

Keynes and the interwar commodity option markets

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In the first quarter of the twentieth century, options began to be widely employed in the main financial centres in Europe and the USA for trading in spot and futures markets. From 1921 onward, Keynes embarked upon investment in these derivatives mainly—but not exclusively—in the commodity markets, showing a true fascination for this method of speculation. This type of financial investment he pursued mainly in the 1920s, with only a few operations undertaken during the 1930s. The option markets in which Keynes traded were metals—in particular copper, lead, spelter and, especially, tin. Besides metals, Keynes dealt in options also in other commodity markets, such as rubber and linseed oil, and sparingly in ordinary stocks and government securities. In this paper we offer a reconstruction of Keynes's speculative activity in commodity options, drawing on the archival material kept in the Keynes Papers held at King's College, Cambridge. This reconstruction is, to the best of our knowledge, entirely new to the literature and aims to provide an analysis of this particular aspect of Keynes's investment behaviour, investigating his capacity to predict market trends and offering a preliminary assessment of his performance.

Key words: Keynes, Speculation, Commodity options, Interwar financial markets

JEL classifications: B26, B31, N20, N50

As regards the principle of investment in Commodities, I know the conventional view. But a pretty long experience convinces me that so far as risk is concerned they are much safer than anything else, since of course intrinsic value remains and one is always protected from catastrophic losses. Held with obstinacy they are, in my experience, far the safest form of investment.

(*Keynes Papers*, PC/1/5/89, 1938–39, quoted in [Holder and Kent, 2011](#), p. 5)

1. Introduction

In the first quarter of the twentieth century, options began to be widely employed in the main financial centres in Europe and the USA for trading in spot and futures markets. From 1921 onward, Keynes embarked upon investment in these derivatives mainly—but not exclusively—in the commodity markets, showing a true fascination

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In this paper we offer a reconstruction of Keynes's speculative activity in commodity options, drawing on the archival material kept in the Keynes Papers held at King's College, Cambridge. This reconstruction is, to the best of our knowledge, entirely new to the literature. The main sources searched are Keynes's ledgers, the weekly statements of the Tilton Company (set up in 1926 for fiscal purposes) and the correspondence between Keynes and his broker, the firm Buckmaster & Moore—in particular with the firm's associates Oswald Falk and Rupert Trouton. These sources contain information about quantities, strike prices, types of options, *premium*, margins, commissions and profits and losses (net and gross). While more work is needed to gain a full understanding of the working of the commodity options at the time,¹ we hope that our investigation into Keynes's dealings in options will also contribute towards research in that direction. As it is, the scope of our paper is much narrower: our aim is to provide an analysis of this particular aspect of Keynes's investment behaviour, investigating his capacity to predict market trends and offering a preliminary assessment of his performance.²

2. Keynes's investment activity: an overview

In Keynes's life-long investment activity, the year 1919 represented a watershed. Before that year (and since 1905) Keynes had operated almost exclusively on his own account and on a very modest scale. His income per annum remained low throughout the entire period: until the fiscal year 1914–15 it was below £1,000, mainly accounted for by the revenues deriving from his academic activity (about 80% of his total income) (see Moggridge, 1983, Table 1). Things started to change the year after, when his investments in securities began to increase (Moggridge, 1983, Table 2) as his income rose, touching on £1,300, only 27% of which deriving from his academic activity. But the turning point in Keynes's revenues occurred in 1919–20, when his annual income reached a peak of £5,000.³ This exceptional rise was evidently the result of the publication of an extraordinarily successful book, *The Economic Consequences of the Peace* (Keynes, 1971),⁴ which explains why his academic and publishing activity once again came to constitute the main source of his total income over these two years. This happy circumstance—which afforded him a revenue four times higher than that of the previous two years—together with the restoration of

¹ The secondary literature on option markets in the 1920s is scanty: see Poitras (2009) and Mixon (2009, 2011), neither of whom specifically address aspects of commodity option markets.

² The assessment of Keynes's general performance as an investor in shares and speculator in currencies and commodities would require a thorough and detailed reconstruction of his portfolio over the whole period in which he was active in those markets, which is part of a wider research project still in progress.

³ Since then and during the 1920s, his annual income settled at values ranging from about £4,000 up to more than £6,500 in 1926–27.

⁴ The book was first published in England at the end of 1919 and just one month later in the USA. It was immediately a great success: 60,000 copies were sold in the first two months and over 100,000 by the end of July 1920 (Moggridge, 1992, p. 335).

the financial markets after the end of World War I may explain why Keynes started to engage in speculation in this very period, operating mainly through futures contracts, first on the foreign exchange market and then on the commodity markets, on such a scale and with such regularity as he had never ventured upon before.

Subsequently—having acquired some experience operating on his own account—Keynes continued his speculative activities, starting to operate also on behalf of others, mainly friends at the beginning (Moggridge, 1983, p. 5) and successively also institutions and companies.⁵ He invested in association with Oswald Falk, who was one of his former colleagues at the Treasury and partner of Buckmaster & Moore, his broker. From 1923–24 onward the main source of his revenues became his professional investment activity while his academic and publishing activity played a secondary part (Moggridge, 1983, Table 1).

Although his speculations on the foreign exchange market at the beginning of the 1920s brought him some—not negligible—losses, by the end of 1922 these losses were completely recuperated,⁶ especially thanks to his successful speculation in the commodity futures markets (metals and cotton) and, to a lesser extent, in securities. In fact, taking Keynes's investment income by source (Moggridge, 1983, Table 4), we observe that starting from 1922 and until 1930 it was his speculative activity in commodities that yielded a greater contribution than his speculation in currencies and dividends or capital gains (denominated both in dollars and sterling) deriving from shares and securities. Accordingly, speculation in commodities represented the main debt source in 1925 and 1928, when his investments went in the wrong direction. Early in the 1930s, the pattern of Keynes's portfolio changed and the main source of his investment income was from capital gains and dividends.⁷

From these data clearly emerges the centrality of commodity investments in Keynes's portfolio in the 1920s. He began the decade with a loss, with a negative income amounting to £10,000, deriving from his unsuccessful speculation in foreign exchange, while his speculation in commodities had yet to get underway. Yet in 1921 things were different: his gains from speculation in currencies almost equalled his losses from the previous year but at the same time he gained approximately £2,000 from his speculation in commodities.

From 1922 onward, Keynes reduced his speculative activity in currencies and in parallel increased his investment in commodities (metals and crops).⁸ From 1923 onward (and until 1928), the speculative activity in commodities (including his investment in options) contributed to his income by between 55% and 65%. This period of prevalent investment in commodities practically ceased at the end of the 1920s, after the great losses of 1928 and those following the 1929–30 crisis. In fact, although his investment in commodities spanned over the whole of the 1930s—and until 1939, the year in which they finally ended because of the outbreak of World War II—as from 1931, the main source of Keynes's income (and the main cause of his losses) became

⁵ First, King's College, where Keynes was appointed First Bursar in 1924, but also the National Mutual Life Assurance Society, Provincial Insurance Company, Independent Investment Trust, AD Investment Trust and PR Finance Company, where he was on the boards.

⁶ On 31 December 1922, in fact, Keynes's net assets were more than £21,000 (see Moggridge, 1983, Table 3).

⁷ For example, in 1937 capital gains in dollars played the major role (and represented his main debt source in 1938, when he came in for heavy losses), which testifies to the marked increase in his financial investment in US securities.

⁸ Indeed, in that year the income deriving from his investment in commodities almost doubled that deriving from his speculation in currencies.

shares and securities. In 1936, for example, dividends and capital gains (both in dollars and sterling) accounted for 75% of his total investment income, but commodities only for 17%. After 1936, and until 1945, the largest portion was represented by the capital gains deriving from securities denominated in dollars.

According to [Moggridge \(1983, p. 15\)](#), the financial setback that Keynes experienced at the end of the 1920s (when securities prices collapsed in September–October 1929) had its origins in the previous years and was mainly due to his speculative activity in commodities, and in particular to the combination of three factors: his long-term holdings, his ample recourse to loans in order to fund his investments and his short-term speculation. In fact, Keynes's investment activity in commodities in the 1920s was characterised by a highly speculative profile, especially from 1922–23 onward, when he started to resort to sophisticated derivatives, such as options. As from January/February 1922, the options Keynes bought were in copper and tin and, immediately after, also in spelter and lead, as we shall see. In 1923–24, Keynes extended his investment in options also to other commodities, in particular rubber and linseed oil. During the 1930s, Keynes's investment in commodities was characterised mainly by futures trading while his recourse to commodity options was limited only to a few operations in tin.

