S|S|S

ABSTRACT Michel Callon's work on 'the performativity of economics' raises interesting theoretical challenges for the social study of markets. Callon proposes that laws of markets do exist, but mainly because they are performed, shaped and formatted through the way economics develops 'spaces of calculation'. The performativity thesis proposes that if markets are not natural entities, but are instead performed by economics, this may open up the reconfiguration of market practices to many previously excluded actors, including STS scholars. However, Callon's focus on the role of *materialities* in performing spaces of calculation and the role of *economics* in creating these materialities, easily leads to *over-enthusiasm for the potential of STS scholars to engage in reconfiguring markets*. Based on an interventionist research project on performing healthcare markets as 'value'-driven, rather than 'cost-saving'-driven, I argue that markets can 'work' despite the absence of well-functioning materialities. This problematizes the approach pursued by Callon, and I therefore propose to temper the ambitions of STS scholars involved in the reconfiguration of markets to direct them towards the analysis of *historically grown prevailing market regimes and market practices as 'forms of the probable' for such reconfiguration*. Analysing such probabilities may be fruitful for reflecting on the risks that such experimental interventions entail for reconfiguring markets.

Keywords healthcare markets, interventionist STS, Michel Callon, performativity of economics, reconfiguration

Competition in the Wild:

Reconfiguring Healthcare Markets

Teun Zuiderent-Jerak

In 1999 the Atrium Medical Centre, a large teaching hospital in the hills of the southern part of the Netherlands, did what many hospitals were doing at that time: it introduced a 'joint care' trajectory for patients receiving hip or knee prosthesis. With the development of 'total hip' or 'total knee' implants in the preceding decades and increasing numbers of patients receiving such a prosthesis (Faulkner, 2002), the 1990s saw intensified efforts to provide hip and knee replacement operations on the same day to several patients (Schrijvers et al., 2003). Clustering the operations in small groups of typically five patients produced a group dynamic in which patients were inspired by each other's recovery process, resulting in reduced stays in the hospital. Combined with an improved intramural coordination, the length of

Social Studies of Science **39/5 (October 2009) 765–792**

ISSN 0306-3127 DOI: 10.1177/0306312709104433

FIGURE 1
Chateau St Gerlach

stay of these patients at the Atrium Medical Centre was reduced from an average of 18 days to about 6 days: a dramatic improvement in service levels, with decreased hospital costs and discomfort for patients.

In May 2005, a nearby clinic, the Maasland Hospital, announced that it had developed a new care arrangement called *Healing Hills*, in which patients are quickly transferred after joint-replacement surgery to a luxurious hotel in the area, Chateau St Gerlach (Fig. 1). They could then recover in pleasant surroundings in the Limburg hills, at a facility in which 'The highest quality of care and the hospitality of Limburg'[1] are brought together. This arrangement was developed in cooperation with one of the smaller health insurance companies in the region, which was preparing itself for changes in the health insurance market that would take effect on 1 January 2006. On that date the Market Regulation Health Care Act would be introduced, and through this Act the traditional system for budgeting care delivery through national health insurance run by the Government was replaced by a system where all citizens were obliged to be insured by private insurance companies. Health insurance providers would thereby be placed in a position where they would have to compete for clients, while also negotiating with hospitals about the quality and price of the 'care products' they offered. By creating an image of its insurance package as combining top clinical care with the typical southern Dutch savoir vivre the insurance company hoped to attract many new customers.

The announcement of the care provided by the Maasland Hospital received substantial local press coverage, and although managers and doctors of the Atrium Medical Centre laughed off the 'innovation' as 'mere window

dressing', they also recognized the potential consequences of this stunt for their own facility's image, and realized something had to be done. They were aware that the Atrium Medical Centre could not compete with the care that the Maasland Hospital was offering, but they figured that, on an economic level, they could become a far more interesting partner for the insurance companies if their joint care trajectory could be made substantially cheaper while delivering better quality medical care. This was particularly interesting since on 1 January 2005, a new financing system was introduced for Dutch hospital care, a type of 'Diagnosis Related Groups' (DRG) system, in which the price for certain common medical procedures became freely negotiable between hospitals and insurance companies, rather than fixed annually by the Dutch government. Since hip and knee replacements are among those procedures with freely negotiable prices, management of the Atrium Medical Centre saw a low price as their vital selling point during the upcoming round of negotiations with insurers. The management therefore decided, together with their orthopaedic surgeons, to have a close look at their joint care trajectory and realized that by running an improvement project, they could further reduce the length of stay to about 4.5 days for a total hip replacement and to 3.5 days for a total knee replacement. Hospital management and surgeons also figured they could expand the inclusion criteria for the joint care service, so that 80% of all patients needing a new hip or knee could be treated in this way instead of the current 50%. They made a business case for this redesigned joint care programme in which they brought together the financial gains from the proposed changes (fewer inpatient days, and so on) with the investments needed to realize the necessary medical improvements. In this way, they could reduce their costs by about €700 per patient – leading to a total net increase in profit of about €600,000, based on estimates of the number of patients treated.[2]

During the annual negotiation with the largest insurance company, which has a market share of roughly 70% in this southern region, the CEO of the Atrium Medical Centre took a considerable risk: he put the business case right on the table and showed not merely the gains of this redesigned trajectory, but also the total cost for the Atrium Medical Centre of providing such treatment. The insurance company appreciated his openness and proposed an agreement in which the Atrium Medical Centre became the 'preferred partner' for knee and hip replacements in this region. The insurer would send a letter to all of its clients, indicating that the Atrium Medical Centre was the place to go for a knee or hip replacement. Also, the insurer supported and participated in the festive opening of the centre for elective treatment that the Atrium Medical Centre organized some months after the negotiations. The insurer and the hospital decided on a price that allowed the Atrium Medical Centre to have a reasonable profit, while still offering joint care at a substantially lower price than neighbouring hospitals.

The director was satisfied about this 'golden deal'; the risk he took by putting all his cards on the table seemed to have paid off. But the quality manager, who was supposed to support the innovation process, still had a major concern: the business case was still based on *proposed* changes and

not on achieved results. Though it may have been easy to sell this product at such a low price, she knew that there would be no sinecure to turn the improved care process from a plan into a reality. She wondered whether the deal that was made would be helpful in realizing the changes that were needed, or whether the orthopaedic department would have a financial deficit in the next year.

Dynamic Relationships Between Market Mechanisms and Healthcare Delivery

Concerns about the relationship between healthcare delivery and market mechanisms have a longstanding history. Even the founding father of economics and the iconic promoter of the 'free market', Adam Smith, argued in *The Wealth of Nations* that the invisible hand would display some imperfections when left to reign in healthcare. The trust patients should invest in their doctors, and the importance for medical professionals to undergo a solid education, would sit uneasily with a doctor's need for income, unless such wages were protected through restricted admission to the medical profession (Smith, 2000 [1776]: chapter X).[3]

Some 230 years later, exploring and reconfiguring those very limitations of free market mechanisms in healthcare has become one of the main tasks for health economists. The founding father of health economics, Kenneth Arrow, posed that 'when the market fails to achieve an optimal state, society will, to some extent at least, recognize the gap and non market [sic.] social institutions will arise attempting to bridge it' (Arrow, 1963: 947).[4] Ever since, health economists have largely focused on the study and development of those very 'social institutions' and on how health economics can contribute to the construction of these 'optimal states'. Health economics therefore is involved in the construction of 'markets for public goods', and the practices through which these goals are pursued have gradually become topics of analytical and normative interest for researchers (Ashmore et al., 1989; Grit & Dolfsma, 2002; Sjögren & Helgesson, 2007).

Unfortunately the structure of the present debate on marketization in healthcare threatens to restrict the space for empirical study. There are clear, and often ideological, divisions between protagonists of healthcare markets who claim that providing 'incentives' for competition automatically ensures efficiency in healthcare, and critics who claim that the managerialization of healthcare is ruining the actual work professionals carry out. The claim that markets can still be kept away from the healthcare domain (Godlee, 2006) or that 'healthcare is not a market' (Palm, 2005) thereby leaves unaddressed crucial questions about the specificity of market mechanisms in healthcare (improvement). These questions include how market mechanisms in healthcare are made to work, what others are constituted in the newly created market 'orders' (Berg & Timmermans, 2000), and what potential alternative configurations of market mechanisms can be envisioned. When critics of consumerism and choice in healthcare (Mol, 2008), or promoters of managerialism in all kinds of social services (such

as the 'new public management' protagonists; Pollit & Bouckaert, 2000), ignore such specificities, they simply leave the development and study of market mechanisms to health economics.

How Economics Performs Markets and May be Getting Company

In recent years, the social study of markets has experienced challenging theoretical developments through the work of Michel Callon (1998a,b,c; 1999; Barry & Slater, 2002b; Callon et al., 2002, 2007; Callon & Muniesa, 2005). Callon and his colleagues address what they call 'the performativity of economics' (MacKenzie & Millo, 2003; MacKenzie et al., 2007). Following early work in actor network theory (ANT) about how scientific facts are produced and enacted through *hybrid collectifs* (Callon & Law, 1995) in which scientists play a crucial role (Callon, 1986; Latour & Woolgar, 1986 [1979]; Latour, 1987), Callon turned his attention to economics. Consistent with ANT studies of the natural sciences, he argued that economics does not merely discover independently existing market laws, but is actively involved in bringing those laws into being. This empirical turn allows for a study of how markets are performed through the activities of economists, and has opened up the enactment of markets for empirical scrutiny, creating 'an abundance of ways of *seeing* economic markets' (Barry & Slater, 2002b: 291; italics in the original).

