



Contents lists available at ScienceDirect

## Management Accounting Research

journal homepage: [www.elsevier.com/locate/mar](http://www.elsevier.com/locate/mar)



# Management accounting goes digital: Will the move make it wiser?

Paolo Quattrone

The University of Edinburgh, The University of Edinburgh Business School, UK

### ARTICLE INFO

Available online xxx

### ABSTRACT

This essay places current fascinations with the digital revolution into the historical and cultural contexts that have intertwined with the evolution of management accounting as a practice involved in the production of knowledge for decision-making. In outlining similarities and differences in the production of management accounting information from aural to digital cultures, it argues that while the effects of the digital revolution on management accounting and decision-making are still unclear, these effects surely (and hopefully) will not deliver the dream of perfect information and rational decision-making as one may be led to believe by the growth of data-driven organizations and societies. Becoming aware of this impossibility is the first step for bringing wisdom back into decision-making processes and making management accounting gaining central stage again in the organizational arena.

© 2016 Elsevier Ltd. All rights reserved.

### Words are important

*“Chi parla male, pensa male e vive male. [...] Le parole sono importanti”* (Palombella Rossa, by Nanni Moretti, 1989)<sup>1</sup>

Words have a history (Long, 2001). Accounting words have a long history too. For example, not many accountants know that the word ‘inventory’ comes from Latin *inventio* (Goody, 1996); that is, the first canon of rhetoric—the process of developing and refining one’s arguments. This link already reveals, and points to, the persuasive power of accounting and its narrative nature (Carruthers and Espeland, 1991), which convinces users, for example, that a given strategic objective may be right. Equally, this narrative nature helps users of accounting to imagine visions and strategies and to construct different courses of action among which one can then choose, making users enthused and engaged by this imaginative power (Busco and Quattrone, 2015): accounting cannot be an ‘answer machine’ (Burchell et al., 1980) that helps decisions to be made simply by calculation but it can prepare the ground for communicative actions which will lead to decisions to happen and be managed.

Similarly, not many know that the word ‘auditing’ comes from *audire*—to listen—showing a remnant of an aural culture that trusted the sense of sound more than that of sight. It was the sixteenth century Benedictine accountant Angelo Pietra who suggested that, in checking the accuracy of accounting records, one

would benefit from “having a practical companion, who could help reading and checking the entries” (1586, p. 19; my translation), thus revealing that when auditing, greater trust was to be placed on hearing figures of speech rather than seeing numbers in writing.<sup>2</sup> Only recently, and only in some languages, the term that describes the auditing process has changed to reflect the shift in the attention paid to the impersonal visual aspect of an objective ‘number’ rather than the interpretation of a subjective ‘figure’ that requires inter-subjective checks and balances. So, for instance, the Italian term for auditing is ‘revision’—i.e., seeing it again, or, rather, auditing made by a visual check rather than an ‘audit’. Nowadays, Pietra’s advice that ‘numbers’ are ‘figures’, i.e., visual pictures that contribute to the composition and reinvention of visions, strategies and rationalities (Quattrone, 2015a) is almost forgotten. At his time, numbers as figures were much more about a speculation on a future to be debated than the representation of past performances to be used in management controls. The etymology of the word ‘auditing’ already points to the need for accounting figures to be checked in a communication effort that requires at least two companions. And if the second companion is not present then a minimal separation between ‘me’ and ‘myself’ needed to be established, as is the case in every act of control (Hoskin and Macve, 1986): for decisions to be well made, information requires an act of communication; i.e., an action which makes a community.

This is even truer if one looks at the origin of the word ‘rationality’, the putative ultimate referee of the correctness of decision-making. Again not many would know that ‘rationality’

E-mail address: [Paolo.Quattrone@ed.ac.uk](mailto:Paolo.Quattrone@ed.ac.uk)

<sup>1</sup> “Those who speak badly, think badly and live badly. [...] Words are important.” (All translations from Italian are mine).

<sup>2</sup> Auditing is indeed claimed to be originally made aurally (Clanchy, 1979).

