

J. M. W. Turner, a celebrated painter and unrecognized financial arbitrageur

Andrew Odlyzko

University of Minnesota

`odlyzko@umn.edu`

`https://www-users.cse.umn.edu/~odlyzko`

November 6, 2025.

Extended version.

Abstract. J. M. W. Turner is famous for his achievements in graphic arts. What is not known is that he engaged in some pioneering market arbitrage, a profitable and risk-free swapping of British government securities. His activities lead to interesting insights into British markets of the 19th century. Financial innovation frequently created profitable arbitrage opportunities. However, among regular investors it seems that it was mostly mavericks like Turner who took advantage of them. Apparently there were strong cultural factors that inhibited most people from imitating him, which allowed obvious pricing anomalies to persist for extended periods.

A shortened version, without many of the details and references, but with some illustrations, including reproductions of a few pages from the relevant ledgers, has appeared in *Financial History Magazine*, No. 155, Fall 2025, pp. 38–42.

1 Introduction

Joseph Mallord William Turner (1775 - 1851) is famous for his oil paintings, watercolors, and drawings. His pioneering work in the graphical arts continues to be admired, enjoyed, and celebrated. The 250th anniversary of his birth was commemorated by many special exhibits in museums around the world. A very few of the many books about his life and art are [2,6,7,9,10], and many more references as well as extensive information about Turner are available at his Wikipedia web page.

What has not been discussed so far are Turner's forays into risk-free arbitrage of British government securities. Those forays were also unknown to the public in his lifetime, and that is easy to understand. They were few in number, and involved minor sums that were too small to move market prices. However, they are of some interest. First of all, they show an amusing side of Turner that was not known before, an artist who successfully played in the market. Second, and more important, they illustrate what might be regarded as incomplete development of the British financial markets. Even though they were the most sophisticated in the world of Turner's time, they produced very obvious pricing anomalies that Turner occasionally took advantage of. The big question is how those anomalies

managed to persist for extended periods. The evidence suggests that there were cultural inhibitions that stopped most participants from taking advantage of those arbitrage opportunities. It appears that it required eccentrics such as Turner to overcome those constraints.

John Constable, another famous painter of that period, wrote of Turner that “he is uncouth but has a wonderful range of mind”¹. And indeed Turner had a wide range of friends and acquaintances, and not just among artists, cf. [7]. But he was certainly “uncouth,” not one of the “well-bred gentlemen” of his age. In particular, he was often called a miser, with an unseemly preoccupation with money. Sir Walter Scott wrote to a friend that “Turner’s palm is as itchy as his fingers are ingenious and he will, take my word for it, do nothing without cash and anything for it” ([2], p. 257). But this was rather unjust, perhaps due to Turner being “uncouth,” as others testified to his generosity in many circumstances. Furthermore, he left his entire estate to the public. It consisted of a very large and priceless collection of his works, along with a very substantial financial legacy². But there was something to the accusation, as he was very thrifty.

It was known that Turner took a keen interest in the prices of his works, and had a good appreciation for the value of his works in what was a flourishing art market [1]. His creations fetched high prices, and, as far as his biographers can tell, were almost the only source of his wealth. Although he is known to have invested £100 in 1805 in an unsuccessful venture in the West Indies [15], the general conclusion has been that he “had no banking account . . . ; when he received money he handed it to his Stockbroker, Mr. William Marsh . . . , to buy stock, and when he wanted money he sold stock to the required amount” ([2], p. 170). (“Stock” in this context meant government securities and a very few others, such as those of the Bank of England.) However, this was based on very fragmentary evidence, mainly Turner’s notes in “his sketch-books [where he jotted] all kinds of odd memoranda” ([2], p. 170). But much more can be done. Details of Turner’s dealings in government securities are available in full detail in the ledgers in the Bank of England Archive, and have not been explored before. The broad pattern seen in his accounts is that of slow accumulation of very secure government bonds. However, although he was not a frequent trader, he did engage in some complicated deals that would require more work to understand. No attempt is made here to explicate those, or to evaluate his entire investing career³. Instead, two cases are examined in which he did risk-free arbitrage. The point of this work is to point out that even in the world’s most sophisticated market of the time, opportunities for such arbitrage did come up, often as results of financial innovation by the government, and that there seemed to be some reluctance on the part of ordinary investors to take advantage of them.

