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M. Migheli, G. B. Ramello

OPEN ACCESS, SOCIAL NORMS & PUBLICATION CHOICE

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Open Access, Social Norms & Publication Choice

Matteo Migheli* and Giovanni B. Ramello**,¹

**University of Turin*

***Institute of Public Policy and Public Choice, POLIS*

University of Eastern Piedmont

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ICER Fellow

Abstract: The aim of this paper is to shed light on scholarly communication and its current trajectories by examining academics' perception of Open Access, while also providing a reference case for studying social norm change. In this respect, the issue of publication choice and the role of Open Access journals casts light on the changes affecting the scientific community and its institutional arrangements for validating and circulating new research. The empirical investigation conducted also offers a useful vantage point for gauging the importance of localised social norms in guiding and constraining behaviour.

JEL classification: K19, Z13, O33, L17

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1. Introduction

The common purpose of both social norms and laws is to constrain the behaviour of social actors. Social norms emerge spontaneously in human groups and, despite being somewhat informal (they are not promulgated by a legislature, and there is no legal penalty for infringement), can still constrain and regulate a great deal of social interaction. Laws are instead a top-down form of regulation enacted by a legislature and enforced by an adjudication system, which provides a clear control mechanism and incentive to obey (Posner, 1997; Young, 2008).

Both laws and norms serve to socially mediate interactions between individual members of human groups. However they work in different ways, and can either substitute for or complement each other. In some cases social norms are written into and replaced by laws, while in others the two systems can coexist. In particular, social norms are important even when a full body of laws governs society, especially within groups where collective action and reciprocal recognition prevail over a top-down structure. In such situations, spontaneous and endogenous arrangements may be better able to achieve group social welfare than exogenous top-down rules, since they make it easier to reach either a Nash equilibrium in coordination games or a cooperative equilibrium in a prisoner's dilemma (Young, 2008; Bicchieri & Ryan, 2011). This is true, for example, in settings where there is peer recognition and conformity has an important role in regulating individual behaviour².

The above description precisely fits the 'republic of science', that is to say, the organisational structure that broadly governs the research world and the scholarly community (Polanyi, 1967). Here, a number of social norms spontaneously emerged that enabled a wide-ranging expansion and circulation of scientific knowledge, beyond the bounds of individual nations or research institutions, and triggered the widespread dialectical process of validation and critical selection of results that is the hallmark of research activity (Merton, 1973; Ramello, 2005).

To achieve the desired outcomes, these norms regulate an essential institution of the republic of science, i.e., scholarly publishing, which is today a pivotal component not only for validating and circulating new scientific knowledge, but also for rewarding researchers, who can easily convert publications into salary, career advancement, research opportunities or funds (Ramello, 2010). Viewed in this light, as well as being an interesting field of study in its own right, scholarly publishing--as we shall further argue--provides a vantage point for understanding how the social norms governing the scientific community shape individuals' behaviour in publication choice, and how this informal regulation can create path dependence and rigidities that may (for example) stand

² Members of the group thus conform to the norm in the expectation that others will do the same, and this creates a feedback loop from which it is difficult to escape (Young, 2008).

in the way of exploiting the opportunities brought by technological change. This is consistent with the observation that, though informal norms might appear to be more susceptible to change than formal laws, their deep embeddedness within the social structure can still confer a substantial ‘stickiness’ that hampers change dynamics, since individuals are locked into the pre-existing regulations and lack adequate economic incentives to deviate from them (Young, 2008).

Hence, this empirical law and economics investigation of scholarly publishing can provide insights into the existing social norms, and lay the groundwork for a positive analysis based on the structure of endogenously shaped preferences, which is a pivotal element for formulating policy guidelines.

In particular, this work examines how academics are responding to the new opportunities offered by Information and Communication Technologies (ICT) for making their ideas widely available through Open Access (OA) publications, set against the constraints they face in publication choice imposed by social norms. Though OA publishing is essentially a straightforward innovation brought to scholarly communication by technological change, the transition to this system is held back by strong drifts in individual preferences and publication choice arising from long-established social norms that govern scholarly communities. When it comes to deciding what journals merit attention, whether as readers or authors, academics’ behaviour is influenced by the norms of the ‘republic of science’³. This favours outcomes that would not occur otherwise and also significantly affects uptake of the innovation, making the sector dynamics essentially path dependent.

This study uses data from a survey conducted on academics of an Italian university, on their subjective perception and use of OA publications.

The paper is organised as follows: section 2 sketches out the role and the organisation of scholarly publishing, while section 3 outlines the current trajectories of the sector and their implications. Section 4 presents the sample used, the statistical methods and the descriptive statistics. Section 5 then discusses the findings, seeking to draw a nuanced picture and provide stimulus for further research. Finally section 6 sums up the study and draws some conclusions.

³ One could argue that this is linked to reputation. However this assertion does not contradict the preceding argument, since reputation is nothing but the outcome of social norms: it is a product of social interactions, and a system of social control. From the epistemic point of view, reputation can directly determine how a scholar is evaluated, and of course in science it can be used as a way to sidestep individual responsibility in taking decisions. In this respect, despite the appearances, striving to publish in a certain academic journal has little to do with the goal of scientific communication, but is rather a matter of complying with the social norms that govern the academic community (and securing the attendant benefits). For an in-depth discussion of this see Origgi (2010).

