Journal of the History of Economic Thought, 2024

RISK, UNCERTAINTY, AND ENTREPRENEURIAL PROFIT: FRED M. TAYLOR AND FRANK H. KNIGHT

BY
LUCA FIORITO
AND
CHARLES R. MCCANN JR.

Frank H. Knight is rightly regarded as having identified the distinction between risk and uncertainty and their respective roles in the entrepreneurial process in his 1921 Risk, Uncertainty, and Profit. Less well appreciated is his recognition of the work of Fred Manville Taylor in this work, even though throughout Knight made several laudatory references to Taylor's Principles. This article will examine through the various editions of Taylor's textbook parallels between Taylor and Knight in their respective understandings of the risk-uncertainty distinction and the emphasis each placed on the role of the entrepreneur.

After all what would our education and current American Economics have been without him?

—Walton H. Hamilton, quoted in "Professor Fred M. Taylor Honored," *Michigan Alumnus* 36 (1925, p. 815)

I. INTRODUCTION

Frank Knight opened his celebrated *Risk, Uncertainty, and Profit* (*RUP*) with what appears to be more a *captatio benevolentiae* than a genuine declaration of modesty.

Luca Fiorito: University of Palermo; Charles R. McCann, Jr.: Independent scholar, Pittsburgh, PA, We wish to thank Ross Emmett and two anonymous referees for comments on an earlier draft. Email:crmccann@aol.com

ISSN 1053-8372 print; ISSN 1469-9656 online/24/000001-14
doi:10.1017/S1053837224000312

"There is little that is fundamentally new in this book," he informed the prospective reader. "It represents an attempt to state the essential principles of the conventional economic doctrine more accurately, and to show their implications more clearly, than has previously been done" (Knight 1921, p. vii). Against this disclaimer of originality, Knight put much effort in examining previous attempts to bring to light the true economic significance of risk and its relation to entrepreneurial activity. His review was an articulate mix of praise and criticism. Among recent contributions, he paid specific attention to the opposed views of "dynamic theory" and "risk theory" of profits, advanced in America by John Bates Clark (1899) and Frederick B. Hawley (1907), respectively. Both theories, he was willing to acknowledge, contain an element of truth, but neither Clark nor Hawley could appreciate the essential difference between risk, as referring to events subject to a known or knowable probability distribution, and uncertainty, as referring to events for which numerical probabilities are not available. In a footnote, Knight acknowledged that other American authors had come close to the crux of the nature of profit, but no one had fully undertaken the task.[1] "Unquestionably," Knight maintained, "the best of these textbook discussions is that of Professor F. M. Taylor in his unpublished *Principles of Economics*, a work characterized throughout by correctly reasoned and accurately stated theoretical argument" (pp. 31–32n4).[2] It is Taylor who concerns us here.[3]

The aim of this article is to analyze in detail Taylor's stance on the matter of risk, uncertainty, and the role of the entrepreneur, and how his understanding evolved over time. We point out a few interesting parallels between Taylor's arguments and some of the arguments advanced by Knight in his main opus. Before launching into the discussion, we note a preliminary consideration. Our primary focus here is on Taylor, and since Knight's contribution has been amply discussed in the literature, we will let him enter the scene only to the extent his views are consistent with Taylor's.

II. TAYLOR ON RISK AND UNCERTAINTY, FIRST ATTEMPT (1902–03)

As early as 1902–03, Taylor explored the nature of risk of the process of production. In his unpublished "Lectures on Elements of Political Economy," he divided industrial processes into two classes, Principal and Auxiliary. The former he defined as "[p]roduction in the narrow sense," a category that "includes the extracted industries such as mining, farming, grazing, lumbering and manafacturing [*sic*] industries." The "abstracted or extracted industries" are those concerned "with elementary utilities," while the manufacturing industries are concerned with "form utilities." Areas such as warehousing, transportation, and exchange he defined as "the

[1] Knight singled out Thomas Nixon Carver (1904), whose "distinction between compensation for risk-taking and the results of successful risk-taking points to the direction in which a solution of the problem is to be sought" (Knight 1921, pp. 31–32n4).

[2] Interestingly, Knight refers to the 1913 edition of Taylor's *Principles* as unpublished and nowhere in *RUP* does he reproduce passages from Taylor's book, although he cities Taylor several times throughout and with a generally approving tone. (Knight had completed his dissertation around 1917 and this explains why he did not refer to subsequent editions.)

[3] For a full account of Taylor's life and career, see Dickinson (1952).

corelating [*sic*] of produce and consumption." The latter, Auxiliary processes, are "supplemental of the principal processes," a category that includes those industries that employ the outputs of the principal industries as well as banks and financial institutions. Included in this category is "the distribution of risks incidental to all production," risks being an "inevitable" part of the process "as long as wealth exists" (Taylor 1902–03, pp. 19–20).

