

Marshall's Views on Savings as an Individual Demand Concept*

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references

Marshall's *Principles*, Bk. 4, Ch. 7, contained some ideas on how the "demand-price of accumulation" (p_A) played a role in the individual's savings function. What later writers such as Keynes have consistently regarded as a straightforward supply function for aggregate personal savings, with the market interest rate as the primary argument, was instead formulated by Marshall as an inverse relation between personal savings and a subjective opportunity cost p_A , which measured the sacrifice of savers: "abstainers" or "waiters", in the short period. Assuming the interest rate given, Marshall was attempting to illustrate an equilibrium for the consumer based on the trade-off between the consumption of an identical good in the present and in the future; he was not trying to show how the rate of discount was determined.

1. Marshall's Ideas on Savings Were Not Clearly Stated

Marshall's theory of savings seems to be a settled issue among historians of economic thought. His theory is generally described in such a way that the supply of savings is a positive function of the market interest rate, in accordance with "the classical theory of the rate of interest", the title of *The General Theory*, Ch. 14 (Keynes 1936): "Just as the price of a commodity is necessarily fixed at that point where the demand for it is equal to the supply, so the rate of interest necessarily comes to rest under the play of market forces at the point where the amount of investment [demanded] at that rate of interest is equal to the amount of saving [supplied] at that rate" (*ibid.*, p. 175). The macro classical tradition of interest determination, like the micro "Marshallian cross" price determination concept, was supposed to have held that the market interest rate was determined by a positively-sloped, but aggregate, savings supply function intersecting a negatively-sloped aggregate investment demand function; moreover, Marshall's theory of interest was representative of it. Marshall was supposed to have believed that in the aggregate economy, the interest rate was the equilibrium price which equated the total supply with the total demand for investible funds. But, even though Keynes described Marshall's ideas on savings in this way: "[...]savings represents the supply [of investible resources], whilst the rate of interest is the 'price' of investible resources" (*ibid.*), he qualified this interpretation of Marshall's theory of savings by making the following well-known statement just below on the same page: "The above is not to be found in Marshall's *Principles* in so many words. Yet his theory seems to be this and it is what I myself was brought up on and what I taught for many years to others" (*ibid.*). It will be shown that Marshall's theory of interest was not necessarily "this" because, in Bk. 4 of the *Principles*, he focused on the savings function of an individual, not of a nation. Furthermore, he used the concept of "demand price", not of supply price, to be the principal cause variable associated with the sacrifice of savings.

Marshall did not consistently assert throughout the *Principles* that the nation's savings curve would be positively sloped, with the market interest rate as its major cause. A major misconception of modern

economics is that such an unqualified savings function existed in Marshall's *Principles*. Evidence which shows that Marshall did not put forward a clearcut savings function may be found scattered throughout the *Principles*, in statements such as this: "[a] strong balance of evidence seems to rest with the opinion that a rise in the rate of interest, or *demand-price for saving*, tends to increase the volume of saving" (Marshall 1920, Bk. 6, Ch. 2, p. 534; emphasis mine). Note the reference to "demand-price", which interpreters of the classical theory of interest, including Keynes, have regarded as a supply concept in Marshall. This suggests the point, missing from the literature, that Marshall wished to use his theory of individual demand to formulate a theory of savings. Marshall did not have the idea firmly entrenched in his theory that savings was merely an aggregate supply concept. Savings as a supply function with respect to the market interest rate existed in the *Principles*, side by side with the description of savings as an individual demand concept. The latter was emphasized mainly in Bk. 4, Ch. 7: "The Growth of Wealth", where the "demand price of accumulation" was regarded as a major cause of savings.

Besides the lack of a clearcut macro savings function, Marshall's *Principles* also never made it clear whether variations in savings were taking place in the short or the long period (see Bliss 1990, esp. sec. 3, pp. 232-37). The long period description of interest rate determination was given in Bk. 6, Ch. 2, where equilibrium in the capital market determined interest and the supply of the capital stock was funded, overtime, from the periodic savings flow. The savings function, in this case, may be regarded as an aggregate concept: "Thus then interest, being the price paid for the use of capital in any market, tends toward an equilibrium level such that the aggregate demand for capital in that market at that rate of interest, is equal to the aggregate stock forthcoming there at that rate" (Marshall 1920, p. 534).

