

MISTS Working Paper No. 1
Position paper: Can Markets Solve Problems?

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1. Introduction:

1.1 Can markets solve problems? Markets appear in discussions of an ever broader variety of social, political, technological, scientific and occasionally economic issues. Many of these discussions position markets as the basis for resolving (even simplifying and delegating responsibility for) otherwise complex problems. Hence, we find discussions of: an apparent need for competition in healthcare¹; the introduction of new formations of rankings and metrics in education²; ever more complex tendering processes for access to local authority budgets³; a drive toward instituting a value for privacy to stimulate new design responses among developers of surveillance technologies⁴; schemes to introduce pools of money to entice pharmaceutical firms to enter into producing vaccines for diseases of the poorest (and conventionally least profitable) sections of the population⁵. And so on. The list of examples is in principle without end for every time I commit to a sentence in this paper, somewhere a new discussion of a new need for a new market to be brought into being via a new device will have begun.

1.2 These discussions introduce multiple questions. For example, just what kind of devices are imagined and discussed as bringing markets into being? We can quickly find examples of: league tables for ranking organisations into competitive relations which did not previously exist, or at least did not exist in quite the way they do once the league table is up and running⁶; contractual bidding processes through which the highest quality at the lowest price is said to be achieved⁷; outsourcing moves to apparently reduce infrastructural costs⁸; the creation of new organisations to monitor, regulate, assess or oversee new forms of competition⁹. And so on, again. The list of devices appears almost as endless as the examples of discussions of markets. Perhaps for good reason as each discussion of a market tends to

¹ See, for example, discussions of the justification for market based reforms in the UK National Health Service: <http://www.bbc.co.uk/news/health-12177084>

² See the UK's new Research Excellence Framework: <http://www.hefce.ac.uk/research/ref/>

³ See: http://www.civitas.org.uk/nhs/download/Civitas_LiteratureReview_NHS_market_Feb10.pdf

⁴ See, for example, <http://pats-project.eu/>

⁵ See: <http://www.who.int/immunization/newsroom/amcs/en/index.html>

⁶ See History of Human Sciences (1999) 'Knowledge for What? The Intellectual Consequences of the Research Assessment Exercise', special issue of History of the Human Sciences 12(4): 111–46.

⁷ See: http://www.ofc.gov.uk/shared_ofc/reports/comp_policy/OFT1314.pdf

⁸ See: <http://blogs.lse.ac.uk/politicsandpolicy/archives/10239>

⁹ Power, M. (2008) In defence of the Audit Society: A response to Maltby, *Ephemera* 8(4): 399-402; Power, M. (2003) Evaluating the Audit Explosion, *Law and Policy* 25(3): 185-202; Power, M. (2000a) The audit implosion: regulating risk from the inside. ICAEW, London, U.K.; Power, M. (2000b) The Audit Society – Second Thoughts, *International Journal of Auditing* 4(1): 111-19; Power, M. (1997) *The Audit Society*. Oxford: Oxford University Press; Power, M. (1995) *Audit and the Decline of Inspection*. London: November, CIPFA, Public Finance Foundation; Power, M. (1994) *The Audit Explosion*. London: DEMOS.

bring into being its own device either from scratch, or through the modification or mimicking of devices from other areas in which markets have been previously discussed.

1.3 Furthermore, the move toward discussing markets is clearly neither neutral nor straightforward. To think of and talk of and seek to introduce a market is to make an intervention. And the interventions discussed are directed toward logics which appear difficult to argue against. Thus markets are said to be required to ensure better value for money¹⁰, more effective public services¹¹ or to repair inequalities¹². Who would not want better value, better services and greater equality (particularly when we are continuously told that government has got too big and expensive and needs to be cut back¹³)? The fields of intervention already mentioned appear pervasive (such as health or the environment) and of import (it would appear to be difficult to do without health or the environment, for example). Market discussions and market devices are at once diverse, complex, and also engaged with profound transformations. However, this project will seek to step back from these logics and ask fundamental questions of: what are markets and how do they work; what counts as value, for whom, decided in what ways; what counts as effective or equitable and how is the counting accomplished?

1.4 These questions are particularly important as alongside the pervasive and profound aspects of the entry of markets into new areas, comes a litany of issues, concerns and troubles. Continuing with some of the same examples, claims are made that in some areas there is no competition and hence there can be no market (for example in malaria vaccines¹⁴); that assumptions built into market models simplify key areas such as scientific discovery into linear financial models¹⁵; that the insistence on creating a market is expensive and inefficient¹⁶; that on the terms on which they are established many market based initiatives fail¹⁷; and that market prerogatives are not neutral, but shape the activities of those subject to them.¹⁸ Although operating in pervasive and profound aspects of our daily lives, there appears to be no straightforward answer to the question: can markets solve problems?

