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## Von Hippel, Eric (2017). Free Innovation<sup>1</sup>

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### Book Review

We are living in an era which some economic historians call the "Great Enrichment". The era began around the year 1800 and, in its course, per capita consumption has grown by factors between 30 or 100. The ultimate causes of the Great Enrichment were, according to McCloskey (2010, 2016), not the usual economic suspects - more bricks, more roads, more telephone lines, more children in school, more university degrees, more trade, and better institutions. Instead, it was market-tested innovation - more useful innovative ideas piled on older innovative ideas - together with a social and political environment, a culture if you will, that grants common people the personal liberty to innovate, and which bestows dignity on those who enrich us with their useful new ideas. Some think that innovation has lost its spark (Gordon 2016). If that were true, it might endanger the sustainability of the Great Enrichment. With his small book "Free Innovation," Eric von Hippel, a MIT innovation economist, provides a new perspective on innovation. He shows us that there is an important source of innovation that has been neglected by innovation economists, policy makers, and business experts alike. Perhaps this source, if properly developed and cultured, will sometime in the future add significantly to the innovation on which the Great Enrichment is based.

A free innovation, as the term is used by von Hippel, is *"...a functionally novel product, service, or process that (1) was developed by consumers at private cost during their unpaid discretionary time (that is, no one paid them to do it) and (2) is not protected by its developers, and so is potentially acquirable by anyone without payment - for free. No compensated transactions take place in the development or in the diffusion of free innovations"* (p. 1; my italics). It seems appropriate to regard free innovation as a kind of subsistence activity that is performed outside the extended network of the market economy. Like most things done by private households - other than consuming goods and services, and restoring the labor capacities of the household's members - free innovation is largely ignored by innovation economists. Von Hippel reminds us of its existence, informs us about its extent, and makes a case for its economic significance.

The book is organized into eleven chapters and two appendices. Most chapters are based on research that von Hippel and his research collaborators have published since the beginning of this century in scientific journals. In chapter 1 von Hippel contrasts the "free innovation paradigm" with the "producer innovation paradigm" which bears Schumpeter's innovation memes, and he discusses the relationships between the two innovation models, in particular, whether they are substitutes or complementary means for generating innovations. The chapter closes with a useful overview of the book's remaining chapters. To the hurried reader, the "Overview" chapter says it all. But you should read on.

In chapter 2 von Hippel provides empirical evidence of the extent of free innovation. The source of the evidence are surveys which von Hippel and his collaborators have conducted in six developed countries - the USA and Canada, Japan and South Korea, the UK and Finland. Representative samples of households from these countries were asked with questionnaires to provide information on "... new products and

<sup>1</sup> Von Hippel, Eric (2017). Free Innovation. Cambridge, Mass. and London: MIT Press. Hardcover US\$ 29.95/ £ 24.95. Free e-book: <https://evhippel.mit.edu/books/>

product modifications that had been developed by household sector individuals for personal or family use" (p. 19-20). Similar questionnaires were used in the country surveys and the questionnaire's latest version is reproduced in Appendix 1 of the book. Based on the survey responses, von Hippel estimates that "... 24.4 million people had developed or modified products for their own use in just six countries surveyed to date" (p. 20).

Perhaps. If free innovators are more likely to respond to such surveys than non-innovators and if the response rates are low, a non-participation bias is likely to be large. Moreover, the surveys are unlikely to represent free innovation in the world. A significant section the world's population lives in the emerging economies of China, India, Latin America, and Africa where people are mostly young and enterprising. They may exhibit free innovation behaviors that are significantly different from that of the older and more complacent people of the six countries where the free innovation surveys had been conducted.

Von Hippel and his collaborators have classed the product innovations reported by the free innovators into eleven categories, one of which is "Food and Clothing". Regrettably, the proportion of innovations that fall into this category is reported only for Finland, where it accounts for 12 percent of all free product innovations. Details on the innovations in this category are not provided.

In chapter 3, "Viability Zones for Free Innovation," von Hippel "... explores the conditions under which innovation *pays* for both free innovators and producers" (p. 37). To this end, he first distinguishes between three basic modes of innovation and then identifies the cost conditions under which the modes are economically viable. The three basic modes of innovation are: (i) single free innovator, (ii) collaborative free innovation project, and (iii) producer innovator. An innovation mode is deemed viable if it satisfies the inequality:  $v > d+c+u+t$ , where  $v$  is the value of an innovation,  $d$  are its design costs, i.e. the costs of creating the "recipe" for the innovation,  $c$  are the costs of communicating design-related information, either between collaborators or between designers and design users,  $u$  are production costs, i.e. the costs of converting a new "recipe" design into a usable product; finally,  $t$  are transaction costs, i.e. "... the cost of establishing property rights and engaging in compensated exchanges of property" (p. 39). Note that the inequality makes no allowance for time and risk. Moreover, the framework assumes that innovation opportunities are somehow given, that is, they are assumed to be available at no cost. This assumption may be more appropriate for free innovation than for producer innovation for which effort may have to be expended in order to identify promising innovation opportunities. With this framework von Hippel then discusses the relative cost advantages of the three basic innovation modes as well as those of hybrid innovation modes that mix components of the basic modes in different ways. In this discussion von Hippel includes considerations about how contemporary information technology may affect the cost components.