2. Science and scholarly publishing

Writing, publishing and disseminating new scientific knowledge are a significant part of academics' work. 'Publish or perish' is (or at least increasingly seems to be) the tenet governing the day-to-day work and careers of university researchers, even though the underlying long-run goal is generally the production of new knowledge (Stern, 2004). The publish or perish imperative emerged spontaneously within the scientific community as a social norm, and was only subsequently endorsed by research institutions and national agencies. Today, scholarly publishing is an essential vehicle for actively participating in the scientific debate and the invisible colleges of the modern research environment, which extend far beyond the confines of individual research institutions. Copyright has of course entered the scene as a legal device for managing the ownership of new scientific texts and generally regulating the production of books and journal articles (Ramello, 2010; Shavell, 2012). However, in this case its meaning is somewhat reversed from the usual one. Unlike the entertainment and media markets, where economic considerations and copyright royalties are normally the most important elements, in academia the 'moral' component takes the lion's share. It is closely tied to a scientist's reputation, which is the most important currency within the academic community, convertible into salary, career and prestige (Hamermesh et al. 1982; Parks, 2002; Stern, 2004). In a sense, much as in branding, a scholar's name can be regarded as an empty box that is infused with 'meaning' by publications and the prestige that they confer. This in turn gives academics a market value that they can use to advance their careers and finance subsequent research.

In the context of science, what constitutes authorship can differ greatly from its mainstream definition. Often, it extends well beyond simply writing a text to embrace more complex contributions such as providing technical inputs or general supervision, or even merely being part of a research team (and thereby conferring credit and currency to all those involved in the knowledge production process). The order in which contributors are listed in an author list can also have the function of disclosing the hierarchies of power existing within research groups. On the whole, the standard rule according to which copyright entitlement is tied to "the fixation of the ideas in a tangible medium" no longer applies here, and the meaning of authorship is essentially distorted from how it is customarily enforced⁴. This is largely due to the idiosyncratic role of publishing in

⁴ See for example the US Code Title 17, Chapter 1, § 102 which states that "Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device". Some scholars, challenging the standard legal definition found in nearly all national and international copyright laws, instead endorse a system that would make explicit the very complex web of contributions that go into a scientific paper. While certain disciplines such as the life sciences do have elaborate systems in place for listing contributors' names that disclose to the community the role of each author in the research, in other disciplines this is totally non-existent (Casati et al., 2011).

academia, rather than to any inherent traits of scientific writings, and has emerged as a private ordering layer that overlaps statutory law. Still, copyright licensing and its exclusive exploitation remain the typical pattern of downstream publication in scientific journals, and accordingly shape the industry along the same lines as other copyright industries, i.e., with heavy reliance on exclusive licensing⁵.

Other social norms emerged spontaneously within the scientific community to foster the selection and circulation of ideas that are validated in some way, since publication by itself is meaningless without proper recognition by the audience, i.e. by peers. These resulted in adoption of the blind peer-review system, designed to maintain high standards in research reporting, and of journal rankings based on specific metrics such as impact factor, intended to help signal the quality of journals and of the articles published therein (Spier, 2002).

Today, besides signalling the quality of research, these mechanisms have other important effects. They directly determine researchers' careers, and can also indirectly attract the attention of follow-on researchers, as readers and authors, thereby prompting them to also pursue research on that topic (Hamermesh et al. 1982; Stern, 2004).

Though the peer review and journal ranking system emerged spontaneously among scientists, and chiefly under the impetus of non-market forces, the advent of commercial publishing reliant on profit maximisation, and the ensuing adoption of strategies for boosting the sector's profitability (Edlin & Rubinfeld, 2004; Laakso et al. 2011), produced a notable drift towards the usual economic incentives. The current dynamics of the sector are thus the resultant of two distinct forces: the scientific norms governing researchers' activities, and the incentives of the market for journals. The overlap and feedback between these two systems tends to blur the picture of scholarly publishing today. Competition among scientific ideas has been (partially) replaced by competition among publishers and journals--or more precisely bundles of journals, in what is known as the 'Big Deal' (Edlin & Rubinfeld, 2004)⁶. At the same time, the evaluation and validation of scientific ideas, which was formerly the core task of scholarly publishing, has been replaced by the task of augmenting journals' 'market value'⁷.

⁵ On the industrial structure of academic publishing see Ramello (2010), while on the role of exclusivity in endogenously driving the market structure see Nicita & Ramello (2007).

⁶ Bundling and discrimination (in the form of the Big Deal) increases market power and has the effect of squeezing libraries' budgets and creating barriers to entry for small competitors (as incumbents have catalogues listing thousands of titles against just one or a few titles for newcomers) (Edlin & Rubinfeld, 2004).

⁷ It is worth noting that these two goals do not necessarily coincide. For example, in economics some of the top titles are published by societies--such as American Economic Review--and have a reasonably low pricing compared to other, much less relevant titles published by commercial publishers. However the latter generally enhance their market value and opportunities for extracting surplus by adopting the previously mentioned bundling strategies. See also the preceding note.