¹ As quoted in the Turner entry in the *Oxford Dictionary of National Biography*.

² About £80,000, comparable to something between \$10 million and \$200 million today, depending on whether one uses inflation adjustments or scales by GDP per capita.

³ Pointers to his accounts in British government securities are given in the appendix, to facilitate further research on Turner’s investments, and their relation to his other activities. It is possible that he made some small wild flings similar to the 1805 Jamaica venture, but those would not be in the Bank of England Archive ledgers, and no indication of such has been found.

2 Financial innovations and unsophisticated experts

Novel financial instruments often surprise their inventors with the ways they end up used and abused. This is true today, and it was true centuries ago. The only difference is that the level of sophistication of both the securities and the people dealing with them were lower in earlier times.

Richard Price was a famous philosopher, mathematician, and demographer of the late 18th century. Today he is often cited for rescuing the work of Thomas Bayes from obscurity. He made substantial contributions to actuarial science, and was a key figure in the establishment of modern life insurance. However, some of his ideas had perverse side effects. In his time, the public was far more concerned about the dangers of a mounting national debt than is the case today. Price suggested the problem could be solved through the establishment of a Sinking Fund, which would repurchase in the market bonds issued earlier. He used what today is sometimes called “mathiness,” reliance on fallacious but hard to penetrate quantitative models. (Price relied on arguments about difference between compound and simple interest, arguments that would likely not mislead any good students in today’s introductory actuarial courses, but people were less sophisticated then.) His suggestions were accepted by the British government, and in 1786 a Sinking Fund was established. It was frequently cited by eminent figures as a jewel of public finance, a proof of Parliament’s determination to fulfill its promises to purchasers of public securities. The dogmatic belief in the virtues of the Sinking Fund was so strong that it was kept in operation through the French and Napoleonic Wars (1792–1815). In a typical year, to finance the huge war deficits, the government would borrow a huge sum from a syndicate of financiers⁴, and then would use some of that money to later repurchase that debt in the market.

The Sinking Fund had quite a few skeptics from the start, but it took until 1813 for Robert Hamilton to produce a convincing quantitative demonstration of its absurdity. And even after that, it was not until 1829 that this ruinously expensive (to taxpayers) concoction was abolished. For its history, and the controversies it aroused, see [8].

Richard Price also laid the foundations for another financial innovation that turned out to be expensive to taxpayers. In 1808, the British government started selling life annuities. Their prices were set using the Northampton Tables of Mortality, which had been compiled around 1780 by Price. Unfortunately these tables were extremely defective, substantially overestimating the probability of death, and not distinguishing between male and female life expectancy. It was generally known in the insurance industry that selling life insurance with rates based on Price’s tables produced excellent profits. So it should have been obvious that selling annuities based on those tables would be ruinous. But apparently this was not known to the policy makers, so sales began, and led to large losses to the taxpayer. Awareness of those losses grew, and in 1828 the government temporarily suspended the sales. They restarted them again at the end of 1829, this time with prices based on much better mortality tables prepared by John Finlaison, a pioneering actuary⁵.

⁴ This was the main source of David Ricardo wealth. He was often among the leaders of those syndicates. That wealth enabled him to retire early and devote more of his attention to economics and finance.

⁵ Some details are available in [16].

Finlaison's tables were sound, but the pricing of the life annuities did not take into account adverse selection. Rules allowed purchase of annuities for the life of any person, potentially totally unrelated to those purchasing the policy, and up to the age of 90. So some enterprising people purchased annuities for lives of elderly individuals who were in excellent shape and lived in healthy parts of the country. Reportedly, in many cases, they even provided extra care for the nominees, to prolong their lives! This led to substantial losses to the taxpayer, and an arms race, as the government periodically tightened the rules, and investors (who eventually came to be dominated by insurance companies) found ways to keep profiting.

The life annuity game was known, and there are some 19th century publications that describe it, for example [5,16], but it does not seem to be covered in the modern literature. There is data in the Bank of England Archive with details of all policies, so with some study it would be possible to determine the losses to the taxpayer. But this would not tell us about the gains to the annuity investors, since we do not have data on their costs of finding good candidates, and in keeping them alive.