In chapter 4 von Hippel makes the point that free innovation tends to lead producer innovation because of information advantages of free innovators compared to producers: free innovators do not think about the market potential of their innovation and about how to protect their new design whereas producers do and require information on both. Von Hippel illustrates this claim with two examples. One is whitewater kayaking, the other is the development of surgical instruments by scientists. The first example is apt but, I am afraid, few readers will have any prior interest in whitewater kayaking. The second example fits the definition of free innovation only partially, because scientists tend to develop new instruments not for home consumption but for their jobs, which violates a defining criterion of free innovation.

Diffusion shortfalls in free innovation, their consequences, and some remedies are the themes of chapter 5. The argument of this chapter is this: Because free innovators, by definition, are unconcerned about diffusing their new designs, fewer users will adopt the designs of free innovators than would be the case if the free innovators actively made their designs known to the world. Therefore, the social benefits from free innovation will be less than they would be if the designs were somehow diffused more widely. To remedy the deficient flow of information from free innovators to users von Hippel suggests "open sites for posting digital designs and design information" (p. 75), which are modern-day versions the "Nongsa Jikseol," the farm extension handbook in which the Korean King Sejong the Great had gathered in the 15<sup>th</sup> century information about new cultivation methods for dissemination to his peasants. In addition, von Hippel discusses several complementary measures for encouraging the flow of information from free innovators to users, such as 'makerspace' communities, open standards, and support for collaborative free innovation. Closing the chapter, von Hippel suggests that governments – i.e. tax payers - should pay for the diffusion of information from free innovators because the adoption of new design generates social benefits. He does, however, not suggest any limits to such support and it may be useful to keep George Stigler's dictum in mind: "Ignorance is like subzero weather: by a sufficient expenditure its effects upon people can be kept within tolerable or even comfortable bounds, but it would be wholly uneconomic entirely to eliminate all its effects" (Stigler 1961, p. 224).

Chapters 6 and 7 are perhaps the most practically relevant chapters of the book. In chapter 6, von Hippel focuses on the "Division of Labor between Free Innovators and Producers". In this chapter four kinds of linkages between free and producer innovation are compared: (i) free-contested markets in which free innovators compete with producers in the market for an innovative product, (ii) free-complemented markets where free and producer innovators complement each other in the market for innovative products, (iii) free spillovers of designs from free to producer innovators, and (iv) tools and platforms that producers may provide to free innovators in order to encourage design spillovers. The basis for the comparison of the linkages is a social welfare model presented in Appendix 2 of the book.

Means and ways for strengthening the interactions, for "tightening the loop" between free innovators and producers, is the theme of chapter 7. Here von Hippel discusses three modes of interaction between free innovation and producers: (i) the transfer of free innovation designs to producers, (ii) the provision of tools and support for free innovators by producers, and (iii) the transgression of free innovators into the producer sphere either by commercializing their design with the help of an existing firm or by founding a new firm. Finally, the chapter discusses crowdsourcing as a means for tapping into households' innovation capabilities.

The scope of free innovation is not limited to products but, as von Hippel suggests, may be "... as broad as that of producer innovation with respect to products, services, and processes of interest to consumers" (p. 101). In support of this claim, chapter 8 presents several examples of free user innovation, such as in retail banking, mobile banking, medical services, 3D printing, developing community brands, and in developing new organizational methods. Examples from the food and agricultural industries are not provided.

In chapter 9 von Hippel turns to the impact of personality traits on free innovation success. This impact was investigated empirically in a survey of household innovators in Germany in which von Hippel has participated. The study distinguishes between three free innovation stages and five personality factors. The results provide some information about the impact of change in the personality traits on the probability of completing a particular stage. However, as von Hippel acknowledges, personality traits are hard to change in adults and the practical use of information on the relationship between personality traits and innovation success is not obvious. Von Hippel nevertheless suggests that there are two ways to improve success in free innovation: one is encouraging collaboration among free innovators, the other is the use of technical advances in order to facilitate innovation.

The legal environment for free innovations is the topic of chapter 10. The chapter is limited to the laws and regulations in the United States and its insights may not generalize easily to economies embedded in different legal systems, such as the economy of the EU and its constituent economies.

In the closing chapter von Hippel proposes "... some specific next steps for those interested in the theory, the policy, and the practice of free innovation" (p. 141). Here he first highlights the commonalities of free innovation with the related research 'lens' of commons-based peer production, user innovation, and open innovation. He then suggests actions in three areas: (i) the measurement of free innovation, which, like all household production activities is presently ignored in national accounts, (ii) the incorporation of free innovation in microeconomic theory, and (iii) policies in support of free innovation.

Overall, von Hippel's "Free Innovation" is an important book because it directs the attention of economists; innovation policy makers, and experts from business to an economically significant, socially beneficial, and personally rewarding activity of households. Like most household activities free innovation is unmeasured, is therefore ignored, and possibly believed not to exist. The most important contribution of von Hippel's book perhaps is that it affords free innovators the attention and dignity that they deserve. As McCloskey has taught us, it was dignity and liberty for the common people that ignited the innovation on which the Great Enrichment is based. If a new dignity for free innovators encourages and stimulates free innovators and their interactions with producer innovators, this may help to sustain the Great Enrichment.

I recommend the book to all researchers, policy makers, and business experts with a professional interest in innovation in food and agriculture, even though the book is largely void of specific contents related to food and agriculture. The book does not need to be read from front to back but readers should spend enough time with it so that the notion of free innovation become a permanently recoverable item in their working memory. The book is available as a free e-book (<https://evhippel.mit.edu/books/>). Yet, the paper version on the book shelf may be a more accessible visual reminder of the existence of free innovation.

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