

KEYNES THE STOCK MARKET INVESTOR[‡]

David Chambers^a, Elroy Dimson^{a,b,*}

^a Cambridge Judge Business School, Trumpington Street, Cambridge CB2 1AG, United Kingdom.

^b London Business School, Regents Park, London NW1 4SA, United Kingdom

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Abstract: Keynes made a major contribution to the development of professional asset management. Combining archival research with modern investment analysis, we evaluate John Maynard Keynes's investment philosophy, strategies, and trading record, principally in the context of the King's College, Cambridge endowment. His portfolios were idiosyncratic and his approach unconventional. He was a leader among institutional investors in making a substantial allocation to the new asset class, equities. Furthermore, we decipher a radical change in Keynes's approach to investment which was to the considerable benefit of subsequent performance. Overall, Keynes's experiences in managing the endowment remain of great relevance to investors today.

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* Corresponding author. Tel.: +44 20 7000 7000; fax: +44 700 607 7390.

Email addresses: d.chambers@jbs.cam.ac.uk, edimson@london.edu.

1. Introduction

John Maynard Keynes's many writings on the stock market are well known. Chapter 12 of *The General Theory* discussed at length the influence of the stock market on the macro-economy. His observations on the "animal spirits" of the market continue to inspire behavioral economists up to the present (Akerlof and Shiller, 2009), to invite studies of the role of investor sentiment in anomalous stock returns (Stambaugh, Yu, and Yuan, 2012) and to anticipate explanations for modern stock market bubbles (Greenwood and Nagel, 2009). Such modern investment giants as Warren Buffett (1986–2005), George Soros (1987, 2011), and David Swensen (2001, 2007) have invoked Keynes in support of their investment beliefs and strategies on numerous occasions. Stories of share-dealing from his bed and the need to fill up King's College Chapel with grain as a result of his commodity dealing have become legend.

The most overlooked of Keynes's many accomplishments is that he was among the first institutional managers to allocate the majority of his portfolio to the new alternative asset class of equities. At the end of the 20th century both British and US long-term institutional investors had the majority of their assets invested in equities, public and private. In contrast, their ancestors one hundred years earlier regarded common stocks (ordinary shares) as extremely risky and shunned this asset class in favour of fixed income and property. At the end of the 1930s British life insurance companies still had only a 10% allocation to ordinary shares. Keynes on the other hand revolutionised the way his own Cambridge college endowment was managed from the early 1920s until his death in 1946. In committing his

portfolios to equities where he was free so to do, he exploited the risk premium available to long-term investors over conventional fixed income assets which was subsequently to emerge over the course of the last century (Jorion and Goetzmann, 1999).

Keynes is reputed to be a star investor yet analysis of Keynes's investment record has been dealt with only cursorily in the literature. Moggridge edited *The Collected Writings of John Maynard Keynes* (hereafter CWK) and in Vol. XII reviewed his personal and institutional investment activities. This included an annual time-series of returns for King's College, Cambridge which suggests that Keynes was a star investor. Whilst Skidelsky (1983, 1992, 2000, 2005, and 2009), Mini (1995) and Clarke (2009) discuss Keynes's investment prowess and provide much insight into the man behind the investor, they offer no additional quantitative evidence. Fantacci, Marcuzzo, and Sanfilippo (2010) focus exclusively on Keynes's 1937 investment in wheat futures. Westall (1992) describes Keynes's influence at Provincial Insurance but without a detailed analysis of his investment record. Backhouse and Bateman (2006) review all aspects of Keynes the polymath except for investment. Walsh (2007) emphasises the need to understand the man's investment philosophy, but does not present evidence on his actual investments. The archival materials described by Cox (1995), a former Keynes archivist, have not given rise to research on Keynes the investor. Lawlor (1995) concludes that, apart from Moggridge, "*no comprehensive study has ever been made of the records in the Keynes papers relating to his investment activity.*" This surprising knowledge gap has persisted to the present day.

The only quantitative study of Keynes's investment performance was by Chua and Woodward (1983), based on an annual time-series of returns for King's College, Cambridge drawn from CWK Vol.XII. Certainly, an analysis of the investment performance of his Cambridge college endowment during his bursarship, 1924-46, is an appropriate measure of his investment talent since Keynes was allowed complete discretion by his Fellows in managing these funds.

The Chua and Woodward study strongly supported the view that Keynes was a star investor estimating an annualised alpha of 14.5%. However, there are considerable problems with this data which warrant a re-examination of this finding. When we correct for these problems in Section 4 B, we find that the annualised alpha drops to 8.0%, a margin of outperformance considerably less than previously thought but nonetheless substantial. In addition, we find that his returns lagged the UK equity market substantially during the second half of the 1920s.

Just as importantly, the almost complete record of Keynes's trading which has remained dormant in the King's College Archives until now provides the detail on security holdings and transactions which we require to reconstruct Keynes's investment decision-making. As a result, we are able to look in detail at Keynes's trading performance. Having started out as a strategic macro manager, we show that Keynes changed into a bottom-up stock picker in the early 1930s from which point his purchases of his long-term holdings began to outperform the market on a consistent basis. We show that he constructed highly idiosyncratic portfolios with pronounced size and value tilts and in so doing anticipated strategies employed by the better performing institutional investors in the modern period (Lewellen, 2011).

A study of Keynes the investor links to several areas of recent research. Firstly, several studies have claimed that there is a tendency for investors to exhibit overconfidence and as a result to trade excessively to the detriment of performance both in individual stocks (Odean, 1999, and Barber and Odean, 1999) and in mutual funds (Bailey, Kumar, and Ng, 2011). In the first period of his stewardship of the College endowment up to the early 1930s, his share trading exhibited overconfidence to the detriment of the post-transaction performance of his purchases, which underperformed the market by -4.0% over the following twelve months. In the later period, however, the performance of his purchases substantially improved to outperform the market by $+6.2\%$ over the following year.

Furthermore, studying Keynes the institutional investor reinforces what we have recently discovered about the characteristics associated with successful fund managers, namely, age, education, intellect, and social networks (Chevalier and Ellison, 1999a and 1999b; Cohen, Frazzini, and Malloy, 2008; Grinblatt, Keloharju, and Linnainmaa, 2011). These were all characteristics that made Keynes a talented investor. Organisation is also important in encouraging investment talent. Solo fund managers typically outperform a team of fund managers because they process soft information more easily and hold a less conventional portfolio (Chen, Hong, Huang, and Kubik, 2004). Keynes benefitted from the right organisational set up at his college where he enjoyed the full confidence of his Fellows in taking all investment decisions. As a result, he was given a free hand to trade extensively in equities, to construct a highly idiosyncratic portfolio to the eventual benefit of performance, and to change his investment approach when necessary.

The paper is organised as follows. Section 2 reviews Keynes's investment activities and, in particular, his duties at King's College. Section 3 describes the data. Section 4 reviews the development of Keynes's approach to equity investing. Section 5 analyses his trading record over the entire 22 years he was in charge of the King's endowment. Section 6 discusses our main findings and Section 7 concludes.

2. Keynes's investment activities

Investment played an important part in Keynes's life. He was an extremely active personal investor as well as fulfilling several institutional investment roles (CWK XII: 1). Among these, he gave most time to the National Mutual Life Assurance Society, where he was Chairman from 1921 to 1938, to the Provincial Insurance Company as investment director from 1923 until to his death, and to his College.

As chairman, Keynes exerted a strong influence on investment policy at the National Mutual but his views were frequently challenged by other board members, especially during the stock market sell-off of 1937-38. Even at the smaller Provincial, Keynes did not have a free hand.

In a letter to Scott in 1933, he bemoaned the potential organisational failings of an investment committee: *"The danger of Board management, against which one has to be on one's guard, is lest one should succeed in persuading the Board rather against its better judgement in the first instance, and then have to suffer the penalty of their faint-heartedness at a later date, just when the virtues of continuity of mind are most required if one is to be successful in the long run"* (CWK XII: 65).

Keynes appears not to have encountered any of these problems at King's, the Cambridge College founded in 1441 by King Henry VI. He became First Bursar of King's College, Cambridge in 1924 having been Second Bursar for the previous five years. As First Bursar, he had full discretion over investment policy until his death in 1946. There seems little doubt that within the College his investment policy went unchallenged. His knowledge and experience of financial markets invited the confidence of his Fellows and his annual "Chancellor of the Exchequer" speech became a not-to-be-missed fixture in the College calendar. During his illness in 1937–38, he still provided his colleague and former student, Richard Kahn, with a stream of detailed instructions on managing the investments.

Traditionally, the assets of Oxford and Cambridge ("Oxbridge") colleges were largely invested in property (Dunbabin, 1975; Dimson and Acharya, 2007) and a college bursar collected the rents from a predominantly agricultural property portfolio, managed the expenditures, and drew up the college books (Neild, 2008: 100).

The King's endowment was run as a collection of separate accounts. An internal annual investment review of the College endowment, entitled *Report to the Inspectors*, was drawn up in October or November following the August financial year-end and dealt with each of these accounts. The market value of all securities held by the College grew from £447,000 in 1924 to £1,252,000 in 1946 at nominal prices (unadjusted for inflation) through a combination of investment performance and cash inflows (Chambers and Dimson, 2011). This would have been equivalent to the size of a small insurer at the time.

In the early 1920s and 1930s, King's along with other Oxbridge Colleges was still subject to the Trustee Acts which dated back to the middle of the 19th century (the Universities and College Estates Act, 1925, ch.26 (1)(i)). The Trustee Acts applied to King's and the other colleges under Section 26 of the Universities and Colleges Estates Act 1925. They were intended to ensure that any trust funds were managed conservatively by severely restricting the type of investments allowable outside the property they continued to own. The Acts severely restricted the ability of a bursar to undertake financial investments primarily to UK and colonial government securities, UK railway securities, water company securities and local authority housing bonds and mortgages (*Stock Exchange Official Intelligence* 1926, p.1922-23). Furthermore, Oxbridge colleges chose to follow these restrictions in the case of both corporate and trustee funds. For example, neither of the two richest Cambridge colleges, Trinity and St. Johns, amended their statutes to permit equity investment until after World War 2 (Nield, 2008, p.122, and Moggridge, 1992, p.352).