Various interpreters of Marshall have regarded his long-run interest theory based on the supply/demand of capital as his main theory and, therefore, the positively-sloped aggregate supply of savings function implicit in it, as his main theory of savings. For example: "According to the classical argument, the rate of interest is determined by the supply and demand for 'capital', which transaction is effected through the medium of money. The supply of 'capital' comes from savings and therefore depends on the level of income as well as the willingness of wealth-owners to postpone current consumption, or 'waiting' [...] the higher the rate of interest, the greater the quantity of 'capital' normally supplied" (Ahiakpor 1990, p. 513)(1).

This paper will focus instead on how Marshall used the opportunity cost of capital accumulation and the interest rate to help explain the proportion of income which would be consumed in the current short-run period vs. the proportion which would be consumed in the future and saved in the present. Savings, it will be shown, was primarily an individual, not an aggregate concept because variations in it were explained as taking place by using rationalizations common to the theory of a consumer's demand function. Furthermore, even though Marshall did not create in his short-run analysis of savings an equilibrium explanation for the interest rate(2), it will be shown that the interest rate was still brought in, but as an exogenously-given variable which may be used to discount the future marginal utility of consumption, so that an equilibrium for the consumer/saver may be established. The question that will still come up, however, is how strong an independent influence the interest rate on savings was.

Stigler did not think it too strong: "Marshall implies [...] that interest is one of the leading *sources* of savings, and this is indeed the only obvious important direct relationship between savings and the rate of interest" (Stigler 1941, pp. 103-04; emphasis Stigler's). The implication was that this relationship in Marshall was a weak one. Further on, "savings are found – with the many qualifications mentioned above – to be functionally related to the interest rate" (*ibid.*, p. 107), and also: "The functional relationship between the interest rate and saving has a nebulous empirical existence" (*ibid.*). The sum of these opinions by this chief interpreter was that Marshall did not state a clear and positive relationship between interest and the supply of savings in his *Principles*. It will be illustrated that one of the reasons why this relationship was fuzzy was that Marshall believed that, in the short period, savings

would be mainly influenced by their implicit demand price.

Marshall differed from many earlier 19th century writers, who took the approach that savings emanated mainly from the business sector. When business savings were discussed, profits, rather than the interest rate, were invariably regarded as their main cause, since businesses saved by retaining part of current profits(3). Marshall did not continue this tradition of the first half of the 19th century, which involved quite a bit more emphasis on the business, rather than the personal, sector as the source of savings(4). Marshall also never bothered to aggregate savers together to form a clear macro-personal-savings-function; Marshall's theory of savings in the short period was formulated at the micro-level.

2. Savings Equals Voluntary Waiting by Rich People

Marshall discussed savings as part of the "Growth of Wealth" in Bk. 4, Ch. 7 of the *Principles*: savings was synonymous with "abstinence". He described previous economists' use of this term as "the sacrifice of present pleasure for the sake of future" (*ibid.*, p. 232)(5). But, he clarified the term to mean "that, when a *person* abstained from consuming anything which he had the power of consuming, with the purpose of increasing his resources in the future, his abstinence from that particular act of consumption increased the accumulation of wealth" (*ibid.*, p. 233, emphasis mine). Thus, there was a relation implied between abstinence and "personal" savings, with the added, over-simple proviso that such savings would automatically lead to an increase in the stock of wealth (or capital) in the long period. In fact, the relation between savings and the increase in the stock of capital was so automatic that it was not necessary even to mention that postponing current consumption would mean that savings had occurred. Instead, it was implicitly assumed that resources not consumed in the current period would be inevitably transformed into capital. Since the interest rate was disregarded as an allocation mechanism during the formation of wealth, Marshall believed in a simple version of Say's identity, at least in his *Principles*, Bk. 4. And, it is not "a misinterpretation to read the classical [Marshallian] theory as suggesting that savings and investment-demand are always equal; hence the rate of interest cannot be determined in this theory or it cannot coordinate investment decisions" (Ahiakpor 1990, p. 514).

