

CORREA MOYLAN WALSH BEYOND INDEX NUMBERS: FROM THE “BATTLE OF THE STANDARDS” TO THE SCIENCE OF MONEY

BY
VICTOR CRUZ-E-SILVA
AND
FELIPE ALMEIDA

*In 1901, Correa Moylan Walsh gained renown for writing a groundbreaking monograph on index numbers. His contributions to monetary economics, however, though neglected, transcend his work on index numbers, which was conceived to serve more foundational concerns of his. Therefore, our aim is twofold. First, we want to recover Walsh’s role as an important early twentieth-century economist. Second, we intend to provide a wider account of his incursion into monetary economics. Our argument is that the cornerstone of Walsh’s approach to the science of money is not confined to index numbers but concerns his distinction between different kinds of economic value and the discussion regarding the kind of value that money should measure and store. As such, we identify Walsh’s 1903 book, *The Fundamental Problem in Monetary Science*, as his archetypical work.*

I. INTRODUCTION

Correa Moylan Walsh strode among the greatest names of early twentieth-century economics. Directly or indirectly, especially as an index-number theorist, he shared the stage with individuals such as Irving Fisher, Wesley Clair Mitchell, Francis Ysidro

Victor Cruz-e-Silva: Adjunct Professor at Federal University of Paraná (UFPR), Brazil. Felipe Almeida: Associate Professor at Federal University of Paraná (UFPR), Brazil. This article was initially presented at the 2021 History of Economics Society Conference and the 49th Brazilian National Conference of Economics. We thank the participants in these meetings for their comments. We also thank two anonymous referees and Pedro Garcia Duarte for insightful comments and suggestions during the submission process. This research has been supported by the National Council for Scientific and Technological Development (CNPq) in Brazil. Email: victor.cruzesilva@ufpr.br

ISSN 1053-8372 print; ISSN 1469-9656 online/24/0100069-91 © The Author(s), 2023. Published by Cambridge University Press on behalf of History of Economics Society.
doi:10.1017/S1053837223000032

Edgeworth, and John Maynard Keynes, who praised his work, and also with others working on similar questions, such as Arthur Cecil Pigou, Warren Milton Persons, George Udny Yule, and Arthur Lyon Bowley. Yet, very little has been said about his work.

In economics, Walsh is recognized mainly for his work on index numbers, a subject that found its most exciting period in the early decades of the twentieth century and found in Walsh one of its most important contributors (see Cruz-e-Silva and Almeida 2022). His most significant work on the subject, a book titled *The Measurement of General Exchange-Value*, was published in 1901, and was deemed a game-changer monograph by most of his contemporaries interested in index numbers (Fisher 1902, p. 112; 1922, p. xi; 1934, p. 56; Mitchell 1921, p. 9).

To this day, nevertheless, the scanty mentions of Walsh's rise as an index-number theorist do not do justice to his oeuvre, as his 1901 book is read with no regard for his other publications. Bert Balk (2008, pp. 16–17), for instance, depicts *The Measurement of General Exchange-Value* as a book written by an “unknown author” that appeared “out of the blue.” The reality, however, is that Walsh's 1901 book was not his first—neither would it be his last—effort to discuss issues related to the so-called science of money.

Accordingly, the goal of this article is twofold. First, it aims at shedding light on Walsh as an important early twentieth-century economist. Second, it intends to provide a wider account of Walsh's allegedly unanticipated incursion into monetary economics. We claim that index numbers, the subject where statistics and monetary economics met, as per John Aldrich (2008, p. 268), were only one element—albeit the most thriving one—within Walsh's more comprehensive approach to the science of money. As such, we locate his contributions to the theory of index numbers within his more sweeping discussions on monetary economics.

In this process, the “battle of the standards” deserves some special attention, because it prompted Walsh's interest in economics. For Walsh, however, this important controversy barely scratched the surface of the fundamental problem in monetary science. As such, it is in the context of his search for definitive answers regarding *the* good monetary science that we locate his rise both as an index-number theorist and as a monetary scientist. We postulate that *The Measurement of General Exchange-Value* should not be read as Walsh's archetypical work—even though it was his most groundbreaking monograph. Alternatively, the work that best represents both Walsh's concerns and his encompassing motif is *The Fundamental Problem in Monetary Science*, published in 1903. We argue, therefore, that Walsh's work within monetary economics was not confined to index numbers but encompassed much deeper and broader concerns, as he was lured into economics by the most pressing monetary questions of his time—an argument that finds resonance in the one letter written by Walsh we managed to track down. This acknowledgment is hitherto undocumented in the history of economics, which bypasses Walsh's name among the monetary economists of his time (see De Boyer des Roches and Gomez Betancourt 2013; Laidler 1991). In this lies the main contribution of this article.

II. WALSH'S WIDE ARRAY OF INTELLECTUAL INTERESTS

Very little is known about Walsh's life. Correa Moylan Walsh, the son of Joseph Correa Walsh (1813–?) and grandson of famous diplomat, journalist, writer, and lawyer Robert

Walsh, Jr. (1784–1859), was born in Newburg, New York, on September 23, 1862, and died on March 10, 1936, in New York City. He received an AB from Harvard in 1884, after which he spent the rest of the 1880s studying abroad at the universities of Paris, Berlin, Rome, and Oxford, returning to the US in 1890 (*New York Times* 1936). There is no record of his time in Europe, but the records of his period at Harvard show that his interests related to classic philosophy (Harvard College 1884, 1894). After his return from Europe, Walsh spent most of his years in Bellport, Long Island. He never married, and was not survived by any members of his immediate family. Professionally, according to the records, Walsh never had any affiliation; his full-time activity was that of an intellectual “without a definite occupation” (Chaffe and Dimand 2006; Harvard College 1909; *New York Times* 1936).

Throughout his life, Walsh was chiefly recognized as a contributor to the field of index numbers—something that remains true as of today. Fisher, arguably the ultimate authority on index numbers, illustrates this well.¹ In several of his writings, Fisher, whose self-proclaimed specialty had been, since 1896, “the study of inflation and deflation” (Barber 1997c, p. 213), adopted a laudatory tone in relation to Walsh as an index-number theorist. For him, Walsh’s *The Measurement of General Exchange-Value* was a “monumental and memorable book,” which showed him to be a master in the field of index numbers (Fisher 1921, p. 536).² Fisher, accordingly, did not waste the opportunity to rely on Walsh’s expertise in writing his own book on the subject, *The Making of Index Numbers*, published in 1922 (Fisher to Mitchell, June 24, 1921, Mitchell Papers). In that work, Fisher (1922, p. 459) praised Walsh’s book as “the largest and best work, and the only general treatise” on index numbers up to that moment. Not by accident, therefore, Walsh is one of the two dedicatees of Fisher’s 1922 book—the other is Edgeworth—and no individual is mentioned more often than Walsh in its pages (thirty entries in the book’s index, followed by Mitchell and Persons, with twenty-two entries each). Fisher (1922, p. xi) also indicates that Walsh had preceded him in reaching the so-called ideal formula for index numbers—to which Walsh himself had suggested, in 1921, the label “Fisher’s index number” (Dimand 1997, p. 10). Furthermore, Fisher would yet define Walsh as “the first American who investigated the problem of index numbers in a truly scholarly fashion,” adding that “[h]is work published in 1901 has remained one of the most fundamental studies on the subject, and has helped greatly to build up the science of measuring the purchasing power of money” (Fisher 1934, p. 56).

Fisher’s views may be taken to represent those of many others of Walsh’s contemporaries, such as Mitchell (1921), Harold Davis and William Nelson (1935), Ragnar Frisch (1936), and Keynes ([1909] 1983, [1930] 1971).³ Others, like Edgeworth (1901, 1923a, 1923b, 1925a, 1925b) and Willford King (1930), also acknowledged Walsh’s expertise on index numbers, but challenged Walsh in a series of aspects regarding his

¹ For Fisher as an authority on index numbers, both theoretically and empirically, see Dimand (1997, p. 11–13).

² Fisher’s first reaction to Walsh’s *The Measurement of General Exchange-Value* was, however, of great skepticism toward both Walsh’s universal method and his exclusive interest in exchange-value (Fisher 1902).

³ Keynes ([1930] 1971, p. 72) opposed the American tradition of making index numbers, as found in Fisher, Mitchell, and Walsh, to that of the British, such as Jevons, Edgeworth, and Bowley, and explicitly favored Walsh in his dispute against Edgeworth. It is difficult to make sense of Keynes’s attempt to homogenize Fisher, Mitchell, and Walsh as an “American tradition of making index numbers.” Mitchell’s approach is very different from the one favored by the other two. An example of such a difference is that Mitchell (1921, pp. 67, 72) favored several of the arguments Edgeworth would hold against Walsh. This is an issue worthy of further investigation, but it transcends the scope of this article.

approach to the subject. Walsh's contemporaries, nonetheless, did not extend to his further works on economic matters the same acclamatory tone they showed toward his expertise on index numbers. *Au contraire*, the other features of Walsh's contributions to monetary economics were nearly ignored.