3. Keynes's investment in commodity options: a view from his ledgers, statements and correspondence

Keynes's ledgers tell us that his first operations in commodity futures were in American cotton,⁹ and in particular a few long positions in February 1921 (SE/11/2/4),¹⁰ while his intention to begin to speculate in futures on metals is documented by a letter that Oswald Falk wrote to him in September 1921:

If you want to deal in tin or copper I think we ought to give you a chance, though it can only be on a small scale, say up to £10,000 worth of the two combined. A 20% margin should be enough at these prices.¹¹ (16 September 1921, SE/2/1/128)

In fact, just three days later, Falk informed Keynes: 'I [Falk] have bought for you 50 tons of copper and 45 of tin' (19 September 1921, SE/2/1/134).¹²

Just two months after this opening of a few long positions in tin and copper futures, Keynes ventured into dealing in metal options.¹³ This happened after a brief by his former

⁹ For analysis of Keynes's activity in cotton futures, see [Cristiano and Naldi \(2014\)](#).

¹⁰ The classification number is given according to the 'Catalogue of Keynes Papers', King's College, Modern Archives, Cambridge, UK.

¹¹ These prices were respectively £156.10s for tin and £69.5s for copper (SE/11/2/7).

¹² The purchase of these two contracts is also registered in Keynes's ledgers (SE/11/2/7). The total value of the two contracts amounted to £10,505 (£7,042.10s for tin and £3,462.10s for copper).

¹³ From the Keynes Papers we also know that in those times option contracts were not available for all the commodities exchanged in the UK markets. In December 1921, Buckmaster & Moore, for example, explained to Keynes that according to the cotton merchant firm Newall & Clayton based in Liverpool: 'there is very rarely a transaction done in [cotton options] here now, nearly all the responsible people in this market refuse to trade in them, as they are not recognized by our Association or in a court of law. We accordingly prefer not to deal in them on your behalf' (5 December 1921, SE/2/1/143). In fact, we have found evidence of only one single operation of a put option in American cotton bought on the 8 April 1925 (SE/2/5/75 and 77). In a letter dated 10 March 1924, once again, Buckmaster & Moore explained to Keynes, who evidently had enquired about this possibility, that sugar options were not dealt with in the London market (SE/2/4/28). Whereas, in the same years, we have evidence that Keynes also traded in stock and government securities options (letters from Buckmaster & Moore to Keynes: 25 April 1923, SE/2/2/246; 17 March 1924, SE/2/4/35). For a detailed explanation of the working of the option market in government securities, see the letter from the broker firm Capel Cure and Terry to Keynes (25 May 1922, SE/2/2/7).

pupil at King's, Rupert Trouton (at the time also working for Buckmaster & Moore), who, in a note probably written in autumn 1921, explained how they worked. Trouton wrote:

Metal Options

Options are of two kinds.

- i) An ordinary call option at the moment is about 25/- [shillings] for copper and about £5 for tin. The option entitles the purchaser to exercise the right, by notification 3 days before the end of 3 months, to take up the metal at the price on the option contract, which is the price when the option is purchased, of 3 months forward. If the spot copper is £67 and forward £68 then the 25/- entitles the purchaser to take up copper at the end of three months for £69.5.0¹⁴ (including his initial expenditure on the option).
- ii) The type of option which includes 'buyer's option to double' is as follows. In return for a sum at present about £3 over forward price for tin the buyer purchases tin much like the ordinary forward purchase but has the additional right to double the amount he takes or not, as he pleases, having to notify 3 days before the end of the 3 months what his intention is. This option really amounts to a combination of two things: an ordinary forward purchase and a call option. Instead of the call option being arranged separately it is attached on to an otherwise normal forward purchase. For some extraordinary reason the price of a call option does not always equal the surcharge when there is 'buyer's option to double'. At the present moment the option to double is purchased for 25/- extra in the case of copper and £3 in the case of tin while the call option is 25/- for copper and £5 for tin. (SE/1/2/126-7)

On 1 December 1921 we have the record of the first transaction in copper options undertaken by Keynes, followed by more in the following three months, which were not exercised (SE/11/2/7). On 19 January 1922 he attempted a buyer's option to double (BOD) on tin that he did not exercise because at maturity the price dropped.

By mid-1922, Keynes had become more confident about the working of the option market and remained very active in it from 1922 to 1925. Later he traded in options sparingly and on a smaller scale until the early 1930s. After 1932 he reduced his exposure in metals, both in futures and, even more drastically, in options. In 1933 he dealt only in tin options (TC/4/3/1-16), while in copper he invested only in futures contracts.¹⁵ In the same years, Keynes concentrated his speculative activity in futures crops (corn, cotton, wheat and maize) and other commodities, such as rubber, lard, cotton oil, whale oil and linseed oil (TC/4/2-3).

Keynes was attracted to the metal option markets by the possibility to speculate on price movements with a financial device that appeared particularly flexible. The options in which he usually traded had three-month maturity, but occasionally they had longer (e.g. six or nine months on copper and spelter, SE/2/2/170, 179) or shorter (e.g. one month on lead and spelter, SE/11/2/17-19-23-29-32) maturities.

Before analysing Keynes's dealings, it is useful to consider the types of options available in the London market and the various costs involved.

Besides ordinary call and put options, other types of instruments were available. First, the double option, which was a combination of a put and a call, giving the right to exercise only one of the two at the expiration date.¹⁶ This type of option was quite expensive and was used when prices were particularly volatile since the holder could gain not by anticipating the direction of price movements but by the size of changes, since the double could be exercised as a put or as a call.

¹⁴ We remind the reader of the old British money system: 1 pound = 20 shillings and 1 shilling = 12 pence.

¹⁵ His investment in the lead market ceased completely in the 1930s, while in spelter Keynes bought only two double options in October 1934 for hedging his exposure in futures (TC/4/3/52).

¹⁶ At that time, this type of option was also called 'straddle' in the USA (see Smith, 1922, p. 46) or 'put-and-call' in England (see Higgins, 1906 [1896], p. 7).

A particular type of contracts—as we have seen from the letter by Trouton—were the BOD and the seller's option to double (SOD), which was an ordinary sale of a future with the purchase of a put option attached. If the amount was not doubled at the expiration date (i.e. the option part was not exercised), these contracts worked in all respects as standard futures contracts, although they had been negotiated at a price that was higher (in the case of BOD) or lower (in the case of SOD) than the standard future price in order to include the option *premium*.

All these types of options, such as the standard call and put, were of the European type, namely they could be exercised only at maturity.

The price of the option changed according to the type of option and the metal traded.¹⁷ At this stage of our investigation we were unable to detect any option pricing formula consistently followed and we had to rely on the information scattered in the ledgers and correspondence, which seem to indicate a rule-of-thumb fixed amount (ranging from £1 to £3) added to the three-month future price of the metal.¹⁸

The cover necessary to carry a position with a broker varied according to the instrument and the underlying commodity. For example, in July 1922, Buckmaster & Moore gave Keynes the following quotes:

We expect the following proportions to cover to be maintained intact at all times on open positions at their current valuation: in exchange 20%, in Commodities 30%, on Call options Payment in full. We are content that not only cash balances standing to your credit and securities deposited with us (reckoned at their current market value), but also book profits on your open position, should count towards the proportions of cover required. (SE/2/2/25)

The commission charges in particular merit careful attention, since they played an important part in determining whether each dealing was profitable or at a loss.

When the option was exercised and the underlying futures contract either bought (in the case of a call) or sold (in the case of a put), Buckmaster & Moore charged commission of 0.1% on the value of the first transaction, namely on the strike price times the quantity involved and 0.1% on the value of the second transaction, namely the market price of the metal traded times the quantity involved. To this, the metal broker's commission,¹⁹ varying between approximately 0.5% and 1% according to the metal, had to be added (see SE/11/2/90 and SE/11/2/9).

