). We use PISA results as a proxy of the quality of the human resources pool from which the universities may recruit research personnel[ix].

Table 4 – Students science skills, localism and excellence indicator

University-location; N=North; C=Centre; S=South	Excellence indicator of the universities in the region (scientific disciplines)	Science competences OECD – PISA survey 2006	Localism coefficient
Torino (N)	1,423	508	0,38
Milano (N)	1,421	499	0,29
Padova (N)	1,398	524	0,26
Firenze* (C)	1,355	513	0,47
Bologna (N)	1,226	510	0,39
Pisa* (C)	1,143	513	0,37
Bari (S)	0,770	447	0,53
Salerno (S)	0,968	442	0,35
Napoli (S)	0,898	442	0,38
Lecce (S)	0,728	447	0,48
Catania (S)	0,635	433	0,64
Palermo (S)	0,603	433	0,6
Messina (S)	0,519	433	0,79

*PISA Oecd 2003

Source: elaboration of the authors

The Linear regression shows very robust results with both localism (P>|t| = 0.001) and skills of students (P>|t| = 0.000), strongly linked to performance of universities. Localism is linked to worse scientific performance (beta -0,39), while good students skills are strongly linked to good performance (beta 0,63). Thus, the bad performance of southern universities appears to be clearly explained by a negative mix of higher localism and worse educated human resources pool.

The second trap states that a fast growth exhausts the capital of excellent researchers and it is based on the assumption that only a given share of students can be regarded as excellent. If recruitment rapidly accelerates, then the group of excellent students may be exhausted and universities may be compelled to hire less talented researchers. Moreover, literature suggests that the quality of the recruitment process has decreased in recent years (Bonaccorsi, 2007; Capano, 2008), then universities with a recent expansion would have been more harmed. One datum seems to allow this hypothesis: the correlation between 1997-2003 universities research personnel growth ratio and excellence indicator is -0,36. Nevertheless, the fact that recent northern universities are still able to gain good performance shows that the quality of human capital is the key issue, and that localism exacerbates the problem because universities do not look for excellent researchers outside the local context, for instance talented temporary researchers in slow growing universities.
The lack of meritocracy is often regarded by literature has the main reason for the Italian HE problems; increasing resources for universities without introducing incentives for their correct use may rather increase clienteles and wastes. Gagliarducci et al. (2005) argue that extreme localism of Italian HEIs and their inability to attract foreign researchers are not due to a lack of financial resources, but rather on the lack of proper incentives, such as linking wages to research and teaching productivity.

MARKET RELATIONSHIPS WITH INEQUALITIES

In order to test the relationship between market and inequality in HEIs performance we can check whether disciplines with higher share of private investment and more variance of private investment are those with stronger qualitative inequalities. Table 5 shows the share of funding from the market for each discipline, the variance in institutions market funding distribution and the variance of institutions performance[x].

Variance coefficient = σ / X
σ = standard deviation
X=average value

Table 5 – Funding from the market and research performance variance[xi].

area	Share of total funding from the market	Market funding variance coefficient	Performance variance coefficient
01 - Mathematics and Informatics	21%	1,19	0,08
02 - Physics	37%	1,35	0,07
03 - Chemistry	28%	0,80	0,09
04 - Earth Sciences (geology)	55%	1,06	0,07
05 - Biology	38%	0,68	0,09
06 - Medicine	48%	0,61	0,08
07 - Agriculture and veterinary	54%	0,72	0,12
08 - Civil engineering and architecture	47%	1,16	0,10
09 - Industrial and informatics engineering	53%	1,37	0,04
10 - Antiquities and humanities	21%	0,97	0,05
11 - History, philosophy, psychology	21%	0,94	0,08
12 - Law	15%	3,07	0,15
13 - Economics and statistics	32%	1,26	0,28
14 - Political Sciences	24%	0,92	0,15

Source: elaboration of the authors

The correlation between the share of funding from other subjects and performance variation is low and negative (-0,20); thus, there is not a relationship between a strong funding share from the market and inequalities. The analysis can be improved by considering the variance of funding distribution and performance variance, it can be supposed that larger market funding variance is correlated with larger performance variance, especially in those fields where market funding share is relevant. This hypothesis in not confirmed by the tests: in the group of disciplines with more impact of funding from the market (more than 37%) the correlation is even negative (-0,551): the stronger the funding are skewed, the more the performance are homogeneous.