It does not come as a surprise, therefore, that the few mentions to Walsh's name in the history of economics literature mainly touch upon his contributions to index numbers (Aldrich 1992; Balk 2008; Banzhaf 2004; Cruz-e-Silva and Almeida 2022; Diewert 2013, 2022; Dimand 1998, 2019; Kendall 1969; Persky 1998; Reinsdorf 2007; Schumpeter 1954). Claes-Henric Siven (2002, pp. 128–129), in a work that marginally recalls some of Walsh's arguments about the stability of money, is an exception. None of these studies, however, focuses on Walsh and his work. The exception in this regard is Allan Chaffe and Robert Dimand (2006), a two-page biographical article on Walsh.

Despite the prevailing narrow account of his oeuvre, Walsh had a prolific trajectory as an intellectual and an author, as his work is by no means restricted to index numbers. Throughout his life, Walsh published seven papers and eleven books.⁴ The multifarious matters discussed in his publications included, according to Chaffe and Dimand (2006, p. 886), “a new arrangement of Shakespeare's sonnets (1908), a study of the doctrine of creation (1910), three volumes deploring socialism, feminism, and the impending decline of civilization (1917), and an attempted proof of Fermat's last theorem (1932)” (see Walsh 1908, 1910, 1917a, 1917b, 1917c, 1932a). His oeuvre, nonetheless, also included issues on monetary economics and statistical methods applied to economics (Walsh 1896, 1897, 1901, 1903, 1921a, 1921b, 1924, 1926, 1932b), and discussions on the ideas of Immanuel Kant (Walsh 1904), Benjamin Franklin and Plato (Walsh 1906), and John Adams (Walsh 1915). Such pervasive interests also translated into his involvement with several learned societies. These included the American Economic Association, the Royal Economic Society, the American Statistical Association, the Royal Statistical Society, the American Mathematical Society, the Mathematical Association of America, the American Academy of Political and Social Science, and the American Association for the Advancement of Science (Chaffe and Dimand 2006; Harvard College 1909; Walsh 1921a).⁵

Within this wide array of interests, the ones that formed the core of his most important works related to the new and rising social disciplines. Two classes of works, which Walsh apparently tried to keep as separate as possible, sprang within this core: one, more technical and economically minded; the other, more sociological and politically minded. The former rarely showed any sign of his political predilections, whereas the latter seldom made use of the apparatuses within his economics toolkit. In this regard, Walsh (1901, p. 8, emphasis in the original) understood economics as “the study of the *phenomena* of exchanges and the laws of their relations” within which the main theme is value (Walsh 1926, p. 3).

Along these lines, the catalyst to Walsh's interest in the discipline was the sound currency debate, which opposed monometallists, defenders of the gold standard

⁴ To our knowledge, the first two works Walsh ever published appeared in 1896 and 1897, in the *Quarterly Journal of Economics*, edited at Harvard, Walsh's alma mater. This may explain the journal's openness to contributions by an unaffiliated private intellectual with no record of scholarly publications.

⁵ In a letter from Charles Roos to Ragnar Frisch, Walsh also appears as a candidate for Charter Membership of the Econometric Society (Roos to Frisch, September 30, 1931, Frisch Papers).

(or sound currency), and bimetallicists, who defended the circulation of both gold and silver currencies (see Friedman 1990a, 1990b). This debate—the “battle of the standards,” as per Walsh (1903, p. 158)—was one of the most pressing issues during the golden age of monetary economics, which lasted from 1870 to 1914, according to David Laidler (1991, p. 1), and coincided with the US transition from the Gilded Age to the Progressive Era (see Hofstadter 1956; Leonard 2016).⁶ In this period, monetary debates in the US concerned three main questions: the determination of the value of money and the demonetization of silver; the crises under the National Banking System and the need for a banking reform; and the choice of the metallic standard (De Boyer des Roches and Gomez Betancourt 2013, pp. 136–137). Walsh’s characterization as a monetary scientist arises from his engagement in the third and, foremost, in the first of these trending debates. In fact, Walsh placed the question of the metallic standard as an appendage to the determination of the value of money. Nonetheless, the “battle of the standards,” the focus of Walsh’s first two publications, represented his initiation in the science of money, and, as such, it is especially relevant to understand his rise as a monetary scientist.

III. THE “BATTLE OF THE STANDARDS” AND WALSH’S INITIATION IN THE SCIENCE OF MONEY

The issue concerning the American monetary standard dates back to 1792, when, by Alexander Hamilton’s recommendation, the US adopted a bimetallic standard, which allowed for the free coining of both gold and silver. The ratio between silver and gold was then established at fifteen to one. Soon after the Coinage Act of 1792, however, the market prices for gold and silver oscillated and this ratio went above fifteen to one. This led to the scenario foreseen by Gresham’s Law, and silver, the cheap money, became the effective monetary standard in the US until 1834, when a new legislation altered the mint ratio to sixteen to one, which then laid above the ratio in international markets. Again, the American bimetallic monetary system witnessed a monometallic standard in practice, as gold became the only metal minted until the 1870s, with the exception of the Civil War period, in which the greenbacks came into play. In that decade, the wish for a “sound currency” gained momentum in the US—as well as in other countries—and the return to a specie standard was put in motion. The goal was not only to put an end to the inconvertible greenbacks issued during the Civil War but also to oust the free coinage of silver (Friedman 1990a, 1990b; Friedman and Schwartz 1963; Rockoff 1990).

By 1879, metal convertibility had been redeemed, bimetallicism had been cast aside, and gold had become the single basis for the American new monometallic monetary system. From that moment until the end of the nineteenth century, the debate on the American specie standard never wavered, reaching its most momentous crossroads in 1896, with William Jennings Bryan’s presidential campaign and his “Cross of Gold”

⁶ Walsh, a conservative, was skeptical about many of the reforms advanced during the Progressive Era. “We greatly deceive ourselves if we think that every change we make is progress. It may be regression. Or rather, instead of progress upward, it may be progress downward—down the slope after leaving the level at the top” (Walsh 1917a, p. 69).

speech. Nevertheless, the context within which the free-silver movement unfolded in the last decades of the nineteenth century was very different from that prevailing in the 1870s, both materially and intellectually (Dimand and Gomez Betancourt 2012; Friedman 1990a, 1990b; Friedman and Schwartz 1963; Girton and Roper 1978; Laidler 2012; Rockoff 1990).

Materially, even though a deflationary process had been put in motion in the US after the consolidation of the gold standard, conditions were much less favorable to bimetallism in the 1890s—particularly at the sixteen to one mint ratio Bryan advocated, which, far from the market price as it was, would have significantly overvalued silver (see Fisher 1894; Friedman 1990a, 1990b; Laughlin 1895; Rockoff 1990).⁷ Intellectually, the debate underlying this phase of the specie-standard divide was a heated one, and many of the most important American economists of the time took part in it, such as James Laurence Laughlin and John Bates Clark (monometallists), and Francis Amasa Walker and Willard Fisher (bimetallists).

Hugh Rockoff (1990, pp. 753–754) offers a bird's-eye view of the main arguments presented by each side of the dispute. The advocates of the gold standard rejected bimetallism because oscillations of the ratio between gold and silver would generate an outflow of the dearest metal, leaving only the cheap metal in circulation. In this sense, in practice, there would not exist a bimetallic standard, and a scenario of alternating gold and silver standards would be set in motion. Bimetallists, contrarily, postulated that the adherence of a nation as big as the US to the bimetallic standard would force the world ratio to adapt to the US ratio, allowing for the simultaneous circulation of both gold and silver. In addition, and more importantly, bimetallists argued that a bimetallic standard would be accompanied by a greater stability both in the stock of money and in the price level, because shortages in the supply of one metal would be compensated by the supply of the other.⁸

This controversy marks the ethos within which Walsh rose as a monetary scientist. His first impressions on currency were laid down in the first two papers he ever published: a review of William Arthur Shaw's book *The History of Currency, 1252 to 1894* (Walsh 1896), and an examination of John Bates Clark's "new theory concerning the influence of changes in the value of money" (Walsh 1897, p. 280). Since both Shaw's book and Clark's papers aimed at defending the gold standard to the detriment of the bimetallic standard (Walsh 1896, p. 431; 1897, p. 281), Walsh's papers also dwelled upon the monometallism–bimetallism divide.

