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Metaeconomic sensibilities: Toward *The Human Firm* on a sustainable blue spaceship

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Abstract
John Tomer, in *The Human Firm*, sets the stage for looking to Metaeconomic sensibilities about achieving sustainability on the Spaceship on which we travel together around the Sun. Using Thaler and Sunstein, the Econs envisioned in the Neoclassical Economics (Microeconomics) model behave differently than actual Humans. So, we need a model that explains the full range of behavior by the Humans, which is what *The Human Firm* is about. Metaeconomics grew out of the same general realization about the inability of the practitioners of Neoclassical Economics to explain more than a small percentage of the variation in environmental behavior of a firm. As Tomer (2014) says it, an "... ideal principled strategy is one that commits the firm to a harmonious relationship with its external social environment... (and, relating to the Spaceship) ...the ideally behaving firm would not engage in any water pollution (and any other kind of damage) that the relevant affected parties find unacceptable." This article explains why only John Tomer's *The Human Firm* can provision the Spaceship travelers in the way that everyone can go along with.

JEL Classification: D01; D02; D21; D23; D90; D91

Keywords
human firm — metaeconomics — self-interest — other-interest — own-interest — tempering greed — excessive greed — ethical reflection — production economics

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Introduction

Tomer (2014, p. 147) in *The Human Firm* sets the stage for looking to Metaeconomic sensibilities about achieving sustainability on the Spaceship on which we travel together around the Sun:

> ... (the) firms' environmental behavior is not simply a response to market and regulatory incentives; if it were, all similarly situated firms would behave the same way. Despite the existence of negative externalities and opportunities to evade environmental regulations, some firms have consciously chosen behavior that is nonopportunistic, long-term oriented, and responsible to interests that go far beyond those of their owners. The neoclassical model cannot account for this behavior.

Using Thaler and Sunstein (2008, p. 7), the Econs envisioned in the Neoclassical Economics (Microeconomics) model, operating in *The Econ Firm* behave differently than actual Humans. So, we need a model that explains the full range of behavior by the Humans, which is what *The Human Firm* is about. Tomer (2014, p. 147 continues:

> What is needed is a model that explains the whole range of environmental behavior, not just the worst case. We need a model that helps us understand the beneficial aspects of the new managerial approach, a model in which the neoclassical model is a special case of a more general model. Moreover, we need a model that (1) incorporates managerial, social, environmental and ethical as well as economic considerations and (2) has clear alternative policy implications.

Metaeconomics grew out of the same general realization about the inability of the NeoClassEcon (the practitioners of Neoclassical Economics, using Production Microeconomics as the analytical engine) to explain more than a small percentage of the variation in environmental behavior of a firm. The MetaEcon (the practitioners of Metaeconomics using Production Metaeconomics) found a more powerful way, based in 3-decades of empirical research, for explaining the wide variation in soil and water conservation behavior by the US farming population (see the overview in Lynne et al. (2016; and, in Lynne, in press, Chp. 8, for research since 2014).

The path starts in 1988-1990. Lockeretz (1990), after reviewing the soil and water conservation (farmer) behavior literature, the answer to the question in his title *What Have We Learned About Who Conserves Soil (and, highly related to it, the Water)?* was simply "Not much." Research going back to the 1930s, when the US government and US land

grant universities first became involved in trying to find out what nudge might work to encourage farmers to put more effort into soil and water conservation, just had not solved the puzzle. In our own case, we first tested *The Econ Firm* in a case study in Northwest Florida in the late-1980s, and empirically confirmed the Lockeretz finding: One could explain only about 15-20 percent of the variation in what farmers were doing (Lynne, Shonkwiler, and Rola, 1988). Models from psychology and sociology also were not performing well: As demonstrated in Lynne and Rola (1988), said models were improved when economic variables were added. And, we also found that the Econ models were improved by adding variables suggested by psychology and sociology (Lynne, Shonkwiler, and Rola, 1988, and made especially clear in Lynne, 1995).

The dismal performance of the Econ model was inexplicable: Farmers in that study area all had access to similar technology (seeds, fertilizers, machinery), similar education and training (University extension service, help from input suppliers), and similar quality of land. According to the Econ model, a single minded pursuit of self(private)-interest focused on profit maximization – a farm as machine – should have led the farmers to essentially the same choices. Granted, there could be some variability, but not being able to explain over 80-85 percent of the variation? In effect, like Tomer (2014, p. 101) says it, there was a need to move "… beyond the machine model of the firm and move toward a holistic model."

Also, the research we conducted during that late-1980s to early-1990s period, suggested the need for a kind of *Consilience* (in the spirit of Wilson, 1998; Cory, 2000) approach, one that built on a wide-array of social and behavioral sciences: The result was *Metaeconomics* (Lynne, in press).

Adam Smith and the Production Metaeconomics of a Human Firm

The matter of a more holistic and Human economics is not new. Adam Smith had a clear vision of a Human economics, and would likely be quite pleased with *The Human Firm*, and *Metaeconomics*. Smith, as moral philosopher, would especially not be pleased with the Libertarian Branch, the NeoClassEconL, who see *The Econ Firm* as not only a machine, but one without a moral and ethical compass.