CONCLUDING REMARKS

The paper analysed the relationship between the market and the imbalances of the HEIs performance in different Italian regions. Market is considered both as a source of income for universities and as a source of competitive advantages because of the richness of the economic context. We wanted to test if government policies aimed at pursuing the equity of the higher education system are more correlated to imbalances in the institutional performance than the market forces.

Despite universities are increasingly expected to behave like any other organisation and their specific nature is often denied, nevertheless the peculiar characteristics of its activities must be taken into account since they affect the way HEIs respond to market pressures and government interventions. Furthermore, the institutional features of the HEIs make them more able to act as non-for-profit organisations rather than as for-profit ones. Thus, they are devoted to invest in research themes and sectors, even if there are no optimal conditions and there is a high risk of failure, this attitude represents the justification for public core funding.

Literature devoted to analyse the impact of the context on the academic performance showed that only under certain conditions (i.e. intense patenting activity) and for some disciplines (i.e. engineering) the context may influence the performance, but not always this influence produce good results in terms of research outputs or in terms of research collaborations.

As to Government policies, failures or success are linked to different reasons, as an inadequate design or implementation, the overcoming unintended effects or the absence of some characteristics of the policy framework (transparency, accountability, measures for efficiency and effectiveness).

In Italy, public policies for overcoming imbalances between the HEIs linked to their geographical localisation were mainly devoted to supply further resources (in terms of new universities and personnel), but no initiatives were set up in order to promote virtuous behaviour of the HEIs.

First, we addressed the role of the market (rich economic context) in the universities in different scientific areas, using data on R&D investment and on academic performance. The relationship between private investment and regional performance is checked both at institutional and discipline level. The results do not confirm the hypothesis that the scientific performance would be higher in rich economic context because of the larger amount of funding from the market. Rather they show that good performances are homogeneously distributed across disciplinary areas, regardless to the market support.

Second, we use data on the location, funding and age of universities in order to address the role of Government policies aimed at filling the regional gap mainly by setting up new universities and increasing research personnel in the South. Here we noted that the gaps between southern and northern universities seem to have been increased rather than reduced. Three traps may have affected the public policy, thus generating counterproductive results: i) recruitment have been harmed by localism, whose negative effects are particularly severe when combined with a context of poorly skilled human resource pool; ii) a fast growth exhausts the capital of excellent researchers; iii) the lack of meritocracy delete any incentive to recruit the best researchers.

Third, we showed that the relationships between inequalities in research performance and market forces are not as strong as those with Government policies aimed to assure equity of the HE system. Our evidences do not allow to conclude on causal effects of the market or of the Government policies, nor let us argument about the reasons of policy failures. Nevertheless we think that these evidences

have a normative content, which allows for higher education the Putnam's assumption about the importance of factors other than the market on the institutional performance. This implies that policies promoting equity devoted mainly to supply further resources instead of incentives and mechanisms aimed to improve efficiency and effectiveness might be more important creating imbalances than resolving them.

NOTES

[i] Excellent: the product is in the top 20% scale of the shared value scale of the international scientific community; Good: the products is in the 60-80% bracket; Acceptable: 40-60% bracket; Limited: bottom 40%.

[ii] Some argues that the outputs submitted for evaluation are not the best ones but the ones of the most prestigious and influencing researchers. Nevertheless, the selection of a poor product would have endangered the reputation of the powerful researcher; thus, the effect of academic power on the selection process must have been limited. The selection process of products was based on four steps: university researchers selected their best research products and submitted them to the department, selection at department level, selection at discipline level, final selection at university level. It is interesting to mention the experience of the University of Modena and Reggio Emilia, which in 2007 commissioned a research evaluation process to an external committee based on a VTR like method. Each department selected the best products (in order to produce also a quantitative evaluation) and peer review was applied to a fixed number of these products: half selected by the department and half randomly drawn. The average quality of products selected by the department was significantly superior, thus supporting the overall quality and efficacy of the selection process.