A related government mispricing produced a case where taxpayer losses were exactly equal to investor gains, and which featured Turner as one of the gainers. In November 1829, as the government started selling the new life annuities, it also offered investors terminable annuities. Today, the usual actuarial term for them is 'annuities certain,' and they consist of a fixed number of equal payments in return for an initial lump sum. At that time, the GDP of Great Britain (so excluding Ireland) was on the order of £400 million, with a population of about 16 million. The national debt was around £800 million, so about twice the GDP (or somewhat less if we include Ireland) and almost all of it consisted of perpetual annuities. Those could not be cashed in by investors, only sold on the open market, but the government could call them in at their par value. The largest of those were the famous Consols, and they formed about half of the total debt. For details, see [16]. Paying just the interest on all the annuities consumed about half of the national budget.

In 1829, in addition to Consols and other perpetual annuities, there were the life annuities mentioned above, and some terminable annuities. The largest of the latter were the Long Annuities, which will be designated LA. They paid interest twice a year, on 5 April and 10 October, through October 1859, with a final quarter-year payment on 5 January 1860. In 1829, paying them cost the government £1.36 million per year. £1 per year of LA was valued in the market at about £19, so LA in total were worth about £25 million, roughly 3% of the national debt.

On Monday, 23 November 1829, the government started selling new terminable annuities. In this article we will only consider the ones sold from that day through 5 January 1830, as this was followed by a two-week break in sales, and afterwards the securities and market prices changed, and the risk-free arbitrage opportunity to be discussed below began to fade away. Those annuities could be for essentially any number of years, and paid interest on the same dates as LA. In particular, they could be bought for 30 years, with the last payment due 10 October 1859, and those will be called here TA. TA were to expire at almost the same time as LA, except that LA had that final £0.25 payment coming on 5 January 1860, a payment that was worth about £0.10 in 1829. (This point was missing

in many contemporary press accounts, which claimed that TA and LA were identical. The £0.10 was about 0.5% of the LA price in 1829, so this made a nontrivial difference, although not enough to destroy the rationale for the arbitrage to be described.) As is shown by the ledger C73/14 in the Bank of England Archive (which is the basis for most of the evidence for this article), practically all of the new terminable annuities sold through 5 January 1830 were TA. And almost two thirds of them were purchased by exchanging LA for them!

The intention of Parliament was that the new terminable annuities would be purchased primarily by exchange from perpetual annuities. This resulted from an almost universal (but fallacious) notion prevailing at that time that the best way to force Parliament to reduce the gigantic national debt was to move from perpetual to terminable annuities. It was widely recognized that the creation of the national debt, backed by Parliament, and so not dependent on the whim of the ruler, was key to Britain attaining its dominant position in the world, even when it was faced with a much larger and richer adversary, France. However, the use of perpetual annuities was often cited as a fatal mistake⁶.

As it turns out, terminable annuities played a minor role in British government finance. Contrary to various cyclical theories that predict catastrophic debt crises when debts reach some high level, during the century between the Battle of Waterloo in 1815 and the outbreak of World War I in 1914, Britain gradually reached a satisfactory national debt position without any crises centered on long-term debt. This happened through two developments. One was growth (the Industrial Revolution, and the start of the Great Enrichment that increased living standards by more than an order of magnitude). The other was lower interest rates (with the perpetual annuities swapped successively for ones that paid less, culminating at the start of the 20th century with most debt at 2.5% per year, less than half of the rate at the height of the Napoleonic Wars). But there were frequent calls for a move to terminable annuities throughout this period.

Although the intention was to sell the new annuities in exchange for perpetual ones, the published rules allowed them to also be sold by exchanging LA for them. Further, the interaction of market prices and the price tables meant that there was a clear gain by swapping LA for TA. On the very first date of sales, Monday, 23 November 1829, there were three purchases of the new annuities, all of TA, and all executed by exchanging LA for them. All three buyers were members of the London Stock Exchange. (They were all what was called “jobbers,” namely the dealers who made the market.) As one example, the first of them exchanged £289 per year of LA for £300.15 per year of TA, so a gain of 3.86% nominally, as was usually reported in the press, but really more like 3.4% if we take into account that stub payment of £0.25 that was due on LA on 5 January 1860.