Smith would be especially displeased with NeoClassEconL Milton Friedman, who made the unfounded claim in the 1960-1970 period that business had no social responsibility to anyone (or anything, including the Spaceship system) beyond the shareholder (after Friedman, 1962, referred to in Tomer, 2014, p. 120; also see Friedman, 1970, for the article that went viral, leading to the Friedman Doctrine for Corporate Governance, with many bad outcomes). So, a farmer, too, has no responsibility for the community within which the farm is embedded, including anything downstream. Adam Smith as moral (and ethics) philosopher would not be pleased because a NeoClassEconL is "… opposed to any ethical reflection whatever (McCloskey, 2019, p. 93)," with ethics essential to discerning social responsibility.

And, when the Doctrine was integrated with the also unfounded (no scientific support for it, either) contention undergirding the Reagan Revolution – that the market can do no bad, and the government can do no good, which also meant the government was to curtail all nudging and control over even an anti-science and unethical market – the consequences have been devastating. For the case at hand, the Spaceship system is now of ever less concern, with environmental regulations slashed, even ignoring climate science. And, more generally, the Doctrine&Revolution have together led to bad capitalism and failing democracy: American farmers and everyone else no longer enjoy the benefits of the New Deal and now live the reality of a Raw Deal (Andersen, 2020; also see Hedges, 2007, 2018; MacLean, 2017; Munger and Villarreal-Diaz, 2019; Stiglitz, 2019) produced by *The Econ Firm*.

As Adam Smith fully recognized, the problem is that the primal driver in a Human is ego based self-interest, which is also confirmed in modern Behavioral Economics science (see Altman, 2012; Tomer, 2017). Adam Smith saw the need to temper that self-interest, temper that arrogance of self-love, with the sentiments. In today's language, empathy (and, perhaps even sympathy-compassion) leading to giving a moral and ethical context to the Human Firm and the Market, as represented in Metaeconomic other(shared with the public, yet internalized)-interest, was to temper the arrogance. The role of empathy has been confirmed in another branch of Behavioral Economics represented in Neuroeconomics (e.g. see Singer, 2009). ***And, it is empathy – which is the starting point to the ethic – that ensures everyone can go along with that which the market composed of Human Firms produces.*** It is about pursuing the own-interest, an interest reflecting good balance in self&other-interest, the "&" pointing to how the two arenas cannot be separate, each are dependent on the other.

Adam Smith made it clear that the focus has to be on pursuing a balanced self&other-interest within *The Human Firm* (***bold italics added***):

> … man has almost ***constant occasion for the help of his brethren***, and it is in vain for him to expect it from their benevolence only. He will be more likely to prevail if he can interest their self-love in his favour, and show them that it is for their own advantage to do for him what he requires of them. Whoever offers to another a bargain of any kind, proposes to do this. Give me that which I want, and you shall have this which you want, is the meaning of every such offer; and it is in this manner that we obtain from one another the far greater part of those good offices which we stand in need of. It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, ***but from their regard to their own interest***. We ***address***

> ***ourselves***, not to their humanity but ***to their self-love***, and never talk to them of our own necessities but of their advantages. (Smith, 1776/1789, loc 239-251)
>
> Though it may be true, therefore, that every individual, in his own breast, naturally prefers himself to all mankind, yet he dares not look mankind in the face, and avow that he acts according to this principle. He feels that in this preference they can never go along with him, ... If he would act so as that the impartial spectator may enter into the principles of his conduct, which is what of all things he has the greatest desire to do, he must, upon this, as upon all other occasions, ***humble the arrogance of his self-love, and bring it down to something which other men can go along with***. (Smith, 1759/1790, loc 1714-1727).

The "not by benevolence" quote is claimed by the NeoClassEcon to justify focusing only on the maximization of self-interest, even though Smith specifically says own-interest. We see how the focus on self-interest is misplaced, once we understand the Smith emphasis on the constant need for help, the inherent interdependence, among all the producers of meat, beer, and bread, as well as with and among the consumers. Such interdependence also assures not only the quantity, but also the quality, a safe product, and a production process that is not destroying the Spaceship system. Supply is interdependent with demand, all reflected in the shared other-interest. So, it is humbling the arrogance of self-love (self-interest) with that which everyone can go along with (other-interest, internalized but shared widely) which produces the meat, beer, and bread. As the sub-title to Lynne (in press) says it, the matter is all about *Tempering Excessive Greed.*

And, to go along with the other, and then move to accept it, also takes considerable self-control – self-command as Adam Smith saw it. Self-control has to be exercised to be an impartial spectator and become mindful of what others will reasonably accept to achieve a shared other-interest, and then act on it. With sufficient self-control to represent the other-interest, the excessive greed of self-interest can be tempered, the tragedy of excess can be avoided, and true economic efficiency can be achieved.

An important aside: The weakest among us are the people acting without self-control, whether in the market or the government. Ironically, the Doctrine&Revolution encourage the weak, with the tendency to excessive greed. As Tomer (2014, p. 122) says it, an essential feature of *The Human Firm* is "... self-regulation or self-control in the social interest." A good capitalism, one that works for everyone, depends on it.