[iii] Dresch and Janson (1987) made similar assumptions on the distribution of talent across the population, the size of the scientific community and the exploited scientific production potential. The model was applied on United States scientific production between early '40 and 1985. In early '40 the scientific community was 0,33% of the population, the average talent was 170 IQ, thus the model presume that 31% of the potential scientific production has actually been exploited; in the seventies, the scientific community was grown up to 0,91% of the population, down at 158 average IQ and exploited 53% of the potential; in 1985 the scientific community was 3% of the population, while talent was 142 IQ and exploited scientific potential was 75%.

[iv] With some exceptions of rare cases where very few products were submitted, less then 9.

[v] The relative weight of the market on total funding was esteemed to be a more meaningful indicator of intense links with industries, not for profit institutions, etc., than the absolute value of market funding. The groups of disciplines selected with the two alternative criteria almost coincide, with the exception of chemistry, which receives a high amount of funding from the market in absolute value. But, in chemistry, other public sources of funding overwhelm the market. Test developed with groups of disciplines selected according to absolute market funding generates quite the same results.

[vi] FFO 1997 (source: Cnvsu doc 02/03; Miur Office of statistics) and research personnel 1997/1998 a.a. (source: Miur Office of statistics)

[vii] Between 2000 and 2006, 93% of the new Full professors and 75% of the new Associate professors were already working in the university that recruits them (Seeber, 2009)

[viii] The formula for the localism coefficient is $A/\sqrt{B}$, where A is the share of professors born in the province were the university is located and B is the population of the province. Population of the province is considered because, given two universities with the same percentage of professors born in the province where the university is located, localism is higher when the province is smaller. For instance, we can compare Lecce and Florence: they have similar share of professors born in the province, but the province of Florence has much more inhabitants.

[ix] On the relationship between students education and research productivity see also De Marchi and Reale (1996)

[x] For each discipline, the sample of public universities with more than 20etp researchers was considered (more than 15 for Political Science); we considered the average funding per researcher; the performance indicator was computed using the average rating of the submitted products.

[xi]Source: Vtr data; the data includes funding for research project, 'market' also includes a share for contracts and services.

REFERENCES

Aksnes D.W. and Taxt R. E. (2004). Peer review and bibliometric indicators: a comparative study at a Norvegian University, *Research Evaluation*, 13, 33-41

Bhidè A., (2006). *Venturesome consumption, Innovation and globalisation, Prospective on the Performance of the Continent's Economies*, EIASM, Venice 21-22 July

Bonaccorsi A., Daraio C., (2005). Exploring size and agglomeration effects on public research productivity, *Scientometrics*, Vol.63/1, pp.87-120

Bonaccorsi A., Daraio C. (2007). University autonomy an structural constraints in the Italian system, in Bonaccorsi A. and Daraio C. (2007). *Universities and strategic knowledge creation*, Edward Elgar, p.241-271

Capano, G. (2008). Looking for serendipity: the problematic reform of government within Italian universities, *Higher Education*, 55, (pp.481-504)

Clark, B.R. (1977). *Academic power in Italy*, Chicago, The University of Chicago Press

Cohen W.M, Florida R., Randazzese L., Walsh J., (1998). Industry and the academy: uneasy partners in the course of technological advance, in Noll R. (1998). *Challenges to research universities*, Brookings Institution, Washington DC

De Marchi M., Reale E. (1996). Premi Nobel e analfabeti: due mondi indipendenti?, *il Mulino* vol. 1/96, p 106-118

Dietz J., Bozeman B., (2005). Academic Careers, patents, and productivity: industry experience as scientific and technical human capital, *Research Policy*, 34

Dill D., Texeira P., Jongbloed B., Aaral A. (2004). Conclusion, in Dill D., Texeira P., Jongbloed B., Amaral A. (2004). *Markets in Higher Education*, Kluwer, The Netherlands, 327-352

Dresch S., Janson K. (1987). Giants, Pygmies, and the Costs of Fundamental Research or Price Revisited, *Technological Forecasting and Social Change*, vol. 32, 1987, pp. 323- 340

Feldman M., (2007). Well-springs of Modern Economic Growth: Higher Education, Innovation and Local Economic Development, *Internal paper*, The Georgia University, Institute of Higher Education

Figà Talamanca A. (2000). Bozza dell'intervento "L'"IMPACT FACTOR" nella valutazione della ricerca", Bologna, 27 Giugno 2000

