

Primary submission: 20.11.2012 | Final acceptance: 20.12.2012

# Understanding the Drivers of Economic Growth: Grounding Endogenous Economic Growth Models in Resource-Advantage Theory

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## ABSTRACT

Foss (2012) provides an informed and informative comment on my article "Trust, Personal Moral Codes, and the Resource-Advantage Theory of Competition: Explaining Productivity, Economic Growth, and Wealth Creation" (Hunt, 2012). In general, his comment is highly supportive of both the theory and the arguments developed in my article. He does, however, raise certain issues that need to be addressed. These issues relate to the concept of total factor productivity, the role of institutions in promoting economic growth, and the importance of understanding how transaction costs impact entrepreneurship and economic growth. This reply focuses on his discussion of growth economics and endogenous economic growth models.

## KEY WORDS:

ethics, trust, resource-advantage theory, economic growth, endogenous economic growth models

**JEL Classification:** F11, C68, F42, F32

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## Introduction

In my article, "Trust, Personal Moral Codes, and the Resource-Advantage Theory of Competition: Explaining Productivity, Economic Growth, and Wealth Creation" (Hunt, 2012), I pointed out that, though scholars agree that societal-level moral codes that promote social trust also promote wealth creation, it is unclear which specific kinds of societal-level moral codes promote social trust and what kind of competitive process is involved. Arguing that societal-level moral codes are formed from peoples' personal moral codes, the article illuminates the concept of personal

moral codes by reviewing the "Hunt-Vitell" theory of ethics and discussing which types of codes foster trust and distrust in society. My article then used resource-advantage (R-A) theory to show the process by which trust-promoting, societal-level moral codes promote productivity, economic growth, and wealth creation.

I thank Professor Nicolai J. Foss for his thoughtful commentary on my article (Foss, 2012). It is gratifying that he finds significant merit in my approach. Indeed, given the critical stance of most commentaries, any author would be pleased to find a commentary that concludes that "Hunt is on absolutely the right track," "I agree that understanding the influence of morals on wealth-creation requires attention to the dynamic nature of competition," and that "Hunt has produced a characteristically stimulating paper." Foss' comment, which focuses on the concept of total factor productivity, the role

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of institutions in promoting economic growth, and the importance of understanding how transaction costs impact entrepreneurship and economic growth, are drawn from his analysis of economic growth detailed in Bjornskov and Foss (forthcoming). I urge all readers interested in the role of entrepreneurship and economic growth to read his forthcoming article with Bjornskov because it significantly extends his discussion in the comment.

Both the comment of Foss and the approach adopted in Bjornskov and Foss (forthcoming) may be viewed as complementing the R-A theory approach taken in my original article. Indeed, I suggest that the points made in Foss' comment and the approach taken in Bjornskov and Foss (forthcoming) imply (or require) a grounding in a dynamic, process theory of competition. Furthermore, R-A theory, which is the most completely articulated dynamic theory of competition in the literature, is precisely the kind of dynamic, process theory of competition that is needed.

However, Foss does raise issues "in the spirit of constructive criticism" that need to be addressed. This reply will focus on his discussion of growth economics and endogenous economic growth models.

### Endogenous growth models

Foss points out that, whereas the economics of growth had historically been mainly concerned labor growth and capital accumulation, recent work has focused on "growth accounting" and developing models that make "endogenizing technological progress a pressing issue." He cites the work of Lucas (1988) and Romer (1990) as examples of endogenous growth models. However, Foss does not elaborate on the development of endogenous growth models. He also does not acknowledge the symbiotic relationship between R-A theory and endogenous growth models. Therefore, this reply will show how R-A theory relates to endogenous growth models.

Since the works of Romer (1986) and Lucas (1988), most formal models of economic growth have abandoned the view that the capital-labor ratio should be the key endogenous variable. Because technological progress accounts for most economic growth, theorists now argue that technological change can no longer be treated as exogenous in growth models. If, however, technological change is endogenous, perfect competition cannot provide the underlying theoretical foundation for growth modeling efforts. Indeed, though his early

works retained the assumption of price-taking competition, Romer (1994, p. 14) notes that "it is obvious in retrospect that endogenous growth theory would have to introduce imperfect competition." Similarly, Solow's (1994, pp. 48-49) review points out that "no one could ever have intended to deny that technological progress is at least partially endogenous to the economy." Indeed, he believes that making technological progress endogenous is "probably the most promising aspect of the current third wave of growth theory" and that "the incorporation of monopolistic competition into growth theory is an unambiguously good thing."