Marshall believed that "the greatest accumulators of wealth" were "very rich persons", who "do not practice abstinence in that sense of the term in which it is convertible with abstemiousness" (Marshall 1920, pp. 232-33; see also p. 229). In order to clarify how savings led to the growth of wealth, Marshall wished to avoid altogether the use of the inappropriate term "abstinence", because it was "liable to be misunderstood"; he replaced it with the term "waiting", because this term highlighted a man's "faculty of realizing the future" (*ibid.*, p. 233), and the process of waiting was also of paramount importance during the creation of future additions to the capital stock. Furthermore, Marshall left unsaid the obvious fact that rich people could afford to wait much more easily than poor – or moderate – income people.

Marshall's idea that the clearer term *waiting* should replace abstinence as part of the process of capital accumulation was attributed to Macvane (1887)(6). Macvane, in turn, credited his ideas on waiting (*ibid.*, p. 482) to Cairnes (1874, p. 87) who described "the sacrifice" of abstinence to "be measured by the quantity of wealth abstained from, taken in conjunction with the risk incurred, and multiplied by the duration of the abstinence"(7). Macvane believed that waiting, rather than abstinence, should be regarded as "the only real element in cost of production", "apart from the necessary labor and risks" (Macvane 1887, p. 483). For Macvane, labor and waiting were "the two main elements of cost of production" (*ibid.*, p. 484).

Cairnes' term "quantity of wealth abstained from" was applied by Marshall to waiting on an individual level, a postponement of current consumption (personal savings). By the late 19th century, Marshall felt that the personal sector, as represented by "the earnings of professional men and hired workers are

an important source of accumulation" (Marshall 1920, p. 229). By focusing on personal savings (voluntarily not spending all one's earnings), Marshall was able to place the individual (a representative of the personal sector) as the driving force behind a nation's ability to increase the size of its capital stock and to grow. Alternatively, Marshall's ideas on capital accumulation did not attach much importance to the business sector, which would instead add to the size of the capital stock by sacrificing current for larger future profits(8).

Marshall even went so far as to contrast his views on who saved with the ideas of the major writers of the first half of the 19th century, who emphasized in fact the business sector as a significant source of savings: "[...] early in the present century, the commercial classes in England had much more saving habits than either the country gentlemen or the working classes. These causes combined to make English economists of the last generation regard savings as made almost exclusively from the profits of capital" (*ibid.*). In disagreeing with this view, Marshall declared that "they [wealthy(9) professional men and workers] have been the chief source of it [accumulation] in all the earlier stages of civilization" (*ibid.*); from this, he reached the following bold conclusion: "we may conclude [...] that any change in the distribution of wealth which gives more to the wage receivers(10) and less to the capitalists [businesses] is likely, other things being equal, to hasten the increase of material production, and that it will not perceptibly retard the storing up of material wealth" (*ibid.*, pp. 229-30). So, Marshall's thinking on how changes in the distribution of income could encourage economic growth in the late 19th century emphasized the personal, while it de-emphasized the business sector (capitalists), as the main source of productive savings. This also meant that "wage receivers" (part of the personal, not the business, sector) would be the principal source of investible funds(11).

Marshall's *Principles*, Bk. 4, Ch. 7, therefore chose two groups, "waiters" and "workers"(12), as the main facilitators of capital accumulation for the economy. Waiters were the abstainers or the savers. The other group that helped facilitate accumulation was the one which would actually make the improvements in production which involved the creation of capital(13). Marshall cryptically referred to the latter group as "workers"(14), rather than "investors", although he qualified this description in the following manner:

It matters not for our immediate purpose whether the power over the enjoyment for which the person waits, was earned by him directly by labour, which is the original source of nearly all enjoyment; or was acquired by him from others [...] the growth of wealth involves in general a deliberate waiting for a pleasure which a person has [...] the power of commanding in the immediate present, and that his willingness so to wait depends on his habit of vividly realizing the future and providing for it (*ibid.*, pp. 233-34).