1.5 One area that proves troublesome immediately upon investigating this field is the relationship between apparent problems and solutions. It is not always clear to what extent a problem pre-exists the search for a market type solution, how problems are formulated in

¹⁰ For a discussion, see: D. Neyland and S. Woolgar (2002) Accountability in Action, *British Journal of Sociology* 53(2): 259-274.

¹¹ See: http://www.civitas.org.uk/nhs/download/Civitas_LiteratureReview_NHS_market_Feb10.pdf

¹² See <http://uk.ibtimes.com/articles/20101115/power-generation-market-039-should-level-playing-field-039.htm>

¹³ See: <http://publicuniversity.org.uk/wp-content/uploads/2010/11/Callender.pdf>

¹⁴ See: A. Farlow (2005) 'The Global HIV Vaccine Enterprise, Malaria Vaccines, and Purchase Commitments: What is the Fit?' (*Innovation Strategy Today*, June 2005: 1-15).

¹⁵ Overlooking the history of STS research into scientific 'discovery' which questions assumptions of linearity.

¹⁶ See for example, criticism of plans to marketise the UK NHS ('No market for the NHS,' *Guardian newspaper*, 14th March, 2011, p.31)

¹⁷ See: http://www.resource.uk.com/article/WEEE/Weevee_got_long_way_go

¹⁸ See *History of Human Sciences* (1999) 'Knowledge for What? The Intellectual Consequences of the Research Assessment Exercise', special issue of *History of the Human Sciences* 12(4): 111-46.

order to fit apparent solutions, or how market solutions are justified in relation to other problems that appear entirely disconnected from the particular problem in focus (for example, why should a device employed to cut the spending of regional government road building programmes, prove relevant for national health care provision?). The assumption often seems to be that a market device from one field can be simply and neatly transposed into another field.

1.6 Yet, with so many market type discussions in so many different fields and with such a range of distinct devices at the centre of discussion, what can we say is shared or provides for common ground here? One shared characteristic is that each of the discussions with associated devices that I have mentioned focuses on markets that in some way appear in areas that were not (at least for a time) considered as dominated by market logics. For some this has enabled discussion to be drawn together in terms of the economization of the political¹⁹ and/or the marketisation of the social²⁰. The trend has been towards noting these developments as one aspect of the development of neo-liberalism²¹, with the shrinking centralised state giving way to the emergence of greater responsibility being placed on market type formations (including an increasing role for private sector firms in the provision of formerly state sectors, regulated by a market logic)²².

1.7 But these moves to discuss economization, marketisation and neo-liberalism risk introducing an unhelpful gloss at an early stage. To reiterate - just what is meant by markets here? What ties these different discussions together as being market-like? Economists define markets in abstraction as “not any particular marketplace in which things are bought and sold but the whole region in which buyers and sellers are in such free intercourse with one another that the prices of the same goods tend to equality easily and quickly.”²³ Do the examples I have introduced above adhere to this kind of definition and its logic? Some economists have suggested no, these arrays of different types of competition, tendering, ranking, oversight, and distribution, do not share the characteristics of a market²⁴. Indeed, some economists even go so far as to suggest that markets as the preserve of economists interested in studying an agreed set of principles, need protecting from the invasion of this mass of not quite market or quasi-market type agglomerations²⁵. As a sociological, rather than an economics project, however, we need to pay attention to the aforementioned discussions which continually utilise the term markets. I do not want to abandon the thinking of economists on markets

¹⁹ R. Shamir (2008) *The Age of Responbilization: on market-embedded morality* (Economy and Society, 37(1): 1-19)

²⁰ D. MacKenzie, F. Muniesa and L.Siu (2007) eds *Do Economists Make Markets?* Princeton University Press, Princeton, New Jersey, USA.

²¹ R. Erickson, B. Dean and A. Doyle (2000) *The Moral Hazards of Neo-Liberalism* (Economy and Society, 29(4): 532-58)

²² S. Strange (1996) *The Retreat of the State* (Cambridge University Press, Cambridge)

²³ A. Cournot (1838/1927) *Researches into the mathematical principles of the theory of wealth* (Macmillan, New York), in: M. Callon (1998) *The Laws of the Market* (Blackwells, Oxford)

²⁴ See: A. Farlow (2005) ‘The Global HIV Vaccine Enterprise, Malaria Vaccines, and Purchase Commitments: What is the Fit?’ (*Innovation Strategy Today*, June 2005: 1-15).

²⁵ See: D. Neyland and E. Simakova (forthcoming) ‘The Mosquito Multiple, to appear in: C.F. Helgesson, F. Lee and I. Dussauge (eds) *Value Practices in the Life Sciences* (Oxford University Press, Oxford)

(indeed economists' definitions of markets might provide useful starting points from which to embark on further investigations), at the same time I am keen to engage with participants who work with market mechanisms in researching how they discursively accomplish markets.