In these two papers, Walsh avoided laying down straightforward statements regarding the merits or demerits of bimetallism per se. He tried to act as an impartial, scientific mediator who should state facts, not opinions. In this process, even though he recognized that bimetallism had had important shortcomings in the past, he showed no a priori resistance to the proposal for a new international bimetallic standard—a position that, in this regard, resembled Walker's (see Friedman 1990a, p. 95; Rockoff 1990, p. 752;

⁷ According to Friedman and Schwartz (1963, chs. 3–4), the US suffered from a decline in prices from 1879 to 1897, after which prices rose. Walsh (1926, p. 130) identifies this decline of prices as ranging from 1873 to 1896—the same is true for Dimand and Gomez Betancourt (2012, p. 186). For Walsh, the downward turn in prices is what triggered the "battle of the standards" (Walsh 1903, p. 158).

⁸ For a more comprehensive discussion on the arguments presented by each side of the controversy, see Friedman (1990a), Laidler (1991, chs. 2–3), and De Boyer des Roches and Gomez Betancourt (2013).

Walker 1896, p. iv). Criticizing Shaw's historically oriented argument against bimetallism, Walsh (1896, p. 454) claimed that: "'the modern theory of bimetalism' is not disproved by 'the failure of practice' of another kind of bimetalism. To make such a disproof, a supplementary argument would be needed, showing that the evils which beset the old bimetalism would still continue in the new, because the element in the old which begot them is still retained in the new."

He contended that the main problem of bimetalism up to 1896 was the prevalence of different legal gold–silver ratios across countries. The new theory of bimetalism defended a scheme in which an international, fixed, and permanent gold–silver ratio ought to be accepted by all nations. This had never been tried before, and, as such, as far as Walsh was concerned, history had nothing to say about its effectiveness. Therefore, if anyone aimed at dismissing bimetalism, they could do it only theoretically, by showing either that the scheme would not fulfil its promises or that it was impracticable.

For Walsh, such a theory was not straightforward, though. Already in 1897, he contested Clark's theory concerning the impacts of changes in the value of money, in which Clark allegedly postulated that businesses would soon adapt to an appreciating or depreciating standard by an adjustment of the rate of interest. Walsh deemed crucial the scrutiny of Clark's theory because such an elaboration was meant as a contribution to the nature of the American monetary system. Arguing against Clark's approach, Walsh (1897, p. 280) appealed to David Hume to recall the idea that "any but a stable standard of values causes injury," and that the stability of the standard should be the primary focus of monetary policy.⁹ He closed his argument by stating that "the conclusion would seem to be that we must either apply the multiple-standard system or do something (with risk of other ills) to prevent the appreciation, or suffer bad consequences" (Walsh 1897, p. 295). In 1903, at a time in which bimetalism had already been utterly defeated in the US, Walsh would yet revisit the "battle of the standards," showing, once again, a veiled sympathy toward bimetalism and highlighting the inconsistencies in the monometallist reasoning (Walsh 1903, pt. II, chs. 5–6).¹⁰ Therefore, in terms of monetary policy, Walsh tended to favor the bimetalists, who—as per Knut Wicksell—privileged a stable price level vis-à-vis a stable nominal wage level (Siven 2002, pp. 128–129).

In light of this, nonetheless, Walsh would soon make it clear that he considered such dispute to be nothing more than an accessory to the real problem at stake. For him, it was not sufficient to state which specie standard—gold, silver, or a combination of both—

⁹ It may be said that Walsh missed Clark's point. For Clark (1895, p. 394), such a correction occurs only when changes in the standard of value are anticipated, because the nominal rate of interest includes only foreseen fluctuations: "A slow, steady and calculable advance or decline in the commodity value of metallic money would do no serious harm. A rapid, irregular or incalculable variation in the purchasing power of it would do harm." Fisher, in *Appreciation and Interest*, a work he wrote "morally aroused ... against the 'silver craze'" (Barber 1997a, p. 7), endorsed a similar idea, differentiating between foreseen and unforeseen changes in the value of money: "[o]nly the losses or gains of the former can be forestalled. A sudden and unexpected inflation ... works enormous losses to creditors while an unforeseen contraction is equally harmful to debtors" (Fisher 1896, p. 6). Fisher, furthermore, praised Clark as one of the few who had scrutinized the role of the interest rate in the sound currency debate—even though he found some faults in Clark's argument (Fisher 1896, pp. 9, 89). Likewise, Dimand and Gomez Betancourt (2012, p. 192) credit Clark as "the first to bring the relationship between nominal interest and expected deflation into the debates over bimetalism."

¹⁰ President McKinley signed the Gold Standard Act, which committed the US firmly to the gold standard, on March 14, 1900 (Friedman and Schwartz 1963, pp. 119, 148–149; Rockoff 1990, p. 756).

was the most appropriate one. This was merely a discussion about a means to achieve an end, that is, greater stability in the value of money. Walsh (1903, p. 2; emphasis in the original), distinctively, posed the following question: “*What kind of value is it that money measures and stores and should possess in a stable manner?*” This is the fundamental problem in monetary science.”

Hence, for Walsh, the definition of the most stable bullion standard was not enough. It was necessary to deal with a prior and much more important issue—the fundamental problem in monetary science: the establishment of an ironclad definition regarding *which kind of value* should be the reference for the stabilization of the monetary standard. Only then should economists engage in discussions regarding the monetary standard and policy recommendations per se.

IV. WALSH’S RISE AS A MONETARY ECONOMIST: INDEX NUMBERS AS A MEANS TO AN END

Walsh’s rise as an authority on index numbers and monetary economics must be considered cautiously. The concentration of his aforementioned Harvard studies in philosophy and the classics took place at a time when professional economics was taking its first steps. American intellectuals—especially those who had studied in a colonial-era college such as Harvard or Yale—were turning off their “expected scholarly path of the classics, theology, and philosophy to study the new social disciplines created to put reform in action—economics, political science, sociology, and public administration” (Leonard 2016, p. 11; see also ch. 3). In this process, Walsh turned his attention to monetary questions, a path many of his contemporaries followed as well (see De Boyer des Roches and Gomez Betancourt 2013). Within this new agenda, Walsh published *The Measurement of General Exchange-Value*, his magnum opus, already in 1901.

We understand this work as his magnum opus because of its lingering impact on the profession and because it was a game-changing book, as its reviews make clear. For John M. Gaines (1902, p. 127), “[t]his is the most exhaustive work ever brought out on the theory of index numbers, embodies a vast deal of labor and acute logic, and will be a mine of information to future investigators.” Fisher (1902, p. 112) believed that the book would “doubtless remain for many years as the standard and most exhaustive treatise on the subject with which it deals.” Edgeworth (1901, p. 404) claimed that: “[t]he capacity of taking boundless trouble, which is a characteristic of solid talent, distinguishes the work of Mr. Walsh. Whether he searches the writings of others or elaborates his original ideas, the thorough student and close thinker is manifest on every page.”¹¹ Accordingly, *The Measurement of General Exchange-Value* represents Walsh’s most valuable contribution to economics.

Walsh’s book is a comprehensive and exhaustive discussion about value and the most appropriate instruments for its measurement. In that work, he recognized—but did not

¹¹ According to his reviewers, originality and independence of thought were a trademark of Walsh’s work—whether related to economics, statistics, history, or sociology (see Carver 1919; Greene 1916; Padan 1901; Schiller 1918; Simiand 1903).

elaborate upon—four different kinds of economic value: cost-value, esteem-value, use-value, and exchange-value. For him, different kinds of value had to be measured through different means, which in turn seldom conformed to more than one kind of value (Walsh 1901, p. 32). In *The Measurement of General Exchange-Value*, his concern lay primarily on exchange-value and on the appropriate way to measure its stability. Walsh (1901, p. 7) defined exchange-value as follows: “Gravity is the power in a thing by which it attracts other things toward itself and is attracted toward other things by a similar power in them. Exchange-value is the power in a thing by which it procures for its owner other things, which procure it for their owners by a similar power in them.”

Accordingly, at a given time and place, there is an exchange-value of one thing in all other things, including the one thing itself. This is the thing’s *general* exchange-value (Walsh 1901, p. 12). Walsh then introduces several (fifty-eight) propositions in order to highlight the association between the exchange-values of different things. These propositions were meant to assist in the design of the appropriate method for the measurement of general exchange-values. Money here plays a paramount role, because it serves as the “common denominator” for all other things. In his words (Walsh 1901, pp. 20–21):

By means of prices, money acts as a perfectly satisfactory measure of the exchange-values of other things in the same place at the same time. Now money alone is brought into direct relationship with every other exchangeable thing, the relations between these others being intermediated through their relations to money. ... Consequently it is primarily only the general exchange-value of money in all other things collectively that we are concerned with measuring; for after measuring it and finding its constancy or variation at different times, or in different places, we can measure the constancy or variation of any other thing in general exchange-value by its known constancy or variation in relation to money.