Here is an example drawn from the ledgers:

On 17 March 1922, Keynes bought a call option for 100 tons of copper at the strike price of £61 per ton, with expiration date on June 17. The sum paid by Keynes was £137.10s. On June 15 he exercised the option, since the price at which copper could be sold was £61.15s per ton. The commission on the first transaction was $0.001 \times £6,100$, i.e. £6.2s, the commission on the second transaction was $0.001 \times £6,175$, i.e. £6.3s.6d.

¹⁷ For example, on 28 February 1923, Trouton explained to Keynes: 'Options are becoming much more expensive. The Call option on Copper is 32/6 bid; the double option on Copper is 60/-; the BOD on Copper is at least £1 over three months, probably more like 25/-. The double option in Tin is £11.10/-; the BOD in Tin is £4.10. Over three months and the three-month Call in Tin might be got at £6' (SE/2/2/181).

¹⁸ It has been rightly pointed out that the pre-twentieth century option markets literature analyses historical option pricing determination with modern methods (Mixon, 2011, p. 4). In fact, 'Option markets existed long before option pricing models. For centuries prior to the development of the Black-Scholes model, option buyers and sellers negotiated prices at which voluntary trade occurred' (Mixon, 2009, p. 171). See also Sotiropoulos and Rutterford (2014, p. 10): 'sophisticated option trading was possible long before the perfecting of the B[lack]S[choles]M[erton] pricing model in the 1970s on the basis of a knowledge spontaneously developed in a practical form in the everyday life of market participants'.

¹⁹ The metal brokers quoted in the statements and the correspondence are Vivian Younger & Bond, Budd and Candover.

To this must be added a commission of 0.5% on the first transaction due to the metal broker, i.e. £30.10s. Thus the total commission charges amounted to £42.15s.6d.

So while the difference between the strike price and the market price at the time when the option was exercised times the quantity involved in the contract gives a positive difference of £75, when we compute the net profit by subtracting to this sum the initial cost of the option (£137.10s) plus the commissions we get a loss of £105.5s.6d.²⁰

In the next sections we will focus on the four markets in which Keynes was most active in his option trading: copper, tin, lead and spelter. For each commodity market we present an overview of the open interest of the various types of options he traded, followed by an analysis of the pattern of his option dealings and a breakdown of profits and losses.

In particular, for each of the four markets we present a weekly account of Keynes's position in options (see [Figures 1–4](#)) according to his ledgers, where he recorded the date and price at which each position was opened and closed, the type of option contract and the quantity involved. In the ledgers we find also the strike price, the total cost of the option (given by the *premium* times the quantity involved in the underlying future) and indication of the cases in which the option was allowed to expire. The weekly time series of both the spot and the typical three-month future prices are derived from *The Times* online archives as recorded for each Friday, while for the strike price we do not have a weekly series but only the entry recorded by Keynes himself in the ledgers.

Then, for Keynes's dealings in options in each metal (see [Table 2](#)) we compute: (i) the value of the gross profits, which are given by the price differential between the market price and the strike price times the quantity involved in the underlying futures for all the options exercised, while they are equal to zero for the options bought which were let expire; and (ii) the value of the total net profits (calculated by subtracting the total commission charges and total costs of the options bought from the gross profits). Considering the data in [Table 2](#), it emerges that good price forecasting (testified by positive and high levels of gross profits) does not necessarily imply high net profits, simply because of the great burden of all the transaction costs when buying and exercising the options.

Finally, a comparison between net profits and losses realised by Keynes in the four markets is provided, together with an appraisal of his investment strategies and behaviours.

4. Keynes's trading in metals

In Keynes's times, the leading market for futures and options trading on metals was the London Metal Exchange (LME), which, established in 1877, had by the 1880s grown and developed as the most important organised world market, in particular for exchanges on non-ferrous metals, namely tin, copper, lead and spelter ([Forrester, 1931](#)). The contracts usually traded had three-month maturity but longer or shorter maturities were also admitted. In 1919, when dealings had just been restored after the end of WWI, it was a period of disturbed trade to which many factors, common to all kinds of business, all contributed (see [Economist Intelligence Unit, 1958](#)). First, there was the problem of readjustment of capacity, stock and prices, aggravated by labour unrest, political uncertainties and fluctuating exchange rates. A further source of trouble and instability, which was specific to metals trading, came from the drastic reduction in world demand that—unlike other commodity markets—took place just after the armistice, when armament requirements suddenly ceased. As a consequence, prices

²⁰ This is exactly the amount that Keynes registered in the ledger within square brackets as net loss deriving from this operation (SE/11/2/7).

immediately began to fall from wartime levels, but this decline was brief and immediately succeeded by a remarkable inflationary boom. Prices reached a peak in February 1920 but collapsed again shortly after, in March and April, and remained low for the remaining part of the year and indeed during 1921, basically because of an excess of supply and accumulation of stocks. Another source of trouble lay in the increasing integration of international metal markets, which made the LME in particular much more sensitive to events in the USA, like metal deliveries there or the selling policies adopted by the American producers, as a consequence of the accrued importance of the USA as world producer (and consumer) and the corresponding decline of Great Britain's role.

Thus when Keynes started to deal in metals, in 1921, the general conditions of these markets were on the upswing but highly volatile and so provided ample scope for speculation.

Let us examine in more detail how Keynes operated in each metal market. In presenting our reconstruction, we have tried to provide an answer to the following questions: how did Keynes form his expectations? What strategy did he adopt? Was Keynes on average good at predicting price trends? Did he on average reap profits or suffer losses in his dealings in options?

4.1 Copper

Keynes entered the copper option market at the beginning of December 1921, after an initial unsuccessful purchase of one future copper contract. He would be active in that market until December 1924 (see Figure 1), when he basically suspended his dealings in options;²¹ he resumed his activity with a small-scale operation in futures in the spring of 1929 (SE/11/2/54) and again later in 1937 (February/April and August/September, TC/4/3/156–163 and TC/4/3/180–186).

Options were the contracts most traded in copper by Keynes, as measured by the number of positions opened (53). Most of these options were call (39), followed by double (7), BOD (5) and put (2) (see Table 1).²²

Keynes's timing of trading and choice of instruments reveal that he had bullish expectations until April–May 1923. His earlier bullish expectations in the first year were supported by the evidence of depressed prices for the previous two years as well

Table 1. *Keynes's investment in metals by type of contract, 1921–39*

	Tin	Copper	Spelter	Lead	Total
Number of futures	166	14	11	38	229
Number of options	129	53	22	64	268
Call	72	39	20	60	191
BOD	15	5	0	0	20
Double	14	7	2	4	27
Put	21	2	0	0	23
SOD	7	0	0	0	7

²¹ We have evidence only of one put traded by Keynes on 15 March 1929 (SE/11/2/54).

²² Since one of these two puts—the one bought on 16 October 1924—was not exercised (SE/11/2/29) and the other one was traded only in 1929 (see fn. 21), we can conclude that in the period considered here Keynes did not trade in copper put options. Furthermore, in neither case were put options associated with long positions in futures contracts for the purpose of hedging.

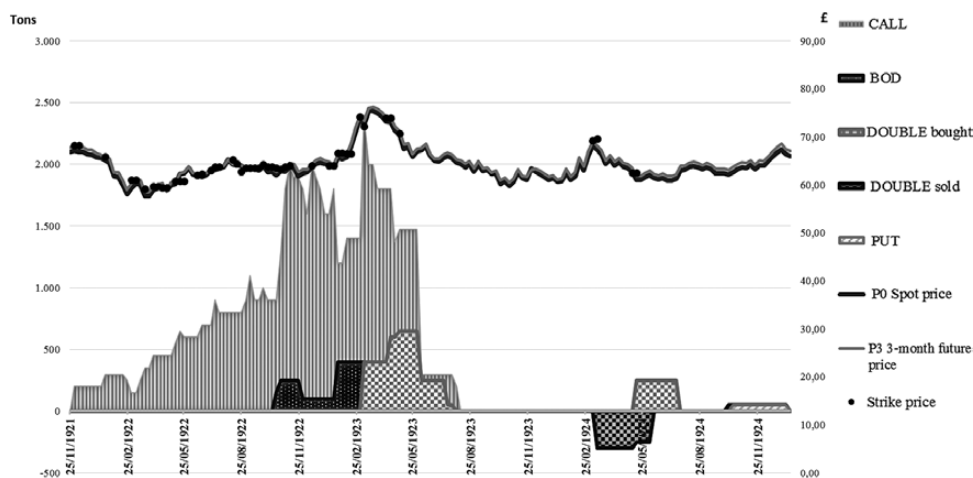


Fig. 1. Copper: Keynes's weekly position in options and prices, December 1921 to December 1924.

as the data he had collected for his 'Memorandum on Stocks of Staple Commodities', which showed that the available supply of copper was decreasing—gradually, but steadily—while 'consumption has remained comparatively steady' (Keynes, 1983, p. 283).