1.8 One means to navigate a course between the constraints of economists' definitions and abandoning economists' thinking on markets, is to come up with a definition for the project. To begin with I will use the term 'market-based initiative' as a means to cover a range of activities that incorporate a market component (from market creation, through market devices, to drawing on market principles in order to, for example, stake a claim for enhanced competition). The project will explore the ways in which market-based initiatives are discussed, brought into being, through various market devices and across several of those fields already alluded to: health, security, the environment and education. To provide a more precise focus, I am particularly interested in problems and solutions which have been discussed as in some way techno-scientific. But what does it mean to say that I am interested in the ways market-based initiatives are brought into being? The impetus in asking the question in such a way appears to be toward questions of genesis (perhaps even including questions of from where market logics emerged).

1.9 So the question 'Can markets solve problems?' is transformed and the terms of enquiry are expanded to investigate market-based initiatives. What is a market-based initiative? What kinds of devices enable a market-based initiative to be brought into being? What does it mean to talk of market-based initiatives coming into being? From where, what or whom, do such initiatives emerge, with what consequences, experienced by whom? What futures are anticipated in market-based initiatives? In order to address these questions I will turn attention first to recent Science and Technology Studies (STS) work on markets. I will then consider how these market ideas might be drawn into consideration with a longer standing STS interest in problems and solutions. Finally, I will turn attention to the ways in which the issues and ideas raised in this position paper can be attuned to engaging with the question: can markets solve problems?

2. STS and markets:

2.1 In recent years STS research has in some part turned attention towards matters of organisation, organising and business.²⁶ Within this turn towards organisation and business

²⁶ See Woolgar, S., Coopmans, C. and Neyland, D. (2009) Does STS Mean Business? *Organization* 16(1): 5-30. Also, see: Law, J. (1996) Organising Account Ethics: Ontology and the Mode of Accounting, in R. Munro and J. Mouritsen (eds), *Accountability: Power, Ethos and the Technologies of Managing*, London: International Thomson Business Press. pp. 283-306; Law, J. and A. Mol. 1998. On Metrics and Fluids – Notes on Otherness, in R. Chia (ed.) *Organised Worlds – Explorations in Technology and organisations with Robert Cooper*. London: Routledge; See Lee, N. and Hassard, J. (1999) Organization Unbound: Actor-Network Theory, Research Strategy and Institutional Flexibility. *Organization*. Vol. 6(3): 391-404; Brown, S. and Lightfoot, G. (2003) Presence, absence and accountability: E-mail and the mediation of organisational memory. In: *Virtual Society? Technology, Cyberbole, Reality*, edited by S. Woolgar, 209-29. Oxford: Oxford University Press. For work in the opposite direction, see: Hopwood, A. (2009) Accounting and the Environment. *Accounting, Organizations and Society* 34: 433-39; Skaerbaek, P. (2009) Public Sector Auditor Identities in Making Efficiency Auditable: The national audit office of Denmark as independent auditor and modernizer. *Accounting, Organizations and Society* 34: 971-87.

and of particular note for the project, markets have held a prominent position, particularly in research which can be said to draw its ideas from Actor-Network Theory (ANT).²⁷ The work of Callon²⁸ has been central in establishing a particular and challenging set of ideas for understanding markets as assemblages of people, things and relations between. Firstly, Callon (1998) suggests that a market assemblage does not simply emerge but is continuously made and re-made through the work of (in his research) economists, models, calculative devices and experimentation. Holm²⁹ suggests that market assembly involves the production of devices and framings which disentangle entities from their social, cultural and technical obligations, “setting them free to realize – put into reality – the market model invented by the economist,” (Holm, 2007: 234). Disentangling entities from their obligations then enables re-entanglement of entities into a specific market framing.

2.2 Secondly, the form of disentangling and re-entangling in market assemblages is said to affirm various demarcations between, for example, relative degrees of value and between the internal and external aspects of the market assemblage. Developing the latter point, Callon argues that forms of assembly work, disentangling and market framing are neither neutral nor unproblematic: “framing constitutes powerful mechanisms of exclusion, for to frame means to select, to sever links,” (2007: 140). In this sense, market assembly work can generate clear demarcations between the included and excluded.³⁰ On the terms of market framings, entities can be rendered valued, valueless, to be incorporated or left external; the very nature (ontology) of the entities is at stake. Callon uses the term orphans to describe those entities which occupy positions as particular kinds of externalities or overflows. Orphans are the non-disentangled, non-modelled, un-framed entities on the outside of market assemblages. Orphans can be enraged by their externality to the market assemblage or “choose to engage in a strategy of construction of the worlds in which they want to live,” (Callon, 2007: 141). Such strategies can then be used to engage in endeavours of inclusion. Callon draws on a vocabulary of lock-in and lock-out to describe these endeavours. Moves to gain inclusion in assemblages are given greater articulation in Callon’s work on hybrid forums.³¹

2.3 Thirdly, STS research on markets has inspired a broad range of further innovative and challenging ideas. For example, economics and markets are considered as performative and calculative devices treated as ordinary aspects of market assemblages, deflating their otherwise grandiose positions in order to open up avenues of analytical enquiry.³² Through

²⁷ A note of caution is advisable here: many early advocates of ANT have over the last 10 to 12 years questioned some of the limitations of ANT, used the label post-ANT or refer in very minimal terms to ANT.