According to Callon, this empirical turn not only has theoretical and analytical implications; it also is highly consequential for the *roles* social scientists may play in the *reconfiguration* of emerging markets:

> the market is no longer that cold, implacable and impersonal monster which imposes its laws and procedures while extending them ever further. It is a many-sided, diversified, evolving device that the social sciences as well as the actors themselves contribute to reconfigure. (Callon, 1998b: 51)

In the light of the often polarized debate on (healthcare) marketization, Callon's work can be taken as an important reminder that 'it would be a mistake to be simply opposed to markets or to marketization' (Callon, in Barry & Slater, 2002a: 186). The question of how markets are reconfigured by various actors thus creates important space for researchers from the field of science and technology studies (STS) to explore particular forms of markets – a topic that has for so long been reserved for economists. It changes markets from impersonal and 'natural' entities into interesting objects for studying the creation and regulation of a particular form of objectivity, which is the topic of this special issue.

The focus on the performativity of economics also opens up a normative conceptualization of 'markets as political issues', which can either be studied critically or, as Callon proposes, reconfigured actively through 'experimenting with new configurations' (Callon, interview in Barry & Slater, 2002b: 288). *How* such reconfiguration can be done is, unfortunately, empirically and conceptually underexplored in the literature. In this paper I

therefore aim to explore how Callon's work affords STS research and intervention on the experimental development of healthcare markets in the Netherlands. I will turn to a case in which I was actively involved as, in Callon's words, one of the '[i]nnovative actors [who] are experimenting with new configurations' (Callon, in Barry & Slater, 2002b: 288) of healthcare markets. On the basis of this interventionist STS project on the innovation of healthcare (market) practices, I will argue that the involvement of STS researchers in the reconfiguration of markets may be less controlled and riskier than Callon suggests. I will elaborate on the fragile connection between materialities of markets and market practices on the basis of which I will conclude by proposing some conceptual changes that may be fruitful for further STS analyses of and involvements in the construction of markets.

Healthcare Improvement and Marketization: The Case of Better Faster

In November 2003 the Dutch Ministry of Health, Welfare and Sport, together with the Dutch Hospital Association, launched a large initiative called *Sneller Beter* ('Better Faster'). The initiative explicitly aimed to improve the quality, safety and efficiency of the hospital care sector. It also was widely perceived as a demonstration of the Ministry's willingness to invest in 'quality' at a time of dramatic change in health policy associated with 'regulated competition' for Dutch healthcare. In the following 2 years the Ministry began switching its payment structure to a diagnosis related groups (DRG)-based system, which as mentioned above was designed to set up competition for the price for a percentage of DRGs. The Ministry also introduced the new health insurance law, which was supposed to give insurance companies a leg-up for becoming ever more powerful players in negotiating healthcare quality and price. The initiative largely resonated with the aims of the broader changes in the policy of 'regulated competition'. The main assumption of the initiative was that healthcare delivery can:

> … often be done faster or better. Faster, because care must be available when it is needed. Better, because it needs to be as safe, efficient and patient-friendly as possible. That is why we need to be more open about how we use both human and financial resources. We need to make it easier to compare the performance of care providers. So they need to work on the basis of clear norms and protocols. And good practice needs to be applied faster. After all, care providers have a lot to learn from each other. (Ministry of Health Welfare and Sport, 2005)

The initiative covered a range of activities, which would 'prepare the hospital sector for the new care system' (ibid.).

The Better Faster initiative consists of three so called 'pillars': first, there is a set of activities aimed at increasing awareness of good practices, partly through an online 'best practice' database and partly through 'ambassadors' from large business firms, who present their views on such matters as safety, logistics and accountability in healthcare.[5] Second, in January 2004 the Dutch Healthcare Inspectorate introduced a set of performance

indicators for hospital care, which was to be extended and improved-upon in the coming years.[6] Third, a quality, innovation and efficiency collaborative was initiated in October 2004. It was set up in three tiers of eight hospitals, with each hospital being included for 2 years at a stretch, and each group starting 1 year after the previous one. Hospitals had to 'apply' for the programme and, once selected, would not have to pay for participation in the collaborative.[7] The initiative consisted of a package of projects to be carried out by each participating hospital, which included preventing post-operative wound infections, preventing bed sores, improving operation theatre efficiency, reducing medication errors, installing blame-free reporting, providing instant access to outpatient clinics, redesigning processes for oncology care and elective surgery, and improving leadership qualities for hospital management. In this third pillar, national working conferences were scheduled on each improvement theme for the teams from participating hospitals, and each hospital received substantial support through attending these conferences and through the availability of an advisor who spent several days a week supporting the various projects and advising unit management and the board of directors.

The three pillars of the Better Faster initiative were supposed to strengthen each other, in order to encourage participating actors to compete for efficiency and high quality:

> The aim is to help parties in the field improve their performance, starting with hospital and primary health care, where there is plenty of room for improvement. The programme does not only target care providers, since it is important for as many parties as possible to benefit from the activities being implemented under its aegis. It will help insurers, for instance, to see who is and who isn't adopting proven good practice. (ibid.)

Better Faster was a highly layered set-up, using benchmarking to classify differences between hospitals, performance indicators to monitor practices, and the collaborative improvement programme to substantially enhance patient safety and patient logistics.

Contrary to any impression that regulated competition is a system that simply needs to be 'implemented', the Better Faster initiative can be seen as *performing healthcare as a market of a particular kind*; a market in which actors would not simply compete over the *price* of the 'care products' or the *service levels*, but where a reduction of the price paid by insurers would go hand-in-hand with an increase of medical quality and patient-centeredness. The initiative thereby could be analysed as a set of experimental devices to materialize the notion that competition in healthcare should aim to 'increase value'; an aim that would probably not be achieved simply by starting a price war (Porter & Olmsted Teisberg, 2004). For example, during the conferences on medication safety the speakers stressed that reducing the number of blood transfusions administered is both a safety issue for patients and a major cost-saving instrument, while researchers from the department of Health Policy and Management produced a study (Manna et al., 2006) that reconfigured pressure ulcers from a *quality* issue to a *major cost issue*, as

their treatment would require much longer hospitalization, which would no longer produce revenues for hospitals within the new payment structure. This is because inpatient days was no longer included as a category in the budgeting system that could be invoiced, but was now a *cost* that hospitals would have to deduct from their income. Through such initiatives, the actors within the collaborative tried to connect cost-saving possibilities to ways of making care patient-centred.[8]

The Department of Health, Policy and Management of the Erasmus University Medical Centre was heavily involved in the second and third pillar of the Better Faster initiative. Researchers from that department were responsible for the development of a set of indicators, following a highly experimental and pragmatic strategy in a debate on performance indicators that had long been dominated by scientistic issues of validation and accuracy.[9] The institute was also one of the three consortium partners running the third pillar, the other two being the Dutch Institute for Healthcare Improvement and the Dutch Order of Medical Specialists. The institute also happens to be the place where I work and, based on earlier experiments with interventionist STS research on the redesign of care practices (Zuiderent, 2002; Zuiderent-Jerak, 2007a), I ended up becoming national project leader of the process redesign project and hospital advisor for the aforementioned Atrium Medical Centre.

The care process redesign project is one of the places where the notion was prominently articulated that creating patient-centred, high-quality care is not just a quality-improvement strategy, but could be used as a 'business strategy'. Focussing on an entire trajectory that patients go through, as compared with, for example, the efficiency of individual organizational units, helps to reveal the often uncoordinated steps that can prove harmful to both patients and the hospital organization. Such a focus on patient trajectories (Strauss et al., 1997) had previously been shown to provide interesting opportunities for overcoming polarized debates on standardization in healthcare, while proposing the notion of 'situated standardization' as a relevant STS contribution to healthcare improvement (Zuiderent-Jerak, 2007a). The importance of care trajectories soon became apparent in one of these projects. Teams collaborating on the improvement project were required to produce overviews of appointments, diagnostic activities, treatments, and follow-up procedures. These overviews were supposed to be made on trajectories patients actually followed, instead of ideal-typical pathways. For each item, a date had to be recorded, to enable insight into the duration of the trajectories. In a multi-disciplinary group that was focusing on the care for patients with colon and rectum carcinoma, it was found that patients received colonoscopies more often than medically necessary. Even when a gastroenterologist had performed the colonoscopy, and had diagnosed the patient with cancer of the colon, a surgeon would perform the same colonoscopy with a slightly different device – something the gastroenterologist had not been aware of prior to seeing the overview. When discussing this finding in the project group, the surgeon indicated that the gastroenterologist did not register the distance between the anus and the