Finally, the expanded role of the market has precipitated the so-called ‘serials crisis’ in scholarly publishing: as publishers gain market power journal prices have dramatically risen, while university budgets have dwindled (Panitch & Michalak, 2005). The practical result is that research libraries struggle to afford the ever more expensive journal bundles, and so are unable to offer a full catalogue of publications to readers.

The described phenomenon and its implications for scholarly communication have provoked much debate. One view that has surfaced is that research should try to leverage the opportunities offered by technological innovation, particularly the ‘freely available’ electronic journals that allow articles to circulate without restriction and at no cost to the reader (Parks, 2002). This proposed remedy for reinstating the scientific commons has ushered in the era of ‘Open Access’ publishing.

3. The shifting boundaries of scholarly publishing

The criticisms sparked by the serials crisis prompted various initiatives designed to at least partially counteract the role of the market in scientific publishing and its attendant shortcomings. A handful of top universities stopped buying the expensive bundles of journals offered by commercial publishers, while a number of learned societies either extended their catalogues of non-profit published titles or withdrew their journals from commercial publishers, to be less exposed to purely economic considerations. Last but not least, many OA journals were founded to provide substitutes for costly commercial journals (Edlin & Rubinfeld, 2004; Cavaleri et al., 2009).

The advent of these new OA journals raises two particular issues. The first concerns how such new ventures can be financed once the usual market mechanism is withdrawn. The second--and thus far largely unanswered--problem concerns the recognition of OA journals by the scientific community. In other words, the key question here is whether OA publications can really substitute for traditional printed journals. The answer hinges on the scientific community’s ability to amend its social norms--including previously entrenched reputations--which have until now made the established publication channels a central element of scholarly communication.

3.1. Open Access and the ‘Publishing Dilemma’

OA is a new publishing model, made possible by technological innovation, that replaces the previous enclosure-based system (i.e., reliant on exclusion against a price for access) with a commons-based system (i.e., free entry without payment). Today, the Internet allows scholarly publications to be distributed in digital form to everyone, without restrictions and free of charge, also thanks to very low--and sometimes zero--marginal costs (Harnad,1999). However, the

disruptive potential of OA does not consist only in the lowering of production, printing and distribution costs, which are all benefits equally available to conventional journals. What it also offers is an alternative model for scholarly publication that eliminates exclusionary leverage over readers, which is instead a pivotal feature of the existing market for journals

Many commentators have accurately pointed out that something more than technological change is involved in the OA revolution: “[...] open access is not just a child of the digital age, but the latest expression of longstanding principles of scholarly publishing having to do with the openness of science. These principles hold that the value and quality of research and scholarship are related to the extent of its circulation, as greater dissemination subjects the knowledge to greater review, as well as enabling more people to take advantage of it” (Willinsky, 2009, p. 53).

The term OA conventionally refers to formal academic journals that employ peer-review and editorial quality control in selecting articles, though there are several other ways to make content freely available online. These include self-archiving of working paper versions (a practice labelled ‘green OA’), or offering a combination of open access and paid-for content as some commercial publishers have done (a strategy called ‘hybrid OA’). However the debate thus far has centred mainly on the pure form known as ‘gold OA’, by which journals make all content fully available, and this will be the focus of the present work (Harnad et al., 2004)⁸.

This new model of scholarly communication has stirred high expectations, to the point that some regard OA as a blank cheque for solving any problem concerning the circulation of scientific research. Certain authors have made highly ambitious claims, saying that OA “has become a flashpoint. It ignites revolution in intellectual life and in the legal support system for that life, copyright [...] Open Access confronts, subverts and creatively destroys the status quo [of scholarly publishing]” (Harper, 2009, p. 283).

While it is difficult not to share this enthusiasm for a new way of making scientific ideas widely and freely available to all researchers, certain aspects make the picture more ambiguous.

A first critical observation concerns the economic viability of OA journals. The traditional enclosure-based business model was in fact intended, among other things, to solve an appropriability problem by providing enough money (though admittedly sometimes more than what was needed) to finance the journal itself. The OA model discards this exclusionary power in favour of accessibility, but this raises the question of how a journal can meet the costs of maintaining itself (Cavaleri et al., 2009). A variety of solutions have been proposed. One possibility is a two-sided market where advertisers pay for readers, much like in free-to-air television or radio, where content

⁸ Recently, the OA practice has also spread to theses, scholarly monographs and book chapters. However here we will refer mainly to journals.

in a sense serves as bait to attract prospective purchasers of the advertised goods⁹. Another possibility is patronage, in which a third party bears the cost of running the journal. This method has been adopted by certain institutions even for funding some traditional journals. The underlying rationale is similar to that of advertising, since the returns are ultimately measured in terms of the patron's prestige (Itahka Report, 2008)¹⁰.

Another widely adopted financial arrangement is to shift the cost burden from readers to authors. This is called the 'author pays' model, and reinstates a two-sided market. Although author pays has been adopted by well-known journals such as PLoS, it raises concerns about quality degradation because the journal can in practice be captured by the authors, who become its main financiers (McCabe & Schneider, 2005; Feess & Scheufen, 2011).