²⁸ Callon, M. (1998) *The Laws of the Markets*. Oxford: Blackwells; MacKenzie, D., Muniesa, F. and Siu, L. (eds) (2007) *Do Economists Make Markets? On the performativity of economics*. Oxford: Princeton University Press; Muniesa, F., Milo, Y. and Callon, M. (2007) *Market Devices* Oxford: Wiley-Blackwell

²⁹ Holm, P. (2007) Which Way is Up on Callon? in *Do Economists Make Markets? On the Performativity of Economics* D. MacKenzie, F. Muniesa, and L. Siu (eds) NJ, USA: Princeton University Press pp. 225-43

³⁰ Callon (2007) refers to the excluded as externalities or orphans who might strike back against the assemblage or inhabit their position as excluded. Callon, M. (2007) *An Essay on the Growing Contribution of Economic Markets to the Proliferation of the Social*. *Theory, Culture, Society*. 24: 139-63.

³¹ Callon, M., P. Lascoumes, and Y. Barthe. (2009) *Acting in an Uncertain World: An Essay on Technical Democracy*. Boston, USA: MIT.

³² MacKenzie, D. (2006) *An Engine, Not a Camera* (London: MIT Press)

such enquiries fundamental questions are pursued of, for example, what counts as a market actor or entity.³³ In Cochoy's work the suggestion is made that the shopping trolley (or cart) can be conceived as a market actor, provocatively broadening the set of entities conventionally considered to play an active role in markets. Further questions are posed of market assemblages,³⁴ suggesting, for example, that broad political systems can be understood as intersecting specific market experiments. The role, position and status of politics and political institutions is also drawn into scrutiny,³⁵ suggesting that forms of market metrology, for example, can generate cross-contamination of the political and economic. The ways in which trading schemes require devices to render market entities equivalent, becomes a topic of research.³⁶ And forms of quality, aside from just metric quantity, are investigated.³⁷ The substantive focus for STS research on markets is also broad, engaging global financial markets, arbitrage and price, through to the exchange of strawberries.³⁸

2.4 Fourthly, STS research on markets has also recently considered questions of practical engagement. For example, MacKenzie³⁹ suggests that STS research could perhaps act as somewhat of a corrective to problematic market functioning. Zuiderent-Jerak draws on the work of Callon amongst others to explore Dutch healthcare reform and engages critiques of the market models being adopted.⁴⁰ These moves to consider engagement with (alongside research on) markets, draws into question the possibility of exploring the utility of STS market research, raising questions of utility for whom, decided in what way, and with what consequences.

2.5 For our question – can markets solve problems? – the notion of the market as assemblage, as a focus for accomplishing demarcation between inclusion and exclusion, counting and not counting, valued and not valued, and as a basis for developing an ever broader array of provocations (from entities and their relations, through politics and political systems), raising questions of utility, suggests myriad themes to be explored.

³³ Cochoy, F. (2009) Driving a Shopping Cart from STS to Business, and the Other Way Round: On the Introduction of Shopping Carts in American Grocery Stores (1936—1959). *Organization*. 16: 31-55.

³⁴ Sjögren, E. and Helgesson, C-F. (2007) The Q(u)ALYfying hand: health economics and medicine in the shaping of Swedish markets for subsidized pharmaceuticals. *Sociological Review* 55(2): 215-240

³⁵ Barry, A. (2002) The Anti-Political Economy. *Economy and Society*. 31(2): 268-84

³⁶ MacKenzie, D. (2009) Making Things the Same: Gases, emission rights and the politics of carbon markets. *Accounting, Organisations and Society*. 34: 440-55.

³⁷ Callon, M., C. Meadel, and V. Rabeharisoa. (2002) The Economy of Qualities. *Economy and Society*. 31(2): 194-217.

³⁸ See for example: MacKenzie, D. (2006) *An Engine, Not a Camera* (London: MIT Press); Beunza, D. and Hardie, I. and MacKenzie, D. (2006) A price is a social thing: towards a material sociology of arbitrage. *Organization studies*, 27 (5). pp. 721-745; Garcia-Parpet, M. (2007) The Social Construction of a Perfect Market: The Strawberry Auction at Fontaines-en-Sologne, in D. MacKenzie, F. Muniesa, and L. Siu (eds) *Do Economists Make Markets? On the Performativity of Economics*. New Jersey, USA: Princeton University Press, pp. 20-53.

