

CENTRE FOR DYNAMIC MACROECONOMIC ANALYSIS  
WORKING PAPER SERIES



CDMA07/16

**Arbitrage and Simple Financial Market  
Efficiency during the South Sea Bubble: A  
Comparative Study of the Royal African and  
South Sea Companies Subscription Share Issues**

Gary S. Shea\*  
University of St Andrews

OCTOBER 2007

**ABSTRACT**

Subscription shares of the early 18<sup>th</sup> century were early examples of what today would be called innovated securities. Either by intent or happenstance, they served to overcome imperfections in the capital markets of the day. Not all such securities were, however, alike. The prominent examples of the subscription shares of the South Sea Company and the Royal African Company in 1720 were quite different in their design and the corporate financial policies they were intended to aid. The historical literature emphasises the importance of irrational pricing behaviour during the South Sea Bubble, yet it is remarkable that in the financial markets of 1720 the relative values of subscription shares are easily understandable using standard financial theory.

**JEL Classification:** G13, N23.

**Keywords:** Royal African Company, South Sea Company, Financial Revolution, subscription shares, call options, derivatives, instalment receipts, innovated securities.

\* School of Economics and Finance, Castlecliffe, University of St Andrews, Fife KY16 9AL, Scotland, UK. Tel: +44 (0) 1334 462441. E-mail: [gss2@st-andrews.ac.uk](mailto:gss2@st-andrews.ac.uk). Web: [www.st-andrews.ac.uk/economics/staff/pages/g.shea.shtml](http://www.st-andrews.ac.uk/economics/staff/pages/g.shea.shtml).

CASTLECLIFFE, SCHOOL OF ECONOMICS & FINANCE, UNIVERSITY OF ST ANDREWS, KY16 9AL  
TEL: +44 (0)1334 462445 FAX: +44 (0)1334 462444 EMAIL: [cdma@st-and.ac.uk](mailto:cdma@st-and.ac.uk)

[www.st-and.ac.uk/cdma](http://www.st-and.ac.uk/cdma)

## ABSTRACT

Subscription shares of the early 18<sup>th</sup> century were early examples of what today would be called innovated securities. Either by intent or happenstance, they served to overcome imperfections in the capital markets of the day. Not all such securities were, however, alike. The prominent examples of the subscription shares of the South Sea Company and the Royal African Company in 1720 were quite different in their design and the corporate financial policies they were intended to aid. The historical literature emphasises the importance of irrational pricing behaviour during the South Sea Bubble, yet it is remarkable that in the financial markets of 1720 the relative values of subscription shares are easily understandable using standard financial theory.

## Introduction

Financial market efficiency can be impaired by a combination of irrational pricing behaviour and limits upon arbitrageurs' ability to eliminate the resulting mispricings of financial assets. In the critique of financial market efficiency that has come to be called behavioural finance, a rigorously defined example of irrational behaviour is noise trading – trading that is highly correlated with what can only be called noise-like movements in security prices. The theoretical explanations for hypothesised noise trading are varied; misperceptions of correct prices can arise from a number of psychological biases in perceptions of risk and return or arise from a utility of risk and return that is heavily biased towards loss aversion. Arbitrageurs can, however, overcome the risk attendant in facing noise traders if arbitrage is sufficiently well financed or there is sufficient time to deliver the required returns to arbitrageurs. Instances of successful arbitrage arise therefore in markets in which a simple form (at least) of market efficiency arises.<sup>1</sup>

The literature on the South Sea Bubble has emphasised irrational behaviour as the dominant behaviour in financial markets, at least as far as explaining the spectacular rise in South Sea equity values, in 1720. The literature largely predates, however, the usage of the term 'irrational' as it appears in the writings on behavioural

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<sup>1</sup> See Shleifer's *Inefficient Markets*, Introduction and Chapter 2.

finance discussed in the paragraph above. The literature moreover says nothing about the limits on arbitrage that could have limited irrational pricing of South Sea and other shares. The literature does present us with individual cases of successful and unsuccessful speculation, but the evidence does not clearly point to any instance of what the modern economist would call arbitrage. There are stories of famous winners (the Duchess of Marlborough and Sir Thomas Guy) and losers (Sir Isaac Newton and the Duke of Chandos) in the South Sea. To these old stories we must add the cases that come from more recent studies and which describe the successes and failures in trade by Sir Thomas Pitt, John Law, Richard Cantillon, Hoare's Bank and the Canton of Berne. As tantalising as the evidence is that some individuals, such as Law and Cantillon in particular, were engaged in what we would now call international risk arbitrage, the evidence is not conclusive. There also appears in the literature stories of individuals and institutions that made money in the South Sea Bubble simply by selling steadily into the rising market of 1720.

In the next section of this paper, we review in brief this literature with regards to speculative, and possible arbitrage, activities of certain institutions and individuals. The summary conclusion that we take from this literature is that individuals and institutions did not succeed or fail as investors by trying to exploit mis-pricings between very similar securities. That would have been arbitrage. They either succeeded or failed, by luck or design, in the way they viewed the intertemporal movement in the market fundamental for shares. Further archival researches might yet find direct evidence of individual attempts at profitable arbitrage, but we do not think that such evidence is likely to be found.