This was a totally risk-free exchange, one stream of payments from the British government for another, almost identical. There were no fees. All an investor had to do was to appear in the office of the Commissioners for the Reduction of the National Debt in Old Jewry Street, which sold the new annuities, sign the papers, then walk two blocks to the Bank of England to carry out the transfer of LA to the government, and then go back to complete the transaction. Such an investor had a few days to do this⁷. *The Times*

⁶ For example, [4], p. 42.

⁷ This was surely to provide some flexibility for investors. In normal times, LA transfers at the Bank of England could only be carried out between 11 am and 1 pm, and only on Monday, Wednesdays, and Saturdays ([3],

of London, already the most important newspaper in the world, reported the exchange mentioned above of £289 per year of LA the next day, Tuesday, but with some incredulity, as a rumor that was hard to believe. But the next day it confirmed that yes, there was a free lunch to be had.

The swap of LA for TA continued all the way to 5 January 1830, or about 6 weeks (and resumed on a smaller scale, with a slightly different instrument, and with lower profits, for a while at the end of January). After the sale of three TAs on Monday through LA swaps, all the sales on Tuesday were in exchange for other securities. But on Wednesday, 25 November, there were 6 more LA for TA swaps, and one of them involved Turner.

In late 1829, Turner had £527.74 per year of LA, worth close to £10,000, which, as mentioned before, can be compared to between \$1 million and \$10 million today. (This was far from a majority of his financial wealth!) On that Wednesday, 25 November, he swapped £20 per year of LA for £20.53 of TA, a gain of about 2.1% (taking into account that small stub payment on LA). How did he learn of this potential? We don't know. Perhaps from his broker, or some acquaintance, or perhaps from *The Times*, which (as will be discussed) seemed to be the only London paper to discuss the potential profits and the steps involved in taking advantage of it in detail. And why did he only swap 4% of his LA holdings? Again, we don't know, but the most likely explanation is that he could not believe such an easy way to make money was legal and wondered if there was some hidden hitch.

Three weeks later, Turner returned and swapped a larger amount, £300 per year of LA. This time he received £305.75 per year of TA, so a gain of just about 1.4% (after the LA stub correction), due to changes in market prices. (So in our time this was comparable to a gain of between \$10,000 and \$100,000 in his assets.) Why did it take him three weeks to come back? And why did he not swap his whole stake in LA at that time, £507.74 per year? Those seem to be puzzles that we are not likely to solve.

Some puzzles from that incident in financial history can almost surely be solved with more research. We know from contemporary press accounts (primarily coverage in *The Times*) that there were heated debates in the City (the financial heart of London) as to what would happen, whether the prices of LA and TA would reach a relation that would make swaps unprofitable. There were also reports that London Stock Exchange jobbers were attempting to keep the price of LA at a premium to maintain the viability of the swap (which continued to yield gains of about 1.5% until the end of this initial period, 5 January 1830). It is easy to imagine how they could keep up the price of LA, simply by buying it. But after swapping that LA for TA, they had the chore of selling the TA at a profit. How was this done? Quite a lot can surely be learned from the ledgers at the Bank of England Archive, which have complete records of transfers. With enough work we can find out the complete flow of securities among various players.

Further research into this period might also provide information about the microstructure of the British financial markets. A lion's share of the LA to TA swaps were performed by London Stock Exchange jobbers, with one, John Francis Maubert, accounting for almost 30% of them. Where did he obtain the LA, and how did he dispose of the TA? Was he act-

p. 42). But entries in LA ledgers show that during the initial period of sales of TA, LA transfers were allowed on all days of the week, but we do not know about available hours.

ing on behalf of a larger group of jobbers, perhaps? Some insights into the relations among jobbers can be obtained from [11], which showed that there was a lot of specialization and stratification among them, with a very few, including Maubert, occupying pre-eminent positions, being called upon for large and specialized operations. An intensive study of the LA to TA swaps might provide more information on this.