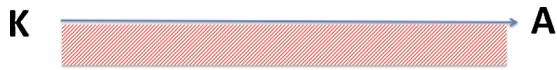


Fig. 1. Remnants of aural accounting: knowledge, action and the exercise of judgment.

comes from Latin *ratio*, and that *ratio* meant also ‘account’ and not ‘logic’ as one may suppose. But *ratio* is not just an account. It is a specific kind of account. In fact, *ratio* also meant ‘proportion’, as Pacioli (1494) reminded us from the very beginning of his work when discussing bookkeeping in a treatise about *proportioni et proportionalità*: a rational account needs also to be a *proportionate* account; i.e., an account that establishes a proportion and seeks to balance opposites (as opposed to being about ‘maximization’). Therefore an account always implies a balancing act that establishes proportionate relationships between *soci* (i.e., companions) in societies (Puyou and Quattrone, 2014), or, as Latour would say, in ‘socie-ties’ (2005), where links among these companions are managed by powerful and pragmatic institutions such as accounting.

Accounting history, and especially the Italian accounting history that I know better, is full of examples where accounting has been used to establish this communication, a dialogue to debate what is right rather than to benchmark it to a given notion of rational social behavior. From the Jesuit way of managing their cash account (Quattrone, 2015a) to the reporting format of the income statement in Italian financial reports (Dagnino and Quattrone, 2006), passing through the planning and budgeting techniques developed in a large Italian state-owned enterprise (Quattrone et al., 2014), accounting (and management accounting even more so) has always been used to interrogate notions of rationality and of what counts as right, rather than assuming rationality as a given, in an effort to avoid that what was technically rational and correct equated with being morally just.<sup>3</sup> In other words, and as illustrated in Fig. 1, this historical account suggests that decision makers exercised judgment all the way along the link that connects knowledge to action: from the beginning of the gaining and construction of knowledge to the execution of the decision through individual and social actions (the red oblique line in the figure).<sup>4</sup>

Knowledge was not a given to be communicated untouched but it was a process of mediation eventually leading to a pragmatic ‘balanced’ decision or compromise.

This is also why accounting inscriptions are called ‘records’ (from Latin *recordor*—to remember) because they are signs that remind us that a communicative process has eventually lead to a decision that can finally be recorded. What is important in this recording process is not the accounting number, the bottom line, but how one got there. As Bob Scapens reminded us while working together on a CIMA sponsored project, one of the interviewees (a financial controller) stated that budgets are important for the process that they require for their construction, not for the outcomes that they generate. Or to quote Merchant and Van der Stede (2012), “for plans and budgets to serve a useful role, the issue is not whether to prepare a plan or budget, but rather *how* to do it.” It is during this process that one really gets to know the organization and colleagues and their problems. The end result of that process, i.e., the budgeted profit, will already be obsolete by the time the budgeting process is complete. It is through discussing budgeting (hearing and discussing figures, visions of the future, as the early modern Benedictine accountant Pietra would remind us) and not by

<sup>3</sup> The reader will forgive me for yet another self-reference to Quattrone, 2016, forthcoming, where I expand these points.

<sup>4</sup> This is also related to Weick’s (1979) notion of ‘enaction’—i.e., the connection of knowledge with action.



Fig. 2. Written accounting: knowledge, action and the exercise of judgment.

looking at budgets (i.e., looking at objective accounting numbers) that the knowledge is generated.

This is not a trivial reflection if one considers that a move towards a digital culture is said to revolutionize decision-making processes by altering the way in which knowledge is gained and actions are undertaken, with technologies and algorithms supplanting humans in the production and certification of knowledge, and in the making of decisions, as is already happening, for instance, in high frequency trading (MacKenzie, 2014).

How the relationship between knowledge and action has changed when moving from aural to digital cultures is what I would like to briefly reflect upon in the remainder of this essay. As the quote by the Italian film director Moretti that opens this section reminds us, words not only have a history: *words are important*. The same applies to figures and numbers: they have to be listened, discussed and understood because numbers, as much as facts, do not speak for themselves. The same applies, I would argue, to digits. Those who assume that figures, numbers and digits convey immutable truths, use them badly, think badly, and act badly.

*Magic words*

“*La contabilità è a posto, Eccellenza. Era la parola magica.*” (Giuseppe Tomasi di Lampedusa, *Il Gattopardo*, 1958, p. 47)<sup>5</sup>

I have illustrated elsewhere (Quattrone, 2009) how the development of accounting has been historically linked to humanist culture and more specifically to rhetoric, conceived of as a method of knowledge classification and invention and not merely as a technique of persuasion. These were the same techniques utilized in religious practices to question individual morality and collective social order (Quattrone, 2015a). When such techniques travelled into other spaces, thus constructing new fields of knowledge, from science (Galison, 1997) to accounting (Quattrone, 2009), recording slightly changed its function: no longer an instrument to question the morality of conduct but one to provide information and skills (Grafton and Jardine, 1986). Subjective and relative figures and images became objective numbers and facts, ready to be stored and objectified in visual inscriptions then accumulated in written books and centers of calculations (Robson, 1992).