Consider next the nature of *rent.* Take Taylor's example of a house: "So much only is rent as is paid for the unimproved site, the rest comes under the other heads of remuneration." Interest is "[r]ent that comes from artificial wealth, produced goods," while profits are rent that derives "from the fact that a man undertakes the responsibility of owning property." Thus we have three types of rent: "true rent, pay for the site; interest, pay or reward for investing in the house and improvements; profit which is a reward for the risk taken in investing in the house" (Taylor 1902–03, p. 26).

An entrepreneur, defined by Taylor as the "agent of production which corresponds to conscious willing" (Taylor 1902–03, p. 24) assumes a "conscious responsibility" for commencement of a project, with the expectation of realizing a profit. ("The entrepreneur gets profits; the laborer wages, the landlord rent; and the capitalist interest" [Taylor 1902–03, p. 24].) The "chief constituent" of this responsibility Taylor identified with risk, which is assumed by the entrepreneur:[4]

> The man who undertakes to put the thing through has the burden of anxiety, he takes the chances of losing his effort and his whole property. And these responsibilities involve various sacrifices. We generally think of captains of industry having a pretty good thing and that he has an easy time of and that his returns are much greater than his sacrifices…. Yet there are sacrifices plainly involved and important functions performed. We often contrast the case of the inventor and the man who undetakes [sic] to exploit his invention. And it seems that there is a great hardship for sometimes the inventor gets very little and may starve to death while the exploiter may get immensely rich from the invention. … There must be some one who is willing to take the risk of its not being practical. But there are to be found many men in society who are enterprising and daring and willing to undergo the risk with the hope that the invention will be good and they will get the reward or profits. It is essential to social progress that there should be some one to take the initiative. It is very vital to the progress of society that it should be done. (Taylor 1902–03, pp. 28–29)

Later, Taylor addressed the question of insurance, one of the Auxiliary industries (Taylor 1902–03, p. 40): "The necessity for insurance grows out of the fact that there is an element of risk in human life." The element of chance is ever present, compelling actions to reduce (ontological?) uncertainty; "[W]e must all die and the time of our death is not ascertained or ascertainable." Insurance allows "the pooling of risks which results in the substitution of a small certain loss for a great risk or loss." It is this pooling of risk made possible by insurance that "reduces the elements of uncertainty." In business, the element of risk can result in diminishing productivity; as the scale of production increases, the risk increases as well. Productive efficiency can be increased, however,

[4] Taylor defined the entrepreneur broadly: "The corporation is the entrepreneur. If you are a stock holder you are a part of the entrepreneur. If you are a bond holder you are the capital" (Taylor 1902–03, p. 24).

through "integration," the formation of trusts or other combinations, which Taylor envisioned as a means to "the elimination of the element of uncertainty." Integration is merely another form of insurance. As the scale of production increases, so does the element of risk. "But when we arrange with our customers in advance and have them under one management that uncertainty disappears. It makes considerable difference in respect to industrial and commercial crises" (Taylor 1902–03, p. 55).

Withal, Taylor in his lecture notes presented what may best be described as an embryonic discussion of the functions and role of the entrepreneur but in the end failed to postulate a distinct nexus between entrepreneurial profit and the bearing of uncertainty.

III. *PRINCIPLES OF ECONOMICS* (1911)

In the first edition of his *Principles of Economics* (1911), Taylor again took up the topics of risk, uncertainty, and the role of the entrepreneur. Put simply, the entrepreneur, "the one who is responsible for the existence of the business, is the producer *par excellence.* All others engaged in the undertaking are naturally conceived as auxiliaries, as producers of services which the entrepreneur assembles, combines, into that community which is the product of the business taken as a whole" (Taylor 1911, p. 38).

> The primary, central, factor in production is *capital, viewed as the responsibility-taking element*; and so, of course, the primary, central, agent in production is the person, natural or legal, who supplies this factor, who assumes the function of responsibility-taking. Adam Smith (1776) called him the undertaker. For obvious reasons this very desirable usage is out of vogue. In its place most English-speaking writers employ the French equivalent, entrepreneur. Recently some writers have taken to using a newly-coined term, enterpriser. (Taylor 1911, p. 40)

Taylor then addressed the question as to the extent to which the term might apply. For Taylor the term is equally applicable to one "who performs the function of responsibility-taking with respect to an *old* business" as it to one who undertakes a new one. This he regarded as "a decisive objection to the statement sometimes made that profit—the remuneration of the entrepreneur—is the reward or wages of enterprise, *i.e.*, taking the risk and general responsibility of *starting new undertakings.*" It is as well an objection to the use of the term "enterpriser," as this neologism "suggests, not the entrepreneur as such, but a particular class of entrepreneurs, *viz.*, those who show enterprise—courage—in starting *new* undertakings" (Taylor 1911, pp. 40–41; emphasis in original). It is the taking of responsibility that Taylor sees as crucial to the production process. The "marginal entrepreneur" is not a risk lover but, on the contrary, is "the one who is least disposed to stay in the business, who would be the first to quit were conditions made more onerous." This suggests that "responsibility-taking must be viewed as one of the disutility costs of production—one of the *sacrifices which have to be made if production is to go on*" (p. 48; emphasis in original).