Unfortunately, these expectations were to be disappointed, since in the early months of 1922 futures prices dropped from £66 (January) to £58 (between March and April), to rise again in May and remaining around the £63–64 level throughout the year. In January 1923 there was a reversal of the trend with a peak of £74 in April, followed by a decline that persisted in the following year, reaching a low of £62 in May 1924. From October 1924 and until January 1925 the prices increased again, followed by a downward trend that reversed only at the end of 1927.

Keynes's strategy in copper options was 3-fold:

- (i) Long position in calls until October 1922. Notwithstanding the falling trend of prices, he was able to exploit the volatility in his favour, making a modest gain.
- (ii) Long position in calls and BOD until March 1923. Since the price trend was upward in the first quarter of 1923, this strategy paid off and Keynes was able to exercise the calls and BODs in a bull market.
- (iii) Hedge of long positions in futures with doubles, which were exercised as put. Keynes used this strategy between March and August 1923.

An example taken from his operations in April–July 1923 (SE/11/2/19) can help to clarify Keynes's investment behaviour in the latter case. On 16 April, Keynes opened a long position with two three-month futures contracts of 75 and 125 tons at the respective price of £74 and £74.2s.6d. The same day he bought a double option of the same maturity and total quantity (200 tons), with a strike price of £74 and premium equal to about £3.8s per ton, for a total cost of about £686. According to our time series drawn from *The Times* online archives, on 13 April the spot price came to £73.5s, while the three-month future price was £74. Keynes's behaviour reveals bullish expectations for the following three months but at the same time he adopted a hedging strategy—against a possible drop in prices—buying a double option. Near to maturity, Keynes's bullish expectations were disappointed. Indeed the spot price

on 13 July fell to £65.12s.6d. Keynes exercised the double option as a put, thereby exactly offsetting the losses deriving from the liquidation of the two futures contracts. On these he came in for losses equal to the difference between the future price and the spot price times the total quantity involved, i.e. £1,800, which is exactly equal to his gain coming from the exercise of the put option. This is the reason why in the ledger (SE/11/2/19) Keynes links together the two futures and the double option entries with a curly bracket writing.

As for Keynes's performance in copper options, from the ledgers we learn that the period in which Keynes's investment was most successful was around March–April 1923 (SE/11/2/17), while in the following year he bore losses for an amount almost equivalent to the profits previously made (SE/2/11/24 and 29).

4.2 Tin

Tin was the commodity most traded by Keynes. He entered the market in September 1921 and carried on trading in it almost uninterruptedly until 1939, when all his commodity dealings were forcefully suspended due to the outbreak of World War II. Between January 1922 and July 1929 he was very active in options, alongside large exposures in futures; he then suspended all trading in this market for 18 months and resumed it in April 1930, continuing until August 1931; he traded options occasionally again between April and June 1932 and between January and April 1933, when he practically left the tin option market (see Figure 2). He returned twice a few years later, between June 1936 and January 1937 and between April 1938 and April 1939, taking up mainly long positions in futures (TC/4/3/124, 138, 216 and 257).²³

When Keynes began trading tin options, futures prices had been rising since he first entered the market; from £154 in February 1922, they had reached the £181 level by October 1922, with ample oscillations around the trend. By March 1923, prices had climbed to the £225 level, suddenly reverting first to a declining trend, which bottomed at £182 in August, and then rising again to £292 in March 1924. From then on prices fell, with wide oscillations to £241 in May 1925, but quickly climbed back to the previous year's figure and peaked at £300 in October 1926. They remained around that level until the middle of 1927 and then began to decline steadily, reaching £204 in July 1928. When Keynes resumed his option dealing in April 1930, futures prices were oscillating around £160; when he left the market they were down to £110. In the last two periods of his activity in tin options, prices were around £107 in mid-1932, but by April 1933 they had returned to the £150–160 figures of 10 years before (see Figure 2).

Keynes realised fairly quickly that tin was a metal with high price volatility, which made it very difficult to predict both its trend and deviations from it. The reasons he gave were 2-fold: (i) tin mining and consumption of smelted tin were highly inelastic, while demand for stocks became highly elastic as soon as they increased from a low working minimum; and (ii) reliable information on the level of existing stocks was lacking. It is not surprising, therefore, that Keynes's expectations were formed mainly from

²³ We have evidence of only two double options sold by Keynes in July 1936 (TC/4/3/128) and July 1938 (TC/4/3/226).

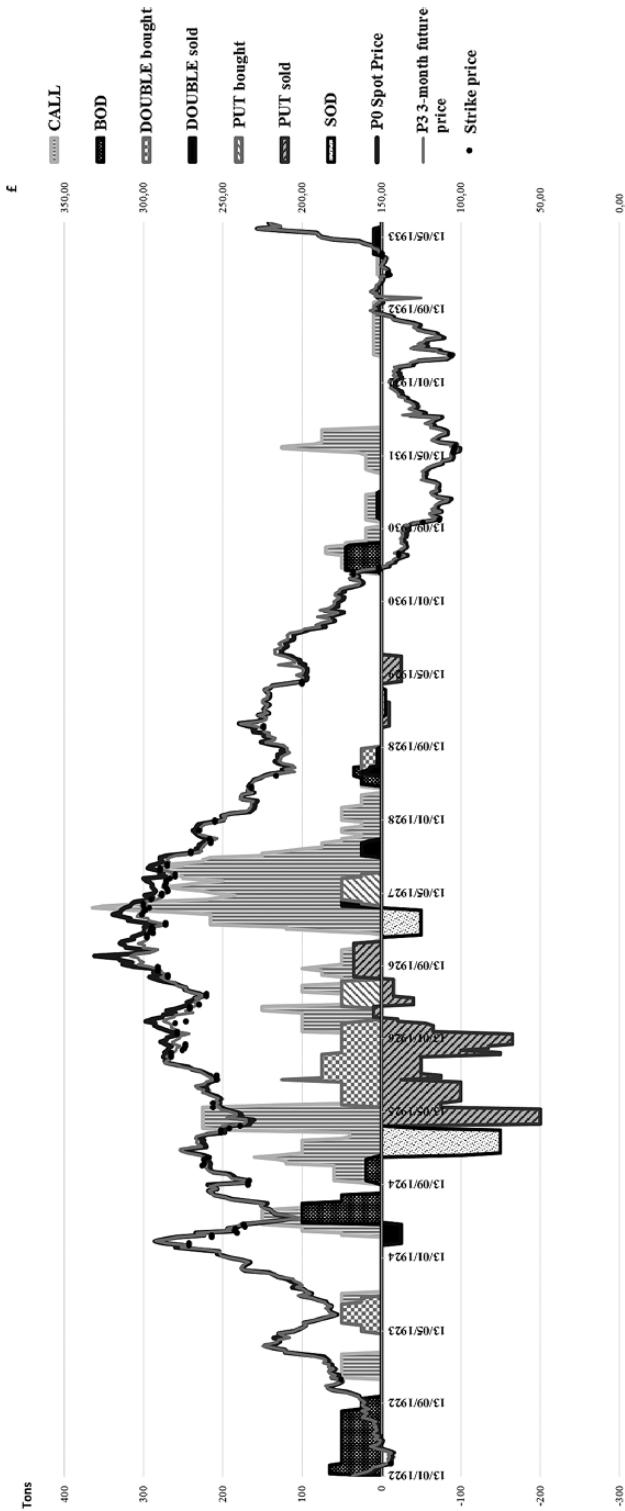


Fig. 2. *Tm: Keynes's weekly position in options and prices, January 1922 to June 1933.*

guesses on the level of ‘visible’ and ‘invisible’²⁴ stocks, besides forecasting the level of production and consumption on the basis of the data available. Moreover, as explained by Cavalli and Cristiano:

tin represented a very special case among staple commodities. In itself, the very low level of tin stocks, usually below one month consumption and sometimes as low as ten-day consumption, made the tin market rather susceptible of manipulations, because any small amount of privately owned stocks could suffice to exert an influence on prices. In addition, the very low level of daily tin turnover in the LME was a further element in favour of manipulation. (Cavalli and Cristiano, 2012, p. 65)

In fact, in the 1920s, several ‘tin pools’ were formed to control production and prices and in May 1925, Keynes himself took a share (SE/2/5/95) in a private pool.²⁵

Keynes stayed in this market longer and traded more than in any other commodity, trying to anticipate the ups and downs of prices, with mixed results throughout the whole period of his investment. He was bullish most of the time, mainly buying BOD and call options, and only in a few cases did he hedge his position by buying double options. In the period 1925–26, he associated the purchase of call options with the sale of put options, greatly increasing his exposure. After 1927 he did not successfully gauge prices and thus he incurred great losses, especially in the year 1928.