The diffusion of Enterprise Resource Planning (ERP) systems made this objective feature of accounting numbers even more pervasive and visible, with a formal separation between supposedly powerful organizational centers and peripheries. However, access to a larger amount of data reconfigurable at will also incidentally allowed multiple loci of controls and therefore the diffusion of power (see, e.g., Quattrone and Hopper, 2001, 2005).

The inscription of accounting numbers on physical and virtual ledgers makes accounting numbers travel easily and become immutable mobiles that make action-at-a-distance a possibility (Latour, 1987), where the production and consumption of accounting numbers is now separated in siloed functions: on one side, the finance function, which produces mountains of data more for compliance than for management purposes (Power, 1997, 2007); on the other, the management and strategic functions, which consume data without a close scrutiny of their quality. This is what we see in Fig. 2, where numbers are used as mere inputs to decision-making processes with the exercising of judgment now beginning at the point when data have already been packaged and made

<sup>5</sup> “*The accounts are in order, Excellency. These were the magic words.*”



Fig. 3. Digital accounting: knowledge, action and the exercise of judgment.

available for consumption. Data are now 'given' to decision makers who are formally and substantially excluded from their manufacture. Decisions happen only after numbers have been recorded and management reports are often tabled rather than discussed.

We nowadays consume accounting figures (Graham, 2008) as we buy groceries in supermarkets, without knowing how the food has been processed, technically alienated from the manufacturing process, with labels there to reassure us about the ingredients but nothing about whether these are the right nutrients for us. The same applies to financial and management accounting numbers with standardized information, too costly to be customized, generating standard charts of accounts formalized in XBRL codes, ready to be consumed but not always questioned and debated. Technological developments make users believe that they can interrogate accounting system and get answers out of it (Burchell et al., 1980), but perhaps that is rather an illusion of control.

As the quote opening this section suggests, accounting information is there to reassure us that everything is "in order"; accounting numbers have become magic words that close conversations about intrinsically doubtful but unquestioned qualities rather than fostering conversations instilling doubt in the user. Accounting numbers are no longer there to be spoken, listened, and debated in communicative acts, but to be consumed as inputs to decision making.

#### Magic digits

*Feeling unknown and you're all alone* *Flesh and bone*, by the telephone *Lift up the receiver, I'll make you a believer*. (Depeche Mode, *Personal Jesus*, 1989)

The world of practice is already embracing the digital revolution with information technology firms using large amounts of data not only to profile customers but also to predict their behavior and to make decisions. This is the case, for instance, with analysis of large amounts of communication flows to understand the 'mood' of organizations. One example is the use of facebook posts to explain investors behavior (Danbolt et al., 2015).

We also know that accounting, management accounting, and finance are 'performative': they are engines and not cameras of financial markets (MacKenzie, 2006), thus defining how markets work regardless of whether financial models provide accurate representations. Algorithms and not humans now match supply and demand in various industries such as transport, retail (the paradigmatic examples being Uber and Amazon; see also Davis, 2015) and finance, where instant trading is managed exclusively by mathematical algorithms (MacKenzie, 2014) in realities that are hyper-real (Macintosh et al., 2000).

In this context of 'big data' and spurious correlations,<sup>6</sup> the appeal to the visual power of numbers as digits is increasing (Davison, 2015) with visualizations that become more and more convincing augmenting the already magic persuasive power of accounting numbers, with predictive models now making decisions and thus limiting the space for judgment to the very last, and short, part of the relationship between knowledge and action (see Fig. 3).

I suspect that marketing experts must be very well aware of this human tendency for a desire for certainty if, in choosing their company name, one of the largest information technology compa-

nies in the world decided to name itself 'Oracle', perhaps to suggest that we can all interrogate the system and wait for it to give us an answer that provides us with a false certainty about an uncertain future. Meyer (1986) and Cooper et al. (1981) already warned us of how solutions and problems are only loosely coupled, and the more managers are exasperated by their problems the more they tend to believe in consulting solutions. As alluded to in the opening quote, Depeche Mode know (and sing) this well too: we are all made of flesh and bones, always by the telephone, ready to lift the receiver to be made believers, with magic digits replacing magic figures and numbers along the process.