The issue of quality leads us to the other doubt surrounding OA, which is whether users will recognise these journals as valid alternatives to traditional publishing outlets. Of course, this is not a problem specific to OA publications, since virtually any newly launched journal will share it. However, it is more important for OA because its potential for disruptive innovation can be hindered by a lack of acceptance within the scientific community. This in turn will affect the trajectory of the sector and the accessibility of scientific knowledge.

History has shown that the way society receives and interprets innovations depends greatly on users and the milieu in which they are embedded. Demand does matter, and outcomes can be path-dependent and constrained by pre-existing inertias, which may stand in the way of an optimal choice (Arthur, 1989).

Drawing from the literature on economics of innovation, we can say that innovation uptake depends greatly on the 'absorptive capacity' of the actors involved. In this case, this means the ability of scholars and research institutions to recognise the value of major technological breakthroughs such as OA publishing, and seize the opportunities they offer (Cohen & Levinthal, 1990). Whereas innovative entry for business firms depends on the organisation's ability to understand and apply new knowledge, in scholarly communication the institutional framework plays a major role in determining the sector's trajectory (Malerba, 2002). In particular, the persistence and stickiness of social norms governing researchers' behaviour with respect to publication choice can decisively affect the uptake of new technological opportunities, and the dynamics of scholarly communication. Thus, in scholarly publishing, the pre-existing channels and social norms constraining researchers' choices create inertias that cause individuals to follow a different path from the socially optimal

⁹ For an in-depth discussion, see Anderson & Gabsewicz (2006).

¹⁰ Many universities, for example, sponsor journals by funding the editors' work, costs, etc. This can be a useful way to promote a school and boost the reputation or even the power of its faculty members within the academic community, by making them become gatekeepers of the circulation of scientific knowledge.

one. This is a result of rational decisions under uncertainty, taken by researchers whose short-term private benefit may diverge from the long-term social welfare, if the latter requires wide accessibility and low cost of access¹¹.

The above dilemma resembles the puzzle of divergence between private and public interests, which is generally resolved by designing some mechanism to bring them back into alignment. In the present case, this would require directing scholars' attention, both as readers and as authors, to OA publications. Whether this can succeed depends greatly on their perception of the expected payoffs, which in turn is largely shaped by the community in which they are embedded. Hence, breaking this feedback loop probably requires an exogenous intervention able to counteract and overcome the force of pre-existing social norms¹².

The empirical investigation reported here provides some insights into these issues from the perspective of a sample of Italian scholars.

4. Data and methods

This work presents the findings of a survey conducted in 2010 at the University of Eastern Piedmont by the Open Access working group of the Unity Library System, with the support of the University Libraries Commission and the technical backing of the Technology Enhanced Learning group, which deployed the questionnaire through the LimeSurvey Open Source software¹³.

The online survey was sent to faculty members, post-docs and PhD candidates in every department of the university, to gather information about researchers' opinions and experiences with regard to Open Access, including journal publishing, self-archiving and repositories. The questions focused specifically on awareness, familiarity and use of these OA channels. The response rate was quite high (58.23%, or 431 out of 723 questionnaire recipients), which in itself signals considerable interest in OA among the scholars at the University of Eastern Piedmont.

A useful feature of this sample was its homogeneity. Since the respondents all came from a single university, they could be assumed to share the same economic incentives and system of governance. This meant we could focus on the effects of discipline field and hierarchy without other confounding uncontrolled factors. It should also be noted that, though our sample was taken from a single Italian public university, it can actually be considered representative of the Italian university

¹¹ Of course the current stylisation, in line with a large body of literature (McCabe & Schnider, 2005), assumes that quality remains the same and that OA provides a cost effective solution for increasing circulation of ideas.

¹² Such a solution has been adopted, for instance, by a number of universities that give their researchers specific incentives for publishing their works in the university's own newly created journals.

¹³ Ref. <http://www.limesurvey.org/>.

system as a whole. In fact, the majority of Italian universities are public, and they are all in any case heavily regulated by the Ministry for Education, University and Research. Candidates for faculty posts are recruited and evaluated on a nationwide basis, and once scholars have been appointed they can transfer with equal rank from one university to another, essentially without any further evaluation. This means there is a fairly uniform incentive system across all Italian universities.

More specifically, our investigation used the survey data:

- (i) To test how researchers subjectively perceive OA journals.
- (ii) To test whether there are differences in publication choice dependent on either the scholar's discipline field or position within the academic hierarchy.
- (iii) To put forward at least a preliminary explanation for such differences.

With the exception of PhD students (only 7 out of 133 potential respondents), the sample was fairly well-balanced among the ranks of the academic hierarchy (Table 1). While the strong participation of all faculty members and post-docs can be ascribed to substantial involvement in the 'publish or perish' game, the scant interest of PhD students might be due, conversely, to their lack of experience with this imperative. In a sense, they are still outside the game and only just starting to learn how research works.

To avoid overly fragmenting the results, we aggregated the respondents into six discipline areas based on their department affiliations. All the hard sciences (e.g., natural, physical and computer sciences) were grouped together under Sciences, keeping only Medicine as a separate field. Similarly, we grouped together languages, literature, history and philosophy under Humanities, but maintained separate categories for legal disciplines (Law), sociology and political studies (Social Studies) and business and economics subjects (Economics), to preserve distinctions between inherently different fields¹⁴.