Thus, "working" meant more than simply laboring; it also meant helping wealth to grow by acquiring from "others" the "power over the enjoyment" of a product. This could be done if an individual business owner borrowed funds directly from an individual saver/waiter. Thus, Marshall broadened the concept of working, to the demand for loanable funds for investment by an expanding business. "Workers" were identified as "investors/capitalists" who allocated individual savings. The supply of loanable funds was derived directly from individual savers or waiters, not banks.

Bk. 4, Ch. 7, sec. 8, even suggested that "waiting" and "working" could be done by the same individual(15). For example, Marshall described how, "when a [rich] person abstained from consuming anything", he had in mind "the purpose of increasing his resources in the future", and how such abstinence "[automatically] increased the accumulation of wealth" (*ibid.*, p. 233). Here, the same individual was the saver (the "waiter") and the investor (the "worker"). Regarding the waiter and the worker to be the same person was Marshall's way of describing the virtual identity of savings and investment.

3. The Opportunity Cost of Savings and the Demand for Accumulation

Marshall's description of savings in *Principles*, Bk. 4, Ch. 7, sec. 8, focused on a concept that he called "demand for accumulation" (16). Although it is unclear whether savings were regarded here as a demand or a supply function, Marshall did use some of the same terminology that he applied to the commodity "demand schedule", defined in Bk. 3, Ch. 3, sec. 4 (*ibid.*, p. 96), where the "demand price" was the only independent variable. But, Bk. 3, Ch. 3 and Bk. 4, Ch. 7 define demand price differently. The former defines demand price as "the price which [a person] is just willing to pay" to purchase any given unit of the good (*ibid.*, p. 95). This concept was based on a current price which was presumably observable in the market place. Bk. 4, Ch. 7 defined the "demand price of accumulation" (p_A) somewhat vaguely as what appeared to be a subjective opportunity cost or sacrifice: "[...] the future pleasure which his surroundings enable a person to obtain by working and waiting for the future" (*ibid.*, sec. 8, p. 233). The clear implication here was that if the person sacrificed and waited for the future in order to consume, he could afford to consume goods which would be "better": either of a higher quality or more finished (e.g.: "a weatherproof hut", rather than a hut into which "snow is drifting", *ibid.*,

p. 233)(17). If the individual were a business, such an implication would mean that the goods produced in the future would be of an improved quality compared to those currently produced. "Working and waiting" (investing and saving) were regarded as alternatives to completely consuming one's current income; they were therefore regarded by Marshall as present costs or sacrifices (the disutility of not consuming) which must be compensated for by the "future pleasure" of consumption (a utility).

These implicit costs of not consuming (of saving) in the present were a disutility which was balanced against the future utility of consumption. p_A was Marshall's implicit measure of the marginal disutility or sacrifice of saving or choosing not to spend all one's current money income now, which meant spending it more slowly, thereby postponing the purchase of some current goods(18). The sacrifice of the individual was to save or not to consume in the current period, so that slow or non-impulsive decisions regarding consumption would be made in the future. Such choices were assumed to be less desirable to most consumers than choices made quickly. In order for the income-earning individual to be indifferent to consuming or saving the last dollar of his current income, the implication was that the "future pleasure", or future expected marginal utility available as compensation to the potential waiter discounted to the present, should be equal in absolute value to the marginal disutility of the last dollar of money income not spent on consumption, but saved instead, or to the positive marginal utility of the last dollar of money income spent on current consumption (p_A).

Since a consumer will attempt to balance the expected MU of an individual good consumed in the future and in the present in such a way that he would be indifferent between these choices, we may use a simple discounting formula to express p_A as an equilibrium concept: If i represents the going interest rate given from outside the system, total utility maximization for a consumer implies that $p_A = u'(c) = v'(f)(1+i)$ (19), where u' and v' are the money marginal utilities, respectively, of consuming a given good in the current (c) period and a later version of the same good in a future (f) period. If an identical good were being consumed in periods c and f , u' would be greater than v' in the current period simply because the consumer has positive time preference. Therefore, i would be positive. Since $p_A = u'$ is the present MU of current consumption, if p_A fell and i were fixed, less current and more future consumption of the standard good would take place and savings would rise; the law of diminishing MU would eventually cause u' to rise and v' to fall until an equality once more prevailed. If the parameter i rose instead while p_A remained constant, less current and more future consumption would still occur; current savings would still rise until an equality were once more established. The savings curve would have the positive slope with respect to i indicated by Marshall later in the *Principles*: "But though saving in general is affected by many causes other than the rate of interest: and though the saving of many people is but little affected by the rate of interest; while a few [...] will save less with a high rate than with a low rate of interest: yet a strong balance of evidence seems to rest with the opinion that a rise in the rate of interest, or demand-price of savings, tends to *increase* the volume of saving" (*ibid.*, Bk. 6, Ch. 2, p. 534, emphasis mine).