Keynes exerted his influence most decisively in persuading his College Fellows to permit a part of the endowment to be excluded from the onerous Trustee Act restrictions. He was aided in this strategic decision by the fact that his college statutes were loosely drawn (Moggridge, 1992, p. 352).

The endowment therefore can be divided into funds subject to the Trustee Acts ("Restricted Portfolios") and those which were not and where Keynes had full discretion ("Discretionary Portfolios"). The Discretionary Portfolios grew from 11% to 65% of the total securities held between 1924 and 1946 (Chambers and

Dimson, 2011). These funds comprised the Chest alone up to 1933 and thereafter the Chest and Fund B together.

The Chest started up in the early 1920s as the *Industrial Index Account* under Keynes's watch as Second Bursar. Fund B was created in September 1933 as a pooled vehicle for a myriad of small endowed funds which had previously been managed on a segregated basis. The two accounts were managed in a similar style, the UK security holdings in the Chest representing in excess of 50% of Fund B throughout the period. Hence, although attention has tended to concentrate on the Chest, we look at Keynes's trading record for both these discretionary accounts.

Keynes also actively managed his own money. This trading record is more challenging to piece together than that of his college. However, he appeared to manage his own and King's money in a similar way. Our comparison of his personal holdings of UK equities and those of the King's Discretionary Portfolios at each December year-end across the entire period reveals that 75% (71%) by value (number) of his personal holdings were also held by King's.

Hence, the great attraction in analysing the King's College endowment and the Discretionary Portfolios in particular lies in it being the purest expression of Keynes's views and skill in an institutional investment context. Given free reign, how much was he prepared to allocate to this risky new asset class and what sort of securities did he invest in? What investment rules or process did he follow? Finally, how successfully did he trade equities?

3. Data

Annual investment reports of the King's endowment, including lists of security holdings, are kept in the King's College Archives for the entire period Keynes acted as First Bursar, namely, for each financial year-end from 1924 until 1946. The financial year-end of the college was August throughout this period. In addition, transaction records covering the same period were also consulted.

UK security prices were collected from the *Stock Exchange Daily Official List*. Capital and dividend histories are taken from the *Stock Exchange Official Yearbooks*. Individual security prices are end-of-month closing mid-market prices, the exceptions being British securities quoted on the *Supplementary List* before 1933, where the average of the daily high and low is taken.

For benchmark purposes we employ the capitalization-weighted 100 Share UK equity index series estimated by Dimson, Marsh, and Staunton (DMS, 2011), which is representative of the sectoral composition of the broad market and includes natural resource stocks as well as commercial and industrial companies. Intra-year DMS index values are inferred from monthly fluctuations in the *London and Cambridge Economic Service* (LCES) 20 Share Index up to 1929, the *Financial News* (FN) 30 Share Index from 1930 to June 1935, and the *Financial Times* (FT) 30 Share Index from July 1935 onward. To do this, we compute for each year the gain or loss of the DMS index relative to the LCES, FN or FT index. We use this estimate of abnormal performance to calculate monthly capital appreciation consistent with the DMS 100 Share index. Monthly dividend income is estimated as one-twelfth of the annual dividends reported by DMS (2011). Our UK

government bond and cash indexes are respectively the total return on UK Consols and UK Treasury Bill returns (DMS, 2002, 2011).

As discussed in the previous section, our analysis focuses on Keynes's trading of quoted UK stocks in the Discretionary Portfolios. (The college also invested in US stocks beginning in 1931, of which 67% were requisitioned by the UK government in 1941 with King's receiving proceeds of £68,054; there was only one further trade among the remaining US holdings until the end of World War 2.) Whilst Keynes was not formally elected First Bursar until June 1924, he had been given responsibility for equity trading before that date. Consequently, we include the 26 UK equity transactions prior to September 1924 for which records are included among the Keynes papers at King's College. The earliest of these transactions occurred in November 1923.

Table 1 summarises his 954 transactions (567 buys and 387 sells) undertaken for all financial years between 1924 and 1946. 898 transactions were made for the Discretionary Portfolios and a further 56 equity transactions were for other accounts before they co-mingled their stock holdings in Fund B at the end of August 1933. We have excluded stock transactions due to: the stock not being quoted in London (29); inadequate disclosure regarding the terms of rights issues (11); and misbooking of transaction price (1) or date (1). There are 198 instances where purchase (sell) trades are executed in a stock which has also been purchased (sold) on another day in the same calendar month. Since we are dealing with monthly frequency price data, in each of these instances we consolidate the purchases (sales) into a single trade to arrive at the 954 transactions in Table 1. In the analysis below, our results are reported on this set of

transactions; however, our findings are robust to using the unconsolidated 1152 transactions.

In total, Keynes bought equities costing £1,153,000 and sold equities receiving proceeds of £778,000. His average buy and sell transactions were very similar at a little over £2,000. His most active year of trading was 1935, when he traded 89 times turning over £163,000 by value. To put these amounts in context, £1 invested in 1935 in equities would by the start of 2011 have been worth £134 in capital terms or £3720 with dividends reinvested; see DMS (2011).

An analysis of the distribution of his trading by calendar month does not suggest that he systematically engaged in window-dressing. Only 7.8% of his trades occurred in August, the month before the end of the financial year compared to his most active and inactive months, February (9.9%) and March (7.1%) respectively.

4. Keynes and equity investing

A great advocate of equity investing for any long-term investor, Keynes wrote a very positive review of Smith (1924), in which he extolled the virtues of ordinary shares (common stocks) as residual claims on industrial growth (Keynes, 1925). By the mid-1920s, therefore, he believed equities constituted a new and separate asset class to sit alongside property, fixed income securities and cash. As an institutional investment, stocks were at that time an alternative asset.

In this section we start by reviewing equities as the (then) new asset class for endowments and long-term investors, and go on to examine the structure of the King's College portfolio. We review the performance of the College's investments,

and examine characteristics such as sector weightings, the size of companies held in the portfolio, and their dividend yields. We then describe Keynes's investment philosophy, and evaluate how he chose individual securities for the Fund.

4.1 *Equities: the new asset class*

History proved Keynes's focus on equities to be correct. During 1900–1923, prior to Keynes's appointment as bursar, the annualised UK equity risk premium over Treasury Bills had been 1.3%. The risk premium rose to 4.5% over the course of Keynes's tenure as First Bursar during 1924–1946. It was to increase further to 6.8% from the year of his death to the end of the century (DMS, 2002).

Institutional investors did not take advantage of these premiums in any meaningful way in this period. When Keynes was active, British insurance companies were by far the largest institutional investors. The insurers concentrated their investments in such fixed income assets as loans, mortgages, government and municipal bonds, and corporate debentures. Portfolios were governed by rules first laid down in 1861 which emphasized the "safety" of principal rather than the pursuit of capital gain. Equity allocations only very modestly increased from an insignificant 3% in 1920 to barely 10% by 1937 (Baker and Collins, 2003, Appendix 1). The most aggressive insurers, led by the National Mutual, never held more than 30% of their assets in equities during the interwar years (Scott, 2002).

As already mentioned, the largest Oxbridge Colleges other than King's had yet to diversify their endowments into equities. Although the largest US university endowments had committed more to common stocks, this allocation on a historical cost-weighted basis remained below 10% in the 1920s and only rose above 20% in the late 1930s (Goetzmann, Griswold, and Tseng, 2010). Other types of major

institutions invested the majority of their assets in fixed income securities in this period (Hannah, 1986; Burton and Corner, 1968). In brief, the stock market was the territory of the individual investor, and equities were rarely perceived as an institutional asset.

King's, like many Oxbridge colleges, was a large property owner. However, the only disclosures regarding its substantial property portfolio concern rents received and no property valuations appear to have been undertaken, nor is there any mention of such in the investment reports. Consequently, all figures presented below exclude property.

Consistent with the discussion in Section 2 above, the Restricted Portfolios of King's were confined by law to invest predominantly in UK government bonds, colonial bonds, and railway fixed income securities. Consequently, the equity weighting of these funds averaged only 1% across the period 1924-46 and from 1933 onwards there were no ordinary share holdings.

Where Keynes enjoyed complete discretion, he aggressively shifted into ordinary shares at the earliest opportunity. The ordinary share weighting of the Discretionary Portfolios averaged 85% over 1924-29, 49% over 1930-39, 68% over 1940-46, and 74% over the entire period. In the 1930s, Keynes started buying US common and preference stocks. Adding in US common stock his total equity weighting averaged 60% over 1930-39 and 73% over 1940-46.

Although Keynes briefly sought refuge in UK government securities in the early 1930s following the fall in UK share prices, the main balance of funds were invested in UK preference shares (1924-29 11%, 1930-39 12%, and 1940-46

14%). In an era when preference shares were much more common than today, we include both ordinary and preference shares in the analysis which follows.

Keynes's portfolio was very different not only from other major Oxbridge colleges, but also from the vast majority of other long-term institutional investors, including highly regarded US investors. For example, Dean Mathey (1966), the remarkably successful chairman of Princeton's investment committee, switched heavily into bonds in the late 1920s and kept out of equities until midway through World War 2. Keynes's early allocation to equities was at least as radical as the much later move by Mathey or the commitment to illiquid assets in the late 20th century by Yale and Harvard. Keynes could therefore lay claim to being among the first institutional equity investors.

4.2 *King's Performance Statistics*

The only prior statistics on Keynes's performance were estimated in Moggridge (CWK XII: 91, Table 7) and analysed by Chua and Woodward (1983). However, there are several problems with these estimates. Firstly, they are price-only returns. Secondly, they are the returns of a single discretionary account within the King's endowment, The Chest. Thirdly, the returns series does not begin until the financial year 1928. Lastly, the stock market index published by the Bankers Magazine is unsuitable as a benchmark for performance measurement. It is biased against "speculative" securities (Grant, 1967, p.135); it has an unusually low beta and volatility (White, 1990, Fig.6); index management rules are not defined; there is no indication of appropriate adjustments for rights issues; there is no computation of dividend yield; and it was calculated at the middle of each month.

We have addressed each of these issues by estimating total returns beginning in the financial year 1925 for a composite of both accounts within the endowment where Keynes had full discretion, namely The Chest and Fund B. We have benchmarked performance against the capitalization-weighted DMS 100 Share UK equity index described above.