3 Culture and finance

The most important puzzle of the LA to TA swap incident is the small number of investors who participated. Of the £1.36 million per year of LA, only £125,954 per year, or 9.3%, were swapped for TA by early January 1830. The easily obtainable gains were widely publicized by Thomas Massa Alsager, the most eminent financial journalist of that time in his daily column in *The Times*, which was the most important newspaper in Britain. Further, Alsager's writeups on the advantages of TA were cited in many provincial papers. So lack of information does not seem to be an adequate explanation. General conservatism of British investors was a more likely cause. But an even more important factor seems to have been a cultural inhibition against dabbling in what was somewhat disreputable finance, with the word "jobber" carrying a heavy pejorative connotation. Thus the *Evening Standard* on 26 November (a day after Turner's first tentative swap), in a diatribe against greed, attacked "the agonising anxiety manifested about half a pound per cent., and the scrupulous and indignant jealousy employed in estimating the proportional value of old and new annuities." Other papers did not come out with such explicit condemnation, but instead responded with silence. There were a few comments about the need for the government to change regulations to avoid losses, and about high level of activity involving TA. What was almost totally lacking was explicit advice to investors to treat themselves to a free lunch. Apparently this was regarded as something unseemly, not to be indulged in by well-bred gentlemen. Turner, not being "well-bred," seems not to have been constrained by such inhibitions.

To put this in modern terms, let us recall the famous joke about an economist who believes in efficient markets who walks on a street with a companion. That person interrupts their conversation to say, "Look, there is a twenty dollar bill lying on the ground!" To which the efficient market economist responds, "Can't be, if it were a real twenty dollar bill, somebody would have picked it up." Would this anecdote carry the same punch if instead of a \$20 bill, it was a dime (\$0.10 for those not familiar with American money) that was lying on the ground? Would people possibly even think it strange for somebody to bother to pick up a dime coin that was likely dirty?

It may be that the culture of early 19th century Britain looked on swapping LA for TA as similar to a reasonably affluent American stooping to pick up a 10 cent piece.

4 Two decades later

The LA to TA swap in 1829 was one of two cases of risk-free arbitrage by Turner that have been found. The other one occurred in 1847. During most of the 19th century, there

was a persistent mispricing in the main British government securities. About half of the national debt consisted of the famed Consols, which paid 3% per year, and were perpetual, but could be redeemed by the government. But about 1/6 consisted of the Reduced 3% Annuities, which will be denoted by RA. (See Table 1 in [14].) They also paid 3% per year and were perpetual but redeemable. They differed from Consols in that they paid interest at the beginning of April and October, as opposed to beginning of January and July for Consols. Simple calculation shows that the rational pricing would have been to have £100 of par value of Consols to be priced almost exactly £0.75 higher than RA in April through June, and also in October through December, and £0.75 lower in the other 6 months. That was recognized by all even moderately financially sophisticated observers of that time, and this relation held at various period. But most of the time Consols were traded at higher prices than RA, occasionally as much as 2% higher. It's as if a dollar bill with an even serial number would buy two cents more in candy bars than one with an odd serial number.

It is surprising this phenomenon was not mentioned in the modern literature until recently. It was widely known to contemporaries, and [12,13] document the many instances of British financial journalists pointing out to their readers the easy gains they could make by switching from Consols to RA. But few investors did that. One who took advantage of this opportunity was Turner.

The 1844 Bank Charter Act reorganized the Bank of England, and imposed a strict form of the gold standard. This reform was promised to eliminate the financial crises that were plaguing Britain. But soon afterwards, a sharp financial crash in October 1847 forced the government to suspend the law. Interestingly enough, while Consols were only slightly overpriced relative to RA prior to and during the crisis, after the monetary disturbance had largely died down, the overpricing increased to a peak of about 1% in late November. That's when Turner acted. He swapped £10,000 (par value) of Consols for the same amount of RA. His broker dealt with the same jobber for both sides of this swap, which should have minimized brokerage and markup charges [11]. How much cash Turner received is impossible to determine, since we don't know the exact terms of the deal. (Price lists did not contain all prices during the day, and also did not indicate whether the listed price was the one at which the jobber bought or sold.) But it is likely that Turner received £150 on that deal, of which half was compensation for the difference in timing of interest payments, and half was the mispricing. If so, the pure gain of £75 was comparable to between \$7,500 and \$75,000 today.