If an improved good were being consumed in period (f) compared with period (c), the difference ($u'-v'$) in the current period would diminish because v' would be expected to rise while $p_A=u'$ would stay constant. Starting from an equilibrium position, if parameter i fell during the current period at the same rate that expected v' rose in the future, consumer equilibrium would maintain itself; the absolute quantity of current and future goods purchased would remain constant. If i fell at a more rapid rate than v' rose, $u'(c)>v'(f)(1+i)$, and more current and less future consumption would occur; current savings would fall until another equality prevailed. If i either fell at a slower rate than v' rose, or if i remained constant or rose with v' , $u'(c)<v'(f)(1+i)$. More future and less current consumption would therefore occur, while current savings would rise. If i fell at a slower rate than v' was expected to rise, the possibility was therefore left open for a negatively-sloped savings curve to exist. It should be noted that this possibility was limited to the case of a consumer good that improved over time, a case which Marshall considered important, and to the situation in which i was falling while the good was being improved and subsequently produced.

One can only surmise that the analysis of Bk. 4, Ch. 7, which introduced an intertemporal analysis of consumption in which the good consumed was improved over time, also introduced an inconsistency into Marshall's "standard" savings supply function. The market interest rate could no longer be exclusively regarded as having a positive effect on individual savings. So, the qualifications or exceptions that Marshall presented elsewhere and in this chapter to such a straightforward theory of savings supply became strong enough to completely overwhelm it. More specifically, the implied comparison of the expected (future) MU and the current MU of consumption which the definition of p_A implied caused the relation of the market interest rate to current savings to be indeterminate: it could be positive or negative. A negative slope would mean that i was falling at a slower rate than v' was rising, as a result of future improvements in the quality of the consumption good (see fig. 1).

If, for whatever reason, more savings were encouraged, a higher income could be accumulated in the future and the larger income constraint could be used to purchase improved future goods. Perhaps this is why Marshall related p_A in this chapter and in subsequent chapters of the *Principles* (e.g.: Bk. 6, Ch. 2, p. 534) to an estimate of the *total interest* which an individual could earn to supplement his income if he decided not to consume, but to save and simultaneously to lend a given proportion of his income, thus providing for "the satisfaction of future wants" (*ibid.*) when the loans were returned with interest added(20). "it [p_A] is similar in all fundamental respects to the [total] interest which the retired physician derives from the capital he has lent" (*ibid.*).

In other words, p_A represented the relative attractiveness of savings, which would make future income higher than current income because of potential total interest earnings. The word *similar* should probably be read as *related* in the last quote, which would mean that p_A helped to determine *total interest*, not the market interest rate, which was assumed to be exogenously given. In fact, as already stated, when p_A fell, current savings were assumed to increase and so would total interest, as long as the interest rate did not fall substantially.

Thus, Marshall's theory of individual savings in *Principles*, Bk. 4, at least implicitly contained a model of sacrifice/compensation. It was based on the principle that sacrifice, a cost to the consumer, required an equal compensation. This idea accounted for the fact that Marshall regarded p_A , a measure of the present sacrifice, to be equivalent to a future compensation: "the price earned by [the saver's] working and waiting. It represents the extra *productiveness* of efforts wisely spent in providing [...] for the satisfaction of future wants" (*ibid.*, p. 233, emphasis Marshall's)(21). "Working and waiting" defined the components of the sacrifice for an individual's savings in Bk. 4, Ch. 7. The payment of total interest income defined the compensation for an individual's savings: by increasing current productiveness and slowing the rate of spending, it allowed future consumption of a substantially larger and more carefully chosen market basket of goods.