³⁹ MacKenzie, D. (2006) *An Engine, Not a Camera* (London: MIT Press)

⁴⁰ Zuiderent-Jerak, T. (2009) Competition in the Wild. *Social Studies of Science*. 39(5): 765-92; Zuiderent-Jerak, T. (2010) Embodied Interventions – Interventions on Bodies. *Science, Technology and Human Values* 35(5): 677-710; with Bal, R. (2011) The Practice of Markets in Dutch Healthcare. *Health Economics, Policy and Law* 6: 139-45.

2.6 However, STS research on markets has also engaged debates in other fields. These debates raise highly pertinent questions for the project. For example, those working in economic sociology⁴¹ (which has an established tradition of thinking through the economic in networked terms) such as Nik-Khah, and Mirowski,⁴² argue that Callon in particular buys too readily into the terms espoused by economists, undermining opportunities for critical engagement with markets and market-making.⁴³ Further questions have been raised within the anthropology of markets,⁴⁴ for example by Miller⁴⁵ who suggests close ethnographic scrutiny of markets is required, investigating the insides and outsides of assemblages and of forms of exchange. Concerns have also been expressed that much STS research risks ‘essential-ising’ the market – presenting ‘the market’ as having properties which appear to exist independent of analysts’ descriptions⁴⁶ – perhaps simplifying the fluidity and mess of market based initiatives into straightforward dichotomies such as inclusion and exclusion or valued and not valued.

2.7 Economic sociologists also suggest that value as a term requires disaggregation.⁴⁷ Stark, for example, argues that contemporary economic life frequently involves the production of perplexing situations in which “there is principled disagreement about what counts,” (2009: 5). However, rather than treating these as a matter of concern, a situation to be avoided or eliminated, organisations might productively gain from generating and addressing such situations. The suggestion from Stark is that a multiplicity of principles, forms of evaluation, frictions and assessments might provide the basis for “creating uncertainty and therefore... opening opportunities for action,” (2009: 13). What counts as a value becomes indistinguishable from what counts as an organisation’s values, estimation cannot be easily separated from esteem. For Stark the move is to instead embrace worth as a term to encompass value and values, estimates and esteem, uncertainty and action.

⁴¹ Granovetter, M. and McGuire, P. (1998) The making of an industry: electricity in the United States. In M. Callon (1998) (ed) *The Laws of the Markets*. Oxford: Blackwells, pp: 147-73; Pinch, T., and R. Swedberg (eds.) (2008) *Living in a Material World: Economic Sociology Meets Science and Technology Studies*, Massachusetts: MIT Press

⁴² Mirowski, P. and E. Nik-Khah. (2007) “Markets Made Flesh,” in D. MacKenzie, F. Muniesa, and L. Siu (eds) *Do Economists Make Markets? On the Performativity of Economics*. New Jersey, USA: Princeton University Press, pp. 190-224

⁴³ Particularly in his approach to the performativity of economics. D. MacKenzie, F. Muniesa, and L. Siu (eds) *Do Economists Make Markets? On the Performativity of Economics*. New Jersey, USA: Princeton University Press, pp. 190-224

⁴⁴ Slater, D. (2002) From Calculation to Alienation: Disentangling Economic Abstractions. *Economy and Society* 31(2): 234-49.

⁴⁵ Miller, D. (2002) Turning Callon the Right Way Up. *Economy and Society*. 31(2): 218-33.

⁴⁶ As such, the anti-essentialist argument with regard to the market echoes earlier critique of the essentialist understandings of networks in ANT. The anti-essentialist move emphasises discursive controversy through which winning claims about particular technologies or networks are produced, and investigates the central role of the analyst in identifying and interpreting such descriptions. For more on this, see D. Neyland and E. Simakova (2010) ‘Trading Bads and Goods: Market Practices in Fair Trade Retailing’ in L. Araujo, H. Kjellberg and J. Finch, ‘Reconnecting Marketing to Markets,’ (Oxford University Press, Oxford).

⁴⁷ See, for example, the work of Stark, D. (2009) *The Sense of Dissonance: Accounts of Worth in Economic Life* (Princeton University Press, Princeton, NJ USA)

2.8 At a minimum, this suggests a need to further explore market value and values, their constitution or enactment or performance in market type situations.⁴⁸ But this perhaps opens up more questions than it resolves. What do we mean by these activity-based terms? What is it to enact or perform markets and how does this differ from the history of activity-based terms made available through STS theories – including construction, social construction, constitution, co-constitution and so on?⁴⁹ Are these useful terms or another unhelpful gloss (see 1.7)?