The response rates of scholars in the different discipline groups varied widely, from 6.99% for Social Studies to 36.79 % for Sciences, providing a first indication that awareness of OA varies across different discipline fields.

¹⁴ Other fields such as architecture and engineering were not included because the university does not offer those subjects.

Table 1. Composition of the sample (% values)

Ph.D. students	2.39
Post-doc fellows	27.38
Assistant professors	31.90
Associate professors	19.05
Full professors	19.25
<i>Number of respondents</i>	<i>431</i>
<hr/>	
Medicine	19.95
Sciences	36.79
Economics	14.25
Law	7.51
Social studies	6.99
Humanities	13.73
<i>Number of respondents</i>	<i>431</i>

The data were analysed using the Mann-Whitney and t-tests. We used both tests because, though the sample size was often sufficient for the t-test, in some cases a non-parametric test (such as the Mann-Whitney) was more robust for our small sample size.

5. Results and discussion

Our results provide an interesting picture of how perception and usage of OA can vary across different discipline fields and ranks even within the same institution. Though the scientific community is often regarded as a homogeneous unit, these findings suggest that the social norms governing its local systems of knowledge can actually show significant variability.

Table 2 reports the answers to the very general survey question probing whether the academics know about the OA movement and its activities. The responses reveal a good degree of familiarity, without noticeable gaps at any level of the academic hierarchy. This is consistent with the findings of other studies conducted on different samples (Xia, 2010; Migheli & Ramello, 2012). PhD students and post-doc fellows are less familiar with OA than the mean for the population, and familiarity increases steadily with academic rank (and hence with seniority). One would expect this pattern to be reflected in academics' publication choices, but as we shall see this is not necessarily the case. The mere fact of knowing about OA is not enough to influence behaviour, which brings us back to the crucial role of social norms.

Looking at the knowledge of OA for the different discipline groupings, we can see that most revolve around the mean with the glaring exception of legal scholars. They, at least in Italy, where

our sample of academics is located, seem to inhabit a peculiar world in which OA journals have a marginal role. This could partly be explained by the fact that, in Italian legal academia today, monographs are still more relevant than articles for career advancement, and also by the fact that this field is comparatively less international than others (with a few individual exceptions). Thus the advantage offered by OA journals, of potentially boosting international visibility via the Internet, is less important here than elsewhere¹⁵.

Table 2. Knowledge of open access¹ (means; significance: difference from the mean)					
	<i>Means</i>	<i>s.e.</i>	<i>M-W</i>	<i>T</i>	
Ph.D. students	14.29	0.028	*	*	
Post-doc fellows	33.73	0.052	**	***	
Assistant professors	45.36	0.051			
Associate professors	48.57	0.060			
Full professors	56.06	0.062	**	***	
<i>Global mean</i>	<i>44.58</i>	<i>0.029</i>			
Medicine	49.27	0.061			
Sciences	41.84	0.050			
Economics	52.28	0.076			
Law	28.00	0.092	**	**	
Social studies	38.46	0.097			
Humanities	54.76	0.078		*	
<i>Global mean</i>	<i>44.58</i>	<i>0.029</i>			
M-W: Mann-Whitney test; T: T-test					
¹ Percentage of interviewees who answered that they "know very well" or "quite well" what OA formats are.					

The next survey question sought to determine whether scholars publish mainly in traditional outlets, i.e., in regular journals and books (Table 3). It emerged that nearly half the respondents rely chiefly on traditional publications. This is consistent with the findings of other studies (e.g. Xia, 2010). Though there are no significant deviations from the global mean associated with hierarchical rank,

¹⁵ This assertion is robustly confirmed by the recent statistics reported by the Italian National Agency for Evaluation of University Research (ANVUR; http://www.anvur.org/sites/anvur-miur/files/tabella_1_mediane_candidati_commissari_non_bib.pdf). These give the median of publications over the past decade as books (column “libri”), articles or contributions to edited books (column “articoli su rivista e capitoli di libri”) and first-tier journal articles (“articoli in riviste di fascia A”). Though there is wide variance between disciplines, so that the articles and contribution column for many already includes international publications, the ‘first-tier journal articles’ column chiefly comprises well known international journals. Law is sector 12, and we can easily see that books are important. However the second column includes mainly Italian journals, while the first-tier journals column is entirely absent. This confirms the irrelevance of international journals to the Italian legal community. Of course this fact has prompted some criticisms (see for instance <http://www.roars.it/online/?p=11526>). Very recently an A list for legal journals have been proposed and while it is unclear whether it will be used because of the many critics, it is interesting to see that more than the 40% of journals are in Italian and a minority in English.

there are some variations between discipline groups. Fewer economics scholars rely on traditional publishing outlets (almost 30% against the mean of 44.48%), while the opposite holds for legal and humanities scholars (both more than 60%).