For that reason, Walsh delves into an elaborate search for the most appropriate approach to the measurement of general exchange-value through the variations in the exchange-value of money. What interests Walsh is the relative measure given by exchange-value, not its causes. In the book’s third chapter, he discusses several theoretical questions regarding such a measurement, such as the standards in simple mensuration and the distinctiveness of the mensuration of general exchange-value. In the following chapters, Walsh (1901, chs. 4–11) moves on to more technical considerations, such as weighting, periods and base periods, the common measurement errors, and the most appropriate kind of average to be used. In an effort that would later be resumed by Fisher (1922), Walsh also proposes a “universal formula for the constancy or variation of the general level of prices,” which is—as would be Fisher’s—a geometric mean between existing formulas (Walsh 1901, p. 381; see ch. 12). In the final chapter, Walsh (1901, ch. 14) further indicates that knowing the constancy or variation of the exchange-value of money is of paramount importance for the good functioning of the economy.

Here, Walsh hints at the fact that he understands index numbers as a statistical tool inherently related to monetary economics. For him, its unique purpose was to measure price changes—a Fisherine perspective that became clearer in the 1920s. Others, like Mitchell, Edgeworth, and Persons, on the other hand, conceived index numbers as a tool suited for application in several fields beyond monetary economics (see Cruz-e-Silva and Almeida 2022; Walsh 1901, 1921a, 1921b).

This is the gist of Walsh's most influential work, the one that gave him the status of authority on index numbers. However, despite the relevance and elaborateness of *The Measurement of General Exchange-Value*, it is our contention that, considering Walsh's intellectual production as a whole, this book did nothing more than lay down a method intended to serve his more comprehensive monetary discussions, presented more carefully two years later, in *The Fundamental Problem in Monetary Science*. Whereas Walsh's aim in his 1901 book was to discuss the appropriate methods for measuring general exchange-value, *The Fundamental Problem in Monetary Science* aimed at a more foundational purpose: to defend *why* we should strive for money stable in exchange-value in the first place. Thus, Walsh's entire discussion on index numbers as the appropriate means to measure the stability of exchange-value hinges on the determination of exchange-value as the benchmark for monetary stability.

Such a relationship was attested by Walsh himself, in a letter sent to Fisher in 1934. While complaining that Fisher had not mentioned, in the pre-print of his *Stable Money*, the fourteenth chapter of *The Measurement of General Exchange-Value* as a reference defending stabilization, Walsh wrote:

That work [*The Measurement of General Exchange-Value*] was written with the avowed purpose of *helping to prepare for the (future) introduction of money kept stable in exchange-value*. ... In that work I left the question between the various kinds of value open, but I immediately followed it up in my second book on *The Fundamental Problem in Monetary Science*, where I argued for stability of money in exchange-value—that is, for the *stabilization of prices* (Walsh to Fisher, September 1, 1934, Fisher Papers; italics added).¹²

In his reply, Fisher indicated that he had made reference to the passages Walsh recommended (Fisher to Walsh, September 8, 1934, Fisher Papers). Nonetheless, it is important to remark that, while Walsh certainly did advocate price stability in 1903, Fisher was aware of others who had done so earlier, such as Alfred Russel Wallace, John Rooke, and Simon Newcomb, and had dedicated his *Stabilizing the Dollar* (Fisher 1920) to their memory. In fact, Newcomb (1879), several decades before Walsh's work, had already proposed a plan for price level stabilization.¹³

V. INTERLUDE: WALSH'S MONETARY THOUGHT AND SUBSEQUENT LITERATURE

Walsh's *The Fundamental Problem in Monetary Science* may be placed within the tradition of book-length works on monetary economics that appeared in the first decade

¹² Unfortunately, Fisher's archives at Yale preserve only one letter sent by Walsh, along with Fisher's reply. The content of these letters indicates that their correspondence exceeded these two pieces.

¹³ Newcomb's plan envisioned that the "invariableness of value" would be attainable through the issuing of "a paper currency which shall be redeemable, not in gold dollars of fixed weight, but in such quantities of gold and silver bullion as shall suffice to make the required purchases." For him, "if we could from time to time increase or diminish the amount of metal in the dollar, so that it would always exactly fill the required condition, we should have all that we want," that is, in other words, a stable purchasing power of money (Newcomb 1879, p. 235). Fisher (1920, p. 293), in fact, mentions Newcomb's plan—among others—as a forerunner of his own famous plan for stabilizing the dollar.

of the 1900s (Girton and Roper 1978, pp. 601–603). Paul Rosenstein-Rodan (1936, p. 259), for one, recommends the book as a thorough compendium on the standards of value. Leonard Darwin (1904, p. 75), for another, in his review of the book, further indicates that “nowhere else, as far as I am aware, has the problem here dealt with been discussed in such a searching manner.”

This does not mean, nonetheless, that Walsh’s comprehensive efforts in the science of money were a mere reproduction of existing arguments. The originality and thoroughness of Walsh’s book spilled over into further theoretical developments, as in Friedrich Hayek (1984), Stanley Salvary (1993), and Clark Warburton (1981). As such, beyond the technicalities involving the theory of index numbers, Walsh arguably also exercised some—limited—theoretical influence on the subsequent literature on monetary economics. It is not an influence that comes remotely close to Fisher’s, inasmuch as the works mentioned in this section are not comprehensive enough as to do justice to Walsh’s multi-layered contribution to monetary economics. Still, it assigns some gravitas to Walsh’s theoretical contributions to monetary economics beyond index numbers.

Therefore, we cannot lose sight of the fact that Walsh’s work on index numbers was conceived to serve the more comprehensive theoretical agenda inaugurated by *The Fundamental Problem in Monetary Science*. Advancing this agenda would also be the intent of *The Four Kinds of Economic Value*, a booklet he published in 1926.¹⁴ It is the purpose of our next section to present Walsh’s approach to the science of money, as presented in his 1903 and 1926 works.

VI. THE INDEX-NUMBER THEORIST AT THE SERVICE OF THE MONETARY SCIENTIST

Both in *The Fundamental Problem in Monetary Science* and in *The Four Kinds of Economic Value*, discussions about the theory of value and the stability of prices took the central stage. In fact, especially in *The Fundamental Problem in Monetary Science*, which represents Walsh’s painstaking effort to establish a comprehensive approach to the science of money, his credentials as a *monetary scientist* become clear-cut. A *scientist*, because he considered that economics had “the misfortune of being a moral science, in which self-interest and desire have influence upon the intellect to befog and to distort the perception of truth.” He assumed, nonetheless, that “impartial theorizing of disinterested science might bear down and override the fallacies and sophisms of self-interest” (Walsh 1903, p. 371). Accordingly, Walsh believed that consensus around solid principles was a necessary condition for economics both to evolve as a scientific discipline and to inform policy: “[i]f economics is really to be a science, it must command unanimity of opinion among its adherents, as well as do physics and chemistry and other established sciences” (Walsh 1903, p. 372). And a *monetary scientist*, because he deemed economics to be too wide a field for anyone to work on the whole discipline. Specialization was, therefore, a

¹⁴ It is not clear why Walsh chose to publish *The Four Kinds of Economic Value*. This book does not advance in any direction the arguments he had presented in 1903. In fact, a review of the book states: “to those who are familiar with Marshall and his followers, it will not seem that any new light is thrown on the subject of value by this discussion” (Bickerdike 1928, p. 106). In some respects, nevertheless, the ideas and concepts are more clearly stated in the 1926 book, to which we will refer whenever necessary.

necessary feature within the discipline, and Walsh chose to concentrate his efforts on the issues that related to the science of money (Walsh 1903, p. 372). In this regard, Walsh's distinction between four kinds of economic value and his conception of the interplay between them to assure both the stability of money and the material prosperity of society are especially relevant to indicate the originality of his work.

From the Original Sin of Economics to the Four Kinds of Economic Value

As a monetary scientist, Walsh (1903, p. 27), following German economist Karl Helfferich, pinpointed that “to prevent, as far as possible, variations in the value of money, and to reduce to the smallest extent unavoidable variations, whether upwards or downwards, is the first task of monetary policy.” Accordingly, keeping money stable “is the most fundamental precept which political economy can give to government for its regulation of the monetary system” (Walsh 1903, p. 28). Thus, he deemed that “for the science of money to teach what is good money, it must teach which kind of value it is that money measures and stores” (Walsh 1903, p. 370). This is precisely the objective he attempted to achieve in his 1903 and 1926 works. For that reason, the science of money, as a branch of economics, simply could not have “value,” the discipline’s most important technical term, “a concept which plays the same role as that of energy or force in physics,” understood ambiguously by economists (Walsh 1903, pp. 26–27).