2.9 Taken together, these concerns regarding essentialism, value, values, worth, the models produced by economists, what counts as the inside and outside of a market exchange, suggest that STS research on markets could usefully pay attention to the messiness, problematic functioning and consequence of markets. That mess is underplayed in STS analyses of markets appears to be further confirmed by the position of ‘failure’ in these accounts. Although there is a strong focus on experimentation,⁵⁰ and with experimentation⁵¹ would appear to come the chance or even likelihood of failure (that on some terms the market does not take off, become established, hold together or accomplish the kinds of things envisaged by proponents at the initiation of the experiment) STS research on markets has tended not to devote much attention to failure. MacKenzie (as previously mentioned) suggests STS might act as a corrective on financial markets. And Callon (2009) devotes a little space to a discussion of the problematic functioning of markets, particularly in talking of experimental trial and error. However, Callon then argues for a move away from discussion of failure as he suggests that matters of concern become things which are “concealed or which we get rid of too quickly by talking in terms of failures,” (2009: 541). Instead, Callon goes on to outline what constitutes a successful market. The possibility of focusing on failure as a means to engage critically with markets is side-stepped in favour of pursuing the idea that a successful market is subject to continual making and re-making. Such side-stepping of failure adds further to the sense that much STS research on markets engages a modified version of Latour and Woolgar’s (1979) splitting and inversion argument.⁵² Hence any particular instance of a problematic market (the ‘error’ in forms of trial and error) is split from other examples of markets or even from markets as a general concept. The problematic market, thus split, is then understood as a specific example of a market which did not, for example, engage in a continual process of re-making. And then the apparent problem is inverted; rather than acting as a critique of markets, the problematic example (split from other examples) is held up as evidence of the need for more inclusive, continuously-open-to-remaking, markets.

⁴⁸ See C.F. Helgesson, F. Lee and I. Dussauge (eds) (forthcoming) *Value Practices in the Life Sciences* (Oxford University Press, Oxford)

⁴⁹ See MISTS working paper 3 for more on performativity.

⁵⁰ See for example, Callon, M. (2009) *Civilizing Markets: Carbon trading between in vitro and in vivo experiments*. *Accounting, Organizations and Society*. 34: 535-48.

⁵¹ Whether the term ‘experiment’ is an analyst’s or participant’s term, the same point appears to apply.

⁵² Whereby a scientific fact is constructed through a great deal of work by scientists, the fact is then split from this work and the relationship between the fact and the world is inverted; the fact is no longer constructed through work, but is now to be understood as awaiting discovery by the work of scientists; see Latour, B. and Woolgar, S. (1979) *Laboratory Life: The Social Construction of Scientific Facts*, London: Sage.

2.10 One means to begin marking out a distinct approach which would take on the challenging and at times provocative set of ideas produced through STS research on markets while also paying attention to the detail of market problems, tensions and possible failures, would be to explore further the very nature of the entities and relations involved in market assemblages. Treating markets, forms of inclusion, exclusion and value as the upshot of a broad array of market practices, sometimes adhering in singular form, sometimes collapsing, sometimes appearing to be characterised by forms of fluidity, hybridity, multiplicity and/or mess,⁵³ could offer one general starting point for exploration. By drawing in the work of Law and Mol⁵⁴ on accounts and accountabilities we could begin to engage with markets as assembled mechanisms through which organizations, outputs, decisions and processes are accomplished. Furthermore, we could begin to engage with assemblages as mechanisms which are not only oriented toward market logics but which also produce and inhibit accountabilities. In this sense assemblages could be said to establish demarcations between what gets to count and what does not in a broader variety of ways, with counting understood in numeric and economic terms, but also in the sense of expressing a view and having that view taken on by the assemblage (from counting, to accounting, to accountability). This might direct us toward engaging with the complexity of what gets to count, who and what gets held to account and who and what is enabled to participate in accountability. Simultaneously, in order to avoid essential-ising the characteristics of assemblages or notions of failure, we could move away from any counter assumption that these demarcations are natural, inevitable or static properties of assemblages which endure over time. Mol's (2002) work on ontological multiplicity⁵⁵ sensitizes us to the need for close and critical scrutiny of the nature of what appear to be the most ontologically settled entities (even including our own bodies). As Cussins (1995) suggests⁵⁶, it is through complex organisational settings (in her case in healthcare) that ontology is choreographed. Turning attention toward market ontologies in this way raises questions of potential import such as what would it mean to conceive of market assemblages as a means to, on occasions, demarcate what counts from what does not, who gets to account and who does not and, on other occasions, to treat market assemblages as focal points for choreographing ontological singularity from multiplicity? And how are these distinct occasions performed or made available for analysis?

2.11 However, this attention to what counts and does not and to ontological singularity, multiplicity and choreography is insufficient on its own; in some ways it simply defers problematic questions of specificity (in terms of critical scrutiny of issues of inclusion and

⁵³ See, for example: De Laet, M. and Mol, A. (2000), "The Zimbabwe Bush Pump: Mechanics of a Fluid Technology", *Social Studies of Science*, Vol. 30, No. 2, (April), pp. 225-63; Mol, A. (2002) *The Body Multiple: ontology in medical practice*. London: Duke University Press.