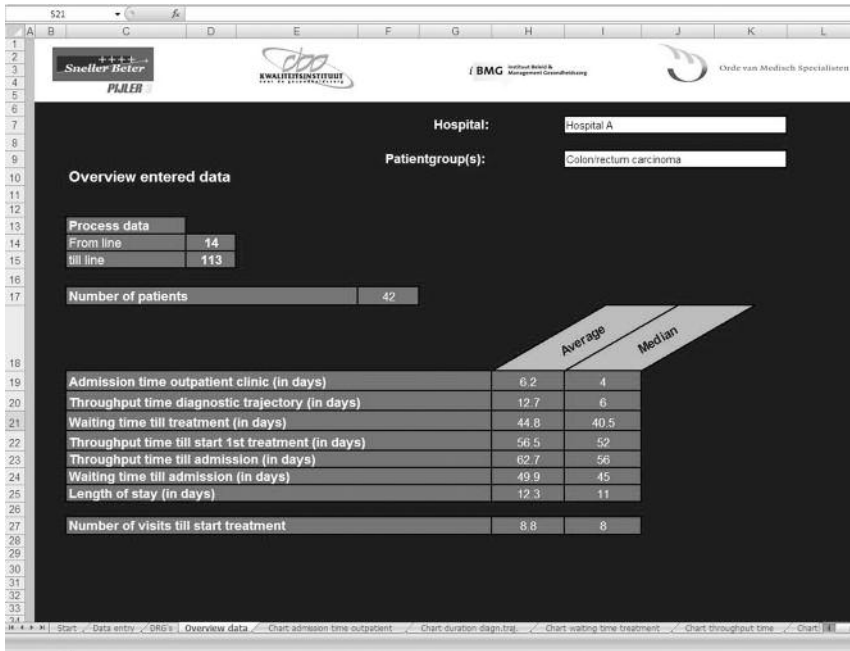
tumour with sufficient accuracy, even though this was crucial for deciding on the treatment procedure: when the tumour was situated in the last 12–15 cm of the large intestine, it was defined as a case of rectum carcinoma to be treated with a combination of radiation therapy and resection. When situated elsewhere it was defined as colon carcinoma, which would not require radiation therapy. Gastroenterologists were not aware of the importance of this information, and this had led to unpleasant surprises for surgeons who only found out *during the operation* that they should have given radiation therapy prior to surgery. This could reduce the chances of patient survival. After the surgeons realized the data produced by gastroenterologists were 'unreliable', they started to perform their own colonoscopies with patients who had been diagnosed with colon cancer in order to define the exact position of the tumour. The meeting of the improvement team led to a change in the gastroenterologists' practice, to ensure that they would register tumour location precisely. Consequently, patients did not have to undergo highly unpleasant colonoscopy procedure twice, which also lowered the risk of infection from the procedure. This enhanced effectiveness, since treating the cancer did not need to be postponed until after the second colonoscopy. It also improved efficiency, since costly diagnostic tests and valuable time were no longer wasted.

Providing safe and rapid treatment was not seen merely as a gain for patients, it was also presented as a viable business strategy. The important issue for this paper is of course *how* healthcare improvement was enacted as the core business for competing hospitals. And, according to Callon, STS has something to learn from health economists:

> The weakness of sociology and anthropology [and, one could add, of STS] when they come to analyse economic activities is precisely their reluctance to do the same jobs as economics. Economists are able to tell how it is possible to calculate profits and so on, but sociologists do not provide these kinds of tools … [we should] devise our own tools, like the economists, but tools that will endow economics agents with the capacity to experiment with different forms of markets organization. (Callon, in Barry & Slater, 2002b: 300–01)

Because I had been involved in previous attempts to bring STS insights to bear on healthcare assessment, I realized from the start that we needed to be able to provide tools for calculating quality improvement. My colleagues and I in the care process redesign project[10] created a space for calculability by providing overviews of patient trajectories and of the activities carried out at different phases. The two generic goals of the project were a 40–90% decrease in throughput time and a 30% decrease in length of stay. We believed that these goals would increase the chance of identifying inefficiencies that were harmful for both patients and hospitals. As there were many different diseases for which patient trajectories were developed, the improvement teams were encouraged to formulate specific goals on quality, efficiency and patient-centeredness, in addition to the generic goals mentioned. In order to monitor whether project aims were being achieved *and*

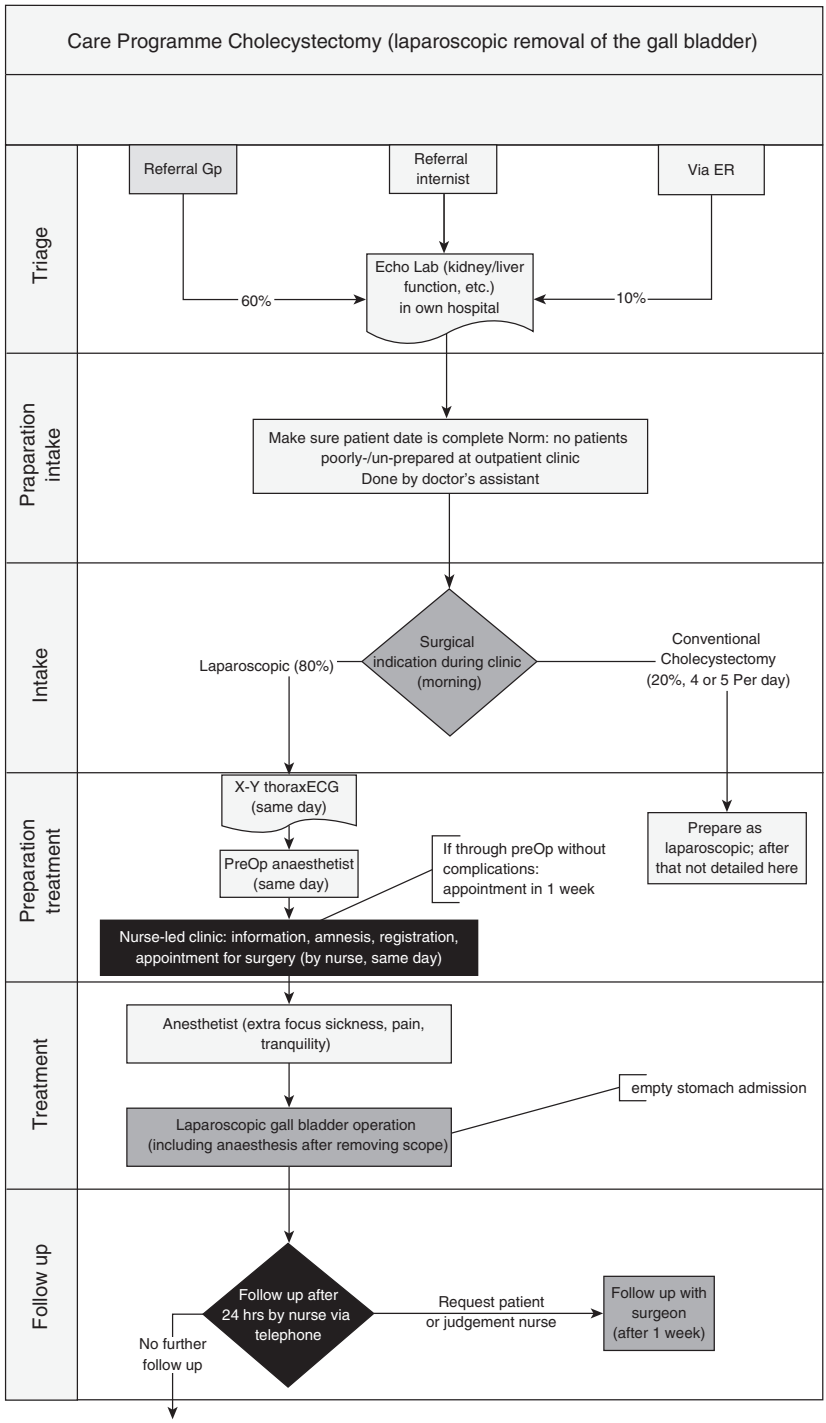
FIGURE 2
Measurement instrument process redesign



as a crucial intervention in the improvement projects, measuring throughput times became crucial. We therefore introduced a measurement tool that would frame steps in patient trajectories and tabulate average durations for each step (see Fig. 2).[11]

This measurement tool performed care trajectories in particular ways. First, by separating the trajectory in various phases, such as 'admission time to outpatient clinic', 'diagnostic trajectory' and 'length of stay', specific problems in the organization of care were articulated. Second, through displaying median and average of each indicator, the device rendered visible whether the process for particular groups of patients was highly variable or fairly similar. Third, by adding an indicator, such as 'number of visits prior to treatment', we articulated how diagnostic procedures could be combined in a single visit (called 'one stop shop diagnostics' in healthcare improvement jargon), or, as in the case of the double colonoscopies, eliminated. To further support the notion that project gains could be realized when the number of steps was reduced, all teams had to produce 'flow charts' of the care processes on which they were working (see Fig. 3). Combining these charts with the calculated waiting time for each individual step or phase in the process connected quality of care, throughput time and the number of activities. At the same time, the flow charts remained highly sketchy, glossing over many of the details of *exactly* what should happen within each individual step in the care process. We asked teams to make such sketchy flow

FIGURE 3
Flow chart for laparoscopy of the gall bladder



charts, in order to emphasize that they are devices that should generate quality improvement, rather than representations of medical work that care professionals should adhere to. Through this approach we tried to accommodate the idea that standardized care processes are *outcomes* of a highly dynamic process of organizational change, rather than starting points for a process of 'implementation' (Zuiderent-Jerak, 2007a). This pragmatic and STS-inspired way of doing standardization caused some confusion among quality managers, who had been trained in the development and introduction of clinical pathways in which each step in the process is mapped, prescribed and implemented. At the same time it caused enthusiasm among care professionals, who had become increasingly frustrated with the rigidity and level of detail of clinical pathways.

These tools thereby 'performed' the delivery of healthcare as processual, rather than divided in separate episodes and disciplines, and they allowed for process standardization in a way that left room for complexity and variation in the case of individual patients. These aspects were crucial for involving professionals in the improvement agenda. They also allowed us to explore further how discussions within STS on standardization of care can be productively reclaimed from the polarized debates between advocates and the critics (cf. Timmermans & Berg, 2003). In some cases doctors enthusiastically adopted and modified the calculative devices, using the relatively simple features of Microsoft Excel, for example, to calculate the inter-doctor variability for certain forms of care. Based on such modifications, a vascular surgeon speaking to nearly 200 colleagues from16 different hospitals at a national working conference, presented the different steps that patients with the same disease would go through in his hospital. He stated that he and his fellow surgeons had found no medically valid explanation for the differences in their practices, which had led to the kind of reflective discussion that they had not had for a long time, on how to deliver care in the best and most efficient way.