Production Metaeconomics: The analytical system

We explore the analytical system in Figures 1 - 4. We follow the visuals with demonstrating Mathematical Production Metaeconomics.

Econ 101 Isoquants: Theory of the (Econ) Firm

The NeoClassEcon use a set of self-interest only isoquants as in Figure 1 to represent *The Econ Firm*. To connect it to the 3-decades of research on soil and water conservation (again, see Lynne et al., 2016), consider the two farm inputs represented in an industrially oriented bundle d favored by an Econ and a conservation oriented bundle e favored by a Human. The bundle e is generally more costly, and thus less favored by the Econ. Assume the three isoquants represent corn production, with production progressively increasing as the move is made from I_G^1 through I_G^2 to the highest corn output on I_G^3 in Figure 1. Equal amounts of corn are produced on any one of the isoquants. The Econ focuses on 1) choosing the best point on any given isoquant, and 2) picking the isoquant that best serves the single-minded pursuit of self-interest with success determined by maximizing profits.

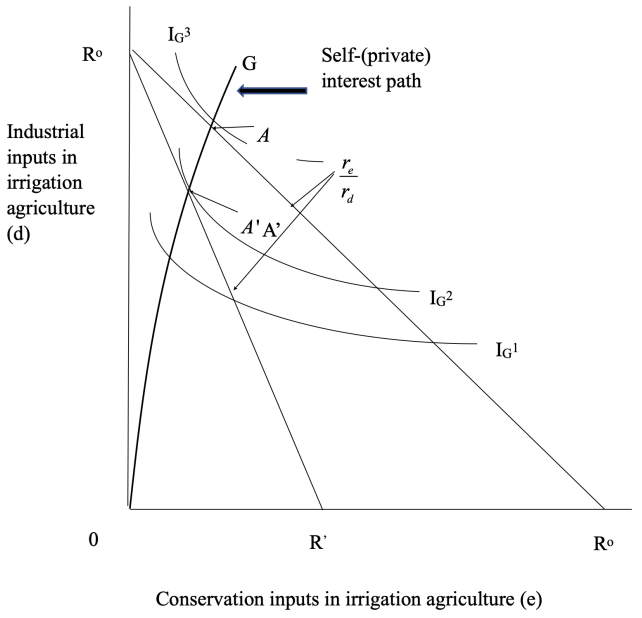

Figure 1. Industrial inputs (d) and water conservation inputs (e) in producing a food product from irrigation agriculture in the self-(private)interest (I_G). *Source: Author original.*

The NeoClassEcon places the iso-cost, capital constraint lines like R^oR' and R^oR^o into the figure, the slope represented in the input price ratio r_e/r_d, and locates the points of tangency with the isoquants. The expansion path OG shows all the least cost ways to produce corn. The NeoClassEcon proposes moving up the path OG looking at the marginal returns as compared to the marginal costs of the movement, and stops

where the marginal value of the product from using more of each input on path *OG* is equal to the marginal resource cost, shown in Figure 1 at point A'. And, if the conservation input price r_e would happen to decrease, the NeoClassEcon would continue further up the path to point *A*. And, notice this is a demonstration of the Doctrine&Revolution: The Econ has only one responsibility, that being to the shareholders and the CEO – the farm owner – to maximize profits, and government is nowhere to be seen. Yet, it is lurking in the background, enforcing private property rights in the land and the machinery, equipment used to produce the corn, but no nudging or controls from the community or the government it represents. Pollute if you want: Just stay focused on maximizing profit.

MetaEcon 101 Isoquants: Theory of the Human Firm

The plot thickens in a Human firm, illustrated in Figure 2, which always has at least two sets of isoquants. The MetaEcon retain the set I_G but add a set I_M, and there may be many sets, each representing a shared other-interest for each stakeholder, including the shareholders, but now also including employees; input suppliers; product buyers; consumers; community within which the farm is located; and on a larger scale, the Spaceship system within which the farm is embedded. Think of set I_M as producing better downstream water quality. So, if the conservation input bundle *e* is favored, perhaps less irrigation water is applied, and perhaps both fertilizers and other chemicals are more judiciously applied (such as in precision agriculture), which means there will be less contamination in water leaving the boundaries of the farm. And, it really applies more generally, a Metaeconomics consistent with the new paradigm emerging in science and business, as Tomer (2014 , p. 165, quoting Ray, 1993, pp. 5-6) points to it:

> … all scientists operating from the new paradigm tell us, there is a wholeness and connectedness between all living things. Everything and everyone is connected in some way to everything else. In business this means that the watchwords for this period are connection, creativity, compassion, and intuition… (it is not Newtonian clockwork, but rather is about applying)… inner knowledge, intuition, compassion, and spirit to prosper in a period of constant and discontinuous change.

The overlapping isoquants in Metaeconomics, arising from nonallocable inputs, illustrate the connectedness of all living things, in a Thermodynamic and Ecological (and Behavioral) Economics Science reality – holistic reality – rather than the Newtonian unreality, the machine model with the firm and the market as mechanisms, as used by the NeoClassEconL. It leaves out "… passion, inspiration, esprit de corps, enthusiasm, vigor, zest, vision, strongly held values, deep commitment, spirituality and highly ethical orientation" (Tomer, 2014, 12-13).

