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Taxonomizing Homo Economicus

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Animality and Ideology in Contemporary Economic Discourse: Taxonomizing *Homo Economicus*

Over the last couple of decades, *Homo economicus* or 'economic man', the idealized figure of the human subject at the centre of mainstream economic thought, has been the object of psychoanalysis (Feiner 1999), genealogy (Read 2009), anthropology (Heath 2000), and ethology (Persky 1995), as well as autopsy (Baudrillard 1998, pp. 69-76), requiem (O'Boyle 2007), and, frequently, obituary (e.g. Gould 2009; Gowdy and Polimeni 2005; Johansson-Stenman 2006). The procedure performed by this article, in contrast, is something like a taxonomy of *Homo economicus*, an attempt to classify this creature, to ask: what species of being is this?

Despite its name, *Homo economicus*' line of descent through classical and neoclassical economics indicates that it is barely an evolutionary relative of *Homo sapiens* at all – that, in fact, it has been traditionally understood less as a living organism than as a machine. Under the pressures of an increasingly hostile intellectual environment, however, *Homo economicus* is undergoing, if not extinction, then a strange mutation. This mutation once again bypasses the human, at least as conventionally understood: it is a metamorphosis from machine to animal, evident in fields ranging from a resurgent Keynesianism to behavioural finance to 'neuroeconomics' to theories of 'adaptive markets', and also registered in a number of prominent contemporary fictional narratives concerned with financial markets. While this 'animal turn' is to be welcomed for the challenge it poses to complacent claims for markets' infallible rationality and efficiency, as well as for the weight it (albeit unknowingly) lends to attempts in the field of animal studies¹ to break down

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artificial species boundaries, it is nonetheless liable to critique for its tendency to re-inscribe, not merely normalized, but in a very literal sense *naturalized*, understandings of historically contingent, ideologically determined forms of economic behaviour. *Zoon economicus* – ‘economic animal’ – is ultimately as amenable to reactionary politics as that rusty machine-man, *Homo economicus*.

***Homo economicus*: Machine or animal?**

In an article published in 1997, Jennifer Roback Morse sums up what was then, and to a significant extent remains, the prevailing picture of the species-being of *Homo economicus*: ‘The economist’s view of the person, as it now stands, is that the person is a pure stimulus-response machine. The preferences are given; the relative prices are given. The person is completely reactive. We might say that the person’s behavior is perfectly predetermined, or predestined’ (p. 182). Similarly, Karen Stephenson and David Lewin observe in a 1996 essay that ‘[t]he “people” who inhabit the economist’s models carry out their prearranged tasks with extraordinary concentration and uncanny accuracy. *Homo economicus* is really a robot’ (p. 174).

The term *Homo economicus* appears to have entered into binomial nomenclature in 1889 (with ‘economic man’ first used the year before) (see O’Boyle 2007, p. 22; Persky 1995, p. 222), but the species was spawned much earlier, in the work of Adam Smith, David Ricardo, John Stuart Mill, and other classical economists of the late eighteenth and early nineteenth centuries. In important studies in the history of economics, Philip Mirowski (1989, 2002), Julie A. Nelson (2006), Harro Maas (1999), and Arjo Klamer and Thomas C. Leonard

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(1994), amongst others, have shown how the mechanical metaphors that figured prominently in classical economics were installed as 'constitutive metaphors' (in Klamer and Leonard's terms) for the discipline with the onset of the 'neoclassical revolution' in the 1870s, most notably in the work of William Stanley Jevons. According to Mirowski, 'machine rationality and machine regularities are the constants in the history of neoclassical economics', and by the turn of the twenty-first century, neoclassical economics – to all intents and purposes synonymous with 'mainstream' or 'orthodox' economics – had succeeded in 'hollowing out ... human beings into hulking mechanical shells' (Mirowski 2002, pp. 9-10, 564).

In the wake of the global financial crisis or 'credit crunch', however, such a conception of the human subject as a rigidly mechanical *Homo economicus* appears glaringly flawed (see McDonald 2009, p. 249). Such dissatisfaction with the neoclassical model of *Homo economicus* considerably predates the recent crisis, however. Over the last couple of decades, a range of alternate methodologies have emerged on the 'heterodox' margins of the discipline, positioning themselves as direct challenges to neoclassical orthodoxy. As we will see shortly, a striking point of commonality between several of these diverse new fields and sub-fields is an attempt to align economic actors not with machines but with *animals*.

First, though, it is important to establish how this latter branch of economic discourse has developed, especially as, compared to the tradition of mechanical theorizing discussed above, the history of animal metaphors in economics has received little scholarly attention. This comparative neglect seems puzzling when one considers the prevalence and visibility of animal imagery in popular and professional economic discourse, especially that surrounding the functioning of financial markets. The *OED* has those mighty antagonists, the stock market

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bull and bear, already locked in combat as early as the 1710s,² and the terms were certainly commonly used to describe those who gambled, respectively, on rising and falling markets by the mid- to late nineteenth century, as evidenced by popular allegorical images like William Holbrook Beard's painting *The Bulls and Bears in the Market* (1879) (see Crosthwaite, Knight, and Marsh 2012, pp. 613-614). Bulls and bears are undoubtedly the most celebrated members of the financial bestiary, but they are by no means the only ones. Amongst the ranks of this economic animal kingdom we also find 'doves' and 'hawks' (economic policy pundits who argue for, respectively, lower and higher interest rates); 'lions' (the CEOs or CFOs of the major banks – the 'big beasts' of Wall Street or the City); 'sheep' (investors who are content to follow the flock); 'vultures' (traders in securitized life insurance); zebras (investors who, regardless of the market, 'don't change their stripes' – or their investment strategies); and 'hogs' (aimless, disorientated traders who are neither bull, bear, nor sheep) (see Weeks 2011). Language of this kind has long circulated within the trading floors, offices, bars, and clubs where financial professionals congregate, as well as within the financial media and, to a lesser extent, the everyday parlance of the general public. The relative lack of interest on the part of historians of economics in such metaphors, and the understandings of human behaviour encoded within them, is not all that surprising, however, given that 'animality' has only recently re-emerged as a preoccupation within those branches of scholarship devoted to the formal study of economic phenomena, after well over a century of exclusion.