In the tin market, Keynes experimented with all the derivatives available to him at the time and held the highest number of contracts: futures (166), call (72), put (21) BOD (15), double (14), SOD (7) (see Table 1). After 1925 he also took delivery of some of his futures and stocked tin in the LME warehouses, thus moving part of his operations onto the spot market.

His strategies with tin options—not unsurprisingly, given the high volatility of prices—were more complex than with the other metals. In this market he experienced the largest combinations of investment strategies. He behaved not only as a buyer of futures, call and double options, but also as buyer of BOD and seller of SOD options. He was also a writer of double options (accompanied by the simultaneous purchase of futures to cover the event that his counterpart would exercise the double as a call, see SE/11/2/24 and TC/4/3/128 and 226) and a writer of put options (SE/11/2/38, 41 and 47), respectively, in February–May 1924 and in September 1925 to December 1926 (these positions are accordingly represented in the negative quadrants in Figure 2). During May–October 1925, while he was in the tin pool, he was persistently long in calls and futures, a bull position strengthened by the sale of put options in September–December 1925. This move brought him some profits because the prices went up and options were not exercised by the buyer. In the period September 1925 to March 1926, Keynes was a writer of 17 put options, 15 of which were let expire by his counterpart. A careful analysis of these operations shows an impressive ability to guess the direction in price movements and to get the timing right. It is tempting to infer that his hunches seem to have been sparked by some ‘insider information’ to which he was privy as a member of the tin pool.

²⁴ In the terminology of Keynes’s times, they were stocks of tin actually not available for consumption, because they were ‘in transit’ or ‘afloat’ (Keynes, 1983, p. 468).

²⁵ From the correspondence, we learn that Oswald Falk, Rupert Trouton and Jack Budd (son of Cecil) belonged to the private pool. From the ledgers, we can infer that Keynes’s participations lasted until October 1925, while the pool was presumably dissolved at the end of that year.

On a few occasions, Keynes followed a strategy of outright positions in put, as for example in the case of the put he bought on the 21 November 1928 for 10 tons at a strike price of £230, with expiration on 21 February 1929, which he exercised at a profit on the 19 February, when the market price came to £224.5s (SE/11/2/54).

In other cases he hedged his long positions on futures with double options, exactly as he did on the copper option market (SE/11/2/21).

However the pattern of high volatility that was typical of tin prices, while providing scope for speculative activity, exposed him to the risk of heavy losses when the buying and selling timing did not match the price swings. Unfortunately, this is exactly what happened. So Keynes's activity in the tin options was unsuccessful: he bore substantial losses throughout the whole period except for a few occasions in 1922 and 1926.

4.3 Lead

Keynes entered the lead option market in July 1922, after six months of holding a small long position in futures. He suspended his option dealings in November 1925 to resume them only a few years later, in January 1927 (see Figure 3). In October 1927 he gave up dealing in options and carried on with long positions in futures, which he closed in August 1928 (SE/11/2/50). Options were the contracts most traded by Keynes in terms of the number of contracts (64) but, contrary to his practice with copper and tin, in the lead market he traded only two types of options: for almost all the cases he bought calls and only in four cases (all in spring 1923) did he take up doubles (see Table 1).

Lead was a commodity, Keynes reckoned in the 'Memorandum on Stocks of Staple Commodities', of which 'there were large post-war accumulations, and stocks of which have been continuously diminishing from abnormal level' (Keynes, 1983, p. 268) and for which 'output could not be expected to increase to meet the increase in demand, due to the scarcity of new sources' (Keynes, 1983, p. 291). Although prices had been steadily decreasing in 1921, Keynes entered the market with clear bullish expectations; until the end of 1925 he believed that 'stocks were very small', but in February 1926 he came to the conclusion that 'the high prices recently prevailing have called forth increasing production, sufficient to satisfy the high level of consumption' (Keynes, 1983, p. 423).

In April 1922 lead future prices climbed to the £23–24 level and remained there until October 1922. The upward trend continued until January 1925 when they reached £40 and then slowly reverted with a low of £30 in May 1925; thereafter they increased to around £37 until November 1925 (see Figure 3). From then onward, the decline in prices was steady, reaching a low of £23 in August 1927.

Keynes's strategy in lead options was 3-fold:

- (i) Long position in futures and calls. This was his strategy in almost all his investment in lead options. We find it in July–August 1922, from November 1922 to March 1923 and continuously from November 1923 to November 1925. This was indeed a highly leveraged set of speculative bets on price increase, which Keynes won when he got the timing right (as was often, but not always, the case). There were several instances in which futures were sold at a loss and options were not exercised.

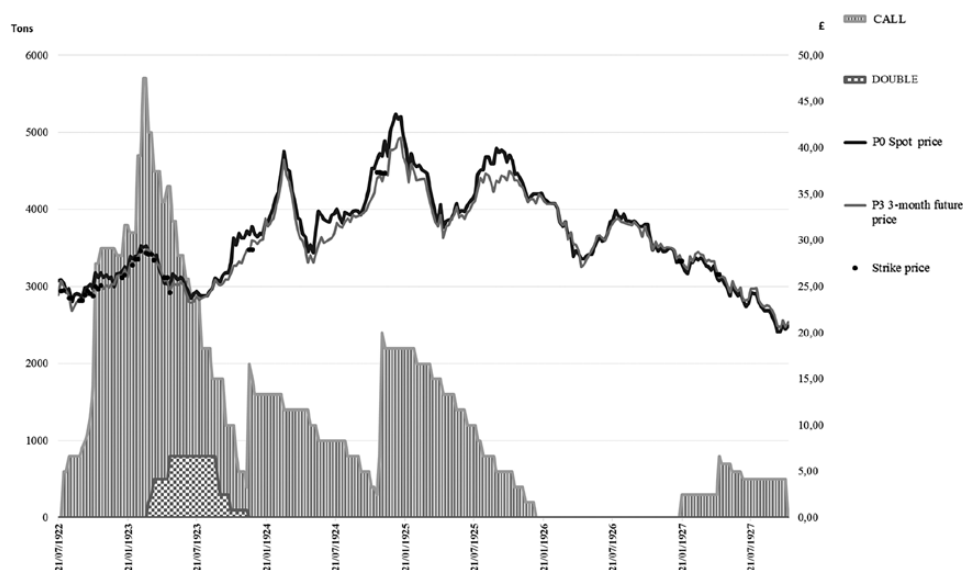


Fig. 3. *Lead: Keynes's weekly position in options and prices, July 1922 to October 1927.*

- (ii) Outright calls positions (mainly in the period August–October 1922 and again in January–September 1927).
- (iii) Hedge of long positions in futures with doubles, exercised as put (only twice in the period September/October 1923).

An example of this strategy is drawn from the ledgers (SE/11/2/19). On 27 March 1923, Keynes opened a long position through a future contract for 200 tons of lead with October delivery (a seven-month future) at a price of £27.17s.6d; on the same day he bought a double option for the same quantity and maturity and with a strike price equal to the future price indicated in the future contract.²⁶ When maturity approached, the lead market price was unfortunately lower than the price at which Keynes had bought his future contract: in fact, on 12 October the spot price was about £26. On 16 October, Keynes exercised the double as a put and made up for the loss on the future contract, incurring a loss only equal to the commissions.²⁷ It is worth noting here that just after the exercise of this option, the price started to increase. If Keynes had waited only 10 days he could have had the chance to close his position on the future contract at a profit, since on 26 October the market price reached about £30. The double could also have been exercised as a call.