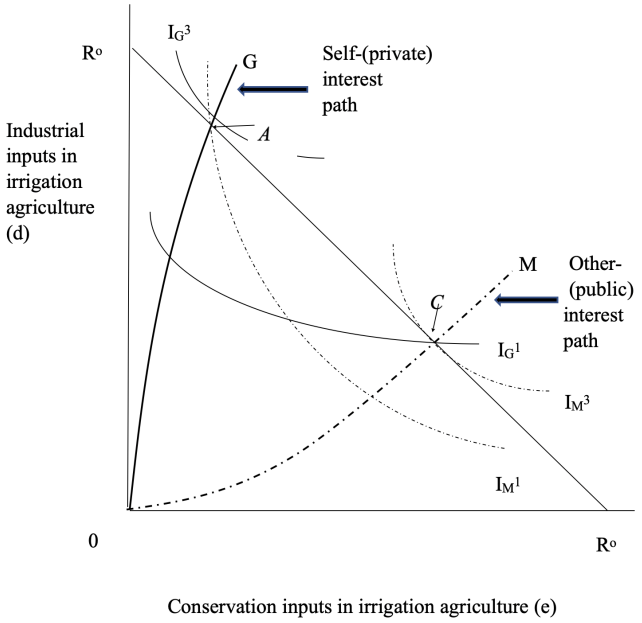

Figure 2. Industrial inputs (d) joint (nonallocable) with water conservation inputs (e) between producing a food product from irrigation agriculture in the self-(private)interest (I_G) and a community environmental product in the other-(public)interest (I_M). *Source: Author original.*

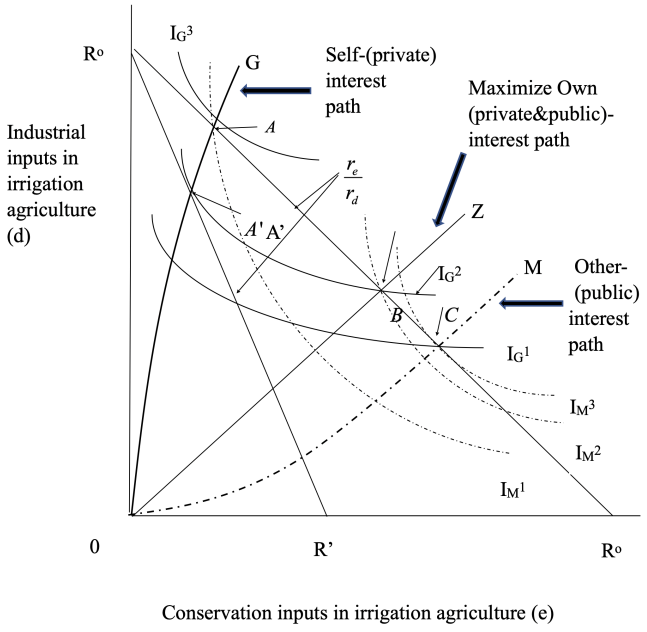

Figure 3. Industrial inputs (d) joint (nonallocable) with water conservation inputs (e) between producing a food product from irrigation agriculture in the self-(private)interest (I_G) and a community environmental product in the other-(public)interest (I_M). *Source: Author original.*

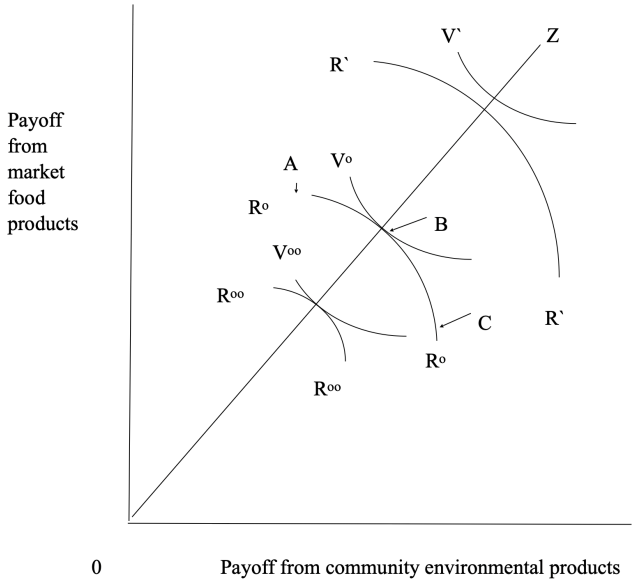

Figure 4. Synergy on the food and community environmental production path, balancing the private interest in the market based food product with the public interest in community environmental products on a higher plane of Value. *Source: Author original.*

So, what is a MetaEcon to do? A NeoClassEconL sees path *OG* as the only way to achieve economic efficiency. But, can others go along with the arrogance of self-love, the maximization of profit with self-interest only considerations, on the machine-like path *OG*? Well, the analytics in Figure 2 do suggest that even the Econ is paying some attention to downstream water quality, in that path *OG* is favored over the vertical axis. The water quality is at a quite low level $I_M^1 < I_M^3$, but at least the Econ is being a bit responsible. Unfortunately, relying only on market signals, r_e does not reflect all the social benefits of having higher quality water downstream, and, if not, the solution is always to privatize the downstream water quality, too, and use the market, so r_e reflects all the costs: Not realistic.