Gagliarducci S., Ichino A., Peri G., Perotti R. (2006). Lo Splendido Isolamento dell'Università Italiana, in Oltre il declino, *il Mulino*, 2006

Hanel P., St-Pierre M., (2006). Industry-university collaboration by Canadian manufacturing firms, *Journal of Technology Transfer*, 31, pp. 485-499

Hansmann, H. (1981). The Rationale for Exempting Non-profit organizations from Corporate Income Taxation, *Yale Law Journal* 91 (November 1981): 54-100

Jongbloed B. (2003). Marketisation in Higher Education: Clark's triangle and the essential ingredients of markets, *Higher Education Quarterly*, 57, 2, 110-135

Jongbloed B. (2004). Regulation and competition in Higher Education, in Dill D., Texeira P., Jongbloed B., Amaral A. (2004). *Markets in Higher Education*, Kluwer, The Netherlands,p. 87-111

Massy W.F. (2004). Markets in Higher Education: Do they promote internal efficiency?, in Texeira et al. (eds). *Markets in Higher Education*, Kluwer, The Netherlands, 13-36

Musselin, C. (2007). Are Universities Specific Organisations?, in Krücken, G., Kosmützky, A., Torka, M. (2007). *Towards a Multiversity?*, Transaction Publishers, New Brunswick (USA) and London (UK)

Paradeise, C. , Reale, E., Goestellac, G. (2009), *A comparative approach to Higher Education reforms in Western European Countries*, in Paradeise, C., Reale, E., Bleiklie, I. and Ferlie, E. , University Governance: Western European Comparative Perspectives, Dordrecht, Springer

Perotti, R. (2008). *L'università truccata*, Einaudi, Milano
Putnam, R. (1993). *Making Democracy Work: Civic Traditions in Modern Italy*, Paperback, trad. it. La tradizione civica delle regioni italiane, Il Mulino, Bologna
Reale, E., Pedron, L., Seeber, M. (2008). Gli squilibri territoriali della ricerca pubblica italiana, in Reale, E. (ed.). *La valutazione della ricerca pubblica*, Franco Angeli, Milano
Reale,,E. (2002). *Le università nel Mezzogiorno*, Angeli, Milano
Reale, E. (2008). Autonomy, accountability and academic freedom. Toward a good balance?, *International Conference on University Autonomy and the Globalization of Academic Career*, European University Institute, Firenze, www.eui.eu/MaxWeberProgramme/PDFs/.../RealePAPERrevised.pdf
Reale, E., Potì, B. (2009). Italy: Local Policy Legacy and Moving to an "In-Between" Configuration, in Paradeise, C., Reale, E., Bleiklie, I. and Ferlie, E. , *University Governance: Western European Comparative Perspectives*, Dordrecht, Springer
Schiantarelli, F. (2006).Un passo nella giusta direzione *http://www.lavoce.info/articoli/pagina1984.html*
Seeber, M. (2009). *Changes in the governance of the Italian Higher Education system, the role of evaluation and funding as steering tools of research*, Doctoral Thesis, Chieti - February 24th 2009, University of Chieti-Pescara - Doctoral course 'Method and tools of research evaluation'
Seglen, P. O (1997). How representative is the journal impact factor?, *BMT*, 314, 497. Available at *http://bnj.bnjjournals.com/ cgi/content/full/314/7079/497*
Svimez (2009). *Rapporto Svimez 2009 sull'economia del Mezzogiorno*, Svimez, Roma
Van Vught, F. (2007). Diversity and differentiation in Higher Education Systems. Challenges for the knowledge society, *Higher Education Policy*, 20, 2
Weick, K.E. (1976). Educational Organization as Loosely coupled Systems, *Administrative Science Quarterly*, 21 (1), 1-19
Weingart, P. (2005). Impact of bibliometrics upon the science system: inadvertent consequences? *Scientometrics*, 62(1). 117–131
Winston G. C. (1997). Why Can't A College Be More Like A Firm?, *Williams College*, May, 1997
Wolf, C. (1993). Markets or Governments: Choosing between Imperfect Alternatives, Cambridge, MA:MIT Press

AFFILIATIONS

Emanuela Reale
Ceris Institute for research on firm and growth, Rome
CNR – National Research Council

Marco Seeber
Ceris Institute for research on firm and growth, Rome
CNR – National Research Council