As per Walsh, economists’ statements in relation to value were often plain and clear but seldom consistent with the true nature of value (Walsh 1903, p. 218). Such ambiguity, the original sin of economics, from which not even Adam Smith and David Ricardo had escaped, was present in the discipline since its early days as an autonomous field. It represented a fundamental mistake, fatal to the discipline’s development (Walsh 1903, pp. 60, 166). For Walsh, value should have its multiple kinds recognized in order to eliminate the several connotations ascribed to the term “value” alone. Only then should these theoretical definitions guide the monetary policy of government (Walsh 1903, p. 27). For Walsh, as signaled in another work of his, “the time for taking thought precedes the time for taking action” (Walsh 1915, p. iv). Hence, Walsh did not delve into the design of specific policy advice. He circumscribed his approach to the clarification of the theoretical problem at stake, which had precedence over practical matters. As suggested in the final paragraphs of his 1903 book, “that the scientifically-minded and theoretical economists may overbear the interest-warped practical men, they must be united among themselves,” because monetary issues represent “a question to be settled by scientists, for the use of statesmen” (Walsh 1903, pp. 372–373).

Departing from that idea, Walsh distinguishes between four kinds of economic value. “Use-value is a thing’s power to serve our ends [its total utility]. Esteem-value is its power to make us desire to possess it [its final utility]. Cost-value is its power to impose upon us effort to acquire it [its cost of production]. Exchange-value is its power to procure other things in its place” (Walsh 1926, p. 15), or, alternatively, “the purchasing power of one thing over another thing or over things in general” (Walsh 1903, p. 6).¹⁵ He

¹⁵ According to King and McLure (2014, p. 1), theories of value may be classified either as objective, focusing on the conditions of production, or as subjective, which are concerned with the preferences of consumers. Walsh’s approach to value has elements of both—cost-value is objective, whereas the others are subjective. Walsh’s science of money, nonetheless, is eminently subjective.

relates the problem of defining which of these values money measures and stores to the material progress of mankind. On long periods of stagnation, money could be stable in all four kinds of value, with no conflict whatsoever. With progress, however, which had never been as rapid as in the 150 years prior to the publication of *The Fundamental Problem in Monetary Science*, the divergence between the kinds of value becomes more flagrant, money stability in multiple values comes to be paradoxical, and the fundamental problem in monetary science emerges. This is the case because the four values vary differently. This progress is also what had demanded of economics a more scientific mentality. Thus, for him, the facts associated with the science of money could be appropriately approached only if measured and theorized in a rigorous and strict manner (Walsh 1903, pp. 284–286; 1926, ch. 9, pp. 123–124).

In *The Fundamental Problem in Monetary Science*, Walsh (1903, p. 303) claims that it was not his purpose to carry out the argument on behalf of any of the standards of value. However, carrying out the argument for the stability of money in one of the standards is what he does. Among the four kinds of value identified, he regards exchange-value as the most important kind of value to the science of money, because money is primarily a medium of exchange that interests people mainly for its capacity to be exchanged for other goods (Walsh 1903, p. 257; 1926, pp. 16, 49). So, exchange-value is the very essence of money (Walsh 1926, p. 18), and the theories of value “are mostly found to be at bottom theories attempting to explain why at any given time and place commodities exchange for one another in certain amounts, that is, why their exchange-values are such as they are” (Walsh 1903, p. 17). For him, therefore, the relative values that money measures throughout time and space are exchange-values (Walsh 1903, p. 304).

This does not mean that the other kinds of value should be ignored or have their relevance in economics diminished. Different kinds of value serve different purposes and have definite roles that are not to be overlooked (Walsh 1903, p. 294; 1926, p. 132). Walsh recognizes, for instance, that the marginalist revolution had proposed a theory of value as esteem-value that represents the “foundation of the modern science of economics” (Walsh 1903, p. 183). Furthermore, Walsh indicates that the exchange-value of a commodity exists only because it possesses use-value and esteem-value, for people exchange commodities with each other only insofar as they both deem the commodities useful and esteem the commodities differently (Walsh 1926, p. 21). In the face of this, Walsh’s theoretical elaboration simply stipulates that exchange-value should be the reference for the science of money in its pursuit of a stable monetary standard.

In this regard, Walsh’s own reasoning displays a utilitarian dimension, inasmuch as he judges and compares the stability of money in exchange-value with the stability of money in cost-value or esteem-value in relation to their results for the economy. For him, stability of money in exchange-value offers better results than its rivals in terms both of distribution of wealth between the different classes of society and of production of wealth by and for society (Walsh 1903, pt. IV, ch. 4). The reason is that money stable in exchange-value does not discriminate in favor of either debtors or creditors, while money stable in either esteem-value or cost-value does discriminate in favor of creditors, a class identified by Walsh as composed chiefly by idle lenders—those who do not contribute directly to production and whose main source of income is

interest.¹⁶ The latter case would encourage people to retire from active enterprise, retarding industrial progress, because a “monetary system that is prejudicial to the borrowing undertakers of industry, in undue favor of their creditors, is also prejudicial to the laborers employed by those undertakers” (Walsh 1903, p. 358). The former case, on the other hand, would leave to the workers their gains, encouraging, therefore, laboriousness and the consequent material progress of society (Walsh 1903, pt. IV, ch. 4; 1926, pp. 136–137).

In this sense, stability in exchange-value, for its distributive neutrality, is compatible with a widespread rise in use-value and a fall in both esteem-value and cost-value—movements desired by all. A rise in use-value indicates that the overall level of utility in society is now higher due to the circulation of more and better goods. A fall in esteem-value also suggests a higher level of material abundance, insofar as marginal utility decreases as the availability of goods increases. A fall in cost-value hints at the notion that society is demanding less labor from its workers than before. In Walsh’s (1926, pp. 41–42) words: “we all wish for better things, that is, for higher use-values. Also we all wish for more of most things, that is, for lower esteem-values as the direct consequence of their greater abundance. And we wish to get them through less labor: we wish their cost-values to fall.”

These movements, taken together, entail higher levels of stability and prosperity. Stability in any kind of value but exchange-value, thus, would prevent society from achieving the highest possible level of material abundance and welfare. This does not mean that stability in exchange-value guarantees the attainment of this level, though. It simply means that stability in exchange-value is the only viable alternative if this level is to be attained (Walsh 1903, pt. IV, ch. 4; 1926, ch. 10). As such, the conclusion that money should be stable in exchange-value is reached by Walsh (1903, p. 365) from the perspective of the general principle of utility, that is, as the alternative that generates “the greatest happiness of the greatest number.”

The Stability of Money in Exchange-Value

In Walsh’s (1903, p. 296) approach, stability of money in exchange-value presupposes one commodity being stable in its purchasing power over other commodities by means of their variations toward one another, regardless of the causes of their variations. Unlike use-value, esteem-value, and cost-value, the general exchange-values cannot *all* fall simultaneously, because exchange-value is necessarily interrelative—that is, a commodity’s exchange-value exists only in relation to the exchange-values of all other things, and any movement upward must necessarily be counterbalanced by at least one movement downward (Walsh 1926, pp. 25, 107–108).

For this reason, for Walsh (1903, pp. 11–13; 1926, p. 128), exchange-value is a kind of value that is measured by the commodity standard—or price standard—which he contrasts with the labor standard. The commodity standard presupposes that the value of money is determined by the value of its metal equivalent—whichever the metal(s)—while the labor standard contrasts the value of money with labor. The commodity

¹⁶ Walsh (1903, p. 346) attributes this recognition to Fisher (1896), for whom the issue of justice between creditor and debtor was at the center of the bimetallic controversy—a diagnosis echoed by Laidler (2012, p. 179).

standard urges money to be stable in exchange-value, while the labor standard relies upon money stable either in cost-value or in esteem-value. According to Walsh (1903, p. 310), money is not comparable with labor, because it is not labor, and because “labor, though it creates wealth, does not create value, except in the single sense of ‘value’ meaning cost-value” (Walsh 1926, p. 98). Alternatively, money is a material item, like commodities, and, as such, is comparable with commodities alone. For him, in other words, “an exchange is a mutual transfer of two objects. Labor cannot be transferred, but only the result of labor” (Walsh 1926, p. 7).

Walsh recognizes that the commodity standard is not a perfect standard of exchange-value, especially because it is not possible to account for an article’s variation in exchange-value in every other article (Walsh 1903, p. 277; 1926, pp. 60–61). Nonetheless, it is Walsh’s contention that the other standards present much more debilitating faults. Here, he divides the labor standard into a wages standard (of esteem-value) and a cost standard (of cost-value). Walsh’s dismissal of the wages standard relates to the unworkability of several other earnings beyond wages, such as profits, which reduces what should be an earnings standard to a wages standard. Walsh also attributes to the wages standard an additional difficulty generated by the zero wage of the unemployed, which must be accounted for—and has no equally debilitating correspondence in the commodity standard (Walsh 1903, pp. 279–280). Alternatively, against the cost standard, often treated as a standard of production cost, Walsh (1903, pp. 280–281) holds that “people in general are not so much interested in the cost of production of an article as they are in its cost of acquisition.”