To move closer to reality, a MetaEcon uses Figure 3, a somewhat more complex version of Figure 2. It shows more possible choices given alternative input price ratios, and, most importantly it introduces another path *OZ*, which a MetaEcon points to as the path of economic efficiency arising out of balance in private&public, self&other-interest. Also, path *OZ* represents good balance in private&social/organizational-capital: Efficiency is impossible without a good measure of social and organizational capital (represented on path *OM*), as Tomer (2014, p. 2- 3) also makes clear, pointing to the example demonstrated in the cooperative business structure. That is, the human firm is at least partially embedded in society and boundedly rational (Tomer, 2014, p. 6, 8), bounded by path *OM*. To make for better understanding of the claim that efficiency can only occur on path *OZ*, we need Figure 4.

Looking to the resource constraint R^oR^o, a MetaEcon starts at the top of the resource constraint line in Figure 3 and moves down toward point *A*, to start a trace of a production possibilities frontier in Figure 4. A MetaEcon could plot that simultaneous increase in both products in Figure 4, but there is no need to do so, in that everything in that range is economically inefficient. So, a MetaEcon starts at point *A* in Figure 3 and moves toward and through point *B*, eventually arriving at point *C*. Again, there is no need to plot what happens beyond point *C*, as it is another set of inefficient combinations (both are increasing, so why stay in that zone) of both products. In fact, zones R^oA and R^oC are both irrational zones; the rational zone (and it is a zone, not one point like the NeoClassEcon claim) is in the region *AC* of both figures. And, the fact the possibility frontiers become further apart for equal increases in resources suggests the support for the idea that the sum is greater than the sum of the parts (Tomer, 2014, p. 14), i.e., when a balance in joint self&other-interest is pursued, the outcome is far better than if just focused on one-interest.

So, how do we decide the best point to choose in the rational zones of Figure 3 and 4? The MetaEcon suggest still one more analytical device, as represented by the value *V* indifference curves in Figure 4. And, where do these come from? If there is a market for both I_G and I_M – downstream water quality is a product with a market price *P* – the point of tangency of the value *V* curve V^o and the production possibility frontier curve R^oR^o is simply the ratio of p_M/p_G, so it is a price *P* reflecting price *V* valuation, the ratio coming out of the markets for the two products, the market forum. If there is no market price for the I_M, which is generally the case, then the value v_M associated with value V^o comes from some other forum. That other forum might be a water pollution management agency and the environmental constituents of said agency, and is usually an other forum(s) represented in government. Hopefully, it will represent a process in democracy, with v_M evolving out of said process.

So, if there is a missing market, it is through market&government we resolve the path of economic efficiency: Once we decide on v_M/p_G (recognizing incommensurability here) we can choose the economically efficient point *B* in Figure 4, which also locates path *OZ*. Said path traces back to Figure 3. And, whatever profit occurs at said point *B* in Figure 3 is the best level of profit for the farmer – a socially responsible profit. If it is a corporation, it is a socially responsible profit for all the stakeholders (including the Spaceship), including the CEO.

So, because Metaeconomics points to an empathy based ethics as a key part of the economic decision, it also points to a substantively more complex process, the many extra lines and curves, a metaphor for the extra complexity within a Human Firm. As Tomer (2014, p. 119-120) says it:

> ... orthodox economics in discussing motivation ignores complex ethical considerations that earlier traditions of thinking (for example, Aristotle, Adam Smith, Karl Marx, John Stuart Mill) took

> more seriously. According to Sen (1987: 7) "it is hard not to notice [in economic publications today]... the neglect of the influence of ethical considerations in the characterization of actual human behavior." It is not that unethical behavior is assumed; the self-interested behavior assumed is simply devoid of ethical content.

And, while perhaps that works for some economic decisions, it clearly does not work for decisions related to sustaining the Spaceship. Empathy based ethics is key to achieving sustainability (also emphasized in Brown et al., 2019). The ethic is represented in the value V.

We can now also make full sense of the notion of nudge and/or control, as such efforts reflect ethics on the way to social responsibility, like in the libertarian paternalism of Thaler and Sunstein (2008). While *The Econ Firm* will want to go to point A, the community ethic in a representative government, can nudge the Econ to consider going to at least to point B if not point M. Also, said nudge could be in the form of a subsidized input price r_e, or perhaps a direct conservation payment (traditional, going back to the New Deal of the 1930s, for farmers) to in effect lower the out-of-pocket cost of the conservation bundle.

If the nudge fails to move the Econ by libertarian means, a paternalistic mandate could move the Econ to point B. Such a mandate would reflect the dreaded (even though ethical) regulation. In all cases, the task is to convince – using the strategy of walking softly with nudging, but using the big stick of regulation and mandate if necessary – the farmer (or CEO) to see point B as the point where own-interest is maximized, and economic efficiency is achieved. Such a mandate is not necessary if the firm has internalized the social responsibility and the self-control to stay with it (Tomer, 2014, p. 8), which results in voluntarily taking path OZ.