As members of the care process redesign team, we were of course pleased with these instances of quality improvement. However, we still had to show how the improvements were *financially* interesting – contributing to the configuration of a healthcare market in which quality improvement, rather than price and merely high 'service levels' would be a core business strategy for the Better Faster hospitals. Though Callon (in Barry & Slater, 2002b: 299) claims that 'the idea of market organization as an open field of reflection and experimentation is making progress', he also states that economists who 'perform the idea of pure markets, governed by natural laws' (p. 299) monopolize the analysis of economic laws, thereby seriously impeding the emergence of collective learning processes. Authors such as Philip Mirowsky and Edward Nik-Khah have voiced this concern even more strongly, stating that 'the very idea that neoclassical economists would consort openly with [STS scholars], much less be willing to share their sources of support with them, appears to us risible' (Mirowski & Nik-Khan, 2007: 216). However, I experienced none of this monopolizing, and the cooperation with both health economists and financial analysts in hospitals was

extremely fruitful for developing so-called 'business cases' for redesigned care trajectories (Leatherman et al., 2003).[12]

The claim that 'economists, by profession, tend to think in terms of a tug of war between the private sector and public sector' (Callon, in Barry & Slater, 2002b: 301), which would restrict the possibility of experimenting with an array of organizational forms with different normative consequences, becomes problematic when we consider a study by Daniel Klein and Charlotta Stern (2007). In a survey among members of the American Economic Association they asked a series of questions on government intervention in market environments and concluded that only 8% of these economists could be classified as 'supporters of free-market principles', and only 3% classified as 'strong believers'. After breaking down the responses by voting behaviour, they stated that '[e]ven the average Republican AEA [American Economic Association] member is "middle-of-the-road", not free-market' (Klein & Stern, 2007: 309). The cliche that economists are against regulation is even less applicable to *health* economists. As stated, healthcare has always had somewhat of a *status aparte* in discussions on the 'free' market. It could even be assumed that the very idea that economists monopolize discussions of potential market forms is a consequence of the distance economic sociologists and anthropologists *and* Callon have put between themselves and economics. Studies of the interactive engagement of STS researchers with other scientific practices, have showed that other disciplines are 'far from unified and in fact highly contested internally … [with] the strongest critique … com[ing] from within the discipline'(Kember, 2003: 176).

Paraphrasing Sarah Kember, I would propose that the social study of markets requires a stance that does not singularize 'economics' by remaining distant from it, as Mirowsky and Nik-Khah (2007) do, but that sees economics as an opportunity rather than merely a problem (Kember, 2003: ix). For the project team in the care process redesign project, such an approach allowed us to play a role of 'engaging strategically with the differences within [economics]' (Kember, 2002: 638) rather than 'rehearsing endless critiques of conventional economics and often in a vain attempt, a delusion, that [we] might convince economists' (Callon, 2002b: 301).

Through this stance of seeing economics as an opportunity, our care process redesign team was able to receive substantial help from some of the participating hospitals and from health economists at the department of Health Policy and Management. The input of the financial departments of individual hospitals proved invaluable for articulating the financial gains from redesigned care trajectories. I soon found out that financial employees were working hard to carry out calculations of costs per step in care processes, from worksites far from the actual process of care delivery – generally located in the basement of hospitals. Until recently, hospitals had no need to know the costs of their different activities. The financial structure of the hospital used to focus mainly on interventions and activities that generated income, and on costs, in a more general sense, of personnel, equipment, and so forth. As part of the introduction of the new funding system in which insurance companies paid a fixed fee for an entire care trajectory rather than

FIGURE 4
Business case for colon/rectum carcinoma

		profile baseline				desired process	
fin.code	activity	frequency	price/unit	costs		frequency	costs
190011	Intake visit internist/GE	1.00	€ 33.15	€ 33.15		1.00	€ 33.15
411000	Return visit internist/GE	2.21	€ 26.52	€ 58.61		0.50	€ 13.26
190011	Intake visit surgeon	1.00	€ 30.19	€ 30.19		1.00	€ 30.19
411000	Return visit surgeon	0.69	€ 24.15	€ 16.66		0.10	€ 2.42
190011	Intake visit cardiology	0.17	€ 27.21	€ 4.63		0.17	€ 4.63
411000	Return visit cardiology	0.17	€ 21.77	€ 3.70		0.17	€ 3.70
	Pre-Op	1.07					
190035	Day treatment	1.02	€ 151.92	€ 154.96		1.00	€ 151.92
34686	Colonoscopy	0.89	€ 253.01	€ 225.18		1.00	€ 253.01
34690	Sigmoidscopy	0.22	€ 204.90	€ 45.08		0.05	€ 10.25
39876	Rectoscopy	0.46	€ 125.60	€ 57.78		0.00	
50501	Biopt (PA)	1.06	€ 42.94	€ 45.52		1.06	€ 45.52
87511	X-colon	0.30	€ 148.00	€ 44.40		0.15	€ 22.20
85002	X-thorax	1.02	€ 43.44	€ 44.31		1.00	€ 43.44
87090	MRI Abdomen	0.44	€ 278.84	€ 122.69		0.66	€ 184.03
87070	Echo stomach organs	0.80	€ 92.30	€ 73.84		0.66	€ 60.92
39494	Echo heart	0.09	€ 53.00	€ 4.77		0.09	€ 4.77
87042	CT abdomen	0.06	€ 235.12	€ 14.11		0.00	
07-_-_	Lab			€ 102.38			€ 102.38
34738	Colon resection	0.60	€ 1,542.00	€ 925.20		0.60	€ 925.20
35024	Anterior resection	0.35	€ 2,057.00	€ 719.95		0.35	€ 719.95
34732	Total colectomy	0.05	€ 2,814.00	€ 140.70		0.05	€ 140.70
	Inpatient						
190204	Inpatient days	12.30	€ 206.04	€ 2,534.29		7.00	€ 1,442.28
		Total: hard euro's		**€ 5,402.08**		**Total: soft euro's**	**€ 4,193.91**

paying for individual activities, it became all the more important for hospital management and doctors to know what the cost was of *all the work* that was carried out within these care processes: otherwise they could be selling care processes at a loss. This situation resulted in financial employees working overtime to produce financial information for items that had never had a price before. These monetary calculations proved to be crucial input, since they allowed improvement teams to analyse what the gains would be – also in financial terms – of a well-organized care trajectory. Costs could be combined for the steps that were presented in our overview tool and could thereby lead to a business case in which the existing and desired processes could be individually priced, which rendered visible 'the cost of poor quality' (see Fig. 4). Accordingly, the above mentioned trajectory for patients with colon or rectum carcinoma resulted in a difference for one hospital of approximately €950 per patient on a total cost of less than €5500. This was the kind of material connection between the organization of care and costs that made quality improvement a very central issue for the management in this hospital.

The development of these calculative devices thereby proved highly consequential. The approach was adopted in the Atrium Medical Centre, among other sites, and soon after the first results came in, a board member presented potential outcomes of the redesign projects in both qualitative and financial terms to his management team. His presentation had the

telling title *Return to the Essence: Top Quality Care with Maximal Profit*. This session resulted in the hospital management embracing the redesign of care processes as a core strategy for the coming 2 years, aiming to redesign care for at least 50% of patients within that time. The hospital director gave a similar presentation at a national working conference of the care process redesign project. The approach was incorporated in a report written by health economists and sociologists, which the Department of Health Policy and Management published and distributed to all other Better Faster hospitals (Manna et al., 2006).

On a more local level, the consequences of treating quality improvement and financial matters together also manifested in an interesting discussion I witnessed between the hospital director and a manager of one of the three hospital locations about appointing new nursing personnel for elective surgery. After having presented the business case for small surgical procedures such as the laparoscopic removal of the gall bladder, the director stated that the location manager could simply submit a proposal for extra nursing staff, since he had a perfectly worked out business case to cover that investment. 'Just hand it in to me and I'll pass it through the board meeting next week without any problems', he stated. 'But I don't need to', the location manager replied. 'I'm exactly showing that I can cover for the investment of extra nursing time through the gains we realize by improving the process. And then I still have nursing time left to spare!' For both actors involved and for me as an advisor witnessing the discussion, it was unusual, to say the least, to hear a manager refuse such an offer. Such a discussion should not be taken to imply that process improvements *always* lead to financial gains: not surprisingly, introducing clinically relevant improvements can also increase costs. The point here is that financial costs and quality gains can be subject to unexpected relationships once they are brought together in a calculative space. By articulating the delivery of care as a process, it was often possible to recombine elements in such a way that issues previously accounted as *costs* could now be seen as *investments*. The introduction of a nurse-led clinic for patients undergoing elective surgical interventions would be treated as a cost when conceptualized in isolation, as an individual step in the care delivery process, but treating the various steps together enabled it to be treated as an investment that produced savings at a later stage in the process. So, in this instance, patients who were better informed would not need to return as often to the hospital after surgery for follow-up visits.

With some reservations, we could say that we were successful in helping to set up a healthcare market in which actors competed in terms of 'value', rather than merely on price and service delivery. Through an experimental process of creating collective calculative devices, quality improvements and financial gains were interwoven and health professionals were potentially disabused of their (historically justified) fears of budget cuts. The redesign project team of doctors, health economists, financial analysts and STS advisors, with their Excel spreadsheets, flow charts, DRG pricing systems and processual insights, were drawn together in the creation of a hybrid forum that

performed an alternative market that had nothing to do with healthcare *adhering* to abstract market mechanisms but with actively *reconfiguring a specific kind of market in this healthcare setting*.