Keynes as First Bursar wrote an internal annual investment review of the College endowment, the *Reports to the Inspectors*, from 1924 until his death. These reports were not for distribution outside the Estates Committee. The endowment consisted of a number of separate accounts reflecting the different investment guidelines and constraints each faced; a detailed breakdown is provided in Chambers and Dimson (2012). The *Reports* strongly suggest that each account was managed on a segregated basis, with Keynes separately reviewing each of the four main accounts which made up the Restricted Portfolios and the two accounts making up the Discretionary Portfolios. For each, he provided segregated lists of year-end holdings at market values as well as annual capital appreciation and income figures. As discussed above, the distinction between account types was particularly crucial for investment policy and asset allocation since Keynes enjoyed the greatest freedom of investment choice in the case of the Discretionary Portfolios.

From the *Reports to the Inspectors*, we have calculated the returns for the Discretionary Portfolios (taking The Chest and Fund B together), the Restricted Portfolios, and the Total Fund excluding property, summarised in **Table 2**. (Note that the Discretionary Portfolio returns include a third fund, Fund C, established in 1933 which on average represented less than 1% of the total market value of the

assets we analyse.) The returns are based on the estimates made by Keynes as bursar of the appreciation (depreciation) for each year as a percentage of market value at the beginning of the year. To this capital gain (loss) is added the income return for the year which is the reported investment income divided by the average of the beginning and end portfolio values. As a general rule all endowment income was spent by the College rather than retained in the endowment.

According to these estimates, over the whole period from end August 1924 to end August 1946, the annual performance of the Discretionary Portfolios averaged +15.21%, as compared to +8.08% for the UK equity market. Compared to Chua and Woodward's estimated Jensen's alpha of 14.45% and a market beta of 1.78 using the single market model, we obtain much lower figures of 8.02% and 0.89 respectively. Whilst these summary statistics suggest the Discretionary Portfolios did well, the Restricted Portfolios generated an annual arithmetic mean total return of only +6.30%, which did not compare favourably with total returns to UK government bonds of +6.51%.

In making such a large allocation to equities, it is interesting to note that King's had to give up nothing in terms of income. During 1924–29, the average dividend yield on the UK equity holdings was 6.1%, above the dividend yield on the UK equity market of 5.1% and the income return on government bonds of 4.5%. During 1930–39, the average dividend yield on the UK equity holdings was 4.8%, again exceeding the 4.3% dividend yield on the UK equity market and the 3.5% income return on government bonds. During 1940–46, the UK equity holdings enjoyed a 6.2% dividend yield, which was again higher than the UK equity market's 4.2% dividend yield and the 3.1% income return on government bonds. In all

periods, the average dividend yield for King's includes non-dividend paying security holdings.

The Sharpe Ratio of 0.69 for the Discretionary Portfolios compares favourably with those for the Restricted Portfolios (0.49) and the UK equity market (0.38). Keynes's tracking error versus the UK equity index is 12.6%, a substantial active risk compared to the typical portfolio today. The time series tracking error for US university endowment funds averaged 3.4% over the period 2002-07 and the tracking error of the 95th percentile fund in the study by Brown, Dimmock, Kang, and Weisbenner (2010) still only reaches 6.3%.¹ The high tracking error of Keynes's fund was attributable to his idiosyncratic stock selection, a subject we take up in the next section, as well as quite possibly to his US equity exposure after 1930.

Examination of the annual time-series of Discretionary Portfolio returns in Table 2, column (1) shows that whilst Keynes underperformed in only five out of the 22 financial years, three of those underperforming years were 1926, 1927, and 1928 when UK equities put in a strong performance. Furthermore, he failed to foresee the sharp fall in equities after September 1929 and to avoid a decline of 12.5% in the financial year 1930, by which time he was a cumulative 17.4% behind the equity benchmark since inception. We return to the significance of this period of underperformance in the following section. After this point, the Discretionary Portfolios only experienced substantial underperformance in the financial year 1938 and were never behind the UK equity market benchmark on either a rolling 3-year or 5-year basis.

¹ We are grateful to Stephen Dimmock for providing this estimate.

4.3 Portfolio characteristics: sector, size, and yield

What did Keynes's equity portfolios look like? We consider the sector, firm size, and valuation characteristics of King's equity holdings. Note that in this section and unlike the rest of the paper, we refer to characteristics at calendar, rather than financial, year-end in accordance with the DMS (2002) benchmark.

Both in the 1920s and afterwards Keynes concentrated the majority of his UK equity holdings in just two sectors, commercial and industrial firms, and metal mining stocks - his exposure to these sectors each averaging one-third of his UK equity portfolio. **Table 3** examines his sector allocations compared to those of the London Stock Exchange, as defined by the top 100 ordinary share capitalisation for two representative year-ends, 1927 and 1936, based on the DMS (2011) UK index constituents.² Such sector allocations suggest a very active investment approach. He was considerably underweighted in banks in 1927 and in commercial and industrial firms in 1936 in favour of large holdings in the mining sector. In between these two dates, his mining exposure in the early 1930s had fallen below 10% in favour of a commercial and industrial stock exposure in excess of 50% of his UK equities.

We define firm size in terms of ordinary share market capitalisation. The inter-quartile size distribution of his UK shareholdings expressed as a percentage of the smallest stock in the DMS (2002) top 100 shares is graphed in **Figure 1**. Other than during the period 1940–45, the majority of his portfolio holdings were firms with an ordinary market capitalisation placing them outside the top 100. He had a decided tilt towards mid-cap and small-cap stocks.

² We are grateful to Mike Staunton for making this data available.

Similarly, the distribution of shareholdings by dividend yield diverged from that of the overall market. **Figure 2** shows that the median dividend yield of his dividend-paying stocks remained above the dividend yield on the DMS 100 other than in 1933. In the mid-1920s, the median dividend yield on his British holdings was between 6.4% and 7.4%, exceeding the market yield of 5.3%. From 1927 to 1936, he dramatically increased his holdings of mining stocks and recovery stocks which had passed their dividends such that his zero-dividend paying stocks accounted for half his equity holdings. Thereafter, the proportion of zero-dividend paying stocks fell back to less than one-fifth of his portfolio through both dividends being reinstated and disposals, and his portfolio readopted a high dividend yield tilt.

It is clear that Keynes took considerable risks in constructing his UK portfolio. He aggressively allocated to equities, adopted very active sector weightings, selected small-cap and mid-cap stocks, and rotated between high dividend yield and low dividend yield stocks relative to the market.

4.4 *Investment philosophy*

How did Keynes think about equity investing? We obtain the clearest statement of his investment philosophy in the 1920s from the Independent Investment Company, established by Keynes with his former Treasury colleague O. T. Falk, and floated on the London Stock Exchange in 1924. According to the prospectus, this closed end fund adhered to the “credit cycle theory of investment” (CWK XII: 33). This approach advocated a close monitoring of monetary and economic indicators necessary to decide on a switch between equities, fixed income, and cash. Keynes adopted this same philosophy in managing the College funds (CWK XII: 106). Whilst it remains unclear precisely what he was

contemplating, Keynes had in mind a role for the business cycle in determining expected returns on stocks and bonds later studied by Fama and French (1989).

He therefore not surprisingly started out with a top-down investment philosophy. He believed that his skill in interpreting the latest economic statistics – he was also a founder of the *London and Cambridge Economic Service* – would enable him to time entry into and exit from the stock and bond markets.

However, performance in the late 1920s was disappointing, as we saw in the previous section. His 83% equity allocation at the end of August 1929 indicates that he failed to foresee the imminent sharp fall in the London market. This sobering experience could well have led Keynes to his beauty contest metaphor and to bemoan the seeming inability of the “serious-minded” investor, frustrated by the “game-players”, “to purchase investments on the best genuine long-term expectations he can frame” (Keynes, 1936: 156). More practically, it also led him to discard a top-down in favour of a bottom-up approach.

In a review of his investment performance for King’s in May 1938, Keynes confessed that: “*We have not proved able to take much advantage of a general systematic movement out of and into ordinary shares as a whole at different phases of the trade cycle*” (CWK XII: 106). A letter to Richard Kahn in May 1938 revealed the difficulty he felt he faced as a macro manager: “*Credit cycling means in practice selling market leaders on a falling market and buying them on a rising one and, allowing for expenses and loss of interest, it needs phenomenal skill to make much out of it*” (CWK XII: 100).

In the same investment review, Keynes went on to attribute his subsequent success managing the College investments to his decision to concentrate on a few

core holdings, considered cheap relative to their intrinsic value and held for several years. This represented a radical change in his investment approach. Hence, on August 15th, 1934, Keynes wrote to Francis Scott, the Provincial Insurance chairman, clearly stating his change of view: *“As time goes on, I get more and more convinced that the right method in investment is to put fairly large sums into enterprises which one thinks one knows something about and in the management of which one thoroughly believes”* (CWK XII: 57). It would seem then that by August 1934 Keynes had already fundamentally revised his investment approach.

Keynes revealed the most about his investment thinking in his correspondence with Scott. Out of the 113 pages devoted to “Keynes as an investor” in CWK XII, fully 39 pages contained correspondence with Francis Scott, the Chairman of the Provincial Insurance Company (CWK XII: 50–88). This exceeded the 22 pages of correspondence concerning the King’s endowment (CWK XII: 88-109) and the 15 pages arising from his dealings at the National Mutual (CWK XII: 36–50). While Keynes’s speeches as Chairman to the AGM are reproduced (CWK XII: 114–254), these reveal relatively little about his investment philosophy.

Following his appointment to the Provincial board in December 1923, our archival research reveals that Keynes corresponded with Scott on investment issues on only two occasions until November 1932, the majority of their discussion being on insurance business. However, in the following twelve months, Scott and Keynes corresponded on individual stock ideas on 22 occasions and then on 52 occasions in the twelve months after that. Moreover, at the end of November 1932, Keynes was attempting to persuade Scott that the Provincial should add to its large

holding of Austin Motors rather than to trim the position and return to a diversified portfolio of industrial stocks (King's Archives JMK/PC/1/153).

It is unlikely that Keynes changed his investment philosophy in an instant and more likely that his thinking evolved over a period of time. Bearing this in mind, the archival evidence suggests that Keynes had substantially shifted his investment approach by August 1932. We return to this important question in Section 5 below.