⁵⁴ Law, J. and A. Mol. (1998) On Metrics and Fluids – Notes on Otherness, in R. Chia (ed.) *Organised Worlds – Explorations in Technology and organisations with Robert Cooper*. London: Routledge; Law, J. (1996) Organising Account Ethics: Ontology and the Mode of Accounting, in R. Munro and J. Mouritsen (eds), *Accountability: Power, Ethos and the Technologies of Managing*, London: International Thomson Business Press. pp. 283-306.

⁵⁵ Mol, A. (2002) *The Body Multiple: ontology in medical practice*. London: Duke University Press.

⁵⁶ Cussins, C. (1995) "Ontological Choreography: Agency Through Objectification in Infertility Clinics," *Social Studies of Science*, (26) pp. 575-610.

exclusion, accounts and accountabilities, forms of exchange, value, tensions, questions and notions of failure and how these might, for example, be usefully understood as ontologically multiple) onto the research. One option for generating a space for greater critical scrutiny, questioning the terms of economists in framing and managing market based initiatives and for exploring the detail of market tensions, questions and possible failures would be to focus more on techno-scientific problems and solutions. Although prominent contemporary problems such as greenhouse gases and carbon trading⁵⁷ or nuclear waste and underground burial⁵⁸ have been the focus of STS research on markets, little work has been done thus far on untangling the genesis, development, experience and consequence of markets as potential solutions to problems engaging STS terms.

3. STS, problems and solutions:

3.1 Two lines of STS enquiry can aid the investigation of problems and solutions. One line of research has focused on the social construction of problems. For example, Woolgar and Pawluch (1985) focus on the constitution or legitimacy of techno-scientific solutions.⁵⁹ This line of research is useful for our project in continuously challenging any counter assumption that problems pre-date solutions, that solutions are straightforwardly designed to solve problems or that predictable consequences flow from the implementation of solutions. Instead it is suggested that problems are frequently re-oriented to fit current understandings of the capability and capacity of solutions, problems are pushed to the fore in order to justify solutions and numerous unintended consequences ensue. For Garfinkel (1967: 100), the recursive relationship between problems and solutions is of broader note than techno-scientific issues; the recursive relationship becomes invoked as a fundamental aspect of sense-making.⁶⁰

3.2 A second line of research into problems and solutions can be found in STS work on science policy.⁶¹ While STS science policy research recognises the complex intertwining of problems and solutions,⁶² further questions are also raised. For example, science and technology problems are said to require detailed understanding of the role of expertise.⁶³ This suggests we might need to investigate the market based expertise of, for example, economists in framing market based initiatives. This would enable a movement away from the critique that STS research buys too readily into the terms of economists and provide the basis for

⁵⁷ MacKenzie, D. (2009) Making Things the Same: Gases, emission rights and the politics of carbon markets. *Accounting, Organisations and Society*. 34: 440-55

⁵⁸ Callon, M., P. Lascoumes, and Y. Barthe. (2009) *Acting in an Uncertain World: An Essay on Technical Democracy*. Boston, USA: MIT.

⁵⁹ Woolgar, S. and Pawluch, D. (1985) "Ontological Gerrymandering: The Anatomy of Social Problems Explanations," *Social Problems* (32:3), pp. 214-27.

⁶⁰ Garfinkel, H. (1967) *Studies in Ethnomethodology* (NJ, USA: Prentice-Hall).

⁶¹ See for example Irwin, A. (1995) *Citizen Science* (Routledge, London); Kitcher, P. (2001) *Science, Democracy and Truth* (Oxford University Press, Oxford); Kleinman, D. (2000) (ed) *Science, Technology and Democracy* (State of New York University Press, Albany NY, USA); Jasanoff, S. (1994) *The Fifth Branch: Science Advisers as Policymakers* (USA: Harvard University Press)

⁶² See for example: Colebatch, H., Hoppe, R. and Noordegraaf, N. (2010) (eds) *Working For Policy* (Amsterdam, Netherlands: University of Amsterdam Press)

⁶³ Rip, A. (2003) Constructing Expertise. *Social Studies of Science* 33(3): 419-34; Collins, H. and Evans, R. (2007) *Rethinking Expertise*. London: University of Chicago Press.

critically exploring the claims to expertise put forward. Science policy research has also highlighted the importance of values held by decision makers in seeking solutions to diverse social problems⁶⁴ and questions are asked of the ways in which views on science and technology become embodied in political culture.⁶⁵ This suggests some possibilities for excavating and analysing the political commitments toward market based initiatives as solutions to techno-scientific problems as made manifest in policy discussions and documents. The plethora of market based initiatives suggests that the ‘economic’ and notions of ‘competition’ occupy a prominent position of value in political discourse. Our project will need to explore in the sub-projects (see pages devoted to each project) the means by which a value for markets as solutions to problems is discursively accomplished. The problem of how science itself should be governed⁶⁶ has formed a further focus for STS science policy research. The sub-projects each imply a governance role for market based initiatives, in distributing finance, in assessing outcomes, in shaping actions towards particular and prescribed ends. The sub-projects will be used to explore the relations between governance and market initiatives. Science policy research has also investigated the role of STS in providing solutions to problems.⁶⁷ The moments in which STS research has been drawn into market orientations, assessed, held to account and conscripted into economic work will be explored in the sub-projects (particularly in the sub-project focused on academic markets).