Callon states that '[i]f we accept that there is nothing which could happen without being framed, the role of the sociology and anthropology of economies is precisely to design tools and to provide actors with such tools' (Callon, in Barry & Slater, 2002b: 300). At some point during this project, however, I began to realize that such an exclusive focus on designing and providing such tools, as one of the main 'performative activities of the social sciences' (p. 300), could prove to be a rather limited and tricky strategy. Callon ascribes a crucial role to the construction of calculative devices, but in this case there seemed to be a more dynamic relationship between market activity and the availability and functioning of materialities.

Fragile Devices, Robust Markets

According to Callon, the most important asset of ANT is that 'ANT is based on no stable theory of the actor; rather it assumes the *radical indeterminacy* of the actor' (Callon, 1999: 181; italics in the original). The main advantage is that ANT opens up the social sciences to non-humans, so that it becomes possible to show the importance of technologies for performing markets in specific ways. In this case, spaces of calculation were created through interactions among Excel spreadsheets, flow charts, project meetings, hospital information systems, quality collaboratives and hospital board rooms. Market practices in healthcare were performed in a way that added value in accordance with the vision for hospitals in the New Health Economy. Following the strategy of 'drawing things together' (Latour, 1990) to associate and disassociate the relevant actors, seemed to produce suitable calculative devices for reconfiguring marketized healthcare as value-driven.

It was both interesting and puzzling to experience how *easy* it was, relatively speaking, to reconfigure a cost-saving- and service-level-based healthcare market into a value-driven one. It surely did not happen without effort, but was it really feasible to perform this shift simply by creating a calculative device? Making such devices available would not seem sufficient on their own to endow the respective calculative spaces with impressive agency, since relations between 'high quality' and 'competitive advantage' were often loose and ambiguous and were susceptible to being seriously challenged by strong players. For example, insurance companies were relied upon within the new Act to be key players for making hospitals compete to provide good medical quality at low cost. However, huge differences emerged between the purchasing and marketing departments of some major insurers. Where purchasing tried to get the *best value deals* with preferred providers, marketing followed a strategy of pursuing contracts with all hospitals in order to provide *maximum choice* for clients. This marketing strategy might have seriously jeopardized the relevance of business cases for improving care at low cost, by resulting in further strategic

alliances with luxury hotels without concern for improving efficiency. Consequently, the calculative devices would have to work really well, in order to thwart such strategies.

The measurement tools, which seemed such faithful allies in the case presented above, sometimes acted unpredictably, and this could have raised questions from team members in hospitals about whether they were actually 'working' at all. It proved very hard for the hospital improvement teams to use the devices we produced, an issue that became clear during a series of interviews with two types of participants: the programme managers of each hospital, who were in charge of all projects at their locale, and the internal advisors for the care process redesign project, who generally had backgrounds in quality management.[13] Those interviews were held after the first year of the project in all eight hospitals in the first tier of Better Faster. Getting the teams to start using the measurement instrument turned out to be far from the smoothest episode within the project. Though hospital teams were generally content with the tool we provided for generating care process data, using that tool did not make their jobs less cumbersome. The production of outcomes and charts required immense amounts of 'invisible work' (Star & Strauss, 1999) in hospital IT departments, in the offices of quality coordinators, and in the wards and clinics in which the care processes took place. Apologetic emails from local improvement team leaders started flowing in after the deadline had passed for handing over the baseline measurements to me as national project leader. Medical professionals told me they were embarrassed that their IT systems were unable to produce the requested data, and while virtually all projects managed to submit their measurements at the end of the day, they often had to make substantial investments of time and other resources to be able to do so. As one quality manager put it during the interview:

> [Generating data] often has required hand-work. It even has gone so far as to have an intern sitting with a stopwatch in the consulting room. Some things have just been tallied, measured. People were making lists. It hasn't been picked up as a normal part of the primary process.

Another hospital team generated measures by going through the paper-based patient records retrospectively and then introducing inserts for the later measurements, so that they would not have to go through the entire medical record again to keep track of the trajectory:

> That was a hell of a job, after which you only have covered twenty patients and that then leads to an immense discussion. 'I know that patient and there was this and that reason why it took so long'. And now the continuous measurement, with the inserts, I just don't find that feasible. It just doesn't work. Period!

Despite all that 'hand-work' with files, the results often were far from complete. Many items that were needed for enacting *trajectories* instead of isolated *events* were not registered, since hospital information systems are still

highly focused on financial administration, and the health market historically was largely based on a pay-per-activity basis. So while *financially relevant activities* are registered, since they used to be reimbursed, crucial steps in the care trajectory that are not accompanied by billable activities are hard to trace. As one quality manager stated:

> Your most important measurement is still: when was the diagnosis finalized? And you just can't trace that back anywhere. The most probable moment is when there is a visit with the doctor after lots of diagnostics. It just makes it really complicated. The only advantage is that the oncologists simply know their patients by heart, can name them and those files you just dig up, you can browse through them and thereby measure the results.

It will come as no surprise that hospital programme managers were in a hopeful mood about ICT plans to reduce this extra work in future: they could simply not see their employees merely generating measurements all day long.

> Now the art is to get those measurements embedded in the organization and make it a part of the work-process of that organization. And also a bit better than how we did the baseline measurements: we'll need to automate that. More hand-work doesn't make anybody happy. I will not tolerate that our care coordinators will be merely walking around here on the wards making lists. They should be able to get this data on their screens in a very easy way.

However, the ICT initiatives that had started in some hospitals also proved demanding:

> Last year we hired someone at Planning & Control who started working on the system to see what we can get out of it. What will have to be registered at the point of care if you want to be able to subtract the data later on? You can generate some things from the system, but for the rest you simply have to dive into the patient records. And this person developed some methodologies to get reasonably reliable figures that were structurally disputed, because there always will be differences [with the data from the paper-based records]. The question then becomes: How big can that difference be? What time should be invested to increase the reliability of the data? You just have to find a way in that.

In another hospital, due to organizational complexities attempts to design screens that allowed care professionals to monitor their redesigned care processes and that they called 'dashboards', took many months, including hours of ICT consultancy, without delivering any tangible results.

So it seems there were plenty of reasons why the calculative devices could have been seen as *unable* to reconfigure the healthcare market into value-driven competition. Figures that were sorely needed to sustain the claim that process improvements were attained and were financially relevant were absent, incomplete or at best generated through huge investments of time, energy and money. The issue of whether the devices we introduced 'worked' seemed highly contestable, and I would not have been

surprised if hospital improvement teams had fundamentally challenged the very act of measuring all these steps. Whereas many team members were embarrassed about the fact that their ICT systems were unable to produce the requested data, to me this seemed normal, in light of empirical analyses of record-keeping and secondary uses of information (Garfinkel, 1967; Lei, 1991; Berg & Goorman, 1999; Brown & Duguid, 2000). More surprising, in a sense, was that neither the relevance of the calculative space nor its workability was challenged. What seemed to make the devices work, was that *actors flexibly ascribed different levels of validity to them in different settings*. Where data could be highly contested during a project meeting with medical specialists, nurses, managers and consultants, those same data seemed to become 'harder' when discussed in a project review with the board of directors, and yet still harder when presented by a board member for a national audience of colleagues. The messy practices of generating indicators hardly seemed to affect the ability of the devices to connect costs and qualities. This process, which Latour and Woolgar (1986 [1979]: 59) have called 'purification', prevented critique to the measurement tools. Rather it reinforced 'an important "looseness of fit" between the political economy of measurement systems in the form of policy demands for accuracy and control, and their instrumental features' (Power, 2004: 769).

This 'looseness of fit' also explains why higher management, who expected that generating quality indicators in simple dashboards would be useful, were not troubled by the struggles their teams and ICT departments undertook to generate those indicators. As one hospital programme manager put it:

> This simply means providing care; what we're doing here is running a business. And we're rapidly improving that …. You've got lots of indicators, that you can all start measuring. But the point is of course to get those indicators that give you the quickest overview of how the process is running. … I actually only want to see the deviations. I'm not really interested in the figures; I want to see whether the light is green, red or yellow. How does it look? I want to see the overviews of departments, but I really want people in those departments to become aware that they'll have to work on this. This also applies to our ward managers. They are directly present in the care process. When I drop by at the ward they should – in a way, when I ask them: How many patients are waiting for discharge here? – they should be able to say: zero, four, three, like that. Or, on quality: How many patients are having painscore x? When I ask people now, they are not aware, they don't know. They all do their best, they are all doing a good job, but they are just not working on that, though that is something that can really tell you something about how things are going in the hospital. How many O.R. [operating room] cancellations are there in the hospital? That's telling for how the process behind it is organized.

The success at reconfiguring the health market *despite serious competing interests* by some insurance companies and *despite the absence of unambiguously reliable devices*, therefore poses a theoretical puzzle that is hard to solve within Callon's approach. I will therefore conclude with some reflections on what this experiment with the development of Dutch healthcare market practices has to offer for social studies of markets.

Economists and Materialities as the Right Stuff? Historicity, Probability and the Sociology of Markets

Callon claims that 'it is impossible to think of markets and their dynamics without taking into account the materiality of markets and the role of technological devices' (Callon, in Bary & Slater, 2002b: 285). He also states, together with colleagues, that '[m]arkets are one form of economic agencement that is marked typically by circulation, pricing and exchange. Without devices … these movements that animate markets would be virtually impossible' (Muniesa et al., 2007: 4). This claim certainly has been valuable for opening up social studies of markets, and it also relates to the experimental shaping of markets. At times, however, the focus on devices seems to assign privileged agential status to material tools and to the economic scientists who construct them.