*What to hope from the move to the digital? Implications for management accounting, accountants and the making of wise decisions*

*"Tutti a pensare che la verità sia la cosa giusta. E invece è la fine del mondo."* (Il divo, by Paolo Sorrentino, 2008)<sup>7</sup>

If one looks at the evolution of reporting practices, one has witnessed the enlargement of the realm of the measurable: from the economic to the social and the environmental. As I have argued elsewhere (Quattrone 2016, forthcoming), this belief in the positive power of representation augments the tyranny of transparency (Strathern, 2000), which presupposes what is to be made transparent, from profits to CO<sub>2</sub> emissions, with the hope that one can control organizational and natural worlds with few key performance indicators. The result is that what is not made transparent is relegated to an eternal oblivion with the paradox that current institutional attempts to increase transparency of financial transactions have instead increased their opacity. By marginalizing what cannot be counted, these attempts have created a veil of transparency behind which all sorts of things happen without being accounted for.

The digital revolution poses to management accounting a similar paradox. It constitutes a modern divide (Latour, 1991): on the one hand, it will increase the belief into the possibility to give better visibility to organizational actions—a dream of full control where distance is cancelled, where databases and statistical models know individuals better than the individuals themselves and are able to predict their wishes and future actions. The realm of the measurable is expanded and could theoretically be extended to our entire lives, well beyond the workplace, knowing that what happens outside work is possibly even more relevant in understanding our attitudes at work. On the other hand, it will augment uncertainty. Spurious correlations as the ones to which I have referred in the previous section and the need to select from among the ocean of data and options by which one will be flooded will augment, not diminish.

The digital revolution has the opportunity to challenge the tyranny of transparency and this modern divide because the entire edifice of measurement could potentially be disrupted by a tweet or an internal email unveiling data that were not presupposed to be made transparent. It will make clear that the dichotomy between measurement and judgment is a false one and that information is always to be scrutinized and never to be quickly consumed. If I had to bet on what big data will do for decision-making, I would say that it will make people take wrong decisions much more quickly than before, with even less room for the exercise of wisdom beyond the increasing compliance that affects various realms of decision-making, from finance to risk management.

How can we revert the process? Or at least use accounting digits to imagine a different one?

Let's go back in history for a moment. Flori (1636) who authored the first treatise that is said to describe what then became known

<sup>6</sup> For a humorous list that is useful though to reflect on the power of graphics and charts in making people believe in science, see [www.tylerwigen.com/spurious-correlations](http://www.tylerwigen.com/spurious-correlations).

<sup>7</sup> "Everybody there to think that truth is the right thing. Instead it is the end of the world."

as accruals, opened his manual by stating that accounting is a pragmatic science, it does not deal with truth, a matter reserved for theologians to discuss: he was just an accountant.

There is much wisdom in this caution. As most of the research in *Management Accounting Research* has shown since the Journal was established 25 years ago, decision-making does not deal only with 'data' to be used neutrally in decision-making. Politics, epistemological limitations, biases and the like all intertwine with figures, numbers, and digits. As the etymology of the word 'data' reveals (from Latin *datum*), data are not only 'given' but also 'attributed' by those who produce and consume accounting data: this attribution implies a lot of politics, pressures, egos, and other factors that inevitably move us away from rational decisions. Yet, in the digital era, this attribution will possibly become more complex with shifting loci of power and control. While, on the one hand, the centralization of data in powerful databases ready to be mined by automated searches will increase the power of those controlling access to such databases; on the other, the knowledge-action continuum will very likely become a constellation as it was already the case with the ERP explosion, where access to a larger amount of data reconfigurable at will allowed multiple loci of controls and therefore the diffusion of power, reminding us that the world of practice always escapes totalitarian forms of control (De Certeau, 1984).

It seems therefore that the digital revolution will prove fruitful if rather than simply increasing divisions between the controlled and the controllers, it will also favor greater dialogue and debate about the attribution of meaning in constellations of action-nets (Czarniawska, 2004) in order not to make rational choices (an epistemologically impossible dream) but reasonable ones. Flori (1636) was already cautioning us that while rational decision-making was impossible, reasonable decision-making was not only possible but it was the primary role of double entry bookkeeping. We seem to have forgotten this message: reasonable not rational choice is what we are after thanks to accounting calculations that create platforms of mediation and maieutic machines used to question and imagine what we cannot know rather than reassuring us of what can be measured (Busco and Quattrone, 2015; Quattrone, 2015b). Let's use representations to discuss what cannot be represented, be these representations provided by aural figures, written numbers or silicon digits.