These observations can again be explained by the extent to which these fields are integrated into the international community, and are consistent with findings reported elsewhere (Faber Frandsen, 2009). Law and humanities in Italy barely step outside the national borders, and this makes them (in the parlance of antitrust scholars) a ‘specific relevant market’ where traditional communication channels such as local journals and books are overwhelmingly preferred. The exact opposite is true for economics, a discipline that by its very nature spans national boundaries and has strong links with the international community, making OA publication more attractive and customary than elsewhere. However, other studies have shown that preferences (and, it stands to reason, social norms) can also vary for the same field in different national systems. For example, Italian and European economists show a greater propensity to publish in OA journals than do their Anglo-Saxon counterparts, who are instead more oriented toward well-known traditional journals¹⁶. A wider investigation would thus be needed to clarify these issues. Nevertheless, our preliminary findings lend some support to the thesis that localized social norms have an important role in determining publication choice. They also show that, even though the scientific community is often regarded as homogeneous, there can actually be significant differences between discipline fields (and countries) arising from distinct local norms.

¹⁶ Migheli & Ramello (2012), in a different investigation that focused on the international economics community, showed that geographical location affects publication choice, with OA considered more valuable everywhere except in Anglo-Saxon countries

Table 3

Table 3. Publishes mainly in traditional outlets (means; significance: difference from the mean)				
	<i>Means</i>	<i>s.e.</i>	<i>M-W</i>	<i>T</i>
Ph.D. students	57.14	0.202		
Post-doc fellows	50.00	0.056		
Assistant professors	39.58	0.050		
Associate professors	46.97	0.062		
Full professors	40.91	0.061		
<i>Global mean</i>	<i>44.48</i>	<i>0.028</i>		
Medicine	39.71	0.060		
Sciences	42.55	0.051		
Economics	29.55	0.070	**	***
Law	66.67	0.098	**	**
Social studies	50.00	0.010		
Humanities	61.90	0.076	**	**
<i>Global mean</i>	<i>44.48</i>	<i>0.028</i>		
M-W: Mann-Whitney test; T: T-test				

Table 4 reports the degree of preference accorded to OA journals. The responses show that academics on average have a low orientation toward OA journals. This indicates that traditional publishing outlets are still collectively perceived to be better, and possibly safer in terms of returns, as previous studies in certain fields have already reported (Warlick & Vaughan, 2007; Xia, 2010). Still, post-doc fellows report a significant and higher than average propensity towards OA publications, possibly due to their weaker legacy investment in the past system, helped along by strong familiarity with ICT and its opportunities.

The responses for the different discipline groups also yield interesting insights. The zero percentage for ‘Law’ confirms the total extraneousness, at least to date, of the OA world from Italian legal scholars’ publishing opportunities. In Economics and Social Studies there is greater openness toward OA, though traditional publishing outlets continue to be very important. From this, and consistently with the previous literature, we can tentatively conclude that many discipline fields still regard OA journals as complementing, rather than substituting for, traditional journals (Faber Frandsen, 2009; Xia, 2010; Migheli & Ramello, 2012).

The outlier here is Medicine, where nearly 40% of respondents say they direct publications to OA journals, with a 99% significant deviation from the mean. This can be explained by the high exposure of medicine to the OA movement, which has likely shifted researchers’ perception of this scholarly communication channel, essentially enabling OA to take over the terrain of pre-existing reputable journals. This outcome can to a great extent be ascribed to exogenous shocks that have

succeeded in overthrowing the established social norms that previously governed publication choice. One example we can interpret in this light is the policy of the National Institutes of Health (NIH)--the chief US public agency for biomedical and health-related research, which funds many national research projects--which requires grant-holders to upload accepted papers that are the result of funded research to the PubMed Central digital archive (<http://www.pubmedcentral.nih.gov/>), which makes them Open Access. Health scholars have also become well accustomed to OA journals in other ways. Since 2000, BioMed Central has been making available more than 200 OA journals, today considered of high-quality, in medical sciences and germane disciplines¹⁷. In addition, the Public Library of Science (PLOS), albeit on a smaller scale, provides a number of now well-recognised OA journals¹⁸. All in all, we can reasonably posit that the rules and local social norms in medicine--possibly driven by specific incentives provided by research institutions and funders--have already evolved toward including OA journals among accepted publishing outlets. As a result, OA journals have already become substitutes for traditional ones, thanks to a change in social norms driven by an internal trigger.

Inter alia, the above also shows that the OA business model and its technological innovation can be neutral in terms of publication quality, once a new journal has been properly received by the scientific community and embedded within the accepted publishing outlets.

¹⁷ The business model here is author pays. See <http://www.biomedcentral.com/>

¹⁸ PLOS Medicine journals was in 2011 ranked fifth out of 153 journals in the ISI Thompson ranking for internal and general medicine. Ref. <http://www.plosmedicine.org/home.action>

Table 4. Publishes mainly in open access journals¹ (means; significance: difference from the mean)				
	<i>Means</i>	<i>s.e.</i>	<i>M-W</i>	<i>T</i>
Ph.D. students	0.00	0.00		
Post-doc fellows	32.50	0.043	***	***
Assistant professors	14.03	0.035		
Associate professors	17.14	0.043		
Full professors	13.51	0.040		
<i>Global mean</i>	<i>17.61</i>	<i>0.020</i>		
Medicine	38.46	0.049	***	***
Sciences	15.35	0.035		
Economics	9.68	0.064		*
Law	0.00	0.00		*
Social studies	7.69	0.072		
Humanities	6.25	0.041		*
<i>Global mean</i>	<i>17.61</i>	<i>0.020</i>		
M-W: Mann-Whitney test; T: T-test				
¹ Percentage of respondents who answered that their works are published mainly in OA journals				

It is worth noting that, even in fields where OA journals are not yet so well recognised, there is a growing readiness to expand the availability of content through free accessibility. Table 5 reports the percentage of researchers who say they also self-archive on the web the papers that they publish in traditional outlets (the solution called ‘green OA’).