Notice that point B shows a bit of sacrifice in both domains of interest, with $I_G^2 < I_G^3$ and $I_M^2 < I_M^3$. So, to maximize own-interest, a person needs to sacrifice a bit, which Adam Smith fully understood (pointed to in Tomer, 2014, p. 121):

> Man... ought to regard himself... as a citizen of the world,... and to the interest of this great community, he ought at all times to be willing that his own little interest should be sacrificed (quoted in Sen, 1987, pp. 22-23, from Smith, 1759/1790, loc 2697).

Maximizing self-interest without sacrifice ensures economic inefficiency, in contrast to what the Doctrine&Revolution teaches (or, is it preaches).

Tomer (2014, p. 166) also points out that transaction costs can be problematic in *The Econ Firm*, as people take advantage: Path OZ is the path of minimum transactions costs, in that empathy leads to something everyone can go along with, with divergence from that path causing transaction costs to increase at an increasing rate (Lynne, Shonkwiler, and Wilson, 1991).

Finally, path OZ represents what Tomer (2014, p. 9) refers to as the idealized Z-firm. In Metaeconomic terms, a Z-firm has internalized the other-interest, and has the self-control to stay on path OZ: It is about flexibility, efficiency, democracy, and community (Tomer, 2014, p. 31). In contrast, the N-firm of the NeoClassEcon operates (at best) on path OG without regard for the other-interest, and, generally without self-control over the excessive greed.

MetaEcon 101 Mathematics

For greater details regarding the formal, mathematical version of jointness arising from nonallocable inputs, and the resulting overlapping isoquants, see Lynne (2006), and Frisch (1965, Chapters 14-15). The essence of the formal model as developed in Lynne (2006; and, in press) starts with the value V function (which is not part of the Frisch, 1965, development of the framework, which presumes price P for the joint products), including a constraint on resources R:

$$\Phi = V(I_G, I_M) + \lambda(R) \tag{1}$$

where the production functions show nonallocable inputs (the cause of jointness represented in overlapping isoquants):

$$I_G = I_G(X_1, X_2) \tag{2}$$

$$I_M = I_M(X_1, X_2) \tag{3}$$

There are no allocating subscripts like X_{1j}, as in Production Microeconomics. Using a subscript presumes independence and complete control, the power of the manager to control the allocation of X_1 which is not possible when there is jointness in the products (the Spaceship system does it, not the producer, as the firm is embedded in the Spaceship). So, the Human Firm responds to economic incentives and social influences (Tomer, 2014, p. 51), as represented in (2) and (3).

To illustrate the formal framework, we take a simple form (leaving out the squared terms of a common quadratic, and there are many other possibilities) of an overall value function:

$$\begin{aligned}\Phi = \iota pI_G(X_1, X_2) + \tau I_M(X_1, X_2) + \gamma(I_G)(I_M) \\ +\lambda(R - \kappa_1 r_1 X_1 - \kappa_2 r_2 X_2)\end{aligned} \tag{4}$$

where the r_1, r_2 are input prices, and p is the market generated price for the ego based self-interest in providing a market product like corn. There is only value V associated with I_M, which is part of an empathy based other-interest, representing downstream water quality, with no market price P. Notice the subjective elements: κ_1, κ_2 for input cost; ι from self-interest; τ from other-interest, the latter about walking-in-the-shoes of employees, input suppliers, consumers, community, and the Spaceship System within which the production is embedded.

First order conditions are:

$$\frac{\delta\Phi}{\delta X_1} = (\iota p + \gamma I_M)\frac{\delta I_G}{\delta X_1} + (\tau + \gamma I_G)\frac{\delta I_M}{\delta X_1} \underline{\underline{set}}\ \kappa_1 r_1 \quad (5)$$

$$\frac{\delta\Phi}{\delta X_2} = (\iota p + \gamma I_M)\frac{\delta I_G}{\delta X_2} + (\tau + \gamma I_G)\frac{\delta I_M}{\delta X_2} \underline{\underline{set}}\ \kappa_2 r_2 \quad (6)$$

$$\frac{\delta\Phi}{\delta \lambda_2} = R - \kappa r_1 X_1 - \kappa r_2 X_2 \underline{\underline{set}}\ 0 \quad (7)$$

Least-cost is achieved where:

$$\frac{(\iota p + \gamma I_M)\frac{\delta I_G}{\delta X_1} + (\tau + \gamma I_G)\frac{\delta I_M}{\delta X_1}}{(\iota p + \gamma I_M)\frac{\delta I_G}{\delta X_2} + (\tau + \gamma I_G)\frac{\delta I_M}{\delta X_2}} = \frac{\kappa_1 r_1}{\kappa_2 r_2} \quad (8)$$

Notice how in production microeconomics as practiced by the NeoClassEcon that $\iota = \kappa_1 = \kappa_2 = 1$ and $\tau = \gamma = 0$. The expansion path $0Z$ in Figure 3, from (8) is:

$$X_2 = X_2(\kappa_1 r_1, \kappa_2 r_2, p, I_G, I_M, X_1) \quad (9)$$

Leading to the derived demand D for X_1

$$X_1^D = X_1^D(\kappa_1 r_1, \kappa_2 r_2, p, I_G, I_M, R) \quad (10)$$

Notice how Empathy I_M (D, for derived demand, but the D might also mean disciplined by the moral and ethical dimension) affects input demand.