4.5 *How did he pick stocks?*

Keynes leaves a few clues in his correspondence as to how he went about selecting his stocks. According to his credit-cycling approach, he restricted himself to "market leaders". However, our analysis of his portfolio characteristics in Section 4.3 above fails to confirm this claim showing that he preferred stocks outside the top 100 firms both in terms of firm size and sector selection.

In general, his stock-picking was the product of fundamental security analysis based on sell-side research, and on a judicious reading of the financial press, on the one hand, and the use of his personal network of City and industry contacts, on the other.

Virtually all his UK share dealing was done through two London stockbrokers: Buckmaster and Moore, and Laurence Keene and Gardner. Both firms supplied him with research and this was supplemented by a constant flow of research notes, including those from provincial brokers such as Harold Brett in Liverpool, who followed local industrial stocks.

A good example of his stock-picking is the large South African mining company, Union Corporation, one of his largest and most successful core holdings.

In another letter to Francis Scott dated June 21st, 1934, Keynes outlined the key reasons he still liked the stock, namely, the fact that it was a “value play” and that he evaluated and trusted the management very highly (CWK XII: 56). The shares traded at a 30% discount to his estimate of break-up value, a third of which was cash and government bonds.

Moreover, the chairman, Henry Strakosch, was someone he had known well since World War 1 and whom he trusted implicitly. He made use of Strakosch and his staff when selecting and undertaking due diligence on mining stocks in the late 1920s (King’s Archives KC/5/3). A second example of the importance of his personal network is Hector Whaling, a small Norwegian whaling firm, in which Keynes built a substantial position and where Rupert Trouton, his former pupil and a partner at Buckmasters, was a director.

Keynes also thought in a novel way about equity valuation. For example, he estimated the value of Austin Motor shares in terms not only of earnings yield but also of market capitalisation per car produced and estimated that Austin traded at a 67% discount to General Motors in October 1933 (King’s Archives JMK/PC/1/221-2).

Was Keynes an insider? One difficulty in answering this question is that the investment community then did not have the same view of insider trading that we have today. Other than directors who owed fiduciary duties to their company not to trade on price-sensitive information, insider trading by investors in general was not subject to regulation until 1980 in the UK (Cheffins, 2008: 39–40). It is certain that Keynes was in receipt of what today would be deemed price-sensitive information – he was, for example, aware of a change in the UK bank rate before it occurred in

1925 (Mini, 1995). However, it is impossible to discover how frequently and the extent to which he exploited such information in his trading. What we can say is that he would most certainly have regarded the exploitation of inside information as substantiating the view of stock trading as a “low pursuit” rather than a “game of skill” (CWK XII, 109).

We might expect the change in Keynes’s investment approach to lead at some point both to lower portfolio turnover and to his systematically accumulating long-term positions in his favourite shares such as Union Corporation, Hector Whaling, and Austin Motors, and to an increase in portfolio concentration.

Discretionary Portfolio turnover in UK equities averaged 28% in 1924-29, 31% in 1930-39, and 11% in 1940-46. The number of financial year-end UK equity holdings showed an upward trend, averaging 30, 50, and 63 respectively in 1924-1929, 1930-39, and 1940-46. Portfolio concentration, whether defined as the proportion of the market value of the Discretionary Portfolios’ UK equity securities allocated to the largest five (C5) or the largest twenty (C20) ordinary and preference shareholdings, was quite high and stable in the 1920s and 1930s before declining in the 1940s. The C5 (C20) annual averages were 44% (90%) in 1924-29, 49% (81%) in 1930-39, and 33% (72%) in 1940-46. We therefore must look elsewhere for stronger evidence of his shift to a greater emphasis on stock selection, namely, in his equity trading behavior.

5. Keynes’s trading behavior

We examine Keynes’s equity trading behavior through event study analysis using an approach that has been applied to assessing the performance of stock-pickers in Dimson and Marsh (1984), Dimson and Fraletti (1986), Womack (1996),

and Jegadeesh and Kim (2010). Discussion of the methodology can be found in standard financial econometrics texts, such as Campbell, Lo, and MacKinlay (1996) and Kothari and Warner (2007). Odean (1999), Barber and Odean (1999) and Coval, Hirshleifer, and Shumway (2005) apply a similar approach to analysing the performance of individual investor trades.

In the following analysis we examine monthly abnormal returns of the 567 buy and 387 sell transactions in the UK equity portfolio over the financial years 1924–46. Of the buy and sell transactions, 80% were ordinary shares and the remainder, preference shares.

5.1 *Abnormal returns*

We calculate abnormal returns in a window centred on the month of the transaction. The return estimates cover the twelve months prior to the start of the month in which the transaction occurs, the partial-month return up to the transaction date, the partial-month return from the transaction date to the end of the month, and the twelve months from the end of the month in which the transaction occurs.

Stock returns throughout are defined as capital appreciation plus dividend income. Since the London Stock Exchange *Supplementary List*, unlike the *Official List*, did not disclose *ex dividend* dates up to 1934, we apportion the annual dividend equally over the twelve months when estimating monthly total returns for these securities up to this point.

The buy-and-hold abnormal return (BHAR) for each security is defined as the geometric difference between the security's observed cumulative return over a specified interval and the cumulative beta-adjusted return on the market over the

same interval. We estimate BHARs over both pre-transaction intervals, ranging from twelve calendar months to one calendar month before the transaction date, and post-transaction intervals, ranging from one to twelve calendar months after the transaction date. The beta-adjusted return on the market makes use of the Vasicek (1973) method to estimate the beta for each security. Over the interval in common event time, we then estimate mean buy-and-hold abnormal returns across all the securities bought (sold). As a form of robustness check, we repeat all the analysis that follows employing cumulative abnormal returns, with similar results that are not reported here. We employ Johnson (1978) skewness-adjusted t-tests to report statistical significance.

Unless otherwise stated, abnormal returns reported below are equal-weighted. We also weight the BHARs by transaction size, adjusting for changes in the UK equity market index. To conserve space, value-weighted results, which are broadly consistent with those reported below, are not reported.

The post-transaction performance reveals the economic consequences of the buys and sells of UK equities in the Discretionary Funds. The pre-transaction performance indicates the appreciation or depreciation that contributed to or anticipated a subsequent investment decision.

The results for all Keynes's buy and sell transactions of UK equities for the Discretionary Funds over the whole period are summarised in **Table 4** over the 25-month window spanning the transaction date of buys and then sells. **Panel A** displays BHARs estimated over periods of twelve months $[-12, Tx]$ through one month $[-1, Tx]$ up to the month-end preceding the transaction date including performance over the part-month up to the transaction date $[Tx]$. **Panel B** presents

the post-transaction returns estimated over the part-month from the day following the transaction [0] up to the end of the first complete month [0,+1] through to twelve complete months [0,+12] after the transaction month. The fact that there are fewer observations in Panel A than in Panel B for both buys and sells reflects Keynes's trading of stocks that had recently received a listing and therefore did not possess a full price history across the 25-month window spanning the transaction date.

As can be seen in Panel A, both his buys and his sells ran up strongly prior to his transacting. His buys returned +14.7%, +7.3%, and +3.2% respectively over 12, 6, and 3 months pre-transaction, all significant at the 1% level, while his sells also performed strongly, +20.7%, +13.1%, and +9.4% respectively, all significant at the 1% level, over the same periods. In Panel B, post-purchase share prices outperformed the market (+3.0%, +4.1%, and +3.3% over 3, 6, and 12 months) and also outperformed the market post-disposal (+1.9%, +2.7%, and +4.0% respectively), all significant at the 1% level.

In Section 4 we discussed the self-professed change in Keynes's investment approach. We now make use of the time series of post-transaction returns to estimate whether or not there was a structural break in Keynes's trading consistent with his own assertions. His correspondence on investments with Scott indicated that this change was already well underway by August 1934. Equally it is unlikely that he had discarded his earlier investment approach before the end of the bull market in October 1929.

We perform a Quandt-Andrews breakpoint test to explore the maximum likelihood of a structural break in any of the monthly abnormal returns series for

each of months 0 through 12 post-transaction for buys and then sells. We calculate the LR-statistic associated with each potential monthly breakpoint where the distribution of this follows Andrews (1993) with approximate asymptotic p -values provided by Hansen (1997).

There are six potential structural breaks to be found in his sell transactions between August 1930 and December 1933, of which just one is statistically significant at the 5% level. In the case of his buy transactions, the analysis suggests a break in eight of the 13 post-transaction monthly time series between April 1931 and December 1933, one of which is statistically significant at the 1% level. The econometric evidence is mildly suggestive of a break in his trading behaviour in the early 1930s.

Taken together with the archival evidence presented in Section 4 D, in the rest of this section we proceed to partition his trading before and after the financial year ended 1932. To check robustness, we also partition his trading at each of August 1929, 1930, 1931, 1933 and 1934, but since the main results are essentially unchanged, we do not report results based on alternative partition dates. **Panel C** of Table 4 therefore splits the pre-transaction BHARs for his buys and sells respectively into two periods: financial years 1924-32 and financial years 1933-46. **Panel D** does the same for his post-transaction BHARs.

Panel C of Table 4 reports that, over the 12, 6, and 3 months pre-purchase, his stock picks in the earlier period had risen strongly, +25.3%, +13.4%, and +7.0%, all highly statistically significant, as compared to a more modest +10.6%, +4.9%, and +1.7% in the later period, the former two returns being significant at the 1% level. In contrast, the value of holdings that were sold in the later sub-period ran up

more strongly over 12, 6, and 3 months pre-transaction, by an abnormal +23.3%, +13.6%, and +9.2%, all highly statistically significant, than those during the 1920s, +13.6%, +11.7%, and +9.9%, albeit these returns are only marginally statistically significant.

Hence, both purchases and disposals were usually made after favourable relative-to-market performance leading up to the trade. This general pattern is consistent with that uncovered by more recent studies of US individual investor trading behavior (Odean, 1999, and Barber and Odean, 1999).