Interestingly, humanities scholars in Italy, who as we have seen (Table 3) tend still to rely on traditional publication, are nonetheless making their work freely available on the web more than anyone else (56.25% with a 99% significant deviation from the mean). It would appear that humanities scholars are constrained, on one side, by local social norms that oblige them to rely on traditional publishing outlets. Yet they also seem to feel a mounting social pressure (likely originating from outside their local community) that prompts them to widen their audience through the remedy of green OA, as a way of compensating for the absence of gold OA.

Supporting the above conjecture, medical scholars and post-doc fellows, who already rely heavily on gold OA, self-archive their publications on the web at a lower than average rate. It thus seems reasonable to say that green OA serves as an imperfect substitute for gold OA. When the latter works, the former essentially disappears.

Here again, Italian legal scholars confirm their extraneousness to any form of OA, including green OA. At first blush one might think this is because their academic community is national rather than international in scope. Yet this applies equally to humanities scholars, who however behave quite differently, as we have seen. Moreover, even within the national boundaries of Italy’s legal

community, there is in any case a huge unreached potential readership (e.g., attorneys, judges, legal employees of public and private organisations). In fact, in 2010 the number of attorneys practising in Italy—excluding law students and graduates in training who have not yet passed the bar exam—was by itself more than 230,000 (Ferrarella, 2010). The number of members of the judiciary, which in Italy also includes public prosecutors, was 10,151 (Gazzetta Ufficiale della Repubblica Italian, Serie Generale n. 268, 15-11-2008), added to which there is a comparable number of specialised judges or honorary judges. Hence the potential audience, even within Italy, is considerable and cannot justify the marginal use of OA.

One plausible explanation for legal scholars' disinterest in reaching a potentially wider readership is that, as well as being nationally focused, law employs an internal system for recognition of academic careers that does not rely on broad visibility of scientific work. This makes it irrelevant for scholars to try to reach a different—even if much larger—audience outside the boundaries of the academic community. However it is worth noting that this attitude is not shared by legal scholars everywhere in the world. Though there have not yet been comparable studies in other national systems, many law journals run by US law schools, for example, are making their content available through gold OA¹⁹.

All in all, these findings again tend to support the claim that the social norms governing the academic community are not only discipline-specific but also country-specific, thus accounting for a substantial localisation.

¹⁹ By way of example, see the Duke Law School's well-known journal *Law & Contemporary Problems* (<http://lcp.law.duke.edu/>) or the Cornell Law School's *Cornell Law Review* (<http://www.lawschool.cornell.edu/research/cornell-law-review/>) and the newly launched Harvard Law School Journal of Legal Analysis (OA though printed by Oxford University Press; <http://jla.oxfordjournals.org/>)

Table 5. Uses own personal web page for open access publications¹ (means; significance: difference from the mean).				
	<i>Means</i>	<i>s.e.</i>	<i>M-W</i>	<i>T</i>
Ph.D. students	0.00	0.00		
Post-doc fellows	17.50	0.060	*	*
Assistant professors	29.82	0.061		
Associate professors	40.00	0.084		*
Full professors	32.43	0.078		
<i>Global mean</i>	<i>29.07</i>	<i>0.035</i>		
<hr/>				
Medicine	17.95	0.062	*	**
Sciences	32.69	0.066		
Economics	32.26	0.085		
Law	0.00	0.00	**	**
Social studies	38.47	0.140		
Humanities	56.25	0.128	***	***
<i>Global mean</i>	<i>29.07</i>	<i>0.035</i>		
<hr/>				
M-W: Mann-Whitney test; T: T-test				
¹ Percentage of respondents who use their personal webpage for rendering their works freely available.				

Finally, turning to the question about whether OA publishing benefits academics' careers (Table 6), we can see that most respondents generally perceive some benefits from OA journals. However, associate professors are significantly more sceptical than average (33.75% compared to 24.58%), suggesting that when it comes to gather credits critical to promotion, they prefer to publish in traditional journals. This view does not seem to be shared by full professors, who are instead significantly less sceptical of OA's career benefits than average.