As with the LA for TA swap in 1829, we do not know what motivated Turner in this case. There was a profit to be made, but there had been earlier opportunities for similar profitable swaps of Consols for RA. Further, at that time he owned somewhat over £25,000 par value of Consols. Why convert just 40% of that? Also, he could have made an even more profitable switch into the security designated NR in [14]. It could be that just as in 1829, he was not checking market prices diligently, but occasionally took a look, and if something piqued his interest acted on it. But whatever his motivation, the most interesting fact is that he did, while the bulk of British investing public did not, and this allowed for persistence of pricing anomalies.

5 Conclusions

Turner violated the stereotype of an outstanding artist devoted to his craft but ignorant of financial affairs. But he also showed that British financial markets of the early 19th century were affected by cultural norms that denigrated finance, and kept pricing anomalies alive for extended periods. His adventures in finance also bring out yet again the dangers of financial innovation, with its creation of unanticipated anomalies.

References

1. F. Etro and E. Stepanova, "Art auctions and art investment in the golden age of British painting," *Scottish Journal of Political Economy*, vol. 64, nol. 2, May 2017, pp. 191–225.
2. A. J. Finberg, *The Life of J. M. W. Turner, R.A.*, 2nd ed., revised with supplement by H. A. Finberg, Oxford Univ. Press, 1961.
3. T. Fortune, *Fortune's Epitome of the Stocks and Public Funds*, 11th ed., Boosey & Sons, 1824.
4. J. Francis, *Chronicles and Characters of the Stock Exchange*, Willoughby, 1849. Available online at <http://books.google.com/books?id=hz5VAAAAcAAJ>.
5. J. Francis, *Annals, Anecdotes and Legends: A Chronicle of Life Assurance*, Longman, Brown, Green, and Longmans, 1853. Available online at <https://books.google.com/books?id=cbRVAAAAcAAJ>.
6. J. Hamilton, *Turner: A Life*, Hodder & Stoughton, 1997.
7. J. Hamilton, *Turner and the Scientists*, Tate Gallery Publishing, 1998.
8. E. L. Hargreaves, *The National Debt*, E. Arnold & Co., 1930.
9. E. Joll, M. Butlin, and L. Hermann, eds., *The Oxford Companion to J. M. W. Turner*, Oxford Univ. Press, 2001.
10. F. Moyle, *The Extraordinary Life and Momentous Times of J. M. W. Turner*, Penguin, 2016.
11. A. M. Odlyzko, "Financialization of the early Victorian economy and the London Stock Exchange," 2016 manuscript, available at <https://ssrn.com/abstract=2787154>.
12. A. M. Odlyzko, "Economically irrational pricing of nineteenth century British government bonds," *Financial History Review*, vol. 23, no. 3, Dec. 2016, pp. 277–302. Preprint available at <https://ssrn.com/abstract=2435399>.
13. A. M. Odlyzko, "Supplementary material for 'Economically irrational pricing of 19th century British government bonds'," Preprint available at <https://ssrn.com/abstract=2435437>.
14. A. M. Odlyzko, "Novel market inefficiencies from early Victorian times," *Financial History Review*, vol. 24, no. 2, Aug. 2017, pp. 143–165. Preprint available at <https://www-users.cse.umn.edu/~odlyzko/doc/mania11.pdf>.
15. S. Smiles, "Turner and the slave trade: Speculation and representation, 1805–40," *British Art Journal*, vol. 8, no. 3, 2007, pp. 47–54. Available online at <https://www.jstor.org/stable/41614774>.
16. United Kingdom, *National Debt. Report by the Secretary and Comptroller General of the Proceedings of the Commissioners for the Reduction of the National Debt, from 1786*

to 31st March 1890, Parliamentary Papers 1890-91 [6539] XLVIII.511. Available online at <https://books.google.com/books?id=XhQnAAAAYAAJ>.

Appendix: Turner's securities holdings

This appendix lists the sources for information about British government securities that Turner owned at various times, and which were found in the Bank of England Archive (whose staff are thanked for helpful assistance). There is no guarantee that this list is complete.