In **Panel D** of Table 4, we look at post-transaction performance. In the bull market of the 1920s, Keynes tended to buy stocks that had outperformed. Sadly, however, they underperformed by 4.0% in the year after purchase, albeit this figure is not statistically significantly different from zero. He had overpaid for the stocks he bought. In the 1930s and 1940s, however, the story is different. There is worthwhile post-transaction outperformance over 3 months (+3.8%), 6 months (+5.5%), and 12 months (+6.2%), all statistically significant at the 1% level. This improvement in the performance of his buys over 12 months of +10.2% is also significant at the 1% level. We obtain a similar result on a value-weighted basis (results not reported).

In the sub-period up to 1932, the evidence based on post-transaction performance is that Keynes managed to time his sell decisions well. On average, his 1920s sales were followed by abnormal returns close to zero (+0.5%, -1.3%, and +2.0% over 3, 6, and 12 months). Unfortunately, as we just saw, over 12 months his buys did worse than the stocks he sold in this earlier period to the detriment of performance. In the later sub-period, prices continued to rise, albeit

modestly, after he sold (+2.4%, +4.1%, and +4.7% over 3, 6, and 12 months post-transaction). Value-weighting returns again gives similar results (not reported). Hence, there is no indication of skill in timing disposals during the 1930s and 1940s. Rather, it is clear that his sell ideas came from among the stocks he previously bought which had performed well.

In **Table 5**, we partition the post-transaction BHARs by the length of holding period of each stock: i.e. securities held less than 2 months, between 2 and 12 months and longer than 12 months. **Panel A** displays results across the whole period. In the first row, his trading of securities held only for the very short-term (less than 2 months) was highly profitable over these initial months ($[0,+1]$ +20.0% and $[0,+2]$ +17.8%), although, had he waited 6 months until selling, these purchases would have risen by as much as +31.2% (first row, $[0,+6]$). Those stocks held between 2 and 12 months were still profitable, although less so (second row), but did not appreciate very much after sale (fifth row). The long-term holdings (more than 12 months) had only returned +2.4% after 6 months, significant at the 1% level, but only a statistically insignificant +1.7% at the end of 12 months (third row). Post-disposal performance of his long-term holdings continued to be strong up to 12 months later, +3.9% significant at the 1% level (sixth row).

In **Panel B** of Table 5, we partition the holding period analysis of his (i) buys and (ii) sells into the two periods 1924–32 and 1933–46.

Again it is apparent that he was a good short-term trader generating strong double-digit returns over both periods in the two windows $[0,+1]$ and $[0,+2]$ (Panel B (i), first and second rows). In contrast, he traded his longer-period holdings much better in the later period than in the earlier period. His stocks held between 2 and

12 months returned +4.4% after 2 months up to +14.8% after 12 months in the period 1933-46 (fourth row) versus -2.7% and -10.8% after 2 and 12 months respectively in the period 1924-32 (third row), the latter returns not being statistically significant. Similarly, his long-term holdings held over 12 months had outperformed by 4.3%, significant at the 1% level, at the end of 12 months in the later period (sixth row) versus a statistically insignificant -5.0% in the period pre-1932 (fifth row). The difference in EW mean BHARs of the stocks held over 12 months is +9.3% significant at the 1% level, whilst that in VW mean BHARs is +8.4%, significant at the 1% level (not reported).

An examination of his post-disposal performance in Panel B (ii) suggests that over time, whilst he did better in timing the disposal of his short-term holdings in the later period (second row) than in the earlier period (first row), the opposite is true of the timing of sales of his long-term holdings which continued to rise relative to the market by up to 4.6% over 12 months in the later period (sixth row).

The main results reported in Table 5 remain unchanged when value-weighting BHARs.

Hence, post-transaction performance reinforces the view that Keynes exhibited more skill in buying individual stocks after the financial year 1932. **Figure 3** charts this improvement: (i) illustrates the post-purchase performance of his 2 to 12 month holdings and (ii) his longer than 12 month holdings and illustrates graphically this improvement across the two periods.

5.2 Disposition Effect

The behavioral interpretation of our finding of his disappointing stock trading performance in the previous section is that Keynes exhibited overconfidence in his

macro-trading ability in the period to 1932. In this section, we consider whether Keynes was susceptible to a second well-known behavioral bias in his stock trading, namely, the desire to avoid regret.

Odean (1998, 1999) and Odean, Barber, and Strahilevitz (2011), observe that different psychological mechanisms affect the buying and selling decisions of investors. As Odean explains, "*Buying is forward-looking and selling is backward-looking. We tend to consider what a new stock will do for the portfolio and what a current holding has done. This makes buying a more hopeful activity, focusing on the future and what good might come from owning a stock, whereas selling can be full of regret as we ponder the poor choice we made or that we held on too long*" (Ervolini, 2009). Odean contends that, when buying, investors consider the past only inasmuch as they believe it is informative about the future, but when it comes to selling their focus is heavily on the past and many investors, seeking to minimize regret, sell winners too early and hold on to their losers. The latter is the disposition effect first postulated by Shefrin and Statman (1985).

Some investors, of course, sell losers rather than winners for such reasons as minimizing capital gains tax liability or window-dressing a portfolio. However, capital gains tax was not introduced in the UK until 1965 and, as discussed in Section 3, Keynes showed no evidence of window-dressing.

We therefore consider whether Keynes exhibited the disposition effect by utilising the same transactions data set as above along with the methodology of Odean (1998). If Keynes exhibited regret in his stock trading then his proportion of gains realized (PGR) should exceed his proportion of losses realized (PLR) where:

$$\text{PGR} = \text{No. of Realized Gains} / (\text{No. of Realized and Unrealized Gains}) \quad (1)$$

and

$$\text{PLR} = \text{No. of Realized Losses} / (\text{No. of Realized and Unrealized Losses}) \quad (2).$$

Unrealized (paper) gains and losses of all the holdings in the portfolio that are not traded are determined by reference to the average purchase price.

Accordingly, each month we undertake a count of the number of realized gains (losses) whenever Keynes traded a stock along with the unrealized gains (losses). We then estimate the mean PGR and PLR for the entire dataset covering 1924–1946 and two sub-periods prior and subsequent to a potential break in his trading behavior. A natural breakpoint is August 1932, but since there were only two realizations that financial year (see Table 1) we deem the potential breakpoint (Break) in trading behavior to be August 1932 or a year before/after then. We present average results for 1924–Break and for Break–1946. Given that Keynes did not trade equities every month and only realised either a gain or a loss 57% of the time, the PGR and PLR statistics are low in absolute terms. However, we are interested in the difference between the two proportions.

In **Table 6**, we report the mean PGR, PLR and the difference between the two for the entire dataset covering 1924 to 1946 (column (1)), and for sub-periods up to and after a potential break in his trading behaviour. We deem the potential break in trading behavior to be August 1932 or a year before/after that date. We average results across all three periods from 1924 to the breakpoint (column (2)) and across all three periods from the breakpoint to 1946 (column (3)). PGR always exceeds PLR and the difference in the two ratios for the whole period, the earlier

period and the later period is 0.010, 0.008, and 0.012 respectively. Hence, Keynes displayed a disposition effect across all periods, albeit in the earlier period this effect is not statistically significant.

5.3 *Contrarian or Momentum Trader?*

Lastly, we make use of the same transactions dataset to determine the extent to which Keynes's trading behavior exhibited contrarian or momentum tendencies.

What behavioral tendencies would we attribute to Keynes? In the case of his buying behavior, in the period to 1932 when Keynes pursued his credit cycling approach to investment, he would put money into equities when his stocks were doing well, thereby displaying momentum behavior. However, his post-1932 bottom-up value approach would have guided him toward making purchases of shares that had underperformed the market, i.e. contrarian behavior.

Since his selling would be constrained by being a long-only investor and a need to fund his best stock ideas, it is not clear that he would exhibit any clear pattern in his selling behaviour.

We define momentum and contrarian in relation to individual security price fluctuations. Hence, we classify the investor as a *momentum buyer* if his frequency of purchases after an abnormal security-price rise exceeds that expected assuming a random distribution of trades within the sample period; and as a *contrarian buyer* if he buys conditional on an abnormal security-price fall.

Following Goetzmann, and Massa (2002) and Blackburn, Goetzmann, and Ukhov (2009) we use a binomial distribution to determine whether the number of contrarian (or momentum) trades exceeds that expected had the investor traded

randomly. The probability of being a contrarian (or momentum) trader is determined as follows:

$$P(X > x) = 1 - \sum_{y=0}^{x-1} \binom{n}{y} p^y (1-p)^{n-y} \quad (3)$$

where n is the total number of buys, x is the number of buys consistent with a particular strategy, and p is the probability of observing a positive return. We classify each strategy's significance by its p-value. A momentum strategy is denoted as significant ($p < 0.10$) by ** or as non-significant ($0.10 < p < 0.50$) by *. A contrarian strategy is denoted as significant ($p < 0.10$) by †† or as non-significant ($0.10 < p < 0.50$) by †. An investor is considered undefined if the p-value is greater than 50% for both the momentum and contrarian strategies.

Our results for his purchase activity are displayed in **Table 7** for short-term (one-month and 3-month), medium-term (6-month), and long-term (12-month) horizons. He displayed only weak contrarianism up to 1932 over all horizons (0.438^\dagger , 0.405^\dagger , 0.202^\dagger , 0.367^\dagger). However, in the period after 1932 he became strongly contrarian ($0.000^{\dagger\dagger}$ over all horizons).

Hence, there was a change in Keynes's trading style, whereby he became strongly contrarian in his stock purchases after 1932. This is further evidence that by this time, he had developed a clearer idea of his investment approach and how he wanted to trade.

6. Discussion

Keynes did not chart an unhindered course of investment success from beginning to end as has been previously assumed. The event study shows that the

pattern of negative post-transaction returns in the 1924–32 period is similar to that of individual investors (Odean, 1998 and 1999, and Barber and Odean, 1999). A behavioral interpretation of this result is that an overconfident Keynes placed too much value in his top-down investment prowess to the detriment of performance. However, our study suggests that Keynes revised his investment philosophy and learned from 1932 onward how he might best invest in equities. This finding is consistent with our archival research of his correspondence, and the results from our analysis of his event time performance and of his trading behavior.

Our view is that after 1932 he was no longer having to make top-down asset allocation decisions which compromised his stock-picking instincts. He could now take greater care in timing the purchases of those stocks he liked. As Keynes is purported to have said “*When the facts change, I change my mind. What do you do sir?*” (Malabre, 1994, p.220). Well, he changed his mind about the best way to manage portfolios.