"True uncertainty" (a term not used by Taylor) or absolute unpredictability of events is the source of "pure" profit distinct from wages, interest, or ordinary rent. Taylor provides a definition of gross profits:

> Profits, as the term is frequently used by the general public, include the *whole* net return to the responsible owner of a business, i.e., the whole return after money outlay has been deducted from money receipts. This whole return, which we might call Gross Profits, usually includes at least three elements, (1) wages of some sort, principally for management, (2) interest on capital invested, and (3) a remuneration for *taking the responsibility* of production, and *making certain final decisions which necessarily fall to the owner.* (Taylor 1911, p. 304; emphasis in original)

He then separates contractual income and payments from residual claims on uncertain revenues; that is, the entrepreneurial function of uncertainty-bearing earns the residual profit after labor and inputs are paid contractually:

> In economics, however, we often find it convenient to limit profits to the third element, the taking of responsibility and making final decisions. From this point of view, profits in the case above would be only three per cent, i.e., the difference between what the capital would have received if lent to the company and what it actually did receive as invested in the business. Profit, in this sense, we will call Pure Profits or Profits Proper. (Taylor 1911, p. 305)

Pure profit—"the difference between what the capital would have received if lent to the company and what it actually did receive as invested in the business"—is "something more than a remuneration for assuming economic risk; for assuming economic risk is not the only disutility or sacrifice connected with the taking of responsibility," although it is certainly "the chief element in the case." Here Taylor introduced the concept of true risk:

> That risk for the bearing of which profits are paid must not be confused with the regular recurring—calculable—losses of a business. Such losses simply increase the outlay for labor and capital goods. The remuneration received by the entrepreneur because of such losses would never be thought of as profits, but only as replacing of costs. The risk for which profits are paid is the risk of losses which cannot be recouped in the experience of the individual *entrepreneur*,—risks of total failure, or some loss almost as great. Compare the breakage of bottles in the brewery business with the chance that temperance legislation will destroy the business. The former is covered by greater outlay. The latter is a not-to-be-compensated loss. It cannot be met by any fund, unless brewers co-operate to insure one another, i.e., unless competition is replaced by consolidation. Here we have a *true risk*,—a case where there is a real danger of real loss. To induce men to assume such a risk, they must be paid something, not of course enough to cover the loss if the risk should become a certainty, but enough to *move their wills*, to induce them to assume the risk. It is thus evident that profits must not be conceived as a contribution to an insurance fund from which losses are covered. There is no such fund; the losses are not covered. (Taylor 1911, pp. 305–306; emphasis in original)

Taylor is here proposing a distinction between the "calculable" risks of business and those risks that of their own nature cannot be "recouped in the experience of the individual *entrepreneur*." These latter risks are incalculable; no statistical estimates can be made. To illustrate his point, he drew upon the famous example brought by the French economist Hans Karl Emil von Mangoldt (1855) on the bursting of champagne bottles (albeit without direct reference to Mangoldt). Interestingly, Knight made use of the same example. These regularly recurring incidents do not introduce "an uncertainty or hazard" into the production of champagne, Knight wrote, "since in the operations of any producer a practically constant and known proportion of the bottles burst." The breakage of bottles thus becomes a predictable event, and "the loss becomes a fixed cost in the industry and is passed on to the consumer, like the outlays for labor materials or any other" (Knight 1921, p. 213). Although Mangoldt has recognized that some risks are insurable, Knight lamented, he provided "no explanation of the fact" (p. 44n4),[5] and so missed the decisive connection between pure profit and uncertainty.[6] Taylor, instead, was right on the Knightian track. His juxtaposition of a predictable occurrence, as in the case of the failure of champagne bottles, to an event for which numerical probabilities are not available, such as the enacting of temperance legislation, points toward Knight's distinction between risk and uncertainty.

Taylor concluded his discussion of profits by offering three considerations that allow us to assess his position better. First, he speculated that, under socialism, "the sort of risk now remunerated by profits would in the main be covered by an insurance fund." The state, acting as a "complete" monopolist of production, "would pool in its own hands all risks," so that the "risk cost of production" would be converted into known fixed labor and capital costs. Even in this case, however, the "price of the psychological disutility of undertaking risks" would not be reduced to zero, especially in the case of "long time enterprises undertaken for future generations" (Taylor 1911, p. 306).