The view of savings as an interest-induced supply relation was only hinted at in *Principles*, Bk. 4. Ch. 7; it was not stated so clearly, and did not receive as strong an emphasis, as Marshall's alternative view

of savings as being determined by the size of its subjective opportunity cost (p_A). In Bk. 4, Ch. 7, sec. 8 (pp. 230-34), Marshall did not seem willing to translate the demand for accumulation into a clearly defined supply of saving function. The person who desired to accumulate was initially called by Marshall the person who would "sacrifice present pleasure" (*ibid.*, pp. 232 and 234) and ultimately, the "saver" (*ibid.*, p. 234)(22). The "demand price of accumulation" was translated into the "demand price of saving" two pages later(23). Even in sections 9 and 10, where he actually used the terms "saving" and the "rate of interest" in the same paragraphs to show a positive relation between these two variables(24) (pp. 234 and 236), he still implied that demand had something to do with the savings relation. For example, section 10, p. 236 states: "it is a nearly universal rule that a rise in the rate [of interest] increases the *desire* to save" (emphasis Marshall's).

4. Summary

The *Principles*, Bk. 4, Ch. 7, contained the essence of Marshall's short run macro-theory of personal savings. Marshall described how, during the 19th century, the personal savings of rich people, took over from business savings as the most important source of funds destined for the purchase of investment goods. The language which Marshall used to describe savings was couched in the use of the term "abstinence", that had been passed down to him from Senior and Cairnes. But, influenced by Macvane, Marshall used this term differently, preferring to focus on the "waiting" involved as the sacrifice of not consuming in the current period, since rich people did not experience any real pain from saving, as the term "abstinence" seemed to imply.

The idea of savings had an evolution during the 19th century which stressed the role of the profit rate as a primary cause variable for business savings. The literature proceeded from Smith to Ricardo to Mill, as the standard classical doctrine. Marshall did not follow this line of thought in Bk. 4, Ch. 7 of the *Principles*; instead, he chose the implicit "demand price of accumulation", a subjective opportunity cost for an individual, as the necessary cost of waiting. So, Marshall's view was that savings, like all other objects of choice, was based on a conscious personal sacrifice. Marshall followed a strictly micro-approach to the description of the savings relation in this chapter, so that the examples he chose to illustrate his main points focused on an "individual" consumer/saver, while the savings function he discussed should be regarded as a demand, rather than as a supply relation. Marshall also failed, in Bk. 4 of the *Principles*, to satisfactorily separate the two groups who would invest and save. He referred to the same person as a "worker/waiter". He therefore suggested that investment was identically equal to savings for each individual saver. In using this simplified approach, he gave the impression that capital accumulation would proceed smoothly.

It should also be noted that Marshall stated in the *Principles*, Bk. 6, Ch. 2, that the savings function could be regarded as a supply relation, but he was referring to the aggregate "supply-of-capital" function in the long period, a stock concept. Instead, Bk. 4, Ch. 7 described a micro "demand for accumulation" function which was negatively-sloped with respect to increases in the consumer's disutility of waiting, the "demand price of accumulation". This was a short run flow description, because Marshall related the rate of savings to the opportunity cost of not spending the last dollar of current income on consumption. Furthermore, the market interest rate was not clearly described as an endogenous variable, with a positive effect on savings; instead, it appeared to be an exogenously-given parameter which could be used to compare future and current consumption of an identical good or of a good that was improved in quality. Moreover, Marshall implied that p_A and savings varied inversely, so that if p_A fell, savings rose and so would the total interest paid to the individual saver. This in turn would raise future income and living standards, but not necessarily affect the level of the interest rate. He also implied that if the exogenously-given market interest rate fell while an expected improvement in the good over time was occurring, the rate of current savings would possibly increase while the consumer/saver was maximizing current utility. Thus, under restrictive conditions, the interest elasticity of savings over time could be negative.

Notes

*. The author would like to thank Professor Marco Dardi, of Università degli Studi di Firenze for the comments which made possible the theoretical descriptions in section 3.