Four economic facts have stimulated the development of endogenous growth models: (1) economic output has outpaced population growth since the industrial revolution, (2) the growth paths of different countries are not converging to a common level of per capita income, as would be expected if the capital/labor ratio were the key endogenous variable explaining growth, (3) technological progress has been found to be the main driver of economic growth, and (4) the innovative ideas that collectively constitute technological progress have most often involved, either at their conception or commercial exploitation (or both), the profit-driven actions of firms. Contrasted with the Solow model's assumption that technological knowledge is an exogenously provided public good, endogenous growth models make technology grow as a result of specific, profit-driven actions of firms.

Formal growth models, as a group, imply an endogenous technological progress, four-stage, theory of economic growth: (1) Certain aspects of the process of monopolistic competition, including the rational expectation of rents, engender innovative ideas at the firm level. (2) These competition-induced innovations, through time, result in both firm and industry-level technological changes. (3) These technological changes, cumulatively, result in increases in total factor productivity for the economy, i.e., technological progress. (4) Thus, competition-induced technological progress, through time, results in economic growth. However, when Romer (1994), Solow (1994), and others—including Foss (2012)—advocate incorporating "imperfect competition" or "monopolistic competition" into growth models, they are using these terms generically. That is, they are not urging the adoption of either Robinson's (1933) specific theory of imperfect competition

or Chamberlin's (1933) specific theory of monopolistic competition as a theoretical foundation for endogenous growth models. Neither of these theories views competition as a process wherein innovations result in technological progress.

A theory of competition that could potentially ground endogenous growth models would be, at the minimum, a process-oriented theory with four requisites. First, technology cannot be assumed to be freely available to all firms, but must be a resource in the production process that is a nonrival, partially excludable good. Second, innovation must not be exogenous, but must be an outcome of the process of competition. Third, firms should not be price-takers, but must have the rational expectation that rents will be earned from innovations that contribute to their efficiency and/or effectiveness. And fourth, societal institutions, such as the patent system, should be viewed as potentially facilitating or inhibiting competition-induced economic growth. A theory of competition having these four requisites would depart not only from perfect competition but also from all extant theories of monopolistic competition.

As discussed in detail in Hunt (1997; 2000), the resource-advantage theory of competition is the *only* fully developed process theory of competition that can provide a theoretical grounding for endogenous growth models. Here, I can only briefly address how R-A theory addresses the four requisites.

The first requisite for a theory that could potentially ground endogenous growth models is that technology cannot be assumed to be freely available to all firms. Because it defines resources as the tangible and intangible entities available to the firm that enable it to produce efficiently and/or effectively a market offering that has value for some market segment(s), R-A theory provides two grounds for the view that technologies are nonrival, partially excludable resources. First, if technologies are viewed as distinctive ways for firms to produce value, then a specific technology is a distinctive pattern or "routine" (Nelson & Winter, 1982) that describes the firm's process for combining inputs to produce valued outputs. In R-A terminology, for a firm to possess a specific technology is equivalent to its having a specific organizational competence. Because R-A theory recognizes that technologies or competences can be replicated by other firms, it acknowledges that they are nonrival goods. As shown in premise

"P6" on page 11 in the original article, R-A theory recognizes organizational competences as a distinctive kind of higher-order, "organizational" resource, where "higher order" implies a specific assortment of socially complex, interconnected, basic resources. Because competences both create value and can be deployed by firms in their strategies, competences are viewed as similar to basic pieces of machinery. For R-A theory, the firm is a combiner of heterogeneous, imperfectly mobile resources, of which competences are but one kind—albeit an important one.

Second, as to how R-A theory provides a rationale for why technologies or competences are partially excludable, note that R-A theory proposes that a comparative advantage in resources of which technologies or competences are prominent, is the manner by which firms achieve marketplace positions of competitive advantage and, thereby, superior financial performance. Therefore, how technologies become partially excludable is simply a part of the following more fundamental question: What determines the life-span of the comparative advantage of *any* advantage-producing resource? Why are some resources less easily replicable, i.e., more easily excludable, than others? Simple resources, such as standard pieces of machinery, can customarily be purchased in the factor markets and, by themselves, are unlikely to produce a comparative advantage with anything beyond a very short life-span. The long life-spans of some advantage-producing resources result from the protection afforded by such societal institutions as patents or their long life-spans result from resources that are causally ambiguous, socially complex, tacit, or have the compression diseconomies. (See Hunt (2000) for a detailed discussion of these factors.)