A story in which animals roamed freely over the economic thought of the eighteenth century, only to be firmly caged off by the end of the nineteenth, is told by one of the few historians to have treated this area in any detail, Margaret Schabas. As Schabas shows in *The*

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Natural Origins of Economics (2005), during the Enlightenment, as the proto-economics of the *philosophes* merged into the early political economy of the likes of Adam Smith, it was a 'given' in economic thinking that 'man was an animal' (p. 35). For all that Smith and the other early political economists frequently had recourse to mechanical metaphors in explaining economic processes, their thinking was complex and ambivalent, for they also, as Schabas notes, 'took the economy to be a natural entity and saw *homo economicus* as a creature of animal passions and instincts bent on outcomes ... that were at odds with the dictates of reason'. In contrast, 'subsequent economists, such as Mill and the early neoclassicists, took man out of nature. The economy was seen to be the result of rational agency and, thus, no longer directly governed by natural forces' (p. 150). Even as the theory of evolution provided 'a detailed argument that man is related by descent to every other living form and, thus, that even human intelligence and morality are simply refined instincts', 'Victorian economists ... tugged in a different direction from Darwin and the social Darwinists' (pp. 146, 150). Schabas adds: 'From our own vantage point more than a century later ... [economists] still appear to be doing so' (p. 150).

Putting the 'animal' into 'animal spirits'

As I have suggested, recent decades have in fact seen a marked shift, on the fringes of economics at least, towards a conception of economic behaviour grounded in such fields as ethology and sociobiology. Though, as Schabas suggests, there are few obvious precedents for such interdisciplinary convergences in the wake of neoclassicism's decisive severance of economics from the life sciences at the end of the nineteenth century, economists working at

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these interfaces can point to at least one major economic thinker from the last hundred years who appears, at least, to invoke an animalistic understanding of human economy: John Maynard Keynes. The brevity of Keynes' discussion of 'animal spirits' in *The General Theory of Employment, Interest, and Money* (1936) is wildly disproportionate to the influence it has enjoyed. It is also far from clear whether Keynes has in mind a facet of 'animal' existence in the everyday sense, at all, or rather a phenomenon relating to an archaic meaning of 'animal', namely, 'designating the functions of the brain and nerves, especially sensation and movement' (*OED*). In the *OED*, 'animal spirit' is 'the (supposed) agent responsible for sensation and movement, originating in the brain and passing to and from the periphery of the body through the nerves'.³ Regardless of Keynes' intended meaning, however, the chief significance of his account of 'animal spirits', in this context, is the way in which it has served as a source of authorization or legitimation for researchers convinced that the study of animal behaviour can inform the study of human economic activity. Those who would seek to displace a mechanistic view of economic behaviour in favour of an animalistic one have been attracted by Keynes' insistence that human action is not reducible to the rational calculation of optimal outcomes, but is equally shaped by impulses that are instinctive, bodily, and precognitive; by his assertion that these latter elements of human nature are essential to the healthy functioning of psyche and economy alike; and by his contention that humans are skittish creatures, profoundly susceptible to influences that any strict definition of economic rationality would exclude (Keynes 1936, pp. 161-162).

Keynes' concept of 'animal spirits', then, has been an important reference point for academic researchers interested in exploring the economic implications of the links between

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human and nonhuman animals.⁴ Much of this work is being conducted under the banner of 'animal behavioural economics'. As George Loewenstein and Ted O'Donoghue indicate in their widely-cited paper 'Animal Spirits: Affective and Deliberative Processes in Economic Behavior' (2005), animal behavioural economics is premised on the fact that 'because many affective responses evolved before humans existed as such, we share many of our affects with other animals' (pp. 5-6). The field makes use of empirical observation of nonhuman animals to 'reveal something about the affective – "animal" – system of the human brain' and its role in economic decision-making (p. 32). In his overview of the field for *Scientific American*, Frans B.M. de Waal describes how he and his team at Emory University have drawn connections between 'basic human economic tendencies and preoccupations' and 'interactions among primates, which involve multiple partners exchanging multiple currencies, such as grooming, sex, support in fights, food, [and] babysitting' (de Waal 2005, pp. 74, 77). Other research projects include studying 'the collective coherent motion of large numbers of self-propelled organisms, such as migrating birds and gnus, lemmings and ants' (Sornette 2003, p. 94) in order to model the tendency of investors to exhibit unreflective, mimetic behaviour during market bubbles and crashes – behaviour defined as 'herding', 'flocking', 'swarming', or 'aping'.

Animal behavioural economics has substantial overlaps with the similarly novel and expanding field of 'neuroeconomics', which aims to map the brain structures involved in economic activity. As a paper co-authored by Loewenstein with Colin F. Camerer and Drazen Prelec notes, much neural evidence used in neuroeconomics 'comes from studies of the brains of nonhuman animals (typically rats and primates)'. Animal brains, the authors

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blandly observe, can be 'deliberately damaged and stimulated, and their tissues studied' (Camerer, Loewenstein, and Prelec 2004, p. 557). Neuroeconomists study 'scans of selected areas of the brain ... in both animals and humans facing situations in which risk, reward, profit, gains, and losses [have] a role' (Rinaldi 2009, p. 823), as well as the impacts of factors including genetic make-up and the functioning of the endocrine system in economic scenarios. Summarising the key implications of the field, Andrea Rinaldi writes:

behavioural aspects that are now considered to have a role in ... financial decision-making might have evolved in association with events such as migration, territory exploration, or sexual competition, which all involve an element of novelty and risk.... If this evolutionary perspective is correct, then the 'animal spirits', which some economists indicate as the real key to comprehend why and how an economy fluctuates (Akerlof and Shiller 2009), might be, in part, deeply rooted in the relationship between genes, hormones, and neurological circuits that scientists have just begun to uncover. (p. 825)

Where behavioural economics and neuroeconomics concern themselves with nonhuman experimental subjects, they also abut upon another emerging research programme, a revision of the neoclassical efficient market hypothesis that its chief proponent, Andrew W. Lo of the Massachusetts Institute of Technology, terms the 'adaptive market hypothesis' (see Lo 2004). As Gary Stix explains,

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just as natural selection postulates that certain organisms are best able to survive in a particular ecological niche, the adaptive-market hypothesis considers different market players from banks to mutual funds as 'species' that are competing for financial success. And it assumes that these players at times use the seat-of-the-pants heuristics described by behavioral economics when investing ('competing') and that they sometimes adopt irrational strategies, such as taking bigger risks during a losing streak. (p. 85).