1. Although Ahiakpor calls this a "classical" argument, he is using Marshall to represent the classical tradition, as can be seen by the liberal quotations from Marshall's *Principles* which are sprinkled through the descriptions of how both savings and investment are affected by the interest rate (*ibid.*, pp. 513-14).

2. Bliss (1990, p. 225), along with Schumpeter, did not believe that Marshall was even very effective at describing long-run capital market equilibrium: "The method with which Marshall approached economic theory [...] was not well designed to deal with some of the persistent and difficult issues of capital theory. These issues involve [...] the mutual equilibrium of capital-providing and capital-using units [...] and its neglect is one reason Schumpeter [...] criticizes Marshall sharply". Bliss also points out that "Joan Robinson's chief objection to Marshall is that his system is not 'closed'" (*ibid.*, p. 239).

3. That early or "traditional" classical economics believed that profit, not the interest rate, was the main cause of aggregate personal savings may be seen in the writings of A. Smith and J. S. Mill. e.g.: Smith (1789, p. 321), referred to personal sector savings as made by a "rich man", not a "businessman". The rich man saves "for the sake of profits". Mill's *Principles*, Bk. 4, Ch. 4, also insisted that profit, not the interest rate, was the main reason for personal savings: "The savings by which an addition is made to the national capital usually emanate from the desire by *persons* to improve what is termed their condition in life [...] Any accumulation, therefore, by which the general capital is increased, requires as its necessary condition a certain *rate of profit*; a rate which an average *person* will deem to be an equivalent for abstinence" (Mill 1871, p. 729, emphasis mine). Ricardo, taking a slightly different tack, believed that the long-run real interest rate (the "natural" rate) was determined only by the going (long-run) rate of profit. Evidence for this can be found in Keynes (1936, appendix to Ch. 14, p. 190) which referred to Ricardo's *Principles*, Ch. 27. See Gootzeit (1991, p. 560). The implication of this idea (for later writers) was that since variations in the profit rate caused variations in the interest rate, at second hand at least, variations in the profit rate would also cause changes in the volume of personal savings. But the latter effect would work over time, by first causing the interest rate to change. Much of Marshall's analysis of personal savings was made in a short run context; therefore, changes in the natural interest rate were not what he was describing. Senior described profits, not as a return to personal savings, but as a return to business savings. He described business savings as the direct result of abstinence, and also described a direct relation between such savings and the expected profit rate. See Gootzeit (1992, p. 250). Cairnes continued this tradition in the last half of the 19th century, emphasizing the profit rate as the return to business savings. See Cairnes (1874, pp. 75-89) and Gootzeit (1995).

4. A comment from Blaug underlines the omission of the business sector as an important source of savings in Marshallian economics: "Marshall notes that the classical economists regarded savings as made almost exclusively from business profits. From the point of view of capital [...] it would seem that Marshall, like most of the economists of his generation, exaggerated the significance of personal savings; his theory of saving completely neglects business saving, which probably accounted in his day for about half of all new funds" (Blaug 1978, pp. 423-24).

5. Marshall did not regard abstinence as a necessary factor of production, and he set out to analyze its cost as did Senior or Cairnes (1874, pp. 73-87). Both Senior and Cairnes treated abstinence as a factor of production and regarded it as an implicit (an "opportunity") cost. See Gootzeit (1992, p. 246), which refers to Senior (1836, p. 59) and Cairnes (1874, p. 87) for a more detailed description of the opportunity cost associated with abstinence.

6. See Marshall (1920, p. 233, note 1). The placement of note 1 is indicated by an asterisk in the following selection which proposed the substitution of the term *waiting* for abstinence: "Since, however, the term [abstinence] is liable to

be misunderstood, we may with advantage avoid its use, and say that the accumulation of wealth is generally the result of a postponement of enjoyment, or of a *waiting* for it*" (emphasis Marshall's).

This reference to Macvane dated from the 2nd edition of the *Principles*, Bk. 6, Ch. 6, according to C. W. Guillebaud, the editor of the 9th edition, 1961. See Bk. 5, Ch. 2, p. 320.

7. Also quoted by Macvane (1887, p. 482). A more correct definition of abstinence would be in terms of "flow", such as: "the quantity of *income* abstained from".

