



## Darwin's invisible hand: Market competition, evolution and the firm

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### ABSTRACT

Competition among firms has been suggested to reflect the ruthless logic of Darwinian selection: a free market is a struggle for survival, in which successful firms survive and unsuccessful ones die. This view appears to bolster three pillars of neoclassical economics: (1) that economic actors are self-interested; (2) that self-interest leads to public goods (Adam Smith's "invisible hand"); and (3) that together these lead to market optimization. However, this chain of reasoning leads to a paradox. We show that the application of Darwinian selection to competition among firms (as opposed to among individuals) invokes *group* selection, which leads to exactly the opposite predictions: notably altruism and the *suppression* of individual self-interest. We apply an alternative evolutionary model of economic competition, multi-level selection (MLS) theory, which integrates the effects of selection at both individual *and* group levels. This approach reveals that, while individuals may generally pursue their own self-interest (as in the standard evolutionary account), humans also have evolved traits that—as if led by an invisible hand—steer our self-interest to align with the good of the firm or wider society as well. But it is the hand of Darwin, not Smith.

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### 1. Introduction

Left to itself, natural selection should work fast to eliminate the weakest institutions in the market, which typically are gobbled up by the successful.

—Niall Ferguson (2007)

Greed is a vice in personal relations, but the whole point of markets is to turn this vice into an instrument of the public good.

—Michael Sandel (2009)

If greed is good, is altruism bad?

—Hugh Hendry (2009)

Evolutionary theory is increasingly used to explain the behavior of individuals and organizations in a range of disciplines spanning psychology, politics, law and beyond (Barkow, 2006; Fowler and Schreiber, 2008; Gintis, 2007). Economics is no exception and in fact has a long history of drawing on insights from evolutionary theory (Fagerberg, 2003; Nelson and Winter, 1982; Veblen, 1898; Witt, 2003). Economic systems can be considered as Darwinian arenas in which a "survival

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**Table 1**

Competition among firms has been argued to represent a process of Darwinian selection (theory #1), with implications that match neoclassical economics (#2). In fact, competition among firms invokes group selection (#3). Group selection is also a flawed model, however, because the interests of groups and the interests of individuals within groups often act in opposing directions. Therefore, if we are to apply evolution to market competition, we need to utilize “multi-level selection” (MLS) theory (#4), which accounts for selection and adaptation at *both* individual and group levels. This approach leads to very different implications and novel predictions for the behavior of firms and workers, how they interact, and how they vary with context.

Theory	Level of selection	Implications		
		Economic actors are self-interested <sup>a</sup>	Self-interest contributes to the public good (the “invisible hand”)	Market optimization
1. Schumpeter/Friedman/Ferguson	Individual	Yes	Yes	Yes
2. Neoclassical economics	N/A	Yes	Yes	Yes
3. Simple group selection	Group	No	No	No
4. Multi-level selection (MLS) theory	Both	Sometimes	Sometimes	Sometimes

<sup>a</sup> Note that “economic actors” could refer to either individuals or firms. Because the observation of interest is competition among firms, but theoretical debates center on assumptions about individual human behavior and human nature, we need to look at both individuals and firms, which is precisely why MLS theory is so important.

of the fittest” environment means successful firms survive while unsuccessful ones die. The idea is commonly invoked by casual observers—especially in the wake of the 2008 financial crisis—but it has been seriously championed by economists and economic historians such as Schumpeter (1961, 2008[1942]), Friedman (1954, 1970), and Ferguson (2007, 2008). However, the Darwinian selection of firms generates a significant paradox.

By invoking the idea that market competition is subject to ruthless Darwinian selection, people tend to conclude that: (1) economic actors are self-interested; (2) self-interest contributes to the public good (Adam Smith’s “invisible hand”); and (3) the combination of these two assumptions will lead to market optimization. In short, Darwinian selection among firms appears to perfectly bolster neoclassical economics.

Ironically, however, this vision of events is in fact a *group selection* argument. Firms are by definition *groups* of individuals. Competition among firms therefore implies selection pressure acting on groups, not individuals, and resulting in adaptations that serve the interest of groups, not individuals (van den Bergh and Gowdy, 2009). This has significant consequences. Group selection, as opposed to conventional Darwinian selection at the individual level, leads to the emergence of traits that, in direct opposition to the predictions given above, act *against* self-interest: (1) other-regarding preferences; (2) altruism; and (3) a concern for group welfare which does not necessarily optimize material outputs for individuals or even for the firm or society as a whole. In short, applying evolutionary logic to economics seems to undermine the very behaviors its proponents seek to explain.

A 21st century understanding of evolutionary biology offers a way out of this paradox. We apply multi-level selection (MLS) theory (Okasha, 2006; Wilson, 2006; Wilson and Gowdy, this issue; Wilson et al., 2008; Wilson and Wilson, 2007) to examine two simultaneous and often opposing forces: (1) the interest of the group/firm as a whole; and (2) the interest of individuals *within* the group/firm (Table 1 outlines key differences between these alternative perspectives, along with our own proposal).<sup>1</sup> As in nature, these two forces are in constant interaction, generating complex outcomes, but outcomes that are predictable given knowledge of evolutionary processes and resulting adaptations.<sup>2</sup> In particular, knowledge of evolved human behavioral tendencies (e.g. cooperation, status, leadership, fairness, sex differences, and inter-group competition) allows us to specify conditions under which more individual, or more groupish, behaviors will be expressed. These predictions—unique to an evolutionary approach—may be useful for firms, managers, and society if we are to understand and improve economic efficiency, output or ethics.

Note, however, that there is a sinister implication. Group selection leads to pro-social outcomes such as altruism—but *only within the group*. Between groups, group selection can lead to competition that is even more intense and savage than competition among individuals. In-group members share more common interests than they do with out-group members. Individuals may therefore be selected to jostle with each other, but selected to actually damage or destroy rival groups (Choi and Bowles, 2007; Van Vugt et al., 2007). In the context of modern economic competition, such behavior might be manifested as intellectual theft, hostile take-overs, personnel poaching, costly price wars, fraudulent behavior, misinforming customers and share holders, and sabotage. Schumpeter, Friedman and Ferguson may thus have been right to place the ruthless logic of market competition at the door of natural selection, but for the wrong reasons. Contrary to the reassuring logic of Smith’s invisible hand, left to themselves evolved human preferences can lead to disaster in the modern world (Frank, 2011).

<sup>1</sup> Let us define exactly what we mean by “self-interest” because alternative meanings lead to different implications in economics and biology. Self-interest can be defined (among other definitions) in terms of seeking: (1) *absolute* fitness (or utility); or (2) *relative* fitness (or utility) compared to other actors. Throughout this paper, we use definition #2 because, from the standpoint of genetic or cultural evolution, all that matters is which traits do well compared with other traits. Evolution selects traits that perform *better* than others, not the best traits possible. This distinction may be especially important because economic self-interest often follows definition #1, in which entities attempt to maximize their own absolute utility, irrespective of others.

<sup>2</sup> We note the literature on “intrinsic” versus “extrinsic” motivations that affect people’s behavior in different ways (e.g. Bénabou and Tirole, 2003; Frey, 1994). Here we take a different approach in deriving evolutionary predictions for when individuals’ interests should diverge or converge with the interests of the groups to which they belong.

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