Viewing the current state of economics from a broad perspective, then, it is striking that a range of overlapping fields and sub-fields, encroaching on the discipline's orthodox centre from the heterodox margins, share a vision of *Homo economicus* not as 'an automaton capable of objective reasoning' 'under all conditions', as Peter Bernstein puts it (qtd. in Stix 2009, p. 80), but (once again, as in an earlier age) as 'a creature of animal passions and instincts' (Schabas 2005, p. 150). Considered against the background of the disciplinary formation of economics itself, the major significance of these interrelated movements clearly lies in their contribution to a wider assault upon the assumptions of calculative rationality and utility maximization that underpin neoclassical models. What I particularly wish to highlight at this point, however, is the intriguing coincidence of this 'animal turn' in economics with an equivalent turn across an array of subject areas in the humanities – an multidisciplinary movement dubbed 'animal studies'. As exemplified by the pioneering contributions of Donna J. Haraway (1993, 2003, 2007), Cary Wolfe (2003a, 2003b), Barbara Herrnstein-Smith (2005), and Jacques Derrida (2008), amongst others, animal studies puts pressure on the

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philosophical and symbolic boundaries that separate human from nonhuman animals, bolstering a wider 'posthumanist' sensibility hostile to the sovereignty, distinctiveness, and centrality accorded to 'the human' in Western thought.

Though animal behavioural economists and neuroeconomists give every indication of being oblivious to the related work that their colleagues in departments of literature, film, philosophy, history, art, and cultural studies are pursuing, there are resonances between the two constituencies in the ways they emphasize the affinities and continuities that connect 'us' to our primate, rodent, reptile, and even bacterial relatives. Strong though the resonances between economics and the humanities in this area are, it must be said that this state of ignorance or indifference is mutual: animal studies' primary concerns have been the commensurability, or otherwise, of 'human' and 'animal' systems of signification, representation, and communication, and the ethical relations that ought to pertain between humans and other species (see Weil 2012, ch. 1). While the field has devoted substantial attention to the condition of animals as commodities within global networks of agriculture, trade, and consumption (e.g. Markus 2005, Shukin 2009), the notion of animals as beings who might themselves participate in 'economic' activities akin to those performed by humans has remained unexplored.

I will shortly suggest some ways in which the kind of critical, politicized analysis characteristic of animal studies might help to track the ideological coordinates of the 'new animal economics'. In order to do so, though, I want first to explore another channel of enquiry that these developing currents in economics help to open up for animal studies. Contributions to the latter field from scholars of literature and film have been particularly

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preoccupied with the ways in which narrative texts project discourses and images of animality onto individuals and groups defined according to categories of gender, race, and sexuality; but, again, the persistent 'animalization' of human figures along economic lines of demarcation has gone unremarked (despite, as already noted, the prevalence of characterizations of this kind in popular culture). The following paragraphs consider four high-profile fictional depictions of financial markets from recent years – Oliver Stone's two *Wall Street* films (1987, 2010) and the novels *Exit Strategy* (2002) by Douglas Rushkoff and *The Fear Index* (2011) by Robert Harris – from this perspective. These narratives are symptomatic of a prevailing tendency – which is both popular and academic – to configure economic life in terms of the animal. As such, they help to clarify what is at stake in professional economists' turn to the language and science of animality: namely, an ideological imperative to ground economic phenomena not in a dynamic field of social, political, and symbolic antagonisms, but rather in a set of innate, inherited biological characteristics.

Bulls, bears, and Gekkos

People who have never seen Stone's *Wall Street* know the name of the film's cold-blooded, predatory corporate raider villain, memorably portrayed by Michael Douglas: Gordon Gekko. Some readers will remember that the film's hero, and Gekko's antagonist, is a handsome, cunning young man named Bud Fox (Charlie Sheen). And a few might recall that Gekko's rival venture capitalist is one Lawrence Wildman (Terence Stamp), an unreconstructed East End wheeler-dealer at heart, beneath the veneer of a knighthood and membership of the

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international jet set. The naming of fictional characters using animalistic language – such that conventionalized views of certain animals, or of animals in general, serve to highlight particular character traits – is, of course, a ‘hackneyed device’, as Janet Staiger (1993, p. 148) says with regard to Jonathan Demme’s *The Silence of the Lambs* (1991), another film in which such a device is prominent (and one that has attracted substantial interest in animal studies and posthumanist circles [see e.g. Wolfe 2003a, ch. 3; Halberstam 1995, ch. 7]). As such, the use of this device in *Wall Street* would barely merit more than a passing mention, if it were not for the fact that the names of the central characters are but three examples of the film’s extraordinary abundance of animal imagery. The figurative uses to which Stone and his script-writing collaborators put animal imagery in *Wall Street*, and in its sequel, *Wall Street: Money Never Sleeps*, are hardly subtle, but the sheer profusion of such imagery is remarkable.

The script that Stone wrote for *Wall Street* with Stanley Weiser indicates the tenor of the film in an outline of the initial establishing shots:

EXT. WALL STREET – EARLY MORNING

The morning rush hour crowds swarm through the dark, narrow streets like mice in a maze, all in pursuit of one thing: MONEY....

INT. SUBWAY PLATFORM – EARLY MORNING

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Blurred faces, bodies, suits, hats, attaché cases float into view pressed like sardines against the sides of a door which now opens, releasing an outward velocity of anger and greed.

Accordingly, over the course of this film and its sequel, characters refer to one another as rats, sharks, elephants, turkeys, sheep, dogs, termites, cockroaches, wolves, bees, barracudas, piranhas, monkeys, jackals, and pigs. Likewise, in the films' *mise-en-scène*, we see emblematic depictions of wildcats, eagles, sharks, and, of course, bulls.