Our evaluation of Keynes the investor lends color to several strands of the finance literature. Chevalier and Ellison (1999a) report that older managers, being less concerned about termination, take on more unsystematic risk and construct less conventional portfolios. Chevalier and Ellison (1999b) conclude that the educational background of fund managers explains good investment performance. In a retail context, Grinblatt, Keloharju, and Linnainmaa (2011) show that ability as proxied by IQ contributes to better investment results. Keynes had been investing personally for 19 years prior to becoming First Bursar of his college at the age of 41, having graduated with a first class degree in mathematics, and having been placed second out of 104 candidates in the Civil Service entrance examinations.

Of course, education can proxy either ability to process information or better access to information via social networks. Cohen, Frazzini, and Malloy (2008) claim that networks between fund managers and senior corporate executives can partly explain investment outperformance. Opportunistic trades by investors who are informed by insiders yield superior returns (Cohen, Malloy, and Pomorski, 2011). By the time he became First Bursar, Keynes possessed a considerable network of City contacts through former pupils, such as the broker Rupert Trouton, ex-Treasury colleagues, such as O.T. Falk, the co-manager of the Independent Investment Company, and industrialist friends, such as Samuel Courtauld, the Chairman of the multinational textile firm.

One approach to investment is to take a large number of active positions, each of a limited scale, and to diversify sufficiently to achieve modest but relatively consistent performance. An early illustration would be the Foreign & Colonial Investment Trust, which was structured to give broad exposure to an asset class (Chambers and Esteves, 2012). A modern example would be the Norwegian Government Pension Fund – Global (Chambers, Dimson, and Iilmanen, 2012). However, Keynes eschewed extreme diversification in favour of large exposures to securities that reflected his preferences and skills as an asset manager.

Crucially, the right organizational set-up is necessary to allow investment talent to flourish. According to Chen, Hong, Huang, and Kubik (2004), solo fund managers perform better than a team of fund managers because they process soft information more easily and hold a less conventional portfolio. Outperforming managers take on more idiosyncratic risk, being able to hold a relatively high proportion of local stocks in their portfolios (Coval and Moskowitz, 2001). Being

free to pursue one's best investment ideas enhances performance (Cohen, Polk, and Silli, 2010). Keynes was able to construct idiosyncratic portfolios, concentrating on relatively few sectors and adopting a small cap bias, precisely because investing for his college, where he enjoyed the full confidence of his Fellows, was the most rewarding of his many investment responsibilities.

Unsurprisingly, Keynes withdrew from his two most public investment roles where he felt constrained by the organization. He resigned the chairmanship of the National Mutual, where he tired of the cross-examination of his investment decisions. His co-management of the Independent Investment Trust, a quoted closed end fund, with a former Treasury colleague suffered from a failure to agree on investment policy and proved spectacularly unsuccessful (CWK XII, p.32-36). In contrast, his college had allowed him the freedom to develop his investment ideas and, when necessary, to adapt his investment approach.

7. Conclusion

This study of Keynes's stock market investing offers both a reappraisal of his investment performance and an assessment of his contribution to professional asset management. The King's College endowment permitted Keynes to give full expression to his investment abilities. We provide the first detailed analysis of his investment ability in terms of his management of the King's portfolios. Previous studies had claimed that Keynes's performance for his college was stellar. Our results, however, qualify this view. According to our event time analysis, the changing pattern of cumulative returns around his buy and sell decisions before and after the difficult early 1930s, provides evidence to substantiate Keynes's own

claims that he fundamentally overhauled his investment approach. Essentially, he switched from a macro market-timing approach to bottom-up stock-picking.

Furthermore, Keynes's experience at King's foreshadowed important developments in modern investment practice on several dimensions. Firstly, his strategic allocation to equities was path-breaking. Not until the second half of the twentieth century did institutional fund managers follow his lead. His aggressive purchase of equities pushed the common stock weighting of the whole endowment's security portfolio over 50% by the 1940s. This was as dramatic and far-sighted a change in the investment landscape as the shift to alternative assets in more recent times. Secondly, his willingness to take a variety of risks in the King's portfolio and to depart dramatically both from the market and institutional consensus exemplifies the opportunity available to long-term investors such as endowments to be unconventional in their portfolio choices. Thirdly, the contrast between the receptive environment at King's and the conditions he faced at other institutions reminds us of how critical, conditional on possessing investment talent, is the right organisational set-up. Talent alone is not enough. Equally, his achievements underscore the main finding of Lerner, Schoar, and Wang (2008) in their analysis, two generations later, of the leading Ivy League endowments that such idiosyncratic investment approaches are very difficult for the vast majority of managers to replicate.

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Table 1. Summary of UK stock transactions for King's Discretionary Portfolios

Buy and Sell equity transactions are summarised by financial year, ended August. Mean value is the total cost and proceeds of the Buy and Sell transactions in each financial year divided by the total number of Buys and Sells respectively.

Year	BUYS			SELLS		
	N	Total (£)	Mean (£)	N	Total (£)	Mean (£)
1924	20	38,111	1,906	6	15,058	2,510
1925	30	44,864	1,495	20	29,201	1,460
1926	17	36,806	2,165	8	31,461	3,933
1927	16	45,823	2,864	8	18,160	2,270
1928	25	54,637	2,185	18	38,788	2,155
1929	11	19,178	1,743	14	33,368	2,383
1930	14	16,259	1,161	19	28,048	1,476
1931	14	10,291	735	6	5,834	972
1932	15	11,472	765	2	1,118	559
1933	25	40,336	1,613	23	34,343	1,493
1934	24	46,600	1,942	35	67,333	1,924
1935	53	82,058	1,548	36	80,802	2,245
1936	25	55,173	2,207	28	60,609	2,165
1937	48	81,839	1,705	28	39,500	1,411
1938	41	46,682	1,139	38	63,966	1,683
1939	13	11,938	918	14	16,131	1,152
1940	33	41,030	1,243	10	19,798	1,980
1941	38	70,941	1,867	3	4,560	1,520
1942	11	23,125	2,102	9	24,558	2,729
1943	25	85,054	3,402	16	33,287	2,080
1944	22	99,302	4,514	16	45,033	2,815
1945	31	115,036	3,711	21	49,829	2,373
1946	16	76,638	4,790	9	36,975	4,108
Total	567	1,153,193	2,034	387	777,760	2,010

Table 2. King's College Performance 1925–46

The total returns of the Discretionary Portfolios, Restricted Portfolios, and the Total Fund ex property of King's College are estimated from the annual *Reports to Inspectors of Accounts*, King's College Archives for financial years ended August. The UK Equity Index is based on the DMS total return index. The UK Government Bond Index is the total return on UK Consols, the benchmark UK government security. The risk-free rate is the Treasury Bill rate. Returns are expressed as percentages. Maximum and minimum are shown in bold typeface. AM = arithmetic mean; SD = standard deviation; Sharpe = Sharpe ratio. Financial year-end is August.

Financial year	Discretionary Portfolios (1)	Restricted Portfolios (2)	Total Fund ex property (3)	UK Equity Index (4)	UK Govt Bond Index (5)	Relative performance (1) - (4)
1925	30.26	4.70	8.54	17.33	3.10	12.93
1926	6.40	5.42	5.59	11.83	2.65	-5.43
1927	2.00	2.70	2.53	19.90	3.08	-17.90
1928	3.04	7.95	6.98	16.99	8.12	-13.95
1929	7.29	3.64	4.32	5.40	-0.31	1.89
1930	-12.48	0.36	-2.08	-17.58	9.13	5.10
1931	-5.70	-6.34	-6.24	-30.17	8.03	24.47
1932	29.19	5.82	9.11	27.33	29.40	1.86
1933	54.39	30.93	34.70	27.04	5.87	27.35
1934	26.13	13.39	17.31	13.15	12.92	12.98
1935	34.75	7.77	17.39	7.95	6.71	26.81
1936	40.00	11.77	23.49	19.08	4.39	20.92
1937	11.20	-1.00	4.26	0.63	-10.15	10.57
1938	-22.75	-8.55	-15.06	-8.64	4.93	-14.11
1939	10.64	-3.93	2.04	-5.17	-10.01	15.81
1940	-7.07	5.83	-0.24	-21.08	16.61	14.01
1941	30.55	23.74	26.67	27.24	15.01	3.31
1942	8.35	9.04	8.74	9.38	4.43	-1.02
1943	39.29	7.82	21.94	26.97	-0.49	12.32
1944	14.20	5.24	10.24	10.86	2.87	3.34
1945	12.52	4.42	9.36	3.65	12.33	8.87
1946	22.41	7.84	17.31	15.62	14.58	6.79
AM	15.21	6.30	9.41	8.08	6.51	7.13
SD	19.07	8.76	11.39	16.18	8.62	12.64
Sharpe	0.69	0.49	0.65	0.38	0.53	n/a

Table 3. UK Discretionary Portfolios: equity sector weightings

LSE denotes the sector weightings as represented by the ordinary share market capitalisation of the top 100 companies quoted on the London Stock Exchange. Active is the difference between the weightings for King's and for the LSE. Weightings are expressed as percentages.