Keynes gained huge profits in the first part of 1923, due to the options he had bought at the end of the previous year; however in the second part of the year he let almost all his call options expire, incurring substantial losses, especially from October to December (SE/11/2/17). Between June and December almost three-quarters of all the options traded expired and some of those he exercised brought him further losses.

²⁶ According to *The Times* series, on 23 March 1923 the spot price was £28.

²⁷ Keynes in fact registered in the ledger losses of only £95 and linked the two operations with a curly bracket (as in the similar cases of copper and tin), writing beside the entries 'offset' (SE/11/2/19).

Although a great number of the options were not exercised and Keynes did not seem particularly successful in predicting the trend of prices, his investments in the lead option market turned out to be successful overall, thanks to two fortunate periods of huge profits during 1923–24 and 1924–25.

4.4 Spelter

Keynes entered the spelter option market in July 1922, with no previous position in futures, and withdrew in November 1923, to return to option dealing between October 1924 and June 1925 (see Figure 4).

In the spelter option market, Keynes traded almost exclusively through calls (see Table 1).²⁸ Keynes's bullish expectations in the months between mid-1922 and at the beginning of 1923 may have relied on his observation of the sharp reduction in stocks between January and July 1922, which continued also to the early months of 1923 (registered in the 1923 memorandum; see Keynes, 1983, pp. 269, 292). In June 1924, Keynes registered that around January 1924, an inversion in the declining trend in stocks had occurred (Keynes, 1983, pp. 317, 340), followed, from January 1925 onward (Keynes, 1983, p. 405), by a renewed marked fall in the level of stocks of spelter.

Prices had indeed increased consistently from a level of £25 in March 1922 to a peak of £37 in November, followed by a series of marked upswings and downswings around a trend of increasing prices, which came to a halt in January 1925 when they

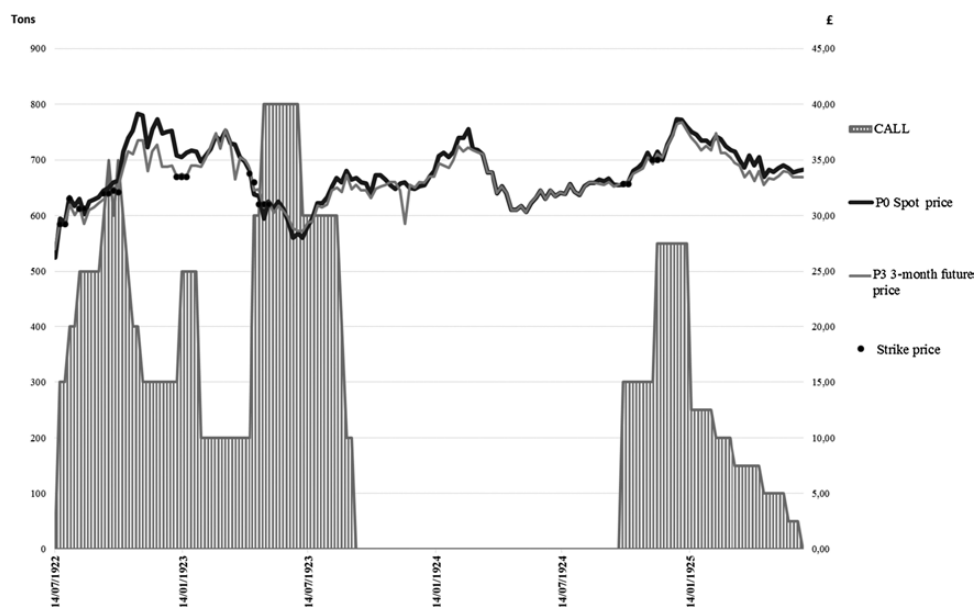


Fig. 4. Spelter: Keynes's weekly position in options and prices, July 1922 to June 1925.

²⁸ We have evidence of only two double options bought by Keynes in October 1924, for 50 tons each (TC/4/3/52 and TC/4/3/66). These operations represented a hedging strategy because they were associated with the purchase of a future for the same total quantity (100 tons) and maturity (see also SE/11/2/57).

reached the overall peak of £38, from where they steadily declined to a level of £12 by January 1935.

His strategy in this market had a similar pattern to that of his trading in lead. He bought outright calls consecutively from July 1922 to November 1923, when he switched to a long position in outright futures (SE/11/2/23). In October–November 1924 he returned to buy call options and then combined long positions in calls and futures between March and June 1925 (SE/11/2/32 and 35).

Overall, Keynes was successful in his investment in spelter options, reaping gains in all the operations carried out in 1922 and until February 1923 and suffering some losses only in the second half of 1923. Then, in January 1925, he obtained an exceptional profit of more than £1,300, followed by some losses due to options that he did not exercise (SE/11/2/29).

4.5 Rubber and linseed oil

Having acquired good experience in metals—and without abandoning his investments in these commodities—in 1923, Keynes extended his use of options also to other commodity markets, albeit on a very modest scale compared with his activity in metals. He started with a series of call options in rubber, bought between the end of May and June 1923 with deliveries from November to March, which in fact he did not exercise (SE/11/2/22). Similarly, in November 1923, Keynes bet on an increase in prices by again buying some call options with April, May and June maturities, but, unfortunately for him, the expected rise did not occur, which is why in these cases, too, Keynes refrained from exercising the options. Observing the general conditions of the rubber market, we learn from Keynes's memoranda that from 1920 to January 1923 there was a constant increase in stocks (the data provided by Keynes refer to the total supply outside plantations) due to quantitative restrictions imposed in the main producing countries (Keynes, 1983, p. 385).²⁹ In June 1923, the positive trend in stock accumulation reversed, which may account for Keynes's bullish expectations regarding prices. Unfortunately for Keynes, this reduction in stocks was not associated with an increase in prices. In the following months and until 1925, stocks continued to dwindle. Keynes insisted on buying call options also in November 1923 with April/June maturities, but the expected increase in prices did not occur and he let the options expire. The persistence of Keynes's long position in rubber throughout the whole period reflects his perception of the trend increase in world demand, overlooking the parallel growth in world production.³⁰ Subsequent to these unsuccessful investments in rubber options, he continued his investment activity in the rubber market in the following years, especially from 1926 to 1928 (SE/11/2/46 and 52), abandoning option trading and assuming long positions in futures for large quantities.³¹

²⁹ Reference is made to the Stevenson Rubber Restriction Scheme, organised in 1922 and covering some of the most important producing countries, such as Ceylon and Malaya.

³⁰ In the 1920s, the increasing use of rubber in many products that were becoming of widespread consumption (such as shoes or hoses) together with the initial development of the automobile industry (and consequently increase in demand for car tyres) could have justified Keynes's expectations of an increase in prices due to growing demand. What seems to have happened, instead, was that the 'rubber boom' induced many countries (especially in East Asia) to enter the market, creating new plantations and so increasing world production.

³¹ His investment choices made in those years proved ill-founded because prices did not increase. At the beginning of 1928, his losses on rubber futures contracts amounted to about £15,000, accounting for a substantial part of his total losses in that unfortunate year (Moggridge, 1983). Keynes returned to investments in the rubber market during the 1930s, but again only through futures contracts.

In February 1924, Keynes embarked upon speculation in linseed oil options (SE/11/2/25). In this case Keynes appears to have had a bearish view of the market, which led him to buy put options. This expectation proved erroneous and he did not exercise the options. In October 1924 he decided to change his strategy, buying double options (until February 1925), which may testify to a marked unpredictability in the price trends.³² In some cases these options were exercised as put to offset his long positions in futures (SE/11/2/25).

Overall, the results of his investments in options on the rubber and linseed oil markets were disappointing, which may explain why Keynes abandoned the use of options in these two commodities while continuing to invest through futures contracts.

4.6 Keynes's forecasting ability and performance

We can now attempt to evaluate Keynes's ability as a speculator by first looking at the balance of profit and losses in his trading of metal options. He had a loss of £6,645 in tin, a gain of £772 in copper, a gain of £2,896 in spelter and a gain of £4,815 in lead, for a total net profit of £1,838 (see Table 2).³³

These data³⁴ reveal that Keynes's investment in metal options was overall only slightly successful: in general he showed a good capacity to predict market trends, but the burden of commissions and costs reduced net profits to below what could be expected.