We seem to have forgotten that accounting, and even more management accounting (which was more or less all the accounting early modern accountants knew) is about establishing and continuing a dialogue, to keep societies united for them to generate marvels as big as the Renaissance (Padgett and McLean, 2011). The aim of accounting was not to understand who made more profit than another, to establish who was right and wrong in this dialogue. That was almost a childish attitude. It would have meant and implied the end of a conversation by closing the dialogue with a 'right' on one side and 'wrong' on the other, forgetting that this symmetrical distinction of accounting was used to explore the middle, to seek balance. Charging accounting with the aim of searching for truth would have meant the end of accounting and the death of the accountant, the end of the society and the end of the world. As Ward notes (2015) in relation to economics, not truth but the interrogation of the mystery of what was worth was the aim of economics, almost a religious practice that would lose grace if that worth was to be measured in objective numbers rather than discussed thanks to relativist figures. Similarly, assuming that the aim of accounting is to establish truth would make this aim accounting's end, the end of a continuous process of ordering, the end of 'socie-ties'.

As Paolo Sorrentino reminded us in *Il divo*: "Everybody there to think that truth is the right thing. Instead it is the end of the world". Accountants used to know it too but we all tend to forget

it. Not truth, a matter for endless theological debates, but a pragmatic communication that is aimed at interrogating the mystery of what cannot be known thanks to the numbers that accounting produces (Quattrone, 2016, forthcoming) is the core of the accounting craft. If we lose that core, believing that representations can be accurate and truthful, then not only we lose grace but the move to the digital will make accountants lose in favor of informatics. If we retain it, and make users understand that this ability to deal with uncertainties has been the power of accounting for centuries, then accounting will keep flourishing as it has for hundreds of years.

## Acknowledgements

I wish to thank the founding editors of *Management Accounting Research*, Bob Scapens and Michael Bromwich, for their kind invitation to join a panel to reflect on the future of management accounting at the 25th Anniversary Conference of the Journal, celebrated at the London School of Economics and Political Science on 17 April 2015. I also thank Wim Van der Stede, who chaired the panel, for inviting me to develop my thoughts further for this article, and even more so for his patience in waiting for this manuscript to be delivered. I also wish to thank Bob Scapens, again, and especially, as some of the thinking he has stimulated in all of these years of fruitful collaboration is contained in these pages. The usual disclaimers apply.

## References

- Burchell, S., Clubb, C., Hopwood, A., Hughes, S., Nahapiet, J., 1980. *The roles of accounting in organizations and society*. *Account. Organ. Soc.* 5, 1.
- Busco, C., Quattrone, P., 2015. Exploring how the balanced scorecard engages and unfolds: articulating the visual power of accounting inscriptions. *Contemp. Account. Res.* 32 (3), 1236–1262.
- Carruthers, B.G., Espeland, W.N., 1991. Accounting for rationality: double-entry bookkeeping and the rhetoric of economic rationality. *Am. J. Sociol.* 97 (1), 31–69.
- Clanchy, M.T., 1979. *From Memory to Written Records*. Harvard University Press, pp. 1066–1300.
- Cooper, D.J., Hayes, D., Wolf, F., 1981. Accounting in organized anarchies: understanding and designing accounting systems in ambiguous situations. *Account. Organ. Soc.* 6 (3), 175–191.
- Czarniawska, B., 2004. On space, time and action nets. *Organization* 11 (6), 773–791.
- Dagnino, G.B., Quattrone, P., 2006. Management and business research Italian style: the methodological contribution of *economia aziendale* to business economics. *J. Manag. Hist.* 12, 1.
- Danbolt, J., Siganos, A., Vagenas-Nanos, E., 2015. Investor sentiment and bidder announcement abnormal returns. *J. Corp. Financ.* 33, 164–179.
- Davis, J., 2015. Editorial essay: what is organizational research for? *Adm. Sci. Q.* 60, 179–188.
- De Certeau, M., 1984. *The Practice of Everyday Life*. University of California Press, Berkeley and Los Angeles.
- Flori, L., 1636. Trattato del modo di tenere il libro doppio domestico con suo esemplare composto dal P. Lodovico Flori della Compagnia di Gesù per uso delle case e dei collegi della medesima Compagnia nel Regno di Sicilia. Palermo: Decio Cirillo.
- Galison, P.L., 1997. *Image and Logic: A Material Culture of Microphysics*. University of Chicago Press, Chicago.
- Goody, J., 1996. *The East in the West*. Cambridge University Press, Cambridge.
- Grafton, A., Jardine, L., 1986. *From Humanism to the Humanities: Education and the Liberal Arts in Fifteenth and Sixteenth-century Europe*. Duckworth, London.
- Graham, C., 2008. Fearful asymmetry: the consumption of accounting signs in the algoma steel pension bailout. *Account. Organ. Soc.* 33 (7–8), 756–782.
- Hoskin, K.W., Macve, R.H., 1986. Accounting and the examination: a genealogy of disciplinary power. *Account. Organ. Soc.* 11 (2), 105–136.
- Latour, B., 1987. *Science in Action How to Follow Scientist and engineers through society*. Cambridge Mass., Harvard University Press.
- Latour, B., 1991. *Nous n'avons jamais été modernes. Essais d'anthropologie symétrique*. Paris: La Découverte; English translation, *We Have Never Been Modern*, Cambridge, MA: Harvard University Press, 1993.
- Long, P., 2001. *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance*. Johns Hopkins University Press, Baltimore, London.
- Macintosh, N., Shearer, T., Thornton, D.B., Welker, M., 2000. Accounting as simulacrum and hyperreality: perspectives on income and capital. *Account. Organ. Soc.* 25 (1), 13–50.