Substituting (10) and the demand for X_2^D into both (2) and (3), supply for the commercial product of interest is:

$$I_G^D = I_G^D(\kappa_1 r_1, \kappa_2 r_2, p, I_M, R) \quad (11)$$

The disciplined (D) supply is influenced by the Empathy I_M arising with employees, input suppliers, consumers, shareholders, and the Spaceship Earth system.

We can derive the production possibilities frontier in Figure 4, but now referring to production tradeoffs along RR^o in Figure 3. We insert both X_1^D and X_2^D into the value function (4), and staying on some budget line RR^o we can trace a production possibility curve in Figure 4 of the form:

$$\Phi = \Phi(I_G, I_M, \kappa_1 r_1, \kappa_2 r_2, p, R) \quad (12)$$

Various measures of complementary, competitive and degrees of independence can be derived from using said production possibility frontiers: See Lynne (2006) for details. The value V curves are simply representations of $V(I_G, I_M)$, the result of ethical reflection.

The Human Firm and dual interest theory

Tomer (2014, esp. Chapters 7-8) fleshes out in some detail, puts substance to, what is meant by *The Human Firm*. We now turn to that detail, giving it even more power and analytical substance through Metaeconomics. Relating to sustaining the Spaceship in particular, Tomer (2014, p. 141) makes clear the key questions: "Under what circumstances will the firm behave environmentally responsibly? And how can a firm's environmentally responsible behavior be fostered?"

Orthodox self-interest doctrine: Motivation, externality, and normative claims

As Tomer (2014, p. 119) points out, the orthodox view is that a firm maximizes profit with little to no regard for the shared other-interest in the Spaceship system, as illustrated on path *OG* in Figures 1-3. The empathy based ethical considerations represented in path *OM* are ignored. As Tomer (2014, p. 120) says it, "... the self-interested behavior assumed is simply devoid of ethical content... (and, referring to contentions by Amartya Sen) ... this approach has (sometimes) been productive, but in other instances this excessively narrow characterization of human motivation has not served well." So, in the frame of 3-decades of research I have been involved in, the upstream farmer has no regard for what happens in terms of water pollution downstream of the farmer, as it is external (literally) to the farm firm.

Metaeconomic based research has clarified this is not how it works. In contrast to the NeoClassEcon denial that pollution is a moral issue (like Blinder, 1987, ch. 5, as pointed to in Tomer, 2014, p. 124), real farmers mindfully empathize – do the ethical reflection – with downstream users. The farmer sees own-self as "... part of (a) larger collectivity (in a) web of relationships (Tomer, 2014, p. 120)," the web(s) represented on path *OM*. As a result, farmers are best characterized as doing a kind of empathy conservation (Czap et al., 2015), i.e. being part of a web means each farmer empathizing with all other users of the water downstream. So, we now can answer the other question, on how to foster environmentally responsible behavior: Empathy can be nudged, which stirs the responsibility to sustain the Spaceship system. So, conservation farmers taking responsibility – and it can be nudged – go against what Tomer (2014, p. 120) refers to as the classical creed, as espoused in the Friedman&Reagan frame. Conservation farmers temper their profit with doing the right thing for others downstream.

The Doctrine (and Revolution) also misrepresents Adam Smith. As Tomer (2014, p. 121) claims, quoting Smith (1776/1789, loc 6842), Friedman apparently interpreted the following in self-interest terms only, claiming a firm owner/manager is:

> ... led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest, he frequently

> promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good.

Friedman misrepresents Adam Smith by interpreting this reference to own interest as self-interest. Also, this is not about an invisible hand: Instead, the people in the firm mindfully go to the station of the impartial spectator, i.e. empathy is visibly engaged, and then they act on what the visible hand produces, reflecting the public good: It is about joint private&public-good. If it turns into habit and tradition, into the norm, to act in responsible ways, only at that point does it become invisible.

Corporate other-interest doctrine: Managerial creed and social responsibility

Tomer (2014, p. 121) points to something a bit closer in spirit to what Adam Smith had in mind, in the managerial creed: The focus is not only on profits, but also on employees, customers, and, to some extent, the general public. So, we might find the firm on a path somewhere in between the maximum profit path (vertical axis or path *OG*) and the socially responsible path *OZ*, but in effect only considering a few of the responsibilities on path *OM*.

Tomer (2014) then introduces a broader creed represented in Corporate Social Responsibility, which might include concern for sustaining the Spaceship, which would take the firm closer to path *OM*. As Tomer (2014, p. 122) says it, such firms "... adopt policies and actions that are in conformity to the norms and goals of society." Also, as Tomer (2014, p. 122) highlights, it is expected the firm would voluntarily choose some path *OZ* without being forced to do so; yet, as pointed out, a kind of big stick is used if the charter is broken.