Second, Taylor considered whether pure profit could be accounted for in terms of the marginal contribution of the entrepreneur. On the one hand, he allowed that profits are to some extent proportional to the utility provided by risk bearers as a class. "Thus," he argued, "all must admit that those persons who initiate a commercially dubious, but socially important, enterprise perform a greater service than those who carry on the same in later years when success is assured" (Taylor 1911, p. 308). On the other hand, Taylor cautioned, in the case of profits the correspondence between the reward and the service rendered is far more difficult to determine than in the case of wages and interest. Competition is largely a game and "profits have not a little resemblance to *prizes*."[7] In the end "[m]any persons get nothing; a few get large rewards," and, "[u]nder these conditions, we can scarcely expect profits to express with great precision the contribution of the profit-receiver." In the case of "Ordinary Profits of the necessary sort, if they exist at all," they will "tend to express the marginal contribution of the entrepreneurs."[8]

[5] Mangoldt, however, had used the example to distinguish between mere irregularities and economic risks rather than between insurable and non-insurable risk.

[6] Knight credited Mangoldt with having produced "[a] most careful and exhaustive analysis of profit." Specifically, Mangoldt, according to Knight, divided the income of the business into "a premium on those risks which are of such a nature that he cannot shift them by insurance," the interest and wages of the entrepreneur, and entrepreneurial rent (Knight 1921, p. 27).

[7] It should be noted that Knight (1921, p. 286) himself equated economic competition to a game. See also his discussion in "The Ethics of Competition": "Industry and trade is a competitive game, in which men engage in part from the same motives as in other games or sports. This is not a matter of want-satisfaction in any direct or economic sense; the 'rewards' of successful participation in the game are not wanted for any satisfying power dependent on any quality which they possess as things, but simply as insignia of success in the game, like the ribbons, medals, and the like which are conferred in other sorts of contests" (Knight 1923, p. 586). Taylor made a further point. If economic behavior resembles the spirit of a game, profit as a status-bearing prize must be conceived in relative terms. This implies that competition can become a zero-sum game: "Gaining a prize is not worth while, if almost all the contestants gain prizes" (Taylor 1911, p. 338). On Knight, see Ross Emmett (1994).

[8] Taylor defined ordinary profits as "the profits realized in well-established lines of business wherein no considerable amount of risk is involved (Taylor 1911, p. 307).

In this scenario "the elements of change and uncertainty are reduced to a minimum; so that the economic processes which tend automatically to secure each factor a share representing its contribution to the joint product, have ample time to work themselves out" (p. 310). With respect to Necessary profits,

> it seems certain that these must express with fair precision the marginal disutility involved in supplying the entrepreneur service. (1) The demand of the public must insure for the product involved a price high enough to cover the disutility undergone by the entrepreneur; since otherwise production will cease, supply will fall off, and so price will rise. (2) The competition of entrepreneurs will keep price from going higher than the above point; since their numbers can be recruited at all times from those capitalists who merely furnish waiting power, i.e., *lend* their capital rather than invest it. (Taylor 1911, p. 311; emphasis in original)

Here Taylor embraced a position not taken by Knight, as he posited a supply and demand relation of entrepreneurs, treating them much as he would any other factor of production.

Taylor did not accept as a "valid objection to the application of the disutility principle" with respect to profits "that there is *too much chance* involved in these cases to insure any particular result," as it "fails to recognize the real nature of the responsibility-taking disutility." The risk (or "disutility") of "responsibility-taking," noted Taylor,

> is not expressed by the term "insure." According to that theory risk comes in, not as a chance of loss to be covered by insurance, but as a chance of loss not to be covered at all. The taking of such chances involves a disutility. To induce men to incur that disutility, a prize, or bonus, of larger or smaller magnitude, must be attainable in case of success. The size of that bonus is roughly proportioned to the risk, though the unit of variation is very different for different races; and, having been fixed, it must be covered in the price of the product. (Taylor 1911, p. 312; emphasis in original)

Taylor in this passage acknowledged that the special type of risks encountered by the entrepreneur as responsibility-taker differ from the ordinary risks not in terms of the "quantity" of uncertainty involved or according to the dimension of the loss that could manifest but on the ground of the different ontological nature of the events taken into consideration.