In a story based on Garcia-Parpet's (1986, 2007) study of the transformation of the table strawberry market in the French Sologne region, Callon seems to produce an actor who's strength can be compared with Latour's better known case of Pasteur (Latour, 1988):

> In the construction of the strawberry market, a young counsellor of the Regional Chamber of Agriculture played a central part. The remarkable thing is that his action was largely inspired by his training in economics received at university and his knowledge of neoclassical theory. The project, which he managed to launch through his alliances and skills, can be summed up in a single sentence: the construction of a real market on the pure model of perfect competition proposed in economic handbooks …. [I]t is no coincidence that the economic practices of the strawberry producers of Solonge correspond to those in economic theory. This economic theory served as a frame of reference to create each element of the market. (Callon, 1999: 191–92)

However seductive this explanation is, we are reminded by critics of ANT (Amsterdamska, 1993; Bloor, 1999a,b) not to overstate the agential strength of (economic) scientists since they are not acting in historic isolation. Indeed, Callon's account fails to situate the counsellor in a wider range of practices that may have been crucial for allowing this Sologne strawberry market to emerge.

Similarly, the reconfiguration of (healthcare) markets is not an isolated project for STS scholars. As I hope to have shown by analysing the interactions with health economists, such reconfiguration was not primarily restricted by the fact that 'the neoclassical school [of economics] has … maintained its appearance of monolithic continuity' (Mirowski & Nik-Khan, 2007: 216). In actual fact, in my experience, such restriction is being performed more by scholars such as Mirowsky and Nik-Khan than by practicing economists. Economists with whom I have discussed this work saw 'neoclassical economics' as a label they could not identify with and asked me to specify which 'laws' of markets I could actually be referring to.[14] Nor could problems with reconfiguration be solved by focussing on 'the most important social processes going on *underneath*' the surface actions (Mirowsky & Nik-Khan, 2007: 217; italics added). Though presented as a

step 'forward' for STS, such analyses achieve 'one step forward and two steps back' when they revert to generic notions such as 'power' and 'the social', presenting as explanations exactly what should be explained (Latour, 2006). In contrast, I propose that what is needed in experiments with the reconfiguration of (healthcare) markets is a sensitivity to what Laurent Thévenot (2002: 70) has called prevailing 'conventions … [which are] involved in the collective creation of "forms of the probable"'. Successful reconfigurations may on the one hand be produced through developing market devices, but are simultaneously influenced by historically shaped 'investment in forms' (Thévenot, 1984). Thévenot has observed that ANT has been less focussed on such historically produced consequences for present-day attempts to reconfigure practices:

> [t]he notion of network is very compelling because of its power to embrace in its description a potential list of entities which is much broader than the one offered by models of action and practice. But this notion tends to overlook the heterogeneity of links for the benefit of a unified picture of interconnected entities. (Thévenot, 2001: 408)

The notion of 'forms of the probable' tries to attend to this heterogeneity and 'historical depth' of particular investments in forms. This focus on 'forms of the probable' has consequences for what actors face during their involvements in the reconfiguration of markets. On the one hand, the story of the construction of healthcare markets is about the enactment of calculative agents through the construction of 'equipment and devices', as Callon (1999: 191) would propose. On the other hand, it is a story of how such devices are made to operate in settings that are shaped by earlier investments in particular market practices.

The enthusiasm that Callon may inspire for the involvement of STS researchers in reconfiguring markets should be tempered by an understanding of the *dual meaning of such 're-configuration'*: on the one hand, it entails a process of *configuring new* healthcare market practices by drawing together heterogeneous agencies, and on the other, it produces a *repetition of configurations* that were existent in healthcare competition and improvement practices through the strength of probable market regimes. With this in mind, STS scholars would focus not only on developing market devices but especially on analysing which type of market regimes afford such devices. An excessive focus on the malleability of market practices through the development of calculative devices, and a lack of sensitivity for prevailing market forms may lead to disappointing consequences for STS research on the subject.

A noteworthy instance of how STS researchers can be tricked by the 'forms of the probable', comes to light when comparing two versions of a paper by an STS researcher who was involved in the second pillar of the Better Faster collaborative: the construction of performance indicators for quality of care. In an early version of their paper on the development of indicators for the Dutch Healthcare Inspectorate, Marc Berg, together with several co-authors from different institutions, proposes a strategy for experimentally introducing such calculative devices:

> [O]ur 'feasibility first' philosophy emphasized that our aim was to start a process of self-improvement, of increased attention to accountability and the legitimacy of the public's question for transparency. It was not a 'ranking' we were after, nor an attempt to provide a flawless and transparent map of the hospital landscape. Such an attempt could only have invoked debates about the accuracy of map [sic], and the injustice of some of the representational techniques selected. Rather, we opted for a deliberately rough and multi-interpretable map, leaving the hospitals free to add explanatory markings and legenda, and work from there. From such a map, no simple overall rankings could be made, but many more or less interpretative comparisons between individual hospitals or scores would be possible. (Berg et al., 2005: 15)

In the published version of their paper, this paragraph has largely remained untouched. However, it no longer ends their discussion, but is followed by the following paragraph:

> This strategy has proven powerful. The Inspectorate received little true opposition to the request for the indicators, and hospitals were fully responsible for the publication of their own information. *When the national news paper* [sic] *did rank the hospitals*, public discussions mostly turned to the as yet rather incomplete data as delivered by the hospitals, and about the ranking method used by the newspaper. (Berg et al., 2005: 70, emphasis added)

By the time their paper had been published, their aim of not providing simple rankings had become outdated, because one of the largest Dutch newspapers provided *exactly such a ranking* on the basis of the performance indicators, which is now published on an annual basis.[15] Contrary to what Berg et al. (2005) suggest, *the mere existence of these rankings was of course highly consequential for hospitals*. This became clear during the kick-off meeting of the Better Faster quality collaborative, which coincided with the newspaper's first publication of the ranking. Some participants were quite upset about this. As one of the quality managers warned me:

> Together we are in the earliest stages of building these indicators and all of a sudden we are comparing it! … This publication in the [newspaper]was initiated by Better Faster. It is a bit too much of a coincidence to have [the kick off meeting and the first publication of the ranking] on the same day. … Those colleagues of yours just shouldn't mess with us like that!

A senior manager of the participating hospital that was ranked lowest of all of the eight hospitals on the first list spent a large part of the day of the kick-off meeting glued to his cell phone in the corridors of the conference hotel, explaining to the local press why he was at some fancy national meeting at a time when it had just been 'shown' that his hospital was a mess. Local media reporting on the hospital ranking displayed little awareness of the far-from-reliable production of these indicators, or of the ecology in which the information became 'knowledge' (Star, 1995; Berg & Goorman, 1999; Brown & Duguid, 2000). All that was left for this manager to do was to indicate that the precise *reason* he was at the Better Faster meeting was to improve the quality of the hospital. When I later visited that hospital to discuss how they were proceeding with their process redesign projects, I certainly did not get

the impression that they were improving their care substantially. However, hospital management strategically focussed on the indicators that counted most for the production of the ranking. Consequently, they rose in the charts to one of the highest positions in the second year of publication, once again confirming that – contrary to the hopes of Marc Berg and colleagues – '[w]hat's measured is what matters' (Bevan & Hood, 2006).

This failed attempt to reconfigure performance regimes by eschewing ranking structures in favour of 'feasible' indicators that would leave more space for interpretation, explanation and a focus on healthcare improvement, should be a warning for STS researchers who would develop (market) devices in hopes of transforming the regimes in which they operate, whether in healthcare or elsewhere. Despite the fact that, in this case, the researchers involved in the construction of these indicators aimed to change such practices of accountability, their efforts were overwhelmed by prevailing performance regimes and the 'probable form' of ranking that the quantitative format of the performance indicator affords. This example also can warn us from drawing overly optimistic conclusions in the case described here about the interventionist potential for STS research to reconfigure healthcare or other markets from price-and-service-driven to value-driven. Consider, for example, what would happen if the *market regime* were to focus solely on price reduction or on improving hospitality and service rather than clinical outcomes. Let us assume, for example, that hospitals participating in the Better Faster initiative were able to reduce the cost of treating colon cancer by implementing the changes discussed in this paper. Insurance companies might then react by fixing a maximum price for treating that illness, using the more efficient process as a standard. Consequently, non-participating hospitals could react by shortening length of stay without making the recommended improvements in quality of the care process.

In light of what prevailing market practices can produce, it is an open question whether, and to what extent, STS researchers can actively shape markets *differently*, to produce examples of 'successful reconfiguration', as opposed to accommodating to prevailing governance regimes. Fortunately, in the case of Dutch healthcare markets, financial calculability did not exclude other values from the 'orders of worth' (Thévenot, 2002: 61) that defined the focus of competition.

Health insurance companies, hospitals and regulatory bodies historically have all been involved in an entangled plurality of values. Dutch insurance companies, like the one discussed earlier in this paper, have a long history of negotiating both price and quality with hospital directors and doctors. This tradition, on the one hand, seems challenged by the marketing department's notion of quality as 'maximum choice', but, on the other hand, it produces a very receptive ecology for using devices that attempt to combine clinical quality improvement with cost-reduction. For many years, insurance companies distributed annual 'care innovation funds', and did not tend to focus solely on financial outcomes or devising 'innovations' for improving service levels by, for example, forming alliances with hotels. The fact that such multiple, sometimes contradictory, regimes are simultaneously present and institutionalized,

enhances the chances for reconfiguring 'regulated competition' in the direction of a value-driven healthcare market. Within such a setting, STS researchers and their calculative devices may find interesting spaces for contributing to the configuration of such a market regime.