Socio-economic based self&other-interest doctrine: Ethics, patience, and organizational capability

Tomer (2014, p. 124- 131) develops a socio-economic model: The Metaeconomics framework and theory gives a powerful analytical system to elaborate and apply that model. The Tomer model suggests the need to address the ethical orientation, patience (how time is viewed), and how organizational capability plays in the firm: The model needs to be flexible enough to handle all combinations. Metaeconomics has that flexibility, which Tomer (2014, p. 142) notes requires a way to explain the role of both the market&government, as in behaviors "... derive from (1) the product and resource markets in which it participates and (2) the regulators that seek to modify its behavior." In Metaeconomic terms, the former is represented in Figure 3 through price *P* and the latter in Figure 4 through value *V*.

Opportunistic/non-opportunistic and impatient/patient

The opportunistic part is played out on the vertical axis, a person willing to be "... sly, crafty and dishonest" (Tomer, 2014, p. 125, alluding to institutional economics framing by Oliver Williamson). Non-opportunistic self-interest is represented on path *OG*, where a person's "... ethical principles do not allow them to be dishonest or otherwise opportunistic, but there is no concern for others beyond what self-interest dictates" (Tomer, 2014, p. 125). High ethical behavior would arise on path *OZ*, or perhaps even path *OM*, representing a person and a Human Firm with "... a sense of high purpose involving the desire to find win-win solutions in their relations with others and experiencing others not simply as means but as ends" (Tomer, 2014, p. 125). Such a Human Firm stops fighting water pollution regulations, and stops supporting politicians bent on shutting down all such regulatory activity, all now recognized as essential to the science&ethics base for sustaining the Spaceship.

Regarding patience, one would tend to find the firm without patience on the vertical axis with extremely short time horizons; with somewhat more patience, on path *OG* with somewhat longer time frame concerns; with substantive patience operating on the longest time frame represented on path *OZ*, or, perhaps even path *OM*. Tomer (2014, p. 125) points to the need to put attention to just what kind of internal organization would lead to the ethical environment on path *OZ* trajectories. It cannot be left to the invisible hand, but must be subjected to mindfulness and the visible hand.

Principled behavior: Tempering self-interest with the other-interest

Tomer (2014, p. 131) rounds out the section of the book on social responsibility with:

> Ideal socially responsible behavior is not based on a self-interested calculation, not even a long-term oriented one. Ideal strategies are based on a commitment to principle transcending narrow self-interest.

And, quoting Clark (1957, p. 207):

> Self-interest is not really enlightened unless it is also enlarged until it identifies itself, to some extent at least, with the interests of others. And once this enlargement has taken place, it can never treat others as mere means... And if "enlightenment" goes this far, it has become ethical. It has gone beyond the idea that "what's good for me is good for the community" and has accepted at least some part of the idea that "what's good for the community is good for me"; or that my economic relationships cannot be healthy unless they are part of a healthy community.

Enlightened self-interest is represented on path *OZ*, an ethical path. Also, it represents the idea that "what's good for me is good for the community ... (and) what's good for the community is good for me." Also, that path reflects the idea of "economic relationships cannot be healthy unless they are

part of a healthy community" – a joint, interdependent, and nonseparable economy&community.

As Tomer (2014, p. 147) says it, the "... human firm's environmental behavior is determined by: 1) the environmental opportunities confronting it; 2) its internal organizational capabilities; 3) the 'macro' societal influence; 4) the 'micro' social influences of extra-firm institutions and infrastructures; and 5) other regulatory influences." In Metaeconomics terms, 1) mindfulness on what producers and consumers are thinking about, e.g. seeing green products, on the way to empathy, reveals the environmental opportunities on path *OM*; 2) internal organization capability focuses on finding economic efficiency on some ethically responsible path *OZ*; 3) macro societal influence, paying attention to what communities really want and need on path *OM*, can lead to ethical reflection on the way to path *OG*; 4) micro influences from each of the stakeholder groups, each with their own path, can put specific pressure while also being helpful for the firm to find the best path *OZ*; and 5) regulatory influences coming out of state and federal entities (e.g. US Environmental Protection Agency) represented on path *OM* can also nudge the firm, and, if the nudge does not work, can be mandated.

Conclusion

Seeing the core role played by *The Human Firm* clarifies that both the Doctrine&Revolution got it wrong. It is essential the Firm operationalize empathy based ethical reflection, which also points to the essential need to invest in both the market&government, rather than investing only in the market while dis-mantling the government. A Human Firm needs both market&government, with both being essential to bringing wider, social responsibility to bear in tempering the profit seeking. It also follows, then, that the stealth and precision of the extreme right over the last 3-4 decades to dis-mantle government, as enabled by the Narrative represented in the Doctrine&Revolution, is also fundamentally misplaced: It has gone too far. Instead of enabling evil geniuses (Andersen, 2020), a new Narrative needs to enable good geniuses directed to facilitating *The Human Firm*, and Metaeconomics can help.

As Tomer (2014, p. 131-132) says it, an "... ideal principled strategy is one that commits the firm to a harmonious relationship with its external social environment... (and, relating to the Spaceship) ... the ideally behaving firm would not engage in any water pollution (and any other kind of damage) that the relevant affected parties find unacceptable." Only *The Human Firm* can provision the Spaceship travelers in the way that everyone can go along with.

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