Furthermore, as per Walsh’s classification (1903, pt. III, ch. 3), the commodity standard presupposes exchange-value as a relative measure, to the extent that any variation in the value of money is immediately indicated by a change in the price level in the opposite direction. In this regard, any general change in the price level can be explained by a relative change in the scarcity of money in contrast with the scarcity of commodities. This idea dictates that in order to keep money stable in “value,” as desired by all, the average level of prices ought to be kept constant (Walsh 1903, p. 220; 1926, p. 117). He defined such a perception as the “quantity theory of the value of money,” or, simply, the general demand-and-supply theory of value applied to money (Walsh 1903, p. 252)—an argument that resonates with the main aspects of the quantity theory of money. It is not a coincidence, therefore, that his diagnosis would find echo in Fisher’s most important monetary treatise, *The Purchasing Power of Money*, in which Fisher with Harry Brown ([1911] 1913, p. 225), quoting Walsh, indicate that exchange-value—as measured by prices—is in fact the reference for monetary stability.¹⁷

In Walsh’s scheme, therefore, the commodity standard prevails, and money ought to be stable in the prices of commodities, that is, *the purchasing power of money should be the benchmark for monetary stability*. From this perspective, once again, prices have a

¹⁷ Predicated upon this notion, Fisher proclaimed before a US Senate hearing in 1913, a “perfectly elastic currency” that varied in accordance with the demands of trade was necessary, “in such a manner as to maintain the price level constant” (Barber 1997b, p. 14). The gold standard, for instance, defended by Fisher, as it were, should be sustained only while it guaranteed a stable purchasing power of the dollar—and cast aside otherwise (Barber 1997c, p. 27). As such, the gold standard did not answer for sound money per se, because the “essence of soundness is stability in value,” and, at times, like in the period 1929 to 1933, the gold-standard dollar could part ways with soundness (Barber 1997c, p. 55).

special place both theoretically and in practice, and, not by accident, Walsh (1903, p. 222) classifies the commodity standard as a price standard as well. For him, the *raison d'être* of prices is the measurement of particular exchange-values (Walsh 1901, p. 29; 1926, pp. 105–106, 110), which he understands as the exchange-value of a commodity in relation to some particular other item (Walsh 1903, p. 114). As far as money is concerned, “the variations of prices are the reciprocals of the variations of the particular exchange-values of money” (Walsh 1926, p. 61). Therefore, money informs, through prices, the variation of the particular exchange-value of all other commodities in relation to money itself (Walsh 1926, pp. 60–61). That means that, even though the commodity standard is not a perfect standard of exchange-value, money offers the necessary data—prices—for the measurement of the variation of its general exchange-value—which is approximately a synthesis of the many existing particular exchange-values of money. Consequently, economists, as impartial onlookers, should concentrate their analyses on the exchange-value of money (Walsh 1926, pp. 44, 116). More specifically:

it is only the particular exchange-values of things in money that are always identical, in magnitude, with prices, by definition; and it is only these particular exchange-values of things in money that can accompany their esteem-values (and cost-values) as they fall all together, or on the whole. Then the particular exchange-values of money in the things, the reciprocals of the prices, all rise together, or on the average, which means that the general exchange-value of money rises. In other words, the general exchange-value of money rises if prices accompany the falling esteem-values (or cost-values) of things. If money is to remain stable in general exchange-value, the average of prices must remain stable, some prices rising and others falling as esteem-values vary among themselves in their general fall (Walsh 1926, p. 110).

Ergo, according to Walsh, even though the different kinds of value must be recognized, it is exchange-value that answers for the kind of value that money measures and stores, and, as such, policy-makers should aim at the stability of exchange-value when discussing the stability of money and the most appropriate monetary standard. Indeed, should money fail to achieve stability in exchange-value naturally, Walsh considered that policy-makers ought to pursue this goal themselves: “money ought to be stable in exchange-value; and if it is not so naturally, it ought to be made so artificially, if this be possible” (Walsh 1901, p. 489). This is so because, as per Walsh (1903, p. 218; emphasis in the original):

It is evident that to say the “value” of money is measured or estimated by, and varies inversely with, the general level of prices, or that a general fall of prices is, or constitutes, appreciation of money, and similarly of a rise and of depreciation, and the like, can rightly refer only to the *exchange-value* of money, in its proper sense with reference to commodities alone, or at most with extension to include the so-called price, or wages, of labor.

Because of the original sin of the founding fathers of economics, Walsh (1903, pt. II, ch. 7) suggests, this realization survived barely on the outskirts of the discipline for nearly a century. Among those responsible for such survival, he lists Joseph Lowe, George Poulett Scrope, Henry James, Patrick James Stirling, and the bimetallicists Louis Wolowski, “the founder of the modern theory of bimetallicism,” Henri Cernuschi, “the

champion of international bimetallism,” and Samuel Dana Horton, “who introduced bimetallic theory in America” (Walsh 1903, pp. 189–190).

In this regard, it is worth highlighting that Walsh (1903, p. 133), revisiting his previous disagreement with the monometallists, charges the advocates of the gold standard, like Laughlin, as those particularly prone to present inconsistent views regarding the concept of value. According to Walsh, such an inconsistency was due to the monometallists’ attempt to deny both the appreciation of gold and the depreciation of silver that took place in the late nineteenth century—an attempt doomed to failure, had they recognized exchange-value as the reference for stability of the monetary standard, as per Walsh. Monometallists chose to attribute the fall of prices to changes in the production cost of commodities, arguing that the value of gold itself remained unchanged. This proposition, for Walsh, was absurd, inasmuch as the very fall of prices evidenced the rise in the purchasing power of gold. So, monometallists often mixed the idea of a commodity standard with the idea of a labor standard (Walsh 1903, pp. 133–146, 297–298; 1926, pp. 130–131). A similar confusion may be also found in the ranks of the bimetallists. However, according to Walsh, such a misstep was much less widespread within the latter group than within the former, because almost all bimetallists privileged the commodity standard, with money stable in exchange-value (Walsh 1903, pp. 146, 189, 223, 226, 299).¹⁸ Walsh (1903, p. 191; emphases added), then, goes as far as to impute a causal relationship between the adherence to bimetallism and the defense of exchange-value as the benchmark for the stability of money:

In general it may be said of these [bimetallist] leaders, and also of most of their followers, that they present the appearance of being bimetallists *because* they hold this doctrine about the need of stability of money in exchange-value; while even the best of their militant opponents, so far as they combat this doctrine, give the impression of holding that money should be stable in some other kind of value (they are not particular as to which), *because* they are advocates of the gold standard or of the status quo.

Walsh, as such, goes from the battle of the standards to the fundamental problem in monetary science and back again. For Walsh, once again, the issue regarding the most appropriate monetary standard—that is, the definition of the specie standard more prone to stability—is something that could be dealt with only once the more foundational discussions regarding the meanings of “value” and of “stability of money” were settled.

In this sense, it is precisely the idea that money should be stable in exchange-value that led Walsh to favor—despite obliquely—a bimetallic standard as the most appropriate monetary policy. This realization arose from the perception that a monometallic monetary standard would be overly exposed to fluctuations in the stock of money, whereas in a bimetallic system the control over the supply of money would be strengthened. Bimetallists, in fact, usual advocates of the quantity theory of money as they were, blamed an insufficient supply of gold for the instability of prices in the nineteenth century. This prompted them to suggest the introduction of “silver alongside gold at a fixed relative price into a monetary system from which ... it had been excluded” (Laidler 2012, p. 177–178).

¹⁸ This does not mean that *all* monometallists rejected exchange-value as the benchmark for money stability. It simply indicates that, for Walsh, the rule among monometallists was to privilege the stability of money in some other kind of value.

Not by accident, it may be said that Walsh's reasoning, already in 1901, asymptotically approached the quantity theory of money. He indicates such approximation by assuming that the quantity theory serves as the foundation for the scheme—to which he subscribes (Walsh 1901, pp. 489–490)—“of regulating the exchange-value of money by exercising artificial control over its issuance” (Walsh 1901, p. 481). Indeed, for him, “[i]f the level of prices is shown to have risen, it is a sign that the quantity of money is too great and should be diminished; and if the level of prices is shown to have fallen, it is a sign that the quantity of money is too small and should be increased” (Walsh 1901, p. 493).

Therefore, for Walsh, the problem at stake, that is, the kind of value that money should measure and store in a stable manner—the fundamental problem in monetary science—was a theoretical problem of untold influence in practical applications (Walsh 1903, p. 26). As far as he was concerned, it was absurd for individuals who had “never tried seriously to measure the variations of the general exchange-value of money, or to work out the theory of the method for making such measurement, to affirm that the measurement of general exchange-value is impossible” (Walsh 1903, p. 300). The task he undertook in *The Measurement of General Exchange-Value* is precisely that of working out both the theory and the method for measuring general exchange-value. In fact, as he claimed in his 1934 letter to Fisher, this book was conceived as the opening act of his defense of money stable in exchange-value, an idea he defended especially in *The Fundamental Problem in Monetary Science*, his most sophisticated work in the science of money, but also in *The Four Kinds of Economic Value*. This latter work, actually, is the one that offers, perhaps, the best summary of his attitude toward the science of money. This summary, Walsh's (1926, p. 138) closing words to *The Four Kinds of Economic Value*, reads as follows:

It is perhaps not so much a piece of good luck that the measurement of exchange-value [through index numbers] is now the easiest, as it is a result of the endeavors to make it so, themselves inspired by the belief that this is the kind of value in which money ought to be stable. At all events, the proper purpose of measuring the exchange-value of money is to prepare the way for somehow rendering money stable in this value. But first of all, this value must be cleared of confusion with the other kinds of value.