The third consideration as well revolved around the persistence of "pure profit." One of the arguments for the proposition that "pure profits" will in time "tend to disappear" is that, as they are payments for the assumption of risk, then, with the elimination of risk, such profits will no longer accrue. This Taylor readily affirmed. However, that assumes the possibility that risk will in fact over time disappear. This argument Taylor finds dubious, as

> it seems sufficient to declare that the complete disappearance of risk, chance, uncertainty from industrial affairs, if not quite impossible, is certainly so remote that it can not properly be made the basis for any affirmations with respect to the present order. Some centuries hence we may have become able to predict the weather for a year in advance with absolute precision, but we shall still have to reckon with the uncertainties due to human folly and caprice. (Taylor 1911, p. 312)

In the discussion of rent, Taylor considered the necessity of change as a required but not sufficient condition for the emergence of pure profit:

> If the prospects of change do not involve serious uncertainty, the case is little different from an unchanging one. A pretty certain prospect of increasing income will cause a corresponding rise in the capitalization, and *vice versa.* Where there is much uncertainty and, so, much risk, this fact will be treated as a diminution of the net income, and, in consequence, the capitalization and, so, the disutility assumed will be lowered. (Taylor 1911, p. 317)

This is very similar to Knight's contention that the crucial flaw in John Bates Clark's dynamic theory of profit was that it overlooked the fundamental difference between a foreseen change within a reasonable time and an unforeseen change.[9]

IV. *PRINCIPLES OF ECONOMICS*, FOURTH EDITION (1916)

Taylor's discussion of profits remained substantially unaltered until the fourth edition of the Principles (1916), where we find a more systematic discussion of the functions of the entrepreneur. Taylor criticized those economists who view the managing of a business as the distinguishing function of the entrepreneur. "The decisive consideration," he speculated, "is that many entrepreneurs almost entirely hire their managing done, just as they hire stoking, engineering, book-keeping, etc., done." Accordingly, "managing takes its place as one of the many kinds of *labor necessary* to a business, and the men who do it are only a higher sort of laborers." Yet, all this does not deprive the entrepreneur of an essential "*residuum of managing*," which cannot be delegated to others. Responsible control requires in fact wise judgment not only about certain "final decisions" the outcomes of which could only be estimated but also about the hiring of "at least … one or more leading members of the managerial force" (Taylor 1916, p. 43; emphasis in original). Taylor then turned his attention to the corporation, the legal structure of which allows the separation of operational control from the enterprise's ownership. Who would in this case fulfill the function played by the entrepreneur in the classic sole proprietorship case? Taylor answered:

> The corporation acting through its usual organs, president, secretary, general manager, *etc.*, can not be the entrepreneur; since these organs are created by a more fundamental power, the board of directors. Again, the corporation acting through the board of directors, can not be the real entrepreneur; since that body is created by a more fundamental power, the general meeting of stockholders. When at last we reach the general body of stockholders, acting in the way prescribed by their charter for the determination of fundamental questions, we are in the presence of something, which

[9] "No *a priori* argument is necessary to prove that with general foreknowledge of progressive changes no losses and no chance to make profits will arise out of them. This is the first principle of speculation, and is particularly familiar in the capitalization of the anticipated increase in the value of land. The effect of any change which can be foreseen will be adequately discounted in advance, any 'costs' connected with it will be affected in exactly the same way as the corresponding 'values' and no separation between the two will take place" (Knight 1921, p. 36).

> from some standpoints, may fairly be called ultimate,—there is nothing behind to determine its action. This general body of stockholders, therefore, may put up a fairly good claim to the title of entrepreneur. (Taylor 1916, p. 43)

The idea that entrepreneurship rests with investors as individuals, Taylor immediately rectified, "is particularly true at the *starting* of corporate undertakings," when the core issue is whether or not the business shall be carried on at all. As complexity increases, some stockholders become "formally organized" so to acquire leadership by controlling a plurality of voting stock. This creates a cadre of corporate owners who serve as "elements in the joint entrepreneur," together with the officials they appoint (Taylor 1916, pp. 43, 45). Knight (1921, pp. 358–359) likely would have agreed with Taylor here. He held that most stockholders are absentee owners who do not interact with the firm except to collect dividends. There is, however, a "small group of 'insiders'" among stockholders, "the real owners of the business," who take responsibility for the direction of the firm, also exposing their own capital at risk. Like Taylor, Knight affirmed that these "insiders," together with the higher salaried managers, are the ones who "venture" (p. 269) and carry out the role of an entrepreneur.[10]

V. *PRINCIPLES OF ECONOMICS*, SIXTH EDITION (1919)

Taylor expanded his discussion of risk and entrepreneurship further in subsequent editions of the *Principles.* In the sixth edition (1919), he added an entire chapter on "Speculative Trading and Insurance" (pp. 351–365). The first paragraph of that section restates Taylor's views on risk and the nature of entrepreneurial profit:

> It must be manifest by this time that risk, the risk of loss, both physical and economic, is an ever-present element in economic life. There is constant danger that goods shall undergo physical destruction or deterioration, and danger that the value—the economic significance—of goods shall decline. Now these risks being ineradicable elements in economic life, individuals, or society as a whole, must in some way bear them. As has already been brought out again and again, a large number of the risks incident to productive activity are borne by the central figure in production, the entrepreneur. It has indeed been maintained by some writers that not only the entrepreneur's greatest, but his only, function is the assumption of the risk of production. The position on this point taken in the present text has been somewhat less extreme. We recognize that the assumption of the responsibility of production involves some other burdens as well as risk-taking, including some very general types of labor. Nevertheless it must be admitted that the chief part of the entrepreneur's task or function is to bear risk. (Taylor 1919, p. 351)

Taylor portrayed insurance as transfers of risk between agents, and he was explicit in conceptualizing the business practice of insurance as covering only calculable risk, not

[10] Our interpretation here is indebted to Emmett (2011), who provides an excellent discussion of Knight's views of entrepreneurial control and responsibility in the context of corporate firms.

unmeasurable events.[11] Ultimately, Taylor wrote, "[r]isk cannot be eliminated from economic relations. It must be borne. Our only freedom of choice concerns the *method* of bearing it. Insurance is surely the best one yet devised" (Taylor 1919, p. 365; emphasis in original). His treatment of speculation was far more original. Taylor looked at speculation as a productive form of economic activity "akin to the function of the entrepreneur in that it assumes non-calculable risks." Yet, he continued, it is different because it separates risk from ownership, "whereas the distinctive mark of the risk-bearing of the entrepreneur is that he assumes that burden by the process of *becoming* the *owner* of the goods" (p. 352; emphasis in original).

Speculation serves two primary functions. First, price risk is transferred from those seeking to reduce it to others willing to assume it in hopes of making a profit. In the example offered by Taylor, the flour producer can hedge against an unfavorable change in the price of wheat by selling wheat futures to lock in the selling price.[12] In so doing "[h]e is thus limited to what he calls legitimate business, the milling business, the turning of wheat into flour … and leaves other people [brokers] to speculate in wheat" (Taylor 1919, p. 359). Second, speculation contributes to the prediction and determination of the "right price" (p. 357) in the market. As Taylor explained:

> As already so often remarked, price is the pre-eminent regulative mechanism of the present economic order. And we mean by *right price* that price which will regulate economic activity in accord with the demands of the situation as a whole. Now it is manifestly of the utmost importance that the right price should prevail. If there is likely to be a diminution of the acreage put into wheat because of the outbreak of the great war it is highly important that something should happen to induce countries unaffected by the war to increase the amount of wheat which they raise. But of course nothing can contribute so effectively to this result as an advance in the price of wheat, and that an early advance. But again nothing can so surely bring about this much-needed result as the efficient working of a great speculative market. (Taylor 1919, pp. 360–361; emphasis in original)

Speculators can estimate future prices because they are "men of exceptional capacity, keenness, and knowledge, furnished with every facility for getting information regarding the probabilities of demand and production in all parts of the world" (Taylor 1919, p. 361). On this matter, we find again Knight aligned with Taylor:

> The most important instrument in modern economic society for the specialization of uncertainty, after the institution of free enterprise itself, is *Speculation.* This phenomenon also combines different principles, and the mere specialization of uncertainty-

[11] "[T]he insurance principle can be used wherever risks are fairly *calculable.* If we can prove statistically that, when any large body of losses are taken together, the per cent. of loss is only moderately high, and fairly regular, insurance is feasible. Doubtless this is a somewhat vague rule; but it has answered in the building up of great businesses. With the improvements in statistical art, and the enlargement of the pools, it has been possible to extend the operation of this industry more and more widely; and doubtless we have not yet seen the end of its development" (Taylor 1919, pp. 363–364).

[12] Taylor may have been influenced by Henry Crosby Emery (1896, 1900), professor of political economy at Bowdoin and Yale, who had equated hedging to buying insurance. Curiously enough, neither Taylor nor Knight refers to Emery's works. There is virtually no reference to other writers in Taylor's *Principles.*

> bearing in the hands of persons most willing to assume the function is probably among the lesser rather than the greater sources of gain. (Knight 1921, p. 255)

Knight saw speculation as an instrument for the "specialization and actual reduction of uncertainty," and he spoke of "professional speculators" as a class of experts who enable the industrial producer to "eliminate the chance of loss or gain due to changes in the value of materials used in his operations" (Knight 1921, p. 256). Knight followed Taylor in mentioning the use of hedging contracts as the "typical illustration to show the advantage of organized speculation to business at large."[13] As importantly, again echoing Taylor, Knight asserted that speculation could reduce uncertainty (and not merely transfer it), providing for an increased capacity for prediction: "One of the principal gains through organized speculation is the provision of information on business conditions, making possible more intelligent forecasting of market changes" (p. 260).