December year-end	1927			1936		
	King's	LSE	Active	King's	LSE	Active
Banks	0.0	21.3	-21.3	0.0	16.6	-16.6
Commercial, Industrial, etc	35.7	40.3	-4.6	16.9	44.4	-27.5
Investment Trusts	2.5	0.7	+1.8	0.3	0.4	-0.1
Iron, Coal & Steel	1.4	4.0	-2.6	4.2	4.7	-0.5
Mines	42.9	6.2	+36.7	65.7	9.8	+55.9
Oil	0.0	10.1	-10.1	0.0	9.1	-9.1
Railways	0.0	6.5	-6.5	1.1	2.1	-1.0
Rubber	9.3	0.0	+9.3	0.7	0.0	+0.7
Shipping	0.9	1.5	-0.6	6.5	0.8	+5.7
Other	7.3	9.5	-2.2	4.6	12.1	-7.5
Total	100.0	100.0	0.0	100.0	100.0	0.0

Table 4. UK Discretionary Portfolios: event time performance 1924–46

Below are the equally weighted mean BHARs of all quoted equity transactions from financial years 1924 to 1946. The financial year ends in August. All returns are expressed in %. Pre-transaction returns are estimated over the 12 months, [-12,Tx], through one month, [-1,Tx], up to the month-end preceding the transaction date plus the partial month up to the transaction date [Tx]. Post-transaction returns are estimated over the partial month over the day following the transaction [0] up to the month-end plus the following one, [0,+1], through 12 months, [0,+12]. Panels A and B show pre-transaction and post-transaction BHARs for Buy and Sell transactions for all financial years 1924–46. Panels C and D show pre- and post-transaction BHARs respectively for Buys and Sells across the financial years 1924–32 and 1933–46. Based on the Johnson (1978) skewness-adjusted t-test we report statistical significance at the 1%, 5%, and 10% level denoted by ^a, ^b, and ^c respectively. There are fewer observations in Panels A and C than in Panels B and D for both Buys and Sells reflecting Keynes's trading of stocks that had recently received a listing and did not possess a full set of prices across the 25-month window.

Panel A		Period	[-12,Tx]	[-11,Tx]	[-10,Tx]	[-9,Tx]	[-8,Tx]	[-7,Tx]	[-6,Tx]	[-5,Tx]	[-4,Tx]	[-3,Tx]	[-2,Tx]	[-1,Tx]	
BUYS		24-46	14.7 ^a	13.7 ^a	12.3 ^a	10.7 ^a	9.2 ^a	8.0 ^a	7.3 ^a	5.5 ^a	5.3 ^a	3.2 ^a	1.8 ^b	1.0	
N			498	501	504	509	512	515	520	520	520	522	527	529	
SELLS		24-46	20.7 ^a	19.6 ^a	18.4 ^a	18.8 ^a	17.0 ^a	15.6 ^a	13.1 ^a	11.7 ^a	10.6 ^a	9.4 ^a	7.7 ^a	6.2 ^a	
N			351	352	354	355	356	357	358	363	365	369	372	376	
Panel B		N	Period	[0,+1]	[0,+2]	[0,+3]	[0,+4]	[0,+5]	[0,+6]	[0,+7]	[0,+8]	[0,+9]	[0,+10]	[0,+11]	[0,+12]
BUYS	567		24-46	2.7 ^a	2.5 ^a	3.0 ^a	3.2 ^a	3.7 ^a	4.1 ^a	3.3 ^a	3.7 ^a	3.6 ^a	3.7 ^a	3.3 ^a	3.3 ^a
SELLS	387		24-46	1.5 ^a	1.6 ^a	1.9 ^a	2.0 ^a	2.4 ^a	2.7 ^a	3.0 ^a	3.3 ^a	3.5 ^a	3.8 ^a	4.2 ^a	4.0 ^a
Panel C		N	Period	[-12,Tx]	[-11,Tx]	[-10,Tx]	[-9,Tx]	[-8,Tx]	[-7,Tx]	[-6,Tx]	[-5,Tx]	[-4,Tx]	[-3,Tx]	[-2,Tx]	[-1,Tx]
BUYS			24-32	25.3 ^a	23.7 ^a	21.8 ^a	19.3 ^a	16.2 ^a	13.4 ^a	13.4 ^a	10.3 ^a	10.1 ^a	7.0 ^a	4.8 ^a	2.7 ^c
N				141	141	141	143	144	145	148	148	148	149	151	152
BUYS			33-46	10.6 ^a	9.8 ^a	8.6 ^a	7.3 ^a	6.5 ^a	5.9 ^a	4.9 ^a	3.7 ^a	3.4 ^a	1.7 ^c	0.5	0.3
N				357	360	363	366	368	370	372	372	372	373	376	377
SELLS			24-32	13.6 ^b	14.2 ^b	13.3 ^b	15.9 ^b	15.9 ^c	13.4 ^c	11.7 ^c	11.8 ^b	10.1 ^c	9.9 ^c	7.6 ^b	4.5 ^a
N				94	95	96	96	96	96	96	99	99	100	100	100
SELLS			33-46	23.3 ^a	21.5 ^a	20.3 ^a	19.9 ^a	17.4 ^a	16.4 ^a	13.6 ^a	11.7 ^a	10.8 ^a	9.2 ^a	7.7 ^a	6.8 ^a
N				257	257	258	259	260	261	262	264	266	269	272	276
Panel D		N	Period	[0,+1]	[0,+2]	[0,+3]	[0,+4]	[0,+5]	[0,+6]	[0,+7]	[0,+8]	[0,+9]	[0,+10]	[0,+11]	[0,+12]
BUYS	162		24-32	0.3	0.1	1.0	0.3	0.5	0.5	-1.7	-2.4	-3.1	-2.2	-3.1	-4.0
	405		33-46	3.7 ^a	3.5 ^a	3.8 ^a	4.4 ^a	5.1 ^a	5.5 ^a	5.3 ^a	6.2 ^a	6.2 ^a	6.0 ^a	5.9 ^a	6.2 ^a
SELLS	101		24-32	-0.3	0.7	0.5	0.3	0.4	-1.3	-1.9	-0.3	-0.5	0.0	1.3	2.0
	286		33-46	2.1 ^a	1.9 ^a	2.4 ^a	2.6 ^a	3.1 ^a	4.1 ^a	4.8 ^a	4.6 ^a	4.9 ^a	5.1 ^a	5.2 ^a	4.7 ^a

Table 5. UK Discretionary Portfolios: event time post-transaction performance 1924–46

Below are the equally weighted mean BHARs of all quoted equity transactions from financial years 1924 to 1946. The financial year ends in August. All returns are expressed in %. Post-transaction returns are estimated over the partial month over the day following the transaction [0] up to the month-end plus the following one, [0,+1], through 12 months, [0,+12]. Panel A shows BHARs for Buy and Sell transactions averaged across all financial years 1924–46, and Panel B shows BHARs partitioned across the two periods 1924–32 and 1933–46. Both panels also partition returns into three holding periods: less than 2 months, 2 to 12 months, and over 12 months. Based on the Johnson (1978) skewness-adjusted t-test we report statistical significance at the 1%, 5% and 10% level denoted by ^a, ^b, and ^c respectively.

	N	Period	[0,+1]	[0,+2]	[0,+3]	[0,+4]	[0,+5]	[0,+6]	[0,+7]	[0,+8]	[0,+9]	[0,+10]	[0,+11]	[0,+12]
Panel A														
(i) BUYS														
less than 2 months	26	24-46	20.0 ^a	17.8 ^a	20.1 ^a	22.9 ^a	27.3 ^a	31.2 ^a	24.5 ^a	20.6 ^a	26.6 ^a	27.8 ^a	24.5 ^a	22.7 ^a
2 to 12 months	78	24-46	3.1 ^b	2.0	1.9	2.7	3.6	5.3 ^b	5.8 ^b	5.4 ^c	4.9	5.3 ^c	5.8	6.3 ^c
over 12 months	463	24-46	1.7 ^a	1.7 ^a	2.2 ^a	2.2 ^a	2.5 ^a	2.4 ^a	1.7 ^c	2.5 ^b	2.0 ^c	2.0 ^c	1.7	1.7
(ii) SELLS														
less than 2 months	25	24-46	4.3 ^a	7.2 ^a	6.1 ^b	7.4 ^b	11.0 ^a	6.8 ^b	4.3	8.1 ^b	9.0 ^b	7.4 ^b	8.1 ^b	6.7 ^c
2 to 12 months	77	24-46	0.3	0.0	-0.1	0.1	-0.5	-0.2	1.7	1.9	2.3	2.9	3.2	3.2
over 12 months	285	24-46	1.5 ^a	1.6 ^a	2.0 ^a	2.1 ^a	2.5 ^a	3.1 ^a	3.3 ^a	3.3 ^a	3.3 ^a	3.7 ^a	4.1 ^a	3.9 ^a
Panel B														
(i) BUYS														
less than 2 months	6	24-32	18.9 ^a	20.4 ^a	35.0 ^a	40.3 ^a	55.3 ^a	70.8 ^a	47.3 ^a	29.7 ^a	48.0 ^a	44.7 ^a	39.6 ^a	46.2 ^a
	20	33-46	20.4 ^a	17.0 ^a	15.6 ^a	17.7 ^a	18.9 ^a	19.3 ^a	17.7 ^a	17.9 ^a	20.2 ^a	22.8 ^a	20.0 ^a	15.7 ^b
2 to 12 months	26	24-32	-1.4	-2.7	-2.8	-4.4	-5.9	-5.4	-4.8	-7.1	-9.0	-7.6	-8.8	-10.8
	52	33-46	5.3 ^a	4.4 ^a	4.2 ^a	6.2 ^a	8.3 ^a	10.6 ^a	11.0 ^a	11.6 ^a	11.9	11.8 ^a	13.0 ^a	14.8 ^a
over 12 months	130	24-32	-0.2	-0.2	0.2	-0.7	-0.8	-1.6	-3.3	-3.0	-4.2	-3.3	-3.9	-5.0
	333	33-46	2.4 ^a	2.5 ^a	3.0 ^a	3.4 ^a	3.7 ^a	3.9 ^a	3.7 ^a	4.6 ^a	4.5 ^a	4.1 ^a	3.9 ^a	4.3 ^a
(ii) SELLS														
less than 2 months	6	24-32	-2.2 ^a	9.3 ^a	12.9 ^a	25.4 ^a	36.4 ^a	18.6 ^a	4.4 ^c	18.3 ^a	16.2 ^a	12.4 ^a	18.3 ^a	16.9 ^a
	19	33-46	6.4 ^a	6.5 ^a	3.9	1.7	3.0	3.1	4.2	4.9	6.7	5.9	4.9	3.5
2 to 12 months	20	24-32	-0.7	0.3	-3.1	-2.3	-5.7	-7.7	-7.1	-6.2	-7.1	-6.1	-4.4	-2.6
	57	33-46	0.6	-0.1	1.0	1.0	1.3	2.5	4.7	4.8	5.6	6.1	5.9	5.2
over 12 months	75	24-32	0.0	0.2	0.5	-1.0	-0.8	-1.2	-1.0	-0.2	-0.1	0.6	1.5	2.0
	210	33-46	2.1 ^a	2.0 ^a	2.6 ^a	3.2 ^a	3.6 ^a	4.6 ^a	4.8 ^a	4.5 ^a	4.5 ^a	4.7 ^a	5.0 ^a	4.6 ^a

Table 6. PGR and PLR for UK Discretionary Portfolios 1924–46

For the stocks held in the UK Discretionary Portfolios, this table compares at the end of each month the Proportion of Gains Realized (PGR) to the Proportion of Losses Realized (PLR), where PGR is the number of realized gains divided by the number of realized and unrealized gains and PLR is the number of realized losses divided by the number of realized and unrealized losses. We estimate the mean PGR and PLR for the entire dataset covering 1924 to 1946 (column (1)), and for sub-periods up to and after a potential break in his trading behaviour. We deem the potential break in trading behavior to be in August 1932 or a year before/after then. We average results across all three periods from 1924 to the breakpoint (column (2)) and across all three periods from the breakpoint to 1946 (column (3)). The financial year ends in August.