Such animalistic imagery assumes additional resonance in the first film's infamous 'greed is good' speech, when Gordon Gekko scathingly points to the complacent executives of a company he is attempting to acquire as evidence that 'the new law of evolution in corporate America seems to be survival of the unfittest'. This conjunction of evolutionary and economic language takes on more substantial proportions in the sequel, which opens with the claim, delivered in voiceover by the protagonist, Jake Moore (Shia LaBeouf), that 'the mother of all bubbles' was the rapid efflorescence of biodiversity on earth known as the Cambrian Explosion, which began 'around 530 million years ago'. Jake's disembodied voice reprises this theme in the movie's closing sequence, observing that 'from [this 'explosion'], suddenly the world had millions of new species. And from that was born us, the human race. Now, in that sense, bubbles are evolutionary. They kill excess. They lean out the herd'.

The imaginative focal point in the *Wall Street* films for what Cary Wolfe (2003a) calls the 'discourse of species' turns out to be the Bronx Zoo. In the first film, we learn that Gordon Gekko has recently gained a place on the Zoo's Board, and the sequel features a

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lengthy scene in which Gekko (presumably no longer occupying this venerable position after a lengthy spell in prison) strolls through the Zoo's grounds with the hero, Jake Moore.

Gekko's – and the films' – connection to this hub of exotic wildlife located amidst the urban sprawl of New York City is fitting, because the insistence of the narratives' animal imagery is such as to paint Wall Street itself as a kind of zoo or safari park, teeming with a diverse array of species. Indeed, it is as if the narrative reality is continually trembling on the verge of the kind of strange metamorphosis famously depicted at the end of George Orwell's *Animal Farm*: where Orwell describes animals becoming indistinguishable from 'men', however, here it is the 'men' who seem to be on the cusp of 'melting and changing' into animals.

While films naturally carry their meanings differently to works of prose fiction, there are nonetheless strong narrative and thematic affinities between the *Wall Street* movies and Douglas Rushkoff's novel, *Exit Strategy*, whose satirical rendering of the speculative 'dot-com' boom of the late 1990s and early 2000s extends to depicting those caught up in the mania as literally transforming into bulls before the protagonist, Jamie Cohen's, eyes (in the UK, the novel was simply titled *Bull*). Here, Manhattan's downtown financial district truly appears as a terrain traversed by wild, aggressive beasts, with Jamie first seeing 'the unmistakable profile of a bull' 'protruding from the top of a starched blue collar' on Broad Street, site of the New York Stock Exchange (p. 110). Later, Jamie, a sought-after computer programmer, attends a fraternity-style weekend getaway for the nation's financial elite, who undergo a mass metamorphosis that blends the exhilaration of a market 'bull run' with the intoxication of an ancient mystery cult:

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In the flickering light of the fire, their skulls took on new proportions. Dark shadows around their brows, deep, inhuman sounds emanating from their huge, gaping mouths. Wild bulls, a pack of them, reveling in mindless ecstasy.... They stamped their feet on the ground. Smoke emanated from their huge nostrils. They were all bulls. All of them. (pp. 158-159).

Jamie's fear that 'the entire world' is turning into 'stock market bulls' (p. 22) appears to be confirmed when, taking a taxi ride across Manhattan, he sees 'the sidewalks ... dense with bull-people, going about their business'. They walk 'in and out of stores searching for bargains, shopping without speaking, determined to finish the day ahead of where they started in terms of total net assets' (p. 309). Much as Stone's *Wall Street* sequel embeds its vision of the Wall Street jungle in an understanding of financial speculation as an expression of an innate evolutionary imperative, Rushkoff frames his depiction of stampeding stock market bulls in the language of animal behavioural economics, relating how the sinister corporation responsible for stirring the population's 'inner animal' (with external results Jamie is uniquely able to see) has conducted 'animal testing' that seems to prove that 'even occasional losses merely provoke the investor towards more impulsive actions' (p. 323).

The branches of evolutionary theory, psychology, and ethology fleetingly invoked in a financial context in the *Wall Street* movies and *Exit Strategy* are drawn into explorations of the 'animal exuberance' (Harris 2011, p. 161) of the markets in more systematic ways in Robert Harris' *The Fear Index*. Harris' best-selling 'financial thriller'⁵ is a re-imagining of Mary Shelley's *Frankenstein* – set, like the original, in Geneva – in which the creation that

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escapes the control of its creator is a computer system designed to trade on financial markets according to indicators of shifts in mass human emotion. The novel's interest in the animal roots of human psychology is announced in the opening pages, as the programmer-protagonist, Alex Hoffman, peruses the pages of Charles Darwin's *The Expression of the Emotions in Man and Animals* (1872), 'a study of *Homo sapiens* as animal, with an animal's instinctive responses, stripped of social graces' (Harris 2011, p. 5). Quotations from Darwin's writings serve as epigraphs to many of the chapters: Harris excerpts, for example, the observations from *The Descent of Man* (1871) that 'suspicion, the offspring of fear, is eminently characteristic of most wild animals' and that 'hardly any faculty is more important for the intellectual progress of man than ATTENTION. Animals clearly manifest this power, as when a cat watches a hole and prepares to spring on its prey' (Harris 2011, pp. 35, 69). In accordance with this line of thinking, Hoffman's business partner refers to the clients who clamour to invest in the pair's successful hedge fund as 'a herd' (p. 63); the narrator later reinforces this characterization by describing a group of clients listening to Hoffman outline the fund's trading strategy as sitting with 'their mouths open, like baby birds hoping for food' (p. 92). As Hoffman explains, this strategy – based on the principles of 'behavioural finance' (p. 96) and evolutionary psychology – 'correlate[s] recent market fluctuations' (p. 97) with collective manifestations of that most primal of human emotional responses, fear, since 'human beings always behave in such predictable ways when they're frightened' (p. 92).