VI. *PRINCIPLES OF ECONOMICS*, LAST EDITIONS (1923, 1925)

In the last two editions of the *Principles* (1923, 1925) Taylor brought some final additions to his analysis of the role of the entrepreneur. In a new section on Function of Entrepreneur Complex (in chapter VI: "The Different Agents in Production"), Taylor moved a step beyond the definition of entrepreneurship as responsibility-bearing, broadly conceived. This time he placed more emphasis on the composite nature of entrepreneurship. The entrepreneur as such cannot disengage from functions that, for their nature, appear to be associated with either labor or capital. As to labor, Taylor reiterated that the entrepreneur can "escape" certain duties, such as the appointing the higher management of his firm, only by emptying his role of any distinctive significance. The entrepreneur cannot delegate these "responsibility-bearing" tasks to salaried managers, "for these acts … are inseparable from his functioning as entrepreneur; in performing them he is not less, but rather more, of an entrepreneur" (Taylor 1923, p. 84).

A similar complication emerges with capital. As a rule, Taylor stated, an entrepreneur invests some of his own resources into the firm and, in this respect, "he may be thought of as both capitalist and entrepreneur." As a capitalist he is providing part of the service of "waiting" necessary to production, and accordingly he should receive interest on his capital just as he must pay it to any bondholder. But, Taylor continued, "the same capital serves in part as the basis of his power to perform his distinctive office as entrepreneur." In addition to the interest he receives as a mere capitalist, the capital invested entitles the entrepreneur to a remuneration for his assumption of risk. In Taylor's words, "in respect to that portion of the capital which he himself supplies, he is both capitalist and entrepreneur, and gets pay for both types of service" (Taylor 1923, pp. 84–85).[14]

[13] As Chris Clarke (2021, p. 976) has recently observed, "Knight has a precise understanding of speculation, distinct from the term that became a target of criticism as a form of economic activity detached from, or even harmful to, productive activity."

[14] Knight has been interpreted as holding the exact same position. As J. Fred Weston put it: "[t]he owner-manager … , according to Knight, carries on entrepreneurial functions, but he is, in addition, a capitalist or owner of capital goods and he is a manager, engaged in operating the business concern" (Weston 1949, p. 143).

VII. FINAL CONSIDERATIONS

Compared with Knight's, Taylor's ruminations on entrepreneurship were fragmentary and far from systematic. His "textbook" approach was often schematic and, more importantly, it lacked a careful statement of the conditions defining perfect competition—an aspect to which Knight devoted the first part of his dissertation. Seen in retrospect, however, Taylor reveals some interesting parallels with Knight, and Knight himself included him among those who "have seen the importance of a critical dissection of the risk concept" (Knight 1921, p. 32). The evidence brought in this article shows that the two men converged (at least) in two main respects.

First, Taylor had a clear understanding of the difference between calculable and incalculable risks, and offered a theory of profit linking this distinction to entrepreneurial activity. As did Knight, Taylor saw the entrepreneur as the agent who assumes responsibility, i.e., who faces uncertainty and demonstrates "judgment and foresight" in recognizing "good opportunities" and in the hiring of suitable managers (Taylor 1923, p. 132). Pure profit, the entrepreneur's return, is the residual between revenue and imputable costs, and does not include the reward for bearing predictable hazards. To make this point, Taylor (exactly as Knight) referred to Mangoldt's example of the probability of champagne bottle breakages during production.

Second, Taylor and Knight converged to the idea that entrepreneurial responsibility cannot be fully separated from control. The entrepreneur-owner can hire the director-manager, they both recognized, but he retains an irreducible "residuum of managing," which makes her/him the ultimate bearer of the risk of failure or error. In the large joint-stock company, Taylor asserted, the "organized" shareholders function as a collective entrepreneur and the dividends they receive also contain an element of wages and interest. Knight held the same views, although his discussion was far more articulate and extended.

This said, it is virtually impossible to assess whether and to what extent Taylor may have exercised a direct influence on Knight, or, for that matter, whether Knight had any influence on Taylor—after all, *RUP* was published in 1921, while Taylor continued updating his *Principles* through 1925. Archival research has revealed no correspondence between the two. In *Risk, Uncertainty, and Profit*, Knight did not go beyond a few passing appreciations of Taylor, and he never quoted directly from Taylor's *Principles* —even those passages that were clearly supportive of his position. A few years later, in his famous essay "The Ethics of Competition" (1923, p. 598n8), Knight dropped another footnote reference to Taylor as a supporter of "equal sharing" as the ideal basis of distribution, but he refrained from making any comment. More significant is the fact that in 1934 Knight authored the entry on Taylor for the *Encyclopaedia of the Social Sciences.* Knight described him as one who "followed the neoclassical economic theory, but with a strong Austrian bias," yet he was silent on Taylor's views on risk and entrepreneurship. Knight's admiration came to the surface when he asserted that Taylor's influence in economics was "extensive and profound" and not limited to the United States. Knight continued:

> His contribution went far beyond the doctrine expounded to the communication of a deep respect for both the vital importance and the strenuous difficulty of correct analytical thinking in the study of economics. Taylor feigned no charitable feeling for

> carelessness or stupidity, and this attitude at times gave him a somewhat stern demeanor; yet he was to an extraordinary degree loved as well as respected by all who knew him. (Knight 1934, p. 541)

Not too ironically, one cannot help but notice that these words would also be fitting for Knight himself.[15]

COMPETING INTERESTS

The author declares no competing interests exist.

REFERENCES

Carver, Thomas Nixon. 1904. *The Distribution of Wealth*. London: Macmillan.

Clark, John Bates. 1899. *The Distribution of Wealth: A Theory of Wages, Interest, and Profits*. New York: Macmillan.

Clarke, Chris. 2021. "The Legacy of Frank H. Knight for the Politics of Financial Governance." *Journal of Institutional Economics* 17 (6): 973–987.

Dickinson, Zenas Clark. 1952. "Fred M. Taylor." *Michigan Alumnus Quarterly Review* 59, 10 (Dec. 6): 48–61.

Emery, Henry C. 1896. *Speculation on the Stock and Produce Exchanges of the United States*. New York: Columbia University Press.

———. 1900. "The Place of the Speculator in the Theory of Distribution." *Publications of the American Economic Association* 1 (1): 103–122.

Emmett, Ross B. 1994. "Maximizers versus Good Sports: Frank Knight's Curious Understanding of Exchange Behavior." *History of Political Economy* 26 (Suppl.): 276–292.

———. 2011. "Frank H. Knight on the 'Entrepreneur Function' in Modern Enterprise." *Seattle University Law Review* 34 (4): 1139–1154.

Hamilton, Walton. 1925. "Professor Fred M. Taylor Honored." *Michigan Alumnus* 31 (36): 815–816.

Hawley, Frederick B. 1907. *Enterprise and the Productive Process*. New York: G. P. Putnam's Sons.

Knight, Bruce. 1952. "The Ballad of 'Right Price.'" *Michigan Business Review* 4 (6): 24–25.

Knight, Frank H. 1921. *Risk, Uncertainty, and Profit*. Boston: Houghton Mifflin.

———. 1923. "The Ethics of Competition." *Quarterly Journal of Economics* 37 (4): 579–624.

———. 1934. "Taylor, Fred Manville (1855–1932)." *Encyclopaedia of the Social Sciences*. Volume 14. New York: Macmillan Co., pp. 541–542.

Mangoldt, Hans Karl Emil von. 1855. *Die Lehre vom Unternehmergewinn: Ein Beitrag zur Volkswirtschaftslehre*. Leipzig: B. G. Teubner.

Smith, Adam. 1776. *An Inquiry Into the Nature and Causes of the Wealth of Nations*. London: W. Strahan and T. Cadell.

Taylor, Fred M. 1902–03. "Lectures on Elements of Political Economy." (Reported by C. G. McCollom.) Ann Arbor, MI: University of Michigan. Lectures on Elements of Political Economy - Fred Manville Taylor - Google Books. https://books.google.ca/books?id=honmAAAAMAAJ&printsec=frontcover&dq=taylor,+lectures+on+elements+of+political+economy&hl=en&newbks=1&newbks_redir=0&sa=

[15] Knight's brother Bruce penned a poem in Taylor's honor, which appeared in the *Michigan Business Review* (Bruce Knight 1952). We are indebted to Ross Emmett for the citation. Bruce was pursuing his MA in economics at Michigan at the time Taylor was teaching.

X&redir_esc=y#v=onepage&q=taylor%2C%20lectures%20on%20elements%20of%20political%20economy&f=false. Accessed January 1, 2024.
———. 1911. *Principles of Economics*. First edition. Ann Arbor, MI: University of Michigan.
———. 1916. *Principles of Economics*. Fourth edition. Ann Arbor, MI: University of Michigan.
———. 1919. *Principles of Economics*. Sixth edition. Ann Arbor, MI: University of Michigan.
———. 1923. *Principles of Economics*. Eighth edition. New York: The Ronald Press Co.
———. 1925. *Principles of Economics*. Ninth edition. New York: The Ronald Press Co.
Weston, J. Fred. 1949. "Enterprise and Profit." *Journal of Business of the University of Chicago* 22 (3): 141–159.