VII. CONCLUDING REMARKS

Walsh's last scholarly contributions came in the 1920s, by means of his presence in the debates regarding Fisher's ideal formula for index numbers (Walsh 1921a, 1921b, 1924) and *The Four Kinds of Economic Value* (Walsh 1926).¹⁹ He would yet publish, in 1932, a booklet, attempting to solve Fermat's Last Theorem using an approach he called “the method of recurrence” (Walsh 1932a), and the entry about index numbers in Edwin Seligman's *Encyclopedia of the Social Sciences* (Walsh 1932b). These works, however,

¹⁹ An important work published by Walsh in the 1920s is *The Problem of Estimation* (1921b). This book offered significant remarks on the making of index numbers, as Walsh (1921b, p. 34) oriented his argument toward the appreciation of “the theoretically true method” for index numbers. This book also ignited the controversy opposing Walsh and Edgeworth, a debate that, as aforementioned, deserves a study of its own.

did not carry any further contributions to the prevailing state of the art in either economics or statistics.

We do not question that *The Measurement of General Exchange-Value* is Walsh's magnum opus. This book brought him to the center of the debates and, to the extent that index numbers were a part of monetary economics, gave him the status of authority on monetary economics. Nonetheless, we cannot lose sight of the fact that this book discusses a statistical instrument deliberately designed to serve his approach to the fundamental problem in monetary science, which he defined as the theoretical identification of the kind of value that money measures and stores. The same is true for Fisher, whose interest in index numbers arose from the problem related to the measurement of the purchasing power of money (Boumans 2001, p. 323; 2005, p. 158; Dimand 1997, p. 2; 2019, pp. 136–137). It is not a coincidence, therefore, that both Fisher and Walsh, as they strived for scientific purity, saw the measurement of variations in exchange-value, or purchasing power of money, as the unique purpose of index numbers (see Cruz-e-Silva and Almeida 2022, p. 656; Yule 1921, p. 626). In fact, regarding such strife for purity, Darwin (1904, p. 79) is categorical: "Mr. Walsh, I venture to think, frequently strives at too great theoretical purity in dealing with these many-sided problems." In terms of monetary policy, this led Walsh to designate the minimization of variations in the exchange-value of money as the primary task—a goal that, for him, given the alternatives at hand, could be more readily achieved under a bimetallic standard.

Accordingly, whereas *The Measurement of General Exchange-Value* is Walsh's magnum opus, his archetypical work is *The Fundamental Problem in Monetary Science*. As far as Walsh was concerned, index numbers were not the most important feature of his work, but a tool at the service of his more comprehensive discussions on the science of money, because an index number was not an end in itself but a means to a single purpose: to measure and discuss the stability of exchange-value. Instead, for him, the solution to the fundamental problem in monetary science was the most important contribution he could offer to economics.

Walsh's approach to the science of money, thereupon, presented a hierarchical arrangement, following the relevance he attributed to each topic. Epistemologically, first, it was necessary to recognize the existence of different kinds of value. Second, it was necessary to ascertain that money should be kept stable in exchange-value. Then, and only then, should economists dwell upon practical issues such as the making of index numbers and the definition of the most appropriate monetary standard. As such, Walsh was not only an index-number theorist: he was a fully-fledged monetary scientist. Regarding him simply as an index-number theorist is a reductionism that is no closer to the truth than the classification of Adam Smith as a free-trade theorist, of Thomas Malthus as a demographer, or of Irving Fisher as an index-number theorist as well.

COMPETING INTERESTS

The authors declare no competing interests exist.

REFERENCES

Archives

- Irving Fisher Papers. Manuscripts and Archives. Collection MS 212. Yale University Library, New Haven, United States.
- New York Times*. "Correa Moylan Walsh: Writer on Economics and Sociology Studied in Europe." March 12, 1936, p. 21.
- Ragnar Frisch Papers. Oslo National Library (*Nasjonalbiblioteket*), Oslo, Norway.
- Wesley Mitchell Papers. Columbia University Libraries. Columbia University, New York, United States.

Other Sources

- Aldrich, John. 1992. "Probability and Depreciation: A History of the Stochastic Approach to Index Numbers." *History of Political Economy* 24 (3): 657–687.
- . 2008. "Keynes among the Statisticians." *History of Political Economy* 40 (2): 265–316.
- Balk, Bert. 2008. *Price and Quantity Index Numbers: Models for Measuring Aggregate Change and Difference*. Cambridge: Cambridge University Press.
- Banzhaf, H. Spencer. 2004. "The Form and Function of Price Indexes: A Historical Accounting." *History of Political Economy* 36 (4): 589–616.
- Barber, William, ed. 1997a. *The Works of Irving Fisher*. Volume 1: *The Early Professional Works*. London: Pickering & Chatto.
- . 1997b. "Editorial Introduction with Selected Documents." In William Barber, ed., *The Works of Irving Fisher*. Volume 4: *The Purchasing Power of Money*. London: Pickering & Chatto, pp. 1–14.
- . 1997c. *The Works of Irving Fisher*. Volume 14: *Correspondence and Other Commentary on Economic Policy 1930–1947*. London: Pickering & Chatto.
- Bickerdike, C. 1928. "Review: *Four Kinds of Economic Value*. By C. M. Walsh." *Economic Journal* 38 (149): 106–107.
- Boumans, Marcel. 2001. "Fisher's Instrumental Approach to Index Numbers." *History of Political Economy* 33 (5): 313–344.
- . 2005. *How Economists Model the World into Numbers*. London: Routledge.
- Carver, Thomas. 1919. "Walsh's The Climax of Civilization: Socialism; Feminism." *Quarterly Journal of Economics* 33 (4): 714–716.
- Chaffé, Allan, and Robert Dimand. 2006. "Correa Moylan Walsh (1862–1936)." In Ross Emmett, ed., *The Biographical Dictionary of American Economists*. Volume 2: J–Z. London: Thoemmes Continuum, pp. 885–887.
- Clark, John Bates. 1895. "The Gold Standard of Currency in the Light of Recent Theory." *Political Science Quarterly* 10 (3): 389–403.
- Cruz-e-Silva, Victor, and Felipe Almeida. 2022. "The Making of Index Numbers in the Early 1920s: A Closer Look at the Fisher-Mitchell Debate." *History of Political Economy* 54 (4): 655–686.
- Darwin, Leonard. 1904. "Review: *The Fundamental Problem in Monetary Science*." *Economic Journal* 14 (53): 75–79.
- Davis, Harold, and William Nelson. 1935. *Elements of Statistics with Applications to Economic Data*. Bloomington: The Principia Press.
- De Boyer des Roches, Jérôme, and Rebeca Gomez Betancourt. 2013. "American Quantity Theorists Prior to Irving Fisher's *The Purchasing Power of Money*." *Journal of the History of Economic Thought* 35 (2): 135–152.
- Diewert, Erwin. 2013. "Irving Fisher and Index Number Theory." *Journal of the History of Economic Thought* 35 (2): 199–232.