A rough indicator of Keynes's ability to predict market trends in each metal market is the exercise ratio, i.e. the percentage of the options exercised out of the options bought. In computing this ratio we have excluded the double options because of the intrinsic characteristic of this type of option, which is always exercised no matter what is the direction of price movements. Thus in the case of the doubles, the *exercise* is not a good indicator of any particular capacity to predict market trends while it remains, obviously, true that the *purchase* of this type of options could reveal in any case something about Keynes's predictions, i.e. his expectations of a high volatility in prices.

These ratios come to about 65% for copper, 62% for tin, 55% for lead and 70% for spelter,³⁵ for an average value for the whole metal option trading of about 63%, which was quite high. Keynes showed, on average, a good capacity to predict market prices in all four markets. It is worth noting that in the case of lead, he obtained the highest net

³² Surveying the price movements of linseed oil in New York, we observe a marked volatility in prices, especially between 1923 and 1925 (see <http://www.nber.org/databases/macrohistory/rectdata/04/m04081a.dat>).

³³ To give an idea of the magnitude of these values, it is worth recalling that in 1921–24, Keynes's total annual income amounted on average to about £5,000 (Moggridge, 1983 Table 1).

³⁴ Since the BODs and SODs played a relatively small part in Keynes's option strategies (copper BODs were five out of 53 operations and only four of them were exercised, i.e. 7%; tin BODs and SODs were 22 out of 129 operations and only eight were exercised, i.e. 6%) and since we do not take futures into consideration, we did not include these contracts in our calculations.

³⁵ There were two call options in lead bought on 13 and 20 November 1924 (SE/11/2/29 and 32) and one in spelter bought on 26 April 1923 (SE/2/11/21), which Keynes exercised even though they were 'out of the money'. We have excluded them from the numerator of the exercise ratio since the exercise in these particular cases does not indicate Keynes's capacity to anticipate price. It remains to be explained why Keynes exercised these options if they were 'out of the money'. It has been noted that 'Out of the money call options, with the strike price more than the current market price, cost less than the underlying asset, meaning that they provide leverage exposure to the upside (relatively to the equivalent expenditure on the asset), and the maximum loss is the upfront payment' (Mixon, 2011, p. 20). This explanation tallies well with the lead and spelter call options, since there was a sufficient interval between the exercise of the option and the liquidation of the underlying future contract, which could be done on any day of the month of the expiration of the

Table 2. *Keynes's investment in metal options (in £)*

	Tin	Copper	Spelter	Lead	Total
1. Total investment in options	21,350	10,652	2,661	13,623	48,286
2. Gross profit	16,280	13,216	6,248	21,083	56,827
3. Commissions	1,575	1,792	691	2,645	6,703
4. Net profit	-6,645	772	2,896	4,815	1,838
5. ROI ^a (%)	-31	7	108	35	3

^aROI (5) for each metal is computed as the ratio of total net profits (4) (given by the total gross profits (2) less the sum of the cost of the options (1) and the commissions (3)) to the total investment in options (given by the cost of all the options contracts bought in the investment period).

absolute profits although he showed a lower predictive capacity than in other markets. This means that in the case of lead he made huge gains because he was able to anticipate prices in a couple of very favourable circumstances, not because of an ability to forecast prices over the whole period. The difference between the strike price and the market price was what really mattered, since transaction costs (commissions + premiums) were very high.

A better picture of Keynes's performance in metal options is provided by computing the return on investment (ROI)³⁶ in option dealings in each market. We have calculated it, as a rough indicator, simply as the ratio of the total net profits/losses to the total capital invested³⁷ over the whole investment period in each market (see Table 2).

Comparison of these ratios provides better understanding of Keynes's performance in his option dealings in the four metal markets. In fact, if we view profits and losses in absolute terms, Keynes achieved his best performance in the lead market, as we have seen. But with regard to the ROI, we observe that the market he had most success in was spelter. In fact Keynes invested in spelter only 5% of the total capital invested in metal options, amounting to £48,286, but he gained net profits of almost £2,900, corresponding to about 35% of his total net profits.

If we compare the ROI in the two markets in which Keynes registered higher net profits, spelter and lead (see Table 2), the big difference is due not only to the better capacity to predict price movements in the spelter market (testified by a higher exercise

option (see, e.g., SE/11/2/74-75 and SE/11/2/103-104)—unlike copper and tin call options, for which the liquidation of the underlying future contract had to be done practically on the very day of expiration of the option (see, e.g., SE/2/110-111 and SE/11/2/83-84).

³⁶ What the 'right' way should be to compute this indicator and specifically what should be considered as 'the capital invested' is a matter of dispute in the literature. In our computation we have followed the view that, in the case of options, the capital invested is represented by the cost of the option. In fact, in this analysis of Keynes's dealings in options, the capital he had effectively advanced when he bought the option (and which is registered by him in his ledgers) is given by the total cost of the option, i.e. the premium times the quantity involved in the underlying future contract. Unfortunately, in the cases of BODs and SODs, Keynes did not clearly register in the ledgers the premium (the margin paid over or below the future price) and this makes it difficult to decide how to compute the 'capital invested'. For these reasons we have excluded, also from computation of the ROI, these peculiar contracts.

³⁷ In our computation we have excluded the hedging operations, i.e. the double options bought the same day (or contiguous days) and with the same maturities (or contiguous maturities) of a long position on futures contract. Since our concern here is analysis of Keynes's behaviour in 'pure speculation', we excluded those dealings that were undertaken by him only as a means to hedge his positions in futures.

ratio), but also to the fact that he invested in spelter an amount which was roughly 20% of that invested in lead, giving spelter profits amounting to 60% of the profits obtained in lead. As far as tin and copper are concerned, the absolute net profits/losses and the ROI value confirm that the investment in tin options was decidedly unsuccessful and only just successful in copper options.

Finally, if we take as a benchmark the annual average yield of consols, which remained around 4.5% in the 1920s and dropped to an average of 3.5% in the 1930s (see [Homer and Sylla, 1991](#), p. 447, Table 59), we can conclude that, comparing it with the annual ROI in each metal, Keynes was not a stellar performer in his metal option dealings overall (see [Table 3](#)), bearing out a similar conclusion reached by [Accominotti and Chambers \(2014\)](#) in their analysis of Keynes's speculation in currencies.³⁸

5. Conclusions

We have presented some of the findings of our investigation into Keynes's speculative activity in the option market. Mainly, he was active in metals, notably copper, tin, lead and spelter, with some trading in rubber and linseed oil. Assembling the data and drawing upon the information to be found in his papers, which to the best of our knowledge has not been analysed previously, we were able to present a detailed picture of his dealings in options in the interwar period.

In particular we gathered information on future, spot and strike prices, commission charges, *premium* and gross and net profits for Keynes's dealings; on this evidence we were able to assess his performance and investment strategies.

Table 3. *Annual ROI on metal options*

	Tin	Spelter	Copper	Lead	Yields on 2.5% consols
1922	290.58	308.75	19.49	98.14	4.43
1923	-82.15	-117.57	-32.21	65.61	4.31
1924	-43.60	160.26	3.72	-104.97	4.39
1925	-10.33	—	—	—	4.43
1926	-0.07	—	—	—	4.55
1927	-66.79	—	—	-100.00	4.56
1928	-131.17	—	—	—	4.47
1929	-100.00	—	—	—	4.60
1930	-104.07	—	—	—	4.46
1931	28.26	—	—	—	4.53
1932	-6.82	—	—	—	3.76
1933	-0.95	—	—	—	3.38

Source: Yield data are from [Homer and Sylla \(1991\)](#).

³⁸ 'Over the whole period he traded during the 1920s and 1930s, we estimate Keynes achieved a considerably lower average return (5.37%) and Sharpe ratio (0.16) than both carry and momentum. This under-performance was mostly concentrated in the 1920s. In the 1930s he managed to beat the carry trade [the strategy of selling the currency with a relatively low interest rate and using the funds to purchase the currency yielding a higher interest rate] but still underperformed the momentum strategy and was unable to match the returns on UK stocks and bonds' ([Accominotti and Chambers, 2014](#), p. 4).

While we do not claim to provide a complete account of Keynes's commodity dealings, we do offer readers some results.