The politics of the new animal economics

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I will return to Harris' and Rushkoff's narratives briefly in closing this essay, but one can already begin to see how their novels, like Stone's films, signal the intellectual and political limitations of an 'animalistic' conception of human economic behaviour. Over the preceding pages, I have pointed to two traditions of thinking about *Homo economicus* or 'economic man': as a machine and as an animal. Recent reinventions of the latter, 'animalistic' mode of thought within academic economics vary markedly in methodology (particularly as regards the kinds of empirical data they gather and analyze), while manifestations of this tradition in contemporary narrative texts – as well as in wider popular discourse – clearly differ again, in terms of idiom, genre, and even medium. Nonetheless, viewed collectively, what is most striking is how strongly these different forms of economic analysis and representation reinforce one another with regard to certain basic assumptions. Most obviously, and to their considerable credit, they stand as more-or-less explicit challenges to the hopelessly narrow understanding of human subjectivity espoused by a long-dominant 'mechanistic' economics, and to the fantasy of a seamlessly 'efficient' market that derives from that understanding. To align the human with the machine, in an economic context, is to suggest that economic decision-making amounts to a simple and undeviating calculation of effort and gain, and thus that 'the market' at large necessarily reflects, with optimal clarity and efficiency, the abundance of information that informs those numberless individual decisions. To align the human with the animal, in contrast, is to conceive of economic decisions as products of a broad spectrum of affective and cognitive states and processes, and therefore to acknowledge the capacity of markets to be propelled out of sync with wider economic and social conditions by disproportionate transactions on the part of market actors.⁶ The latter view is

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clearly conceptually and – as has been abundantly apparent in recent years – empirically superior to the first, but it is only when one interrogates the politics of these two lines of thought that they turn out to be less divergent than they at first appear.

Like any ideology worth its salt, neoclassical economics, with its mechanical model of *Homo economicus*, purports not to be ideology at all, but rather science. One of the few virtues (and a paradoxical one at that) which the neoclassical paradigm has had for heterodox economists and a wider community of critical commentators, however, has been precisely the transparency with which ideology has masqueraded as science: indeed, the familiar litany of neoclassical assumptions (rational preferences, utility maximization, information symmetry, efficient markets, etc.) may well be the closest thing we have to a codified doctrine of that notoriously content-free 'ism', capitalism. While, over the last few decades, critiques of the neoclassical 'mechanistic world hypothesis' (Klamer and Leonard, p. 42) have had lamentably negligible effects on the discipline's centre of gravity, much less that of 'the economy' itself, the extent to which this 'hypothesis' was liable to critique could hardly have been greater, or more obvious.

In the case of what I have called the 'new animal economics', matters are rather different. To express things very crudely, this school of thought is, on the face of it, less ideological and more empirical than neoclassicism: while neoclassicists are typically content, as Milton Friedman notoriously advocated, to posit "assumptions" that are wildly inaccurate descriptive representations of reality', provided that they produce internally consistent predictive models (Friedman 2008 [1953], p. 153), exponents of the new animal economics strive to ground their 'assumptions' in extensive observation of human and animal behaviour

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on macro, micro, and even (in the case of neuroeconomics) sub-cranial levels. Nonetheless, the animal economists share with their mechanical counterparts a tendency to install as natural, universal, and inevitable economic phenomena that are in fact the products of particular historical conjunctures and political struggles. In fact, the animal-orientated research may, in some ways, be more problematic, since, all the way back to Jevons, the neoclassicists (ultras like Gary Becker, perhaps, excluded) have acknowledged, albeit reluctantly, that their models of human subjectivity are, necessarily, simplifications of reality, whereas the force of the new animal economics derives precisely from the confidence of its claim that *this*, instead, is what humans are *really* like, and hence that this is how economies really function, so that factors that fall outside the field's purview must by definition be of negligible significance. If one considers those recent market bubbles or 'bull runs' – in securities, derivatives, and real estate – which have been such significant features of the economic landscape over the last couple of decades, and which both the new animal economists and the authors and filmmakers I have highlighted in this essay seek to characterize in animalistic terms, it is clear that to identify the primary causes of such events in deep-rooted, 'mammalian' instincts born of aeons of evolution is to treat them as, quite literally, natural phenomena, and to occlude the ways in which they are determined (indeed, overdetermined) by historically specific, symbolically coded, and politically fraught shifts, including changing social mores surrounding credit and investment, stagnant real-terms wages across swathes of the Western middle and working classes, structural adjustments in the relations between industrial and financial sectors, innovations in financial engineering, and relaxation of regulatory oversight, to name just a few of the most important. By treating

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the economy as a field effectively devoid of politics, the new animal economics in fact simply reproduces the politics that constituted that field in the first place.

To clarify my argument, let me turn to a more specific example of the claims made by the new animal economics. Again, it is a contention that ostensibly marks the field as compatible with a progressive politics – where the neoclassical alternative clearly is not – but which once more reveals its reactionary underpinnings on closer inspection. By far the most prominent showcase of the new animal economics to date – Frans B.M. de Waal's 2005 feature introducing his sub-field of 'animal behavioural economics' to readers of *Scientific American* – points to the interactions of primates as evidence that humans are naturally predisposed not to be 'profit maximizers driven by pure selfishness', as 'classical economics' maintains, but instead to seek 'reciprocity, the division of rewards, and cooperation' (pp. 73, 74). Primates apparently exhibit highly attuned senses of fairness and obligation in their distribution of food, grooming, and other 'commodities', and there is something undeniably appealing about the idea that, contrary to mainstream economists' self-satisfied faith in their own lack of illusion concerning human nature, it should turn out to be sharing, rather than selfishness, that lies at the base of our social existence. Yet a politics of equality or social justice cannot stand or fall on appeals to 'human nature'. For no sooner has de Waal introduced the phenomenon of systematic sharing amongst primates than he makes clear that it is a form of sharing that is only one step away from naked self-interest, a manifestation of what the sociobiologist Robert L. Trivers calls 'reciprocal altruism', whereby 'making a sacrifice for another pays off if the other later returns the favor'. In a quite literal sense, in

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this case, 'reciprocity boils down to "I'll scratch your back, if you scratch mine"' (de Waal 2005, p. 75). In a remarkably telling passage, de Waal goes on to observe:

Biological market theory offers an elegant solution to the problem of freeloaders, which has occupied biologists for a long time because reciprocity systems are obviously vulnerable to those who take rather than give. Theorists often assume that offenders must be punished, although this has yet to be demonstrated for animals. Instead cheaters can be taken care of in a much simpler way. If there is a choice of partners, animals can simply abandon unsatisfactory relationships and replace them with those offering more benefits. Market mechanisms are all that is needed to sideline profiteers. In our own societies, too, we neither like nor trust those who take more than they give, and we tend to stay away from them. (p. 78)