- MacKenzie, D., 2006. *An Engine, Not a Camera: How Financial Models Shape the Markets*. MIT Press, Cambridge (MA).
- MacKenzie, D., 2014. A Sociology of Algorithms: High-Frequency Trading and the Shaping of Markets. Working paper.
- Merchant, K.A., Van der Stede, W.A., 2012. *Management Control Systems: Performance Measurement, Evaluation and Incentives*. Prentice Hall, London, UK.
- Meyer, J.W., 1986. Social environments and organizational accounting. *Account. Organ. Soc.* 11, 345–356.
- Pacioli, L., 1494. *Summa de arithmetica, geometria, de proportioni et de proportionalita*. Venice, Italy.
- Padgett, J.F., McLean, P.D., 2011. Economic credit in Renaissance Florence. *J. Mod. Hist.* 83, 1–47.
- Pietra, A., 1586. Indirizzo degli economisti o sia ordinatissima istruzione da regolarmente formare qualunque scrittura in un libro doppio. Aggiuntovi l'esemplare di un Libro nobile co 'l suo Giornale ad uso della Congregazione Cassinese dell'Ordine in San Benedetto. Mantova: Francesco Osanna.
- Power, M., 1997. *The Audit Society: Rituals of Verification*. Oxford University Press, Oxford.
- Power, M., 2007. *Organized Uncertainty: Designing a World of Risk Management*. Oxford University Press, Oxford.
- Puyou, F.-R., Quattrone, P., 2014. Figures not numbers: accounting, legitimacy and the making of 'socie-ties'. In: Paper Presented at the EGOS Conference, Rotterdam.
- Quattrone, P., Hopper, T., 2001. What does organisational change mean? Speculations on a taken-for-granted category. *Manage. Account. Res.* 12 (4), 403–435.
- Quattrone, P., 2009. Books to be practiced. Memory, the power of the visual and the success of accounting. *Account. Organ. Soc.* 34, 85–118.
- Quattrone, P., 2015a. Governing social orders, unfolding rationality, and jesuit accounting practices: a procedural approach to institutional logics. *Adm. Sci. Q.*, 1–35.
- Quattrone, P., 2015b. Value in the age of doubt. Accounting as a maieutic machine. In: Kornberger, M., Jusesen, L., Moursitsen, J., Koed Madsen, A. (Eds.), *Making Things Valuable*. Oxford University Press, Oxford, pp. 38–61.
- Quattrone, P., (forthcoming). In search of what accounting is not: Speculations on the future of valuing, transparency, and a new aesth-etics for governing capitalism and democracy. In: Czarniawska, B. (Ed.), *A Research Agenda for Management & Organization Studies*. Elgar, forthcoming.
- Quattrone, P., Hopper, T., 2005. A 'time-space odyssey': management control systems in multinational organisations. *Account. Organ. Soc.* 30 (7–8), 735–764.
- Quattrone, P., Monfardini, P., Ruggiero, P., 2014. Le pratiche di programmazione e controllo nel Gruppo IRI: tra contesti organizzativi, politica economica e cambiamenti globali. In: Ciocca et al. (Eds.), *La storia dell'IRI*. vol. V, Bari: La Terza (2014).
- Robson, K., 1992. 'Accounting numbers as inscription: action at a distance and the development of accounting'. *Account. Organ. Soc.* 17 (7), 685–708.
- Strathern, M., 2000. The tyranny of transparency. *Br. Educ. Res. J.* 26 (3), 309–321.