	(1) 1924–46	(2) 1924–Break	(3) Break–1946
Mean PGR	0.032	0.031	0.034
Mean PLR	0.022	0.022	0.022
Difference in proportions	0.010	0.008	0.012
<i>(p-value)</i>	<i>(0.004)</i>	<i>(0.142)</i>	<i>(0.007)</i>

Table 7. UK Discretionary Portfolios: Keynes's equity trading behavior 1924–45

Keynes's equity trading behavior is classified using a binomial distribution to determine whether the number of his purchases following a contrarian or momentum strategy is greater than expected had he traded randomly. We consider the timing of his purchase transactions in relation to the prior abnormal performance of each individual share over one-month, 3-month, 6-month, and 12-month periods prior to his trading. His trading is classified as momentum, namely, purchasing conditional on a prior positive return; or contrarian. We classify each strategy's significance by its p-value. A momentum strategy is denoted as significant ($p < 0.10$) by ** or as non-significant ($0.10 < p < 0.50$) by *. A contrarian strategy is denoted as significant ($p < 0.10$) by ^{††} or as non-significant ($0.10 < p < 0.50$) by [†]. An investor is considered undefined if the p-value is greater than 50% for both the momentum and contrarian strategies. The financial year ends in August.

Time horizon	1924–32	1932–46
1-month	0.438 [†]	0.000 ^{††}
3-months	0.405 [†]	0.000 ^{††}
6-months	0.202 [†]	0.000 ^{††}
12-months	0.367 [†]	0.000 ^{††}

Fig. 1. Size distribution of UK Discretionary Portfolio holdings 1924–45

Size is defined as ordinary share market capitalisation. At each calendar year-end, the 25th percentile, median, and 75th percentile are expressed relative to the size in that year of the smallest firm in the DMS 100 on a logarithmic scale.

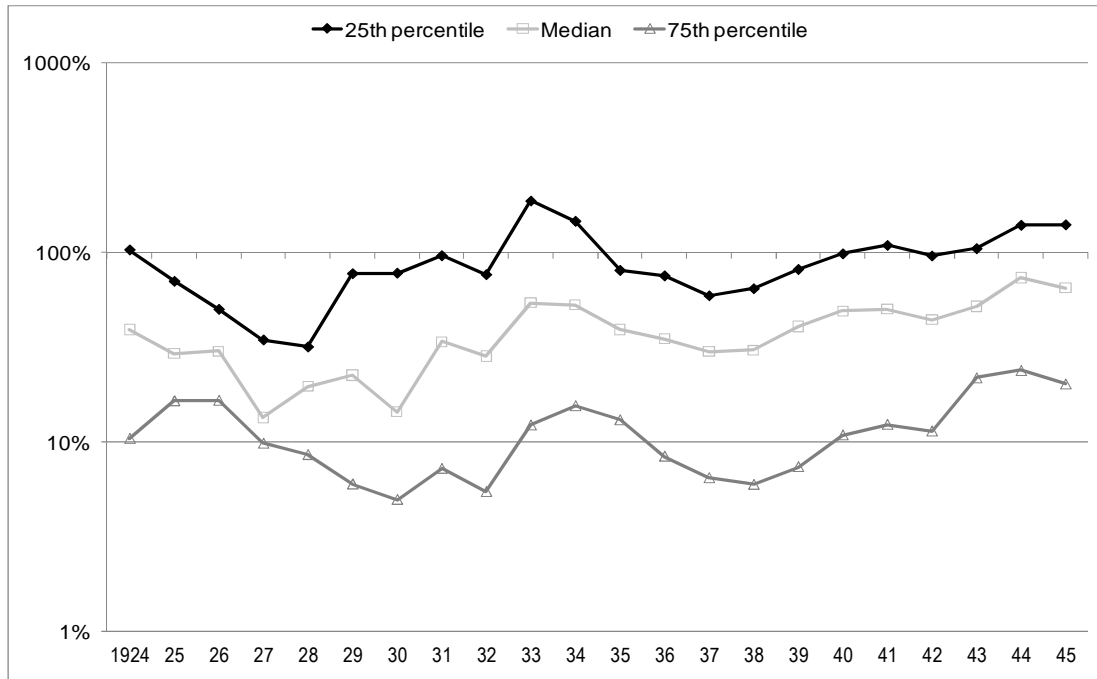


Fig. 2. Yield distribution of UK Discretionary Portfolio holdings 1924–45

The distribution excludes all zero-dividend yield observations. At each calendar year-end, the 25th percentile, median, and 75th percentile dividend yields are expressed relative to the UK equity market dividend yield on a logarithmic scale.

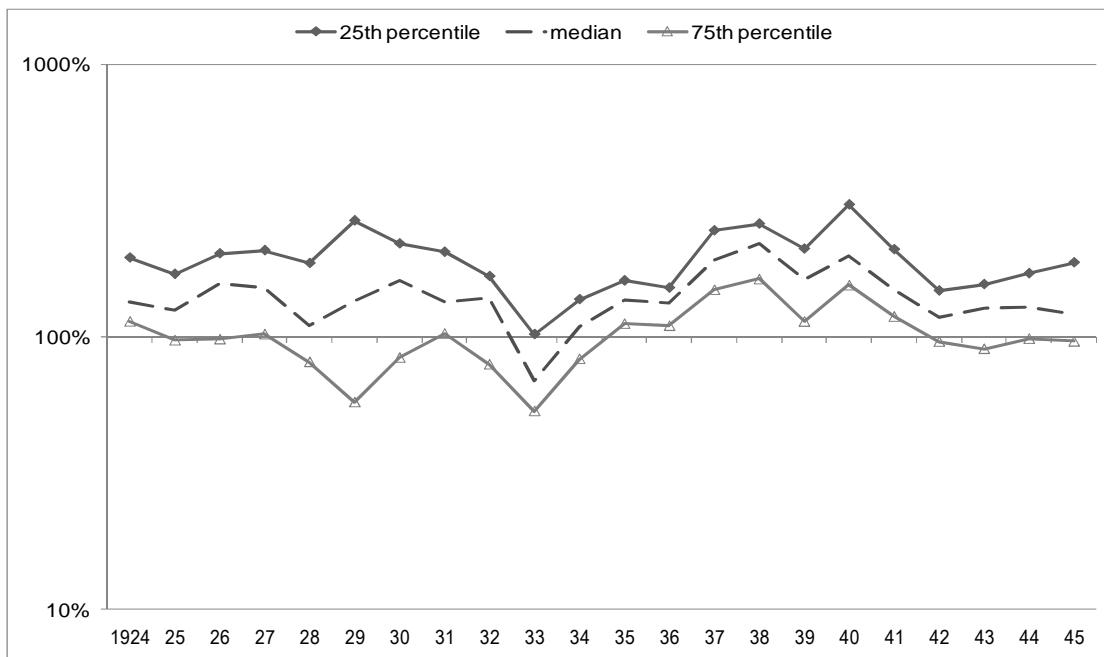
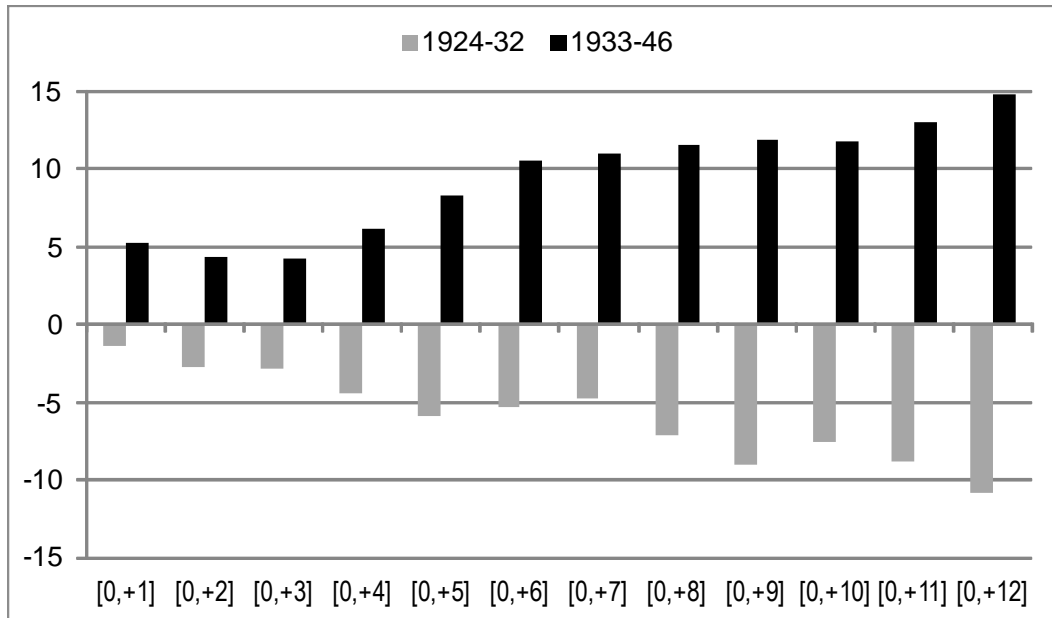


Fig. 3. UK Discretionary Portfolios: event time performance 1924–46

(i) Post-transaction BHARs of stocks held between 2 and 12 months



(ii) Post-transaction BHARs of stocks held over 12 months