There are no explicit references here to 'welfare queens' or 'benefit scroungers', but one need not be a fully paid-up subscriber to the notion of the 'social construction of nature' to recognise that, in the time-honoured fashion so assiduously critiqued by scholars in animal studies, de Waal's characterization of these animal relationships is tinged with assumptions and prejudices concerning the appropriate organization of human societies. Yet even if this were a purely empirical account, which accurately reflected the facts of animal nature and human predisposition in every particular, it would still be profoundly ideological. Why? Because it rests on the implicit supposition that human social arrangements that diverge from the species' evolutionary inheritance – such as the extension of redistributory mechanisms to

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encompass remote, unknown individuals unable, or unwilling, to reciprocate in kind – is not merely unnatural (which, on this view, goes without saying) but, simply, wrong. As such, de Waal's remarks exemplify a potent contemporary creed, rooted in the evolutionary sciences but advancing across the social sciences and even into the humanities (in the form of critical movements like 'Literary Darwinism'), which sees human flourishing as reliant on the alignment of our personal, cultural, social, and economic lives with psychological proclivities hardwired many thousands, if not millions, of years ago. In the face of this powerful new intellectual consensus, the critique of simplistic, reductive notions of 'human nature' pioneered by an earlier generation of poststructuralist, postmodernist, and social constructionist critics remains crucial, but it must be augmented by an approach that is prepared to countenance the existence of such a nature, whilst insisting that where it is at odds with social values that are ethically and politically imperative – including not only greater economic equality, but also greater equality in other spheres, most obviously that of gender – it is something not simply to be dispelled but actively resisted and reconfigured, by exploiting the considerable 'plasticity' (Malabou 2008 [2004]) that must itself be acknowledged as a crucial element of any model of human nature.

Conclusion: skittish markets and swarming algorithms

In conclusion, I want briefly to consider how some of the ideas explored in this essay play out in areas of economic life that are of immediate and practical concern. I have pointed to key ways in which the 'new animal economics' unconsciously reproduces certain dominant ideological assumptions, but I would certainly not go so far as to dismiss what is a serious,

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innovative, and important, if flawed, research programme as a mere smokescreen for a reactionary political agenda. In the terrain of the mass media, to which I turn my attention now, however, we can see how the lines of thought earnestly pursued in this area of economics can be quite cynically and strategically employed to naturalize highly contestable economic arrangements. As I've noted, the use of animal imagery to describe the functioning of financial markets in media discourse long predates (by several centuries, in fact) the rise of the new animal economics. Today, discussions of the markets in newspapers or on the radio, TV, or the web rarely, if ever, explicitly contextualize their 'animalistic' characterizations of events in relation to this developing branch of economics; the existence of an academic paradigm that theorizes human economic behaviour in animal terms, however, forms part of the cultural background against which such characterizations are made, and helps to endow them with a certain 'scientific' currency. One particularly visible example of this phenomenon in recent years concerns discussions of 'the markets' where that vague but ubiquitous plural noun refers more specifically to the markets for government bonds, especially those of debt- and deficit-laden European economies like Greece, Spain, Portugal, Italy, Ireland, and the UK. Time and again, pundits and commentators across large swathes of the financial media have played their part in constructing an image of 'the markets' that is so radiant with power, authority, and legitimacy that governments' capitulation to the 'will of the markets' (invariably, for swingeing 'austerity' measures), and thus the confirmation of these very attributes, has been a virtual inevitability. Typically, 'the markets' are portrayed as beings of absolute, imperious mastery (see Jones 2011), but, in an example of the kind of contradiction with which students of capitalist ideology are familiar, they are often also

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described in terms more suited to timid, vulnerable animals: prone to be 'nervous' or 'skittish', they are liable to 'turn tail' and 'flee' in a terrified 'herd' or 'stampede' if they are not 'soothed', 'calmed', and 'reassured'. The language of animality, that is, becomes a tool in attempts to blackmail sovereign governments into dismantling social welfare programmes and instituting neoliberal 'reforms'.

Another, closely related trope that has circulated through the financial media in recent years stages a convergence between the two streams of discourse that have structured this essay, and also echoes the themes of two of the fictional texts I have discussed. Rushkoff's *Exit Strategy* and Harris' *The Fear Index* both end with the revelation that the market gyrations narrated in the foregoing pages have been orchestrated by beings that are hybrids of animal and machine: in the case of *Exit Strategy*, a computer programme whose avatar is, naturally, a bull, a 'slow-moving mass of black' with 'red diode eyes' (p. 323); and, in the case of *The Fear Index*, an automated trading system that has 'evolved' into a sentient state and is described as trading like a 'shark', 'swarming' through cyberspace, and 'roosting undetected on a hundred thousand home computers' (pp. 297, 321-22). Harris' novel is particularly strongly informed by the recent explosion in the use of 'high-frequency trading' (HFT), whereby investment strategies are determined by computer algorithms processing financial information at phenomenal speed. This trend may render the question of whether the human economic agent – *Homo economicus* – is best understood in mechanical or animal terms moot, at least in the domain of finance, but, as Harris' text suggests, this apparently decisive triumph of *actual* machines need not dispel a discourse of animality from surrounding debates.

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Discussions in the media about HFT have focused on its implication in a series of 'flash crashes' on US stock markets, most notably that on 6 May 2010 (explicitly dramatized in Harris' novel [pp. 266-314), when the Dow Jones plunged by around 1,000 points in a matter of minutes, before largely rebounding. In such discussions, it is striking how often these mechanical systems are described using animal metaphors. To give just some examples from recent reports and features in the financial media, HFT systems exhibit 'lemming-like behaviour'; 'stampede in herds to flee a sell-off'; 'turn as a flock'; and 'run wild'. They are 'sharks' 'devouring' the profits of the 'guppies'; 'locusts' 'swarming the market'; 'velociraptors' 'roaming the financial jungle'; and 'strong, powerful predators' doing 'great damage to the other species living in the same habitat'. The HFT 'ecology' is 'a big lake full of different types of piranhas'. While the ostensible tenor of such comments is typically critical (though sometimes merely neutral), their effect is paradoxically affirmative, because they imply that these autonomous and largely unregulated systems, with the potential to generate devastating financial convulsions, should be treated not merely as lying outside the scope of human deliberation and intervention, but as 'natural' and unchangeable facts of life. As such, they suggest that a centuries-long interplay between machine and animal in economic discourse may be entering a new phase, in which the prevailing tendency is to endow the technological systems that play such a dominant role in economic processes with that air of the natural, the timeless, and the necessary that is conventionally associated with the animal world. As this shift occurs, cultural critics concerned with economic discourse will need to remain attentive to the political implications of the metaphors and images they encounter.