- . 2022. “Scanner Data, Elementary Price Indexes and the Chain Drift Problem.” In Duangkamon Chotikapanich, Alicia Rambaldi, and Nicholas Rohde, eds., *Advances in Economic Measurement*. Singapore: Palgrave Macmillan, pp. 445–606.
- Dimand, Robert. 1997. “Editorial Introduction with Selected Documents.” In William Barber, ed., *The Works of Irving Fisher*. Volume 7: *The Making of Index Numbers*. London: Pickering & Chatto, pp. 1–13.
- . 1998. “The Quest for an Ideal Index: Irving Fisher and *The Making of Index Numbers*.” In Malcolm Rutherford, ed., *The Economic Mind in America: Essays in the History of American Economics*. London: Routledge, pp. 128–144.
- . 2019. *Irving Fisher*. Cham: Palgrave Macmillan.
- Dimand, Robert, and Rebeca Gomez Betancourt. 2012. “Retrospectives: Irving Fisher’s *Appreciation and Interest* (1896) and the Fisher Relation.” *Journal of Economic Perspectives* 26 (4): 185–196.
- Edgeworth, Francis Ysidro. 1901. “Mr. Walsh on the Measurement of General Exchange Value.” *Economic Journal* 11 (43): 404–416.
- . 1923a. “Mr. Correa Walsh on the Calculation of Index-Numbers.” *Journal of the Royal Statistical Society* 86 (4): 570–590.
- . 1923b. “The Doctrine of Index-Numbers According to Mr. Correa Walsh.” *Economic Journal* 33 (131): 343–351.
- . 1925a. “The Element of Probability in Index Numbers.” *Journal of the Royal Statistical Society* 88 (4): 557–575.
- . 1925b. “The Plurality of Index-Numbers.” *Economic Journal* 35 (139): 379–388.
- Fisher, Irving. 1894. “The Mechanics of Bimetallism.” *Economic Journal* 4 (15): 527–537.
- . 1896. *Appreciation and Interest*. New York: The Macmillan Company.
- . 1902. “Review: *The Measurement of General Exchange-Value*. By Correa M. Walsh.” *Yale Review* (11): 109–112.
- . 1920. *Stabilizing the Dollar*. New York: Macmillan.
- . 1921. “The Best Form of Index Number.” *Quarterly Publications of the American Statistical Association* 17 (133): 533–537.
- . 1922. *The Making of Index Numbers*. Boston: Houghton Mifflin Company.
- . 1934. *Stable Money: A History of the Movement*. New York: Adelphi Company.
- Fisher, Irving, with Harry Gunnison Brown. [1911] 1913. *The Purchasing Power of Money*. New York: Macmillan.
- Friedman, Milton. 1990a. “Bimetallism Revisited.” *Journal of Economic Perspectives* 4 (4): 85–104.
- . 1990b. “The Crime of 1873.” *Journal of Political Economy* 98 (6): 1159–1194.
- Friedman, Milton, and Anna Schwartz. 1963. *A Monetary History of the United States, 1867–1960*. Princeton: Princeton University Press.
- Frisch, Ragnar. 1936. “Annual Survey of General Economic Theory: The Problem of Index Numbers.” *Econometrica* 4 (1): 1–38.
- Gaines, John M. 1902. “Review: Correa Moylan Walsh, *The Measurement of General Exchange Value*.” *Bulletin of the American Mathematical Society* 9 (2): 127–128.
- Girton, Lance, and Don Roper. 1978. “J. Laurence Laughlin and the Quantity Theory of Money.” *Journal of Political Economy* 86 (4): 599–625.
- Greene, Evarts Boutell. 1916. “The Political Science of John Adams by Correa Moylan Walsh.” *Mississippi Valley Historical Review* 2 (4): 575–576.
- Harvard College. 1884. *Class of 1884*. Cambridge: Harvard University Press.
- . 1894. *Class of 1884: Decennial Report of the Secretary*. Cambridge: Harvard University Press.
- . 1909. *Class of 1884: Twenty-fifth Anniversary Report of the Secretary*. Cambridge: Harvard University Press.
- Hayek, Friedrich A. 1984. “Intertemporal Price Equilibrium and Movements in the Value of Money [1928].” In Friedrich Hayek and Roy McCloughry, *Money Capital and Fluctuations: Early Essays*. London: Routledge & Kegan Paul, pp. 71–117.
- Hofstadter, Richard. 1956. *The Age of Reform: From Bryce to F.D.R.* New York: Alfred A. Knopf.

- Kendall, Maurice. 1969. "Studies in the History of Probability and Statistics, XXI. The Early History of Index Numbers." *Review of the International Statistical Institute* 37 (1): 1–12.
- Keynes, John Maynard. [1909] 1983. "Index Numbers." In Elizabeth Johnson, Daniel Moggridge, and Austin Robinson, eds., *The Collected Writings of John Maynard Keynes*. Volume XI. Cambridge: Cambridge University Press, pp. 49–173.
- . [1930] 1971. "A Treatise on Money." In Elizabeth Johnson, Daniel Moggridge, and Austin Robinson, eds., *The Collected Writings of John Maynard Keynes*. Volume V. Cambridge: Cambridge University Press.
- King, John, and Michael McLure. 2014. "History of the Concept of Value." Discussion Paper 14.06, University of Western Australia, Department of Economics.
- King, Willford. 1930. *Index Numbers Elucidated*. New York: Longmans, Green and Co.
- Laidler, David. 1991. *The Golden Age of the Quantity Theory of Money*. New York: Harvester Wheatsheaf.
- . 2012. "Professor Fisher and the Quantity Theory—A Significant Encounter." *European Journal of the History of Economic Thought* 20 (2): 174–205.
- Laughlin, James Laurence. 1895. *The History of Bimetallism in the United States*. New York: D. Appleton and Company.
- Leonard, Thomas. 2016. *Illiberal Reformers: Race, Eugenics and American Economics in the Progressive Era*. Princeton: Princeton University Press.
- Mitchell, Wesley. 1921. *Bureau of Labor Statistics Bulletin 284: Index Numbers of Wholesale Prices in the United States and Foreign Countries*. Washington: Government Printing Office.
- Newcomb, Simon. 1879. "The Standard of Value." *North American Review* 129: 223–237.
- Padan, Robert Samuel. 1901. "Review: The Measurement of General Exchange-Value by Correa Moylan Walsh." *Journal of Political Economy* 9 (4): 608–610.
- Persky, Joseph. 1998. "Retrospectives: Price Indexes and General Exchange Values." *Journal of Economic Perspectives* 12 (1): 197–205.
- Reinsdorf, Marshall. 2007. "Axiomatic Price Index Theory." In Marcel Boumans, ed., *Measurement in Economics: A Handbook*. Amsterdam: Elsevier, pp. 153–188.
- Rockoff, Hugh. 1990. "The 'Wizard of Oz' As a Monetary Allegory." *Journal of Political Economy* 98 (4): 739–760.
- Rosenstein-Rodan, Paul. 1936. "The Coordination of the General Theories of Money and Price." *Economica*, New Series 3 (1): 257–280.
- Salvary, Stanley. 1993. "On the Historical Validity of Nominal Money as a Measure of Organizational Performance: Some Evidence and Logical Analysis." *Essays in Economic and Business History* 11: 153–177.
- Schiller, Ferdinand. 1918. "Review of Correa Moylan Walsh, *The Climax of Civilization; Socialism; and Feminism*." *Eugenics Review* 10 (2): 97–101.
- Schumpeter, Joseph. 1954. *History of Economic Analysis*. New York: Oxford University Press.
- Simiand, François. 1903. "Review." *L'Année Sociologique* 7: 559–569.
- Siven, Claes-Henric. 2002. "Analytical Foundations of Erick Lindahl's Monetary Analysis, 1924–1930." *History of Political Economy* 34 (1): 111–153.
- Walker, Francis Amasa. 1896. *International Bimetallism*. New York: Henry Holt and Company.
- Walsh, Correa Moylan. 1896. "Shaw's History of Currency." *Quarterly Journal of Economics* 10 (4): 431–454.
- . 1897. "The Steadily Appreciating Standard." *Quarterly Journal of Economics* 11 (3): 280–295.
- . 1901. *The Measurement of General Exchange-Value*. New York: Macmillan.
- . 1903. *The Fundamental Problem in Monetary Science*. New York: Macmillan.
- . 1904. "Kant's Transcendental Idealism and Empirical Realism." *Mind* 13 (49): 54–71.
- . 1906. "Franklin and Plato." *Open Court: A Monthly Magazine* 20 (3): 129–133.
- . 1908. *Shakespeare's Complete Sonnets: A New Arrangement*. New York: Thoms and Eron.
- . 1910. *The Doctrine of Creation*. London: T. Fisher Unwin.

- . 1915. *The Political Science of John Adams: A Study in the Theory of Mixed Government and the Bicameral System*. New York: G. P. Putnam's Sons.
- . 1917a. *The Climax of Civilization*. New York: Sturgis & Walton Company.
- . 1917b. *Socialism*. New York: Sturgis & Walton Company.
- . 1917c. *Feminism*. New York: Sturgis & Walton Company.
- . 1921a. "The Best Form of Index Number: Discussion." *Quarterly Publications of the American Statistical Association* 17 (133): 537–544.
- . 1921b. *The Problem of Estimation*. London: P.S. King & Son Ltd.
- . 1924. "Professor Edgeworth's View on Index-Numbers." *Quarterly Journal of Economics* 38 (3): 500–519.
- . 1926. *The Four Kinds of Economic Value*. Cambridge: Harvard University Press.
- . 1932a. *An Attempted Proof of Fermat's Last Theorem by a New Method*. New York: G. E. Stechert & Co.
- . 1932b. "Index Numbers." In Edwin Seligman, ed., *Encyclopedia of the Social Sciences*. New York: Macmillan Company, pp. 652–658.
- Warburton, Clark. 1981. "Monetary Disequilibrium Theory in the First Half of the Twentieth Century." *History of Political Economy* 13 (2): 285–299.
- Yule, George Udny. 1921. "Review." *Journal of the Royal Statistical Society* 84 (4): 625–626.