At his death on 19 December 1851, Turner owned, in rounded figures, Consols of par value 26,095, RA of par value 42,647, NR of par value 4,221, LA that paid £331 per year, annuities that terminated on 10 October 1859 (the TA of this paper, which he started buying in November and December 1829) that paid £349 per year, and annuities that terminated 5 January 1860 that paid £255 per year. With market prices of around 97 to 98 for the three perpetual 3% annuities, and about 7 for the terminable annuities, this was worth about £78,000, with RA accounting for about 54% of the total, and the three terminable annuities for about 8.3%.

Information about terminable annuities sold by the Commissioners for the Reduction of the National Debt between 23 November 1829 and 21 April 1830 is contained in ledger C73/14 (which is incorrectly labeled in the Bank Archive catalog as covering life annuities). Turner's purchases are listed as transactions #24 and #594. Later sales are in ledgers C73/15,

Ledgers created at the Bank of England to record holdings of various securities that were found to contain information about Turner's accounts are listed below. The entry AC27/2052(47678,47765) indicates that in ledger AC27/2052, his account appears on pages 47678 and 47765.

A few words about the information one can deduce from the Bank of England ledgers (with some more relevant information available in [3,11]). Those ledgers are in modified double entry format. A transfer of W amount of some security (which is always par value, prices are not recorded) from X to Y is entered on one side in X's account, and the other in Y's account. The dates of transfer are those when it was executed at the Bank of England. The deal could have been struck any time before. It could also have been struck almost anywhere. The London Stock Exchange did not have any exclusivity rights, it was just a convenient place to bring buyers and sellers together. If one side of a transaction was that of a jobber (a dealer at the LSE, who can be identified by a heavy volume of transactions, and, for some securities, by having his account in special jobber ledgers), then the deal was likely agreed to at the LSE, and was between the jobber and the broker acting for the other party (unless it was a deal between jobbers, a frequent occurrence). However, the broker's name did not appear in the records. Transactions could be carried out entirely without any involvement of brokers or jobbers. So examining Turner's dealings might reveal some of his business deals.

The earliest Turner entry was a purchase of 100.00 (par value, market value about £70) of Consols on 4 May 1794. Turner was just 19 at that time.

Listing of Bank of England Archive ledgers where Turner accounts were found, including relevant pages:

Consols (for details, see p. 119ff in [16]):

- AC27/1650(42481)
- AC27/1651(43502)
- AC27/1719(47224)
- AC27/1792(47350)
- AC27/1793(48214)
- AC27/1879(47263)
- AC27/1969(47566,47638)
- AC27/1970(47725,47786,48229)
- AC27/2051(47227)
- AC27/2052(47678,47765)
- AC27/2136(47030)
- AC27/2137(47693,47762,48174)
- AC27/2222(47011)
- AC27/2223(47866,48053)
- AC27/2276(48006)

Reduced 3% Annuities (called RA here, p. 126ff in [16]):

- AC27/6839(11598)
- AC27/6874(38209,38364,38537)
- AC27/6923(38036,38368,38558)
- AC27/6972(38020,38355,38409)
- AC27/7017(38006,38215,38350)
- AC27/7052(14005)

3.25% and from 1854 New Reduced 3% Annuities (called NR here, p. 117ff and p. 132ff in [16]):

- AC27/5711(47296)
- AC27/5773(44053)
- AC27/5409(44053)

Navy 5% Annuties (p. 103ff in [16]):

- AC27/5215(15485)
- AC27/5256(17052,17366)
- AC27/5318(45024,45843,45998)

New 4% Annuities (p. 111ff in [16]):

- AC27/6014(47807)

Old 4% Consols (p. 101ff in [16]):

- AC27/5939(22336)

New 3.5% Annuities (p. 116ff in [16]):

- AC27/5634(47228)
- AC27/5711(47296)

Reduced 3.5% Annuities (p. 115ff in [16]):

- AC27/7294(22238)

Long Annuities (called LA here, p. 134 in [16]):

- AC27/4430(5219,5243,5292)
- AC27/4449(7011,7203)
- AC27/4469(5603)
- AC27/4474(1027)

Terminable Annuities, payable in April and October, ending 10 October 1859 (called TA here, p. 242ff in [16]):

- AC27/31(1155,1164)
- AC27/37(2002)
- AC27/40(614)

Terminable Annuities, payable in January and July, ending 5 January 1860 (p. 242ff in [16]):

- AC27/14(1135)
- AC27/20(2020)
- AC27/22(19)