As the ambiguities from the case of the Dutch healthcare market indicate, there are important conceptual and practical limitations to a theory that ascribes special agential status to economics and its associated materialities, without also paying attention to the historical investments in forms. As stated by MacKenzie and Millo (2003: 111), leaving historical situatedness out of a study of markets can lead to 'quite mistaken conclusions about performativity'. My proposal to enhance 'Callonistic' studies of the reconfiguration of (healthcare) markets with a sensitivity to 'forms of the probable' aims to overcome the, perhaps excessive, expectations about opportunities for STS scholars to experiment with a radical (re)shaping of healthcare markets. This is not the same conclusion that Malcolm Ashmore, Michael Mulkay and Trevor Pinch reached when they studied attempts by health economists to change healthcare practices in the UK: '[health economists'] disappointments and failures must stand as a warning to us all of the inherent difficulty of using academic social science as a basis for practical assistance to others' (Ashmore et al., 1989: 3). As Simon Cole (2009) has recently argued, continuing a discussion he started some years before with Michael Lynch (Lynch & Cole, 2005), cautionary tales about the potential for STS intervention also need to be treated with caution: viewed with hindsight, Ashmore and colleagues not only underestimated the impact health economists were having on the delivery and organization of healthcare, their conclusion also prevented them from explaining *why and how* health economists were able to have such impact. Focusing both on the production of calculative devices and the market regimes in which they are introduced may prove invaluable for addressing exactly those questions. An historically sensitive approach therefore may be crucial for sociologists, anthropologists and STS researchers, when they explore the frictions within (health) economics and actively engage in reconfiguring (healthcare) markets. It will enable them better to navigate the tricky and complex field in which their experimental market devices interact with the very market practices they were designed to undo. Such sensitivity is needed in what, to paraphrase Edwin Hutchins (1995), I would like to call interventionist studies of 'competition in the wild'.

Notes

This study would not have been possible without the cooperation with other participants in the Better Faster collaborative, particularly Marc Rouppe van der Voort of the Dutch Institute for Healthcare Improvement, Nico van Weert and Francoise Vaessen of the Atrium Medical Centre and the interviewees from other participating hospitals. Previous versions of this paper have benefited from comments from Roland Bal, Marc Berg and Sonja Jerak-Zuiderent. The paper was presented at the workshop *The Institutions of Objectivity in Medicine: Informal and Formal Modalities of Regulation* at McGill University. Here, particularly valuable comments were made by Laurent Thévenot and Alberto Cambrosio. Discussion in the department of Healthcare Governance of the institute of Health Policy

and Management led to helpful comments by Tom van der Grinten and Kor Grit. I would further like to thank the anonymous reviewers of *Social Studies of Science* for their critical and useful suggestions and Mike Lynch for his committed and careful editing.

1. Broos, CEO of the hospital group in the press release on 2 May 2005.
2. For strategic reasons the Atrium Medical Centre requested that the figures used be fictitious. The figures used in this paper are however fairly close to reality.
3. Referred to in Schut (2003).
4. Quoted in Schut (2003).
5. Resulting in claims by, for example, Rein Willems, at the time the CEO of the national industry 'flagship' Shell Royal Dutch Oil, that their motto 'You work safely or you don't work here at all' is equally applicable to the healthcare sector which should have a safety management system up and running within a few years (Shell-Nederland, 2004), and Peter Bakker, the CEO of TPG, a large logistics firm that includes the recently privatized Dutch postal service claiming that '2.5 billion euros' could be saved in the hospital sector through logistic improvements (TPG, 2004).
6. See Jerak-Zuiderent & Ball (forthcoming) for an empirical analysis of the consequences of these indicators for quality improvement practices.
7. Interestingly, this choice of the ministry was challenged by existing healthcare consultancy companies, which claimed that investing in quality through assigning advisors to hospitals and allowing them to participate in the collaborative without having to pay for it was a form of 'market contamination'.
8. This is of course a rather specific configuration of the notion of 'patient-centeredness'. See Zuiderent-Jerak (2007b) for an elaboration on the changes of this conceptualization and the way it relates to issues of standardization in healthcare.
9. See Berg et al. (2005) for an account of their construction. I will return to this pillar in the last section.
10. Marc Berg, Marije Stoffer and Marc Rouppe van der Voort. I am very grateful for working with them.
11. Our Microsoft Excel expert was Jeroen Wien of the Dutch Institute for Healthcare Improvement. I'm very grateful to his expertise and enthusiasm for developing such tools.
12. That such monopolizing could be historically challenged becomes clear when thinking of the involvement of sociology in framing the market for risk management through, for example, the notion of Risk Society (Beck, 1992): few other concepts have had a stronger influence on the emergence of an industry of risk management (Barry & Slater, 2002b: 289).
13. I carried out all interviews together with Marije Stoffer except the one with the Atrium Medical Centre. Since I was already advising the Atrium Medical Centre, the respondents of this hospital were interviewed by Marc Rouppe van der Voort and Marije Stoffer. I am grateful for their contribution.
14. As did the reviewers and editor of *Social Studies of Science*. I have avoided alienating economists any further by referring to 'market practices' rather than to 'market laws'.
15. I wish to thank Sonja Jerak-Zuiderent for pointing out the difference in the two versions of this paper and its analytical consequences.

References

Amsterdamska, Olga (1993) 'Surely, You Are Joking Monsieur Latour', *Science, Technology, & Human Values* 15(4): 495–504.

Arrow, Kenneth J. (1963) 'Uncertainty and the Welfare Economics of Medical Care', *American Economic Review* 53(5): 941–73.

Ashmore, Malcolm, Michael Mulkay & Trevor Pinch (1989) *Health and Efficiency: A Sociology of Health Economics* (Milton Keynes: Open University Press).

Barry, Andrew & Don Slater (2002a) 'Introduction: The Technological Economy', *Economy and Society* 31(2): 175–93.

Barry, Andrew & Don Slater (2002b) 'Technology, Politics and the Market: An Interview with Michel Callon', *Economy and Society* 31(2): 285–306.

Beck, Ulrich (1992) *Risk Society: Towards a New Modernity* (London: Sage Publications).
Berg, Marc & Els Goorman (1999) 'The Contextual Nature of Medical Information', *International Journal of Medical Informatics* 56: 51–60.
Berg, Marc, Yvonne Meijerink, Marit Gras, Anne Eland, Wim Schellekens, et al. (2004) 'Feasibility First: Developing Public Performance Indicators on Patient Safety and Clinical Effectiveness for Dutch Hospitals'. Available at <www.sbs.ox.ac.uk/NR/rdonlyres/DF5A536C-F691–4056-BD7C-ADB610F9B2C3/900/stsbusberg.pdf (accessed 30 August 2006).
Berg, Marc, Yvonne Meijerink, Marit Gras, Anne Goossensen, Wim Schellekens, et al. (2005) 'Feasibility First: Developing Public Performance Indicators on Patient Safety and Clinical Effectiveness for Dutch Hospitals', *Health Policy* 75(1): 59–73.
Berg, Marc & Stefan Timmermans (2000) 'Orders and Their Others: On the Constitution of Universalities in Medical Work', *Configurations* 8: 31–61.
Bevan, Gwyn & Christopher Hood (2006) 'What's Measured is what Matters: Targets and Gaming in the English Public Health Care System', *Public Administration* 84(3): 517–38.
Bloor, David (1999a) 'Anti-Latour', *Studies in the History and Philosophy of Science* 30(1): 81–112.
Bloor, David (1999b) 'Reply to Bruno Latour', *Studies in the History and Philosophy of Science* 30(1): 131–36.
Brown, John Seely & Paul Duguid (2000) *The Social Life of Information* (Boston, MA: Harvard Business School Press).
Callon, Michel (1986) 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Brieuc Bay', in J. Law (ed.), *Power, Action and Belief: A New Sociology of Knowledge?* (Boston, MA: Routledge and Kegan Paul: 196–233).
Callon, Michel (1998a) 'An Essay on Framing and Overflowing: Economic Externatities Revisited by Sociology', in M. Callon (ed.), *The Laws of the Markets* (Oxford: Blackwell Publishers): 244–69.
Callon, Michel (1998b) 'Introduction: The Embeddedness of Economic Markets in Economics', in M. Callon (ed.), *The Laws of the Markets* (Oxford: Blackwell Publishers): 1–57.
Callon, Michel (ed.) (1998c) *The Laws of the Markets* (Oxford: Blackwell Publishers).
Callon, Michel (1999) 'Actor-network Theory: The Market Test', in J. Law & J. Hassard (eds), *Actor Network Theory and After* (Oxford: Blackwell Publishers): 181–95.
Callon, Michel & John Law (1995) 'Agency and the Hybrid Collectif', *South Atlantic Quarterly* 94: 481–507.
Callon, Michel, Cécile Méadel & Vololona Rabeharisoa (2002) 'The Economy of Qualities', *Economy and Society* 31(2): 194–217.
Callon, Michel, Yuval Millo & Fabian Muniesa (eds) (2007) *Market Devices* (Oxford: Blackwell).
Callon, Michel & Fabian Muniesa (2005) 'Economic Markets as Calculative Collective Devices', *Organization Studies* 28(8): 1229–50.
Cole, Simon A. (2009) 'A Cautionary Tale about Cautionary Tales about Intervention', *Organization* 16(1): 121–141.
Faulkner, Alex (2002) 'Casing the Joint: The Material Development of Artificial Hips', in K. Ott, D. Serlin & S. Mihm (eds), *Artificial Parts, Practical Lives: Modern Histories of Prosthetics* (New York: NYU Press): 199–226.
Garcia-Parpet, Marie-France (1986) 'La construction sociale d'un marché parfait: le marché au cadran de Fontaines-en-Sologne', *Actes de la Recherche en Sciences Sociales* 65: 2–13.
Garcia-Parpet, Marie-France (2007) 'The Social Construction of a Perfect Market: The Strawberry Auction at Fontaines-en-Solonge', in D. MacKenzie, F. Muniesa & L. Siu (eds), *Do Economists Make Markets: On the Performativity of Economics* (Princeton, NJ: Princeton University Press).
Garfinkel, Harold (1967) '"Good" Organizational Reasons for "Bad" Clinic Records', in H. Garfinkel, *Studies in Ethnomethodology* (Englewood-Cliffs, NJ: Prentice-Hall): 189–207.
Godlee, Fiona (2006) 'Say No to the Market', *British Medical Journal* 333: 0.
Grit, Kor & Wilfred Dolfsma (2002) 'The Dynamics of the Dutch Health Care System: A Discourse Analysis', *Review of Social Economy* 60(3): 377–401.