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Notes

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¹ As explained later in this article, 'animal studies' is a multidisciplinary field in the humanities in which, in Kari Weil's words, 'nonhuman animals have become a limit case for theories of difference, otherness, and power' (Weil 2012, p. 5). This article brings animal studies into contact with a separate body of work that I refer to as the 'new animal economics', and which consists of research in academic economics into the economic implications of the biological, psychological, and social continuities that exist between human and nonhuman animals. As I show, some of the key assumptions underpinning the new animal economics are reflected in popular culture texts and public discourse. Animal studies offers a means of critiquing the new animal economics and its popular manifestations.

² 'As applied to stock thus sold, *bear* appears early in 18th c., and was common at the time of the South Sea Bubble. The term "bearskin jobber", then applied to the dealer now called the "bear", makes it probable that the original phrase was "sell the bearskin", and that it originated in the well-known proverb, "to sell the bear's skin before one has caught the bear". The associated *bull* appears somewhat later and was perhaps suggested by bear' (*OED*).

³ For an extended discussion of the origin and meaning of Keynes' term, see Terzi 1999.

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⁴ When, in recent years, Keynes' recondite philosophical and economic discourse has been made available for immediate consumption by a mass, non-specialist audience, the notion of 'animal spirits' has likewise been readily assimilated to enduring popular images of bankers, brokers, and traders as wild, rampaging beasts. See, for example, the cover image of George A. Akerlof and Robert J. Shiller's *Animal Spirits: How Human Psychology Drives the Economy, and Why it Matters for Global Capitalism* (2009) and the illustrations accompanying a review of Akerlof and Shiller's book (Uchitelle 2009) and two articles by Shiller on the theme of animal spirits (2009a, 2009b). See also the headlines of articles on this topic in *The Economist* and *Forbes*: 'Wild-Animal Spirits' and 'Animal Planet Vs. Economic Reasoning' ('Wild-animal spirits' 2009; Cooley 2009).

⁵ On financial thrillers, see Marsh 2007, ch. 4 and Crosthwaite 2010.

⁶ Important recent interrogations of the notion of the rational economic actor include Langley 2007, de Goede 2005, and Aitken 2006.

References

Aitken, R. (2006) 'Capital at its Fringes', *New Political Economy*, vol. 11, no. 4, pp. 479-98.

Akerlof, G.A. and Shiller, R.J. (2009) *Animal Spirits: How Human Psychology Drives the Economy, and Why it Matters for Global Capitalism*, Princeton University Press, Princeton.

Baudrillard, J. (1998 [1970]) *The Consumer Society: Myths and Structures*, SAGE, London.

Camerer, C.F., Loewenstein, G., and Prelec, D. (2004) 'Neuroeconomics: why economics needs brains', *Scandinavian Journal of Economics*, vol. 106, no. 3, pp. 555-579.

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Please refer to the published article for citation purposes.

Cooley, T.F. (2009) 'Animal planet vs. economic reasoning', *Forbes*, 9 Sept., Available at:

<http://www.forbes.com/2009/09/08/recesion-behavioral-economics-akerlof-shiller-opinions-columnists-thomas-f-cooley.html>

Crosthwaite, P. (2010) 'Blood on the trading floor: waste, sacrifice, and death in financial crises', *Angelaki: Journal of the Theoretical Humanities*, vo. 15, no. 2, pp. 3-18.

———, Knight, P., and Marsh, N. (2012) 'Imagining the market: a visual history', *Public Culture*, vol. 24, no. 3, pp. 607-28.

de Goede, M. (2005) *Virtue, Fortune, and Faith: A Genealogy of Finance*, University of Minnesota Press, Minneapolis.

Derrida, J. (2008) *The Animal That Therefore I Am*, ed. M.-L. Mallet, trans. D. Wills, Fordham University Press, New York.

de Waal, F.B.M. (2005) 'How animals do business', *Scientific American*, April, pp. 78-85.

Feiner, S.F. (1999) 'A portrait of *homo economicus* as a young man', in *The New Economic Criticism: Studies at the Intersection of Literature and Economics*, eds. M.

Woodmansee and M. Osteen, Routledge, London, pp. 193-209.

Friedman, M. (2008 [1953]) 'The methodology of positive economics', in *The Philosophy of Economics: An Anthology*, third edition, ed. D.M. Hausman, Cambridge University Press, Cambridge, pp. 145-178.

Gould, B. (2009) 'Economic man is dead. Time for rebirth', *Guardian*, 28 April, Available at: <http://www.guardian.co.uk/commentisfree/2009/apr/28/unesco-global-recession>

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Please refer to the published article for citation purposes.

-
- Gowdy, J.M. and Polimeni, R.I. (2005) The death of *homo economicus*: is there life after welfare economics?', *International Journal of Social Economics*, vol. 32, no. 11, pp. 924-938.
- Halberstam, J. (1995) *Skin Shows: Gothic Horror and the Technology of Monsters*, Duke University Press, Durham, NC.
- Haraway, D.J. (1990) *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, Routledge, New York.
- (2003) *The Companion Species Manifesto: Dogs, People, and Significant Otherness*, Prickly Paradigm, Chicago.
- (2007) *When Species Meet*, University of Minnesota Press, Minneapolis.
- Herrnstein Smith, B. (2005) *Scandalous Knowledge: Science, Truth, and the Human*, Edinburgh University Press, Edinburgh.
- Johansson-Stenman, O. (2006) 'A note on the risk behavior and death of homo economicus', Goetborg University Economics Working Paper no. 221, Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=929496
- Jones, C. (2011) 'What kind of subject is the market?', *New Formations*, no. 72, pp. 131-144.
- Keynes, J.M. (1936) *The General Theory of Employment, Interest, and Money*, Harcourt Brace, New York.
- Klamer, A. and T.C. Leonard. (1994) 'So what's an economic metaphor?', in *Natural Images in Economic Thought: 'Markets Read in Tooth and Claw'*, ed. Philip Mirowski, Cambridge University Press, Cambridge, pp. 20-51.