We introduce a distinction that is not generally adopted in the literature. We calculated the gross and net revenue for each option bought and the net revenue as a proxy for performance.³⁹ In this respect we found that both his ability to forecast prices and his performance were variable in relation to the different markets and time spans, but we roughly determined a total ROI⁴⁰ of 3% and a net profit of £1,838 (see Table 2) over his 12 years of activity in metal options. This very modest success in commodity option dealings, however, does not seem to have shaken his general faith in the superiority of the investment in commodities over other assets, as testified by the comment quoted in the epigraph, which he made several years later.

From the analysis of his investment activity in options, what general conclusions can be drawn about Keynes as an investor? At least throughout the 1920s, Keynes appeared as an informed trader who took great care in collecting information about the 'fundamentals' of the commodities he traded. This was certainly facilitated by his work for the London and Cambridge Economic Service, for which he wrote an annual special memorandum (1923–30), where data on consumption, production and stocks were systematically analysed. At the same time, the frequent strategy of leveraging his long positions with a combination of futures, calls and BODs shows Keynes to have been a risk-loving investor who seldom hedged his exposure in futures⁴¹ and who most of the time was simply long in call options.

We have not considered Keynes's dealings in options in relation to his portfolio, where futures in commodities had the largest share, while currencies were traded mainly in the early 1920s and shares mainly in the 1930s, but as the chief instrument of his speculative activity. In this respect, no attempt has been made to evaluate the overall performance of Keynes as an investor—which requires further data collection and analysis—but to reconstruct his behaviour and assess the outcome in dealing with a highly risky and leveraged asset.

Keynes basically gave up his dealings in options in the early 1930s and this can be interpreted also as a break in his style of speculation, as indeed is documented in the literature. Chambers and Dimson (2012), analysing his activity as bursar for King's College, evidenced a radical change in Keynes's approach to investment around the same time.⁴²

It is tempting to relate this change in investment behaviour to a change in Keynes's views on speculation (Marcuzzo, 2012), paralleling the development of his ideas from the *Treatise* to the *General Theory* (Keynes, 1973). Unfortunately, the influence of his practice as a speculator on his theory of speculation is not easy to pin down specifically, although it can certainly be argued in general terms.

³⁹ 'In commodity futures markets a measure of the forecasting ability of speculators is not hard to find, for it is immediately reflected in their profits and losses' (Houthakker, 1957, p. 43).

⁴⁰ It has been computed as the ratio of the total net profits to the total investment in options in the four metal markets.

⁴¹ Only in 15 cases (in a total of 268 options traded) did Keynes hedge his position in futures with options.

⁴² Also in Foresti and Sanfilippo (2012), who analysed Keynes's investment in the wheat futures markets, a change is shown in Keynes's speculative style occurring around the beginning of the 1930s, when he abandoned a short-term type of investment behaviour (adopted especially in the North American markets), which aimed at anticipating the reversal in market trends, in favour of a long-term investment behaviour characterised by the adoption of a rollover strategy of long positions in futures, mainly on the Liverpool market.

We are aware that this paper contributes only a small part to the full picture of Keynes's overall financial investment, but nevertheless we believe that it is a valuable part, since it draws on new archival findings and concerns the most speculative asset available to Keynes at the time. It also shows how in the 1920s, Keynes relied heavily on information relative to each individual market and commodity, weighing up the quality and reliability of that information through calculation of the relevant data, the advice of experts and his own assessment of market conditions and of other participants' opinions. Although his strategy changed in the 1930s and shares became the main component of his portfolio, he still believed in commodities—as testified in the quotation opening this paper—but he gave up the riskier component of this type of investment represented by options.

Perhaps his early belief that superior knowledge conferred the speculator with an advantage over the market gave way to his mature conviction of the impossibility of gauging the 'prospective yield' on the basis of the fundamentals and that performance depended upon the successful bet on the 'favourable change in the conventional basis of valuation', as he wrote in the *General Theory* (Keynes, 1973, p. 159). Since the conventional basis is the average market opinion, as described in the 'beauty contest' example, the basis of success becomes more uncertain and fragile and boldness necessarily gives way to prudence.

Bibliography

- Accominotti, O. and Chambers, D. 2014. The returns to currency speculation: evidence from Keynes the trader, *Vox*, 18 March
- Cavalli, N. and Cristiano, C. 2012. Keynes's speculation in the London tin market: 1921–1930, pp. 57–78 in Marcuzzo, M. C. (ed.), *Speculation and Regulation in Commodity Markets: The Keynesian Approach in Theory and Practice*, *Rapporto Tecnico*, n. 21, Dipartimento di Scienze Statistiche, Sapienza, Università di Roma
- Chambers, D. and Dimson, E. 2012. 'Keynes the Stock Market Investor', SSRN-id2023011. <http://www.valorintrinseco.com/SSRN-id2023011.pdf>
- Cristiano, C. and Naldi, N. 2014. Keynes's activity on the cotton market and the theory of the 'normal backwardation': 1921–29, *European Journal for the History of Economic Thought*, vol. 21, no. 6, 1039–59
- Economist Intelligence Unit. 1958. *A History of the London Metal Exchange*, London, The Economist Intelligence Unit Limited
- Foresti, T. and Sanfilippo, E. 2012. An analysis of Keynes's investments in the wheat futures markets: 1925–1935, pp. 79–105 in Marcuzzo, M. C. (ed.), *Speculation and Regulation in Commodity Markets: The Keynesian Approach in Theory and Practice*, *Rapporto Tecnico*, n. 21, Dipartimento di Scienze Statistiche, Sapienza, Università di Roma
- Forrester, R. B. 1931. Commodity exchanges in England, *Annals of the American Academy of Political and Social Science*, vol. 155, 196–207
- Higgins, L. 1906 [1896]. *The Put-and-Call*, London, Effingham Wilson, Royal Exchange
- Holder, M. E. and Kent, R. J. 2011. On the art of investing according to Keynes, *Journal of Portfolio Management*, vol. 37, no. 3, 4–6
- Homer, S. and Sylla, R. 1991. *A History of Interest Rates*, Hoboken, Wiley and Sons
- Houthakker, H. S. 1957. Can speculators forecast prices? *Review of Economics and Statistics*, vol. 39, no. 2, 143–51
- Keynes, J. M. 1971. *The economic consequences of the peace* in Robinson, E. A. G. and Moggridge, D. (eds), *The Collected Writings of John Maynard Keynes*, vol. II, London, Macmillan
- Keynes, J. M. 1973. *The General Theory of Employment, Interest, and Money*, in Robinson, E. A. G. and Moggridge, D. (eds), *The Collected Writings of John Maynard Keynes*, vol. VII, London, Macmillan

- Keynes, J. M. 1983. *Economic Articles and Correspondence, Investment and Editorial*, in Robinson, E. A. G. and Moggridge, D. (eds), *The Collected Writings of John Maynard Keynes*, vol. XII, London, Macmillan
- Marcuzzo, M. C. 2012. From speculation to regulation: Keynes and primary commodity markets, pp. 3–23 in Marcuzzo, M. C. (ed.), *Speculation and Regulation in Commodity Markets: The Keynesian Approach in Theory and Practice*, *Rapporto Tecnico*, n. 21, Dipartimento di Scienze Statistiche, Sapienza, Università di Roma
- Mixon, S. 2009. Option markets and implied volatility: past versus present, *Journal of Financial Economics*, vol. 94, no. 2, 171–91
- Mixon, S. 2011. *The Foreign Exchange Option Market, 1917–1921*, mimeo. http://econ.as.nyu.edu/docs/IO/23160/Mixon_0309012.pdf.
- Moggridge, D. E. 1983. Keynes as an investor, editorial introduction, pp. 1–113 in *The Collected Writings of John Maynard Keynes*, vol. XII, *Economic Articles and Correspondence, Investment and Editorial*, London, Macmillan
- Moggridge, D. 1992. *Maynard Keynes: An Economist's Biography*, London, Routledge
- Poitras, G. 2009. The early history of option contracts, pp. 487–518 in Hafner, W. and Zimmermann, H. (eds.), *Vincenz Bronzin's Option Pricing Models: Exposition and Appraisal*, New York, Springer-Verlag
- Smith, J. G. 1922. *Organized Produce Markets*, London, Longmans Green
- Sotiropoulos, D. P. and Rutterford, J. 2014. *On the Performativity Agenda: Option Pricing Before Stochastic Calculus*, paper presented at the Annual Conference of the European Society for the History of Economic Thought, Lausanne