Hutchins, Ed (1995) *Cognition in the Wild* (Cambridge, MA: MIT Press).
Jerak-Zuiderent, Sonja & Roland Ball (forthcoming) 'Locating the Worths of Performance Indicators; Performing Transparencies and Accountabilities in Health Care', in A. Rudinow Sœtnan, H. Mork Lomell & S. Hammer (eds), *By the Very Act of Counting. On the Co-construction of Society, Numbers, and their Subjects and Objects* (London & New York: Routledge).
Kember, Sarah (2002) 'Reinventing Cyberfeminism: Cyberfeminism and the New Biology', *Economy and Society* 31(4): 626–41.
Kember, Sarah (2003) *Cyberfeminism and Artificial Life* (London & New York: Routledge).
Klein, Daniel B. & Charlotta Stern (2007) 'Is There a Free-market Economist in the House? The Policy Views of American Economic Association Members', *American Journal of Economics and Sociology* 66(2): 309–34.
Latour, Bruno (1987) *Science in Action: How to Follow Scientists and Engineers Through Society* (Cambridge, MA: Harvard University Press).
Latour, Bruno (1988) *The Pasteurization of France* (Cambridge, MA: Harvard University Press).
Latour, Bruno (1990) 'Drawing Things Together', in M. Lynch & S. Woolgar (eds), *Representation in Scientific Practice* (Cambridge, MA: MIT Press): 19–68.
Latour, Bruno (2006) *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press).
Latour, Bruno & Steve Woolgar (1986 [1979]) *Laboratory Life: The Construction of Scientific Facts* (Princeton, NJ: Princeton University Press [London: Sage Publications, 1979]).
Leatherman, Sheila, Donald M. Berwick, D. Iles, L.S. Lewin, F. Davidoff, et al. (2003) 'The Business Case for Quality: Case Studies and an Analysis', *Health Affairs* 22(2): 17–30.
Lei, Johan van der (1991) 'Use and Abuse of Computer-stored Medical Records', *Methods of Information in Medicine* 30: 79–80.
Lynch, Michael & Simon Cole (2005) 'Science and Technology Studies on Trial: Dilemmas of Expertise', *Social Studies of Science* 35(2):269–311.
MacKenzie, Donald, Fabian Muniesa & Lucia Siu (eds) (2007) *Do Economists Make Markets? On the Performativity of Economics* (Princeton, NJ: Princeton University Press).
MacKenzie, Donald & Yuval Millo (2003) 'Constructing a Market, Performing Theory: The Historical Sociology of a Financial Derivatives Exchange', *American Journal of Sociology* 109(1): 107–145.
Manna, Radjesh, Paul Steinbusch, Joost Zuurbier & Marc Berg (2006) 'Businesscase voor kwaliteit: Kostenbeheersing door maximale inzet op verbetering van zorg', Department of Health, Policy and Management, Erasmus MC, Rotterdam, the Netherlands. Available at <www.qconsult.nl/upload/File/Kostenbesparing%20door%20Kwaliteitsverbetering%20de%20Businesscase%20voor%20kwaliteit.pdf> (accessed 8 July 2007).
Ministry of Health Welfare and Sport (2005) *Better Faster*. Available at <www.snellerbeter.nl/english> (accessed 11 October 2005).
Mirowski, Philip & Edward Nik-Khan (2007) 'Markets Made Flesh: Performativity, and a Problem in Science Studies, Augmented with Consideration of the FCC Auctions', in D. MacKenzie, F. Muniesa & L. Siu (eds), *Do Economists Make Markets: On the Performativity of Economics* (Princeton, NJ: Princeton University Press).
Mol, Annemarie (2008) *The Logic of Care: Health and the Problem of Patient Choice* (London: Routledge).
Muniesa, Fabian, Yuval Millo & Michel Callon (2007) 'An Introduction to Market Devices', in M. Callon, Y. Millo & F. Muniesa (eds), *Market Devices* (Oxford: Blackwell).
Palm, Ineke (2005) *De zorg is geen markt: een kritische analyse van de marktwerking in de zorg vanuit verschillende perspectieven* (Rotterdam: tenschappelijk Bureau SP).
Pollit, Christopher & G. Bouckaert (2000) *Public Management Reform* (Oxford: Oxford University Press).
Porter, Michael E. & Elizabeth Olmsted Teisberg (2004) 'Redefining Competition in Health Care', *Harvard Business Review* (June): 65–76.
Power, Michael (2004) 'Counting, Control and Calculation: Reflections on Measuring and Management', *Human Relations* 57(6): 765–83.
Schrijvers, Guus, Nico Oudendijk & Pety de Vries (2003) 'In Search of the Quickest Way to Disseminate Health Care Innovations', *International Journal of Integrated Care* 3: 1–22.

Schut, Erik (2003) *De zorg is toch geen markt? Laveren tussen marktfalen en overheidsfalen in de gezondheidszorg* (Rotterdam: Oratiereeks Erasmus MC).
Shell-Nederland (2004) *Here You Work Safely or You Don't Work Here at All* (The Hague: Shell Nederland).
Sjögren, Ebba & Claes-Frederik Helgesson (2007) The Q(u)ALYfying Hand: Health Economics and Medicine in the Shaping of Swedish Markets for Subsidized Pharmaceuticals', in M. Callon, Y. Millo & F. Muniesa (eds), *Market Devices* (Oxford: Blackwell).
Smith, Adam (2000 [1776]) *The Wealth of Nations* (New York: The Modern Library).
Star, Susan Leigh (ed.) (1995) *Ecologies of Knowledge: Work and Politics in Science and Technology* (New York: State University of New York Press).
Star, Susan Leigh & Anselm Strauss (1999) 'Layers of Silence, Arenas of Voice: The Ecology of Visible and Invisible Work', *Computer Supported Cooperative Work* 8: 9–30.
Strauss, Anselm, Shizuko Fagerhaugh, Barbara Suczek & Carolyn Wiener (1997) *Social Organization of Medical Work* (New Brunswick, NJ, & London: Transaction Publishers).
Thévenot, Laurent (1984) 'Rules and Implements: Investment in Forms', *Social Science Information* 23(1): 1–45.
Thévenot, Laurent (2001) 'Organized Complexity: Conventions of Coordination and the Composition of Economic Arrangements', *European Journal of Social Theory* 4(4): 405–25.
Thévenot, Laurent (2002) 'Which Road to Follow? The Moral Complexity of an "Equipped" Humanity', in J. Law & A. Mol (eds), *Complexities: Social Studies of Knowledge Practices* (Durham, NC & London: Duke University Press): 53–87.
Timmermans, Stefan & Marc Berg (2003) *The Gold Standard: An Exploration of Evidence-based Medicine and Standardization in Health Care* (Philadelphia, PA: Temple University Press).
TPG (2004) *Het kan écht: Betere zorg voor minder geld* (Hoofddorp: TPG).
Zuiderent, Teun (2002) 'Blurring the Center: On the Politics of Ethnography', *Scandinavian Journal of Information Systems* 14(2): 59–78.
Zuiderent-Jerak, Teun (2007a) 'Preventing Implementation: Experimental Interventions with Standardization in Healthcare', *Science as Culture* 16(3): 311–29.
Zuiderent-Jerak, Teun (2007b) 'Standardizing Healthcare Practices: Experimental Interventions in Medicine and Science and Technology Studies', PhD Thesis, Department of Health Policy and Management, Erasmus University, Rotterdam, available at <http://publishing.eur.nl/ir/repub/asset/10605/071025_Zuiderent-Jerak_Standarizing%20Healthcare%20Practices_partial.pdf> (accessed 18 June 2009).

Teun Zuiderent-Jerak is Assistant Professor of Science and Technology Studies at the institute of Health Policy and Management at the Erasmus University Rotterdam, the Netherlands. His research focuses on standardization and innovation practices in healthcare, the construction of markets for public goods, and on STS research that explicitly aims to 'intervene' in the practices it studies. In 2007 he completed his PhD thesis, 'Standardizing Healthcare Practices; Experimental Interventions in Medicine and Science and Technology Studies'. He has published papers in the *Scandinavian Journal of Information Systems, Human-Computer Interaction* and *Science as Culture*, and has co-edited a special issue of *Science as Culture* on 'Unpacking "Intervention" in Science and Technology Studies'. For an earlier draft of the present paper he received the 2007 Nicholas Mullins Award from the Society for Social Studies of Science.

Address: Institute of Health Policy and Management, Erasmus University Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, the Netherlands; email: zuiderent@bmg.eur.nl