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Please refer to the published article for citation purposes.

Langley, P. (2007) 'Uncertain Subjects of Anglo-American Financialization', *Cultural Critique*, no. 65, pp. 67-91.

Lo, A.W. (2004) 'The adaptive markets hypothesis', *Journal of Portfolio Management*, vol. 30, no. 5, pp. 15-29.

Loewenstein, G. and O'Donoghue, T. (2005) 'Animal spirits: affective and deliberative processes in economic behavior', Cornell University Center for Analytical Economics Working Paper no. 04-14 (revised version), Available at: <http://www.arts.cornell.edu/econ/edo1/will.pdf>

O'Boyle, E.J. (2007) 'Requiem for *homo economicus*', *Journal of Markets and Morality*, vol. 10, no. 2, pp. 321-337.

Maas, H. (1999) 'Mechanical rationality: Jevons and the making of economic man', *Studies in History and Philosophy of Science*, vol. 30, no. 4, pp. 587-619.

Malabou, C. (2008 [2004]) *What Should We Do with Our Brain?*, trans. S. Rand, Fordham University Press, New York.

Markus, E. (2005) *Meat Market: Animals, Ethics, and Money*, Brio, Boston.

Marsh, N. (2007) *Money, Speculation, and Finance in Contemporary British Fiction*, Continuum, London.

McDonald, I.M. (2009) 'The global financial crisis and behavioural economics', *Economic Papers*, vol. 28, no. 3, pp. 249-254.

Mirowski, P. (1989) *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics*, Cambridge University Press, Cambridge.

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Please refer to the published article for citation purposes.

——— (2002) *Machine Dreams: Economics Becomes a Cyborg Science*, Cambridge University Press, Cambridge.

Nelson, J.A. (2006) *Economics for Humans*, University of Chicago Press, Chicago.

Pearson, H. (2000) 'Homo economicus goes native, 1859-1945: the rise and fall of primitive economics', *History of Political Economy*, vol. 32, no. 4, pp. 933-989.

Persky, J. (1995) 'The ethology of *homo economicus*', *Journal of Economic Perspectives*, vol. 9, no. 2, pp. 221-231.

Rinaldi, A. (2009) 'Homo economicus?', *EMBO Reports*, vol. 10, no. 8, pp. 823-826.

Read, J. (2009), 'A genealogy of homo-economicus: neoliberalism and the production of subjectivity', *Foucault Studies* no. 6, pp. 25-36.

Roback Morse, J. (1997) 'Who is rational economic man?', *Social Philosophy and Policy*, vol. 14, no. 1, pp. 179-206.

Rushkoff, D. (2002) *Exit Strategy*, Soft Skull Press, New York.

Schabas, Margaret (2005) *The Natural Origins of Economics*, University of Chicago Press, Chicago.

Shiller, R.J. (2009a) 'Animal spirits depend on trust', *Wall Street Journal*, 27 Jan., Available at: <http://online.wsj.com/article/SB123302080925418107.html>

——— (2009b) 'A failure to control the animal spirits', *Financial Times*, 8 March, Available at: <http://www.ft.com/cms/s/0/453e55ca-0c0c-11de-b87d-0000779fd2ac.html#axzz1sfhTPeuu>

Shukin, N. (2009) *Animal Capital: Rendering Life in Biopolitical Times*, University of Minnesota Press, Minneapolis.

This is the Author's Final Version of © Crosthwaite, P. (2013). Animality and Ideology in Contemporary Economic Discourse: Taxonomizing Homo Economicus. *Journal of Cultural Economy*. 10.1080/17530350.2012.745440

Please refer to the published article for citation purposes.

Sornette, D. (2003) *Why Stock Markets Crash: Critical Events in Complex Systems*, Princeton University Press, Princeton.

Staiger, J. (1993) 'Taboos and totems: cultural meanings of *The Silence of the Lambs*', in *Film Theory Goes to the Movies*, ed. J. Collins, H. Radner, A. Preacher Collins, Routledge, New York, pp. 142-154.

Stephenson, K. and D. Lewin (1996), 'Managing workforce diversity: macro and micro level HR implications of network analysis', *International Journal of Manpower*, vol. 17, nos. 4/5, pp. 168-196.

Stone. O., dir. (1987) *Wall Street*, 20th Century Fox.

——— (2010) *Wall Street: Money Never Sleeps*, 20th Century Fox.

Stix, G. (2009) 'The science of bubbles & busts', *Scientific American*, July, pp. 78-85.

Terzi, A. (1999) 'Animal spirits', in *Encyclopedia of Political Economy*, vol. 1, ed. P.A. O'Hara, Routledge, London, pp. 16-18.

Uchitelle, L. (2009) 'Irrational exuberance', *New York Times*, 17 April, Available at:

<http://www.nytimes.com/2009/04/19/books/review/Uchitelle-t.html?pagewanted=all>

Weeks, L. (2011) 'Beyond bulls and bears: a quick guide to the Wall Street circus', Southern California Public Radio web site, Available at:

<http://www.scpr.org/news/2011/08/12/28208/beyond-bulls-and-bears-a-wall-street-bestiary/>

Weil, K. (2012) *Thinking Animals: Why Animal Studies Now?*, Columbia University Press, New York.

This is the Author's Final Version of © Crosthwaite, P. (2013). Animality and Ideology in Contemporary Economic Discourse: Taxonomizing Homo Economicus. *Journal of Cultural Economy*. 10.1080/17530350.2012.745440

Please refer to the published article for citation purposes.

'Wild-animal spirits' (2009), *Economist*, 22 Jan., Available at:

<http://www.economist.com/node/12957779>

Wolfe, C. (2003a) *Animal Rites: American Culture, the Discourse of Species, and*

Posthumanist Theory, University of Chicago Press, Chicago.

———, ed. (2003b) *Zoontologies: The Question of the Animal*, University of Minnesota Press, Minneapolis.