8. Cairnes, himself, it is interesting to note, applied the term "abstinence" much more closely to the business sector than did Marshall. See Gootzeit (1995).

9. "The power to save depends on an excess of income over necessary expenditure; and this is greatest among the *wealthy*" (*ibid.*, emphasis mine).

10. The term "wage receivers" will be shown below to refer to the group who could afford to be "waiters" or abstainers: mainly high-income people. Thus, the term "wage receivers", like "professional men", referred to wealthy members of the personal sector: relatively well-off wage earners, who were not necessarily also business owners.

11. Marshall disregarded the allocation of personal savings, however. The exact description of how savings would be channelled into investment or how savings would be lent to potential borrowers was missing. Such a description would consider the role of financial intermediaries and the role of the interest rate in allocating the scarce savings flow. The "increase in material production" promised in the last quotation, which would follow from an improvement in "wealth distribution" ("income distribution" would be more relevant here), may not take place so easily if the lending practices of financial institutions (the repository of unspent income) did not properly coordinate the allocation of personal savings.

12. "The extra pleasure which a peasant who has built a weatherproof hut desires from its use [...] is the price earned by his *working and waiting*" (*ibid.*, p. 233, emphasis mine).

13. Marshall cited a saver-"physician" who "makes a loan [directly] to a factory or a mine to enable it to improve its machinery" (*ibid.*, p. 233). The owners of the factory or mine were the creators of capital.

14. Those individuals who create "extra *productiveness* of efforts wisely spent in providing against distant evils, or for the satisfaction of future wants" (*ibid.*, p. 233, emphasis Marshall's).

15. Both "waiting" and "working" were regarded as individual, rather than group (aggregate), tasks. Marshall focused little on the macro savings function.

16. The term "accumulation", used here instead of the term "savings", focused on the fact that all savings would automatically be channelled into the accumulation of capital for, as has already been noted, in the relatively short period Marshall did not clearly separate the functions of savings and investment. But, Marshall's use of the term "accumulation", rather than "savings", in Bk. 4, Ch. 7 of the *Principles*, made it difficult to understand the concept that he was describing as an individual's savings function. The issue was clarified in sec. 10 of this same chapter, when Marshall finally referred to "the demand [...] price for saving" (*ibid.*, p. 236).

17. In this primitive example, current savings by a consumer would lead directly to the consumption of an improved good in the future; savings and investment were accomplished simultaneously by the consumer.

18. Future, could even be better satisfied than immediate wants, because the latter could only be satisfied "impulsively". Marshall described in a negative way the unwise spending decisions of a consumer who would exhibit "an *impulsive* grasping at immediate satisfactions" (*ibid.*, p. 233, emphasis mine).

19. For the derivation of this equation, see the analysis in Baare (1978, pp. 103-05), which references to I. Fisher's *Theory of Interest* (1930).

20. Both Senior (1836, p. 59) and Cairnes (1874, p. 75) also treated abstinence as an opportunity cost, but in production, not consumption. They then theorized as to how such a cost could affect the supply of business savings. See Gootzeit (1995). Marshall's unique approach regarded an individual's propensity to wait, or not to consume, as a direct determinant of his desire for accumulation.

21. The use of the term "waiting" reflected the influence on Marshall of Macvane's 1887 article.

22. Marshall (1920) included a marginal note on p. 234, which translated the term "increase in the amount of present sacrifice" from the text into a "greater" amount of "saving".

23. It is tempting to call the savings function introduced in Bk. 4, Ch. 7 a *demand* for accumulation concept (see fig. 1)

since it was based on the "pA" variable. Yet, Marshall never defined this function clearly. The most that may be said of it is that there was an inverse relation implied between pA and savings. Furthermore, adding to further confusion, Marshall even referred to the interest rate later in Bk. 4, Ch. 7 and in Bk. 6, Ch. 2 as a "demand price for saving" (*ibid.*, p. 236 and p. 534, respectively).

24. Marshall was illustrating how a person would "increase the volume of saving" in response to a "rise in the rate of interest" (*ibid.*, p. 236). Presumably, this could take place over time, although Marshall never distinguished in this chapter between short and long run changes in the interest rate.

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