The second requisite for a theory that could potentially ground endogenous growth models is that innovation should be an outcome of competition. R-A theory identifies two different kinds of innovative activities: proactive and reactive. The former occurs when, for example, a firm's market research identifies a previously unserved market segment and tailors a market offering for it. A firm is also being proactive when its R&D department develops a market offering and the firm then finds a market segment for it. When proactive innovative activities successfully produce innovations that contribute to efficiency and/or

effectiveness, firms will be rewarded by marketplace positions of competitive advantage (see cells 2A, 3A, and 6A of Figure 3 of my original article) and, thus, accomplish their goal of superior financial performance (see Figure 1 of original article).

Reactive innovative activities occur when inferior financial performance signals firms that their comparative disadvantage in resources has resulted in their occupying marketplace positions of competitive disadvantage (see cells 4A, 7A, and 8A of Figure 3 in my original article). Upon so learning, firms react by attempting to acquire their rivals' advantage-producing resource, by imitating it, by finding an equivalent resource for it, or by finding a superior resource. Firms having a comparative disadvantage in resources are motivated to innovate by their desire for superior financial performance. Necessity is, indeed, the mother of invention.

The third requisite for a theory that could potentially ground endogenous growth models is that firms must have the rational expectation of rents to be earned from innovations that contribute to their efficiency and/or effectiveness. R-A theory maintains that firms can expect superior financial performance when they have a comparative advantage in resources that leads to marketplace positions of competitive advantage. That is, as shown in Figure 3 of the original article, firms can have superior financial performance when their resources, relative to their rivals, enable them to produce market offerings that are perceived by some market segment(s) as (1) being of superior value at parity costs, or (2) having superior value at lower costs, or (3) having parity value at lower costs. In cases one and two firms are able to charge higher than parity prices. In case three they can achieve superior performance at parity prices because of lower costs. Importantly, the expectation of superior financial performance is rational because empirical works reveal large within-industry variance in financial performance. Indeed, using return on investment (ROI) as the measure of financial performance, studies show that "firm effects" account for 46 to 55% of the variance in business-unit ROI and "industry effects" account for only 8 to 10% (Roquebert, Philips, & Westfall 1996; Rumelt 1991).

The fourth requisite for a theory that could potentially ground endogenous growth models is that

such societal institutions as the patent system should contribute to facilitating or inhibiting competition-induced economic growth. Two examples will illustrate how R-A theory accommodates institutions. First, the institution of a patent system fosters efficiency and/or effectiveness by extending the life-span of the advantage produced by an innovation. Absent an effective patent system, the financial rewards for inventions would often be insufficient for prompting the investment in R&D required for their discovery.

Second, trademarks are considered to be resources. Therefore, the legal protection of trademarks, by protecting the investment that firms have in them, encourages firms to protect this resource by maintaining high quality market offerings. Because R-A theory maintains that consumers have imperfect information and that gathering information is costly, trademarks not only help reduce consumer search costs, but also serve as a quality control mechanism for society.

## Conclusion

I again thank Professor Nicolai J. Foss for his thoughtful commentary on my article. I am delighted that he found it to be on the "right track" and that he agrees that "wealth-creation requires attention to the dynamic nature of competition." This reply has focused on recent work on economic growth and, in particular, the use of endogenous growth models, such as those of Lucas (1988) and Romer (1990), among many others. This reply shows that all "modern" models of economic growth must satisfy four fundamental requirements: (1) technology cannot be assumed to be freely available to all firms, but must be a resource in the production process that is a nonrival, partially excludable good; (2) innovation must not be exogenous, but must be an outcome of the process of competition; (3) firms should not be price-takers, but must have the rational expectation that rents will be earned from innovations that contribute to their efficiency and/or effectiveness; (4) societal institutions, such as the patent system, should be viewed as potentially facilitating or inhibiting competition-induced economic growth. Although additional theories of competition that can satisfy the requirements may be forthcoming, at the present time, *only* resource-advantage theory can satisfy the criteria.

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