Although this result requires further investigation, it appears that a difference in hierarchical rank--i.e., being an associate rather than a full professor—affects whether OA publications are considered useful for career advancement. A tentative explanation might be that associate professors are under much more pressure when choosing a publishing outlet than their higher-ranked colleagues, because this may determine their chances of reaching the highest level of the academic hierarchy. Accordingly, they take greater care to minimise risk in their publication portfolio, by choosing the 'safest investment'. Since they already have a substantial record of publications, the final step in their career is not so much about quantity but quality²⁰. Hence, a traditional journal could be regarded as more reliable than an OA one, whose quality as perceived by the community, we have seen, is more uncertain. For full professors, who are instead less exposed to this career pressure, the

²⁰ According to the data provided by ANVUR (see note 16), associate professors already have substantial publication records. Hence to improve their 'market value' it is much more important to increase the marginal value of their latest publication, rather than simply collecting another publication which would leave their reputation unchanged.

marginal utility of an additional article is much lower, which allows them to take a more benevolent attitude toward OA journals.

Another important aspect to consider is that associate professors' promotion depends upon evaluation by a jury composed of full professors. So, if associate professors perceive traditional journals as better for career advancement than OA, and if this is a rational choice within the incentive framework governing academia, they must be responding to the value distribution of their evaluators, i.e. of full professors. In other words, the implication is that even though full professors take a more relaxed approach to publishing in OA journals and claim to be benevolent towards these new publishing outlets, when it comes to evaluating colleagues for promotion they still give greater credence to traditional journals. Put differently, the social norms governing the community are persistent even if individuals can sometimes disregard them (e.g., when their idiosyncratic position within the group hierarchy shields them from the peer system and its norms). However once these same individuals are again interacting with the community, they no longer feel free to deviate from the norms.

The above provides a fairly robustly confirmation of the strength and stickiness of social norms. No significant differences between discipline fields emerge from Table 6, suggesting that this assertion can be applied to the entire scientific community.

Table 6. OA publications are not useful for the career¹ (means; significance: difference from the mean)				
	<i>Means</i>	<i>s.e.</i>	<i>M-W</i>	<i>T</i>
Ph.D. students	10.00	0.010		
Post-doc fellows	26.09	0.041		
Assistant professors	25.37	0.038		
Associate professors	33.75	0.053	**	**
Full professors	13.58	0.038	***	***
<i>Global mean</i>	<i>24.58</i>	<i>0.021</i>		
Medicine	23.38	0.049		
Sciences	28.87	0.038		
Economics	25.45	0.059		
Law	27.59	0.084		
Social studies	18.52	0.076		
Humanities	22.64	0.058		
<i>Global mean</i>	<i>24.58</i>	<i>0.021</i>		
M-W: Mann-Whitney test; T: T-test				
¹ Percentage of respondents who deem OA publications not useful for their academic career.				

Taken together, the survey findings show there is a common rule that makes publishing important almost everywhere within the community. However, each discipline field appears to be governed by its own set of local rules, partially determined by the boundaries of that scientific community or even by pre-existing local practices. Even where individuals support a change in norms, the stickiness of the existing system and a coordination problem can prevent it from happening. This means the technological opportunities of ICT may be lost unless facilitated by changes in norms. One way of solving this chicken-egg dilemma is through an exogenous shock, such as the NIH's mandating that its health science researchers make publication freely accessible, that creates a focal point for the community and fosters the requisite dynamics.

Though we recognize the limitations of an analysis based on a sample from a single Italian university, this study still suggests useful avenues for further research, and enables us to draw some conclusions, consistent with the existing behavioural literature on scholarly communication and change in social norms.

6. Conclusions

In science, as in other social contexts that rely more on collective action and reciprocal recognition than on a top-down structure, social norms tend to prevail over laws because they seem better able to regulate social interactions, as underlined by an extensive literature. Still, in certain cases the stickiness of social norms, and their resultant resistance to change, can present shortcomings.

The aim of this work was to shed light on scholarly communication and its current trajectories by examining academics' perception of OA, while also providing a reference case for studying social norm change. In this respect, the issue of publication choice and the role of OA journals casts light on the changes affecting the republic of science and its institutional arrangements for validating and circulating new research. It also offers a useful vantage point for gauging the importance of localised social norms in guiding and constraining behaviour.

The overall picture reveals some interesting nuances. Though we generally think of academics as a unified group, their social norms are actually localized and vary across disciplines and national boundaries. Indeed, as has been reported in the literature, norms seem to push toward uniformity of behaviour within social groups even as they vary across different groups. There are certain discipline fields where norms are shared almost worldwide, however local arrangements generally tend to be quite important. Most notably, as far as publishing is concerned, there is an exception in Italy concerning law. Legal scholars are not using publications to communicate with the rest of the

world, nor with the wider legal community within Italy. This suggests that, in their case, broad circulation of knowledge outside the boundaries of the local academic community is not the scientific priority, and career advancement is governed by rules substantially divergent from those that govern other disciplines, which mainly rely on publication.

Other fields are more oriented toward circulating knowledge by taking advantage of ICT. When social norms do not make gold OA publishing valuable, they follow the alternative route of complying with the community's rules while at the same time supporting green OA, which thus acts as a sort of surrogate for gold OA.

Finally, even where certain groups--such as full professors--report a stronger orientation toward OA publication, this seems to be a conflicting signal that does not materially affect their community's behaviour. This supports the finding, previously reported in the literature, that accomplishing a shift in norms requires a deep and community-wide change in perceptions and expectations, as well as in individual mindsets.

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