3.3 Furthermore the adequacy of new methods of public consultation in the contexts of demands for greater accountability and transparency has become a significant focus for STS science policy work⁶⁸ and concerns have been expressed regarding the means by which legislation and regulation, public representation, participation or consultation have been established.⁶⁹ Returning to the suggestion (p. 8) that market assemblages can be thought of as enabling, inhibiting or distributing forms of accounts and accountability, working through the accountability implications of particular market based initiatives (who gets to hold whom to account, through what means, with what consequences) will become important for the project. The distributional consequences of market based initiatives broadly conceived to incorporate, for example, distributions of value, participation and opportunities for accountability, will form a focus for empirical research.

4. How the project will work:

4.1 These STS lines of thinking on problems and solutions further emphasise the need for detailed understanding and in-depth research into the genesis, development, experience and consequence of market based initiatives as solutions to techno-scientific problems. Treating markets as assemblages provides one provocative starting point for research. The STS lines

⁶⁴ Bozeman, B. and Sarewitz, D. (2007) Public Values and Public Failure in US Science Policy. *Science and Public Policy*, 32(2): 119-36.

⁶⁵ Jasanoff, S. (2007) *Designs on Nature* (USA: Princeton Press)

⁶⁶ Fuller, S. (1999) *The Governance of Science*. Buckinghamshire: Open University Press.

⁶⁷ See for example, Webster, A. (2007) Crossing Boundaries Social Science in the Policy Room. *Science Technology and Human Values*, 32(4): 458-78.

⁶⁸ Neyland, D. (2007) ‘Achieving Transparency: The visible, invisible and divisible in academic accountability networks’ (*Organization*, Vol 14 (4), pp 499-516)

⁶⁹ Jasanoff, D. (2004) Science and Citizenship: A new Synergy. *Science and Public Policy*, 31(2): 90-94.

of thinking on problems and solutions suggest a need to combine a focus on assemblages with a detailed understanding of the complex relations of problems and solutions, the non-linearity of problems and solutions, the ways in which markets have become embodied within political cultures, the nature of the audience to be understood as beneficiaries of a solution or suffering from a problem (e.g. a particular public), who gets to talk on behalf of whom as expert in any particular problem and solution and to what extent, in what ways and to what end market-based initiatives are incorporated into contemporary drives for greater transparency and accountability. Such drives continue despite current government austerity measures.⁷⁰ Taking on these questions will also open opportunities to explore in greater depth the ways in which market based initiatives, when invoked as solutions to techno-scientific problems, on occasions, involve particular forms of inclusion and exclusion, value and non-value, and on other occasions, involve choreographing ontological multiplicity among market entities. The specificities of market tensions, problems and possible failures will also be opened for investigation.

4.2 The MISTS programme of research proposes to explore these issues by drawing together the theoretical underpinnings of STS moves into researching organisation, business and management, in particular markets, and more policy-oriented attempts to work through problems/solutions⁷¹ in researching four sub-projects. The four inter-linked sub-projects will capture the distinct temporalities and substantive concerns of market-based initiatives as solutions to techno-scientific problems. The sub-projects will focus on: security, health, the environment and education.

4.3 In order to address the question – can markets solve problems – MISTS will engage with ideas from recent STS research which suggests that markets can be usefully conceptualised as assemblages, engaging questions of inclusion and exclusion, value and non-value, and who/what gets to count and who/what does not. These ideas will be augmented through a focus on the specificities of tensions, questions, problems and possibilities of failure that emerge through the genesis, development, experience and consequence of market-based initiatives as solutions to techno-scientific problems. Attention will be paid to the accounts and accountabilities, ontological singularities and multiplicities of market assemblages. In order to explore further the complex and recursive relationship between problems and solutions, more policy oriented STS research will be drawn on. This research will be used to explore questions raised by market based initiatives in relation to, for example: the terms and consequences of inclusion and exclusion; the values built into initiatives; how initiatives might operate as forms of techno-scientific governance; the role of expertise; and the degree, desirability and possibility of incorporating accountability and transparency into market based initiatives. The four sub-projects will form a research programme which will develop insights for the STS research community, for those involved in researching markets and for those interested in techno-scientific problems and solutions.

⁷⁰ See: http://www.conservatives.com/News/Speeches/2010/03/David_Cameron_Our_Big_Society_plan.aspx

⁷¹ Various calls have been made to draw together theoretical and policy-oriented STS, see for example: Woodhouse, E. et al. (2002) Science studies and activism: Possibilities and problems for reconstructivist agendas. *Social Studies of Science* 32 (2):297-319.