Subscription shares have been referred to also as subscription contracts. They were share purchase agreements that required a down-payment and subsequent payments to follow in scheduled instalments. Subsequent events in 1720 and in later

years suggest, however, that the general investing public did not necessarily see these contracts as simple instalment purchase contracts for shares, at least as far as South Sea shares were concerned. There is good evidence to suggest that the investing public viewed the South Sea subscription contracts as complex packages of call options on shares. In this paper we demonstrate that the Royal African Company avoided these problems with its subscription shares with a combination of good luck and prudent financial management. An option to default on subscription instalments was embedded in both South Sea and Royal African subscription shares, but because of the terms of their issue, maturity and the companies' respective management policies, the default option was practically worthless in the Royal African subscription shares, whereas it obtained high values in the South Sea subscription shares.

### **Literature regarding speculation and arbitrage in 1720**

In this section we review what little recent literature there is that reflects upon individual (or institutional) speculation and arbitrage. In the course of the review, it will become clear why it is so unlikely that archives will produce clear cases of arbitrage by individuals and institutions. Evidence of arbitrage will have to be discovered in other ways than by looking at investor case histories.

It has now been confirmed that John Law wrote a series of very large call options on East India shares for Lord Londonderry (Thomas Pitt). The exercise of these options were variously due in the middle to early autumn of 1720 and Neal (2000) writes of the difficulties that Law's agents had in honouring the calls. These difficulties strongly suggest that Law did not construct hedges against the risks he faced in writing these calls. In today's terms he was writing "naked" calls, which exposed him to liabilities that could only be capped by the limited extent to which East India shares could rise in value. Although we have few details, it also appears that by early 1720 Law was the author of some very large naked calls in South Sea

shares as well. The correspondence with his London banker suggests that these calls were very strongly in the money and about to expire to the great financial embarrassment of their author. Londonderry, for his part, appeared to be in a position in which he had to receive the settlement of the calls directly from Law's agents or receive nothing at all. Whether by design or necessity, Londonderry was to receive settlement of the calls by paying the exercise price and by taking possession of the shares. We know that Londonderry had earlier sold pieces of the call options he held to others, but he was still left in possession of a large quantity of these options. Londonderry obviously felt that he faced a very specific risk that Law would not be able to deliver on his calls and he even found it in his own interests to aid Law's agents in placing the shares at advantageous prices. Neal shows how Londonderry took appreciable steps to reduce the risks he faced, but these risks were quite unique risks because he was in possession of such a large number of in-the-money calls written by just one very wealthy and politically-powerful individual.

Richard Cantillon's financial contracts were extensive and varied, but it is impossible here too to place them within the context of arbitrage strategies. To take just one of the examples analysed by Murphy (1986), between March and May 1720 Cantillon concentrated on the exchange rate policies being followed by John Law in his administration of the Mississippi Scheme. He made substantial loans to a number of individuals, but primarily to various members of the Powis family, Lady Mary Herbert and her father, Lord Montgomery. The value of these loans to Cantillon would have appreciated in the event of devaluation of French banknotes relative to specie, yet the collateral he accepted for these loans were in the form of Mississippi Company shares. Cantillon clearly expected that, because of the system being followed by Law, the value of Mississippi shares would rise or fall *pari passu* with the exchange rate between banknotes and specie, yet there is no apparent evidence

that he was concerned with risk that the collateral value for his loans would be low n value in the very circumstances in which he would likely have to retain the collateral.

Sir Thomas Guy built the fortune that lay behind the charitable foundation of Sir Thomas Guy's Hospital by simply selling South Sea shares steadily into the rising market of early 1720. The largest known investor in English funds, the Canton of Berne, also did very well in 1720 by steadily selling South Sea shares that it had purchased in 1719. In the latter case there was a clear statement that the motive behind the strategy was simply to hold a low-risk portfolio. The financial directorate of the Canton viewed the rapid rise in South Sea share prices in early 1720 as a signal that the riskiness of South Sea shares were suddenly much higher than it had heretofore expected and the shares were peremptorily dumped (Altorfer, 2004). On a comparatively small scale, Hoare's Bank purchased shares before the steepest run-up in prices and managed to sell a good portion of these shares before the market collapsed. Temin and Voth (2003) present a case that this was the result of a precocious trading strategy of "riding the bubble".

Pure arbitrage requires the arbitrageur to take opposite positions in two assets that are precisely alike. Perhaps a bit easier to find are two assets, nearly alike in all respects except in their riskinesses. If there is a reward towards bearing risk that is easier for arbitrageurs to carry than for other persons in the markets to carry, another type of arbitrage – risk arbitrage might be detectable. Most likely this is the arbitrage in which Richard Cantillon and John Law were engaged if they were engaged in arbitrage at all.

The other way to discover arbitrage is to analyse values for financial instruments that are very close substitutes for each other in order to look for mis-pricings or successful arbitrage that prevents such mis-pricings. In this paper we consider the arbitrage relationship between fully-paid equity shares and subscription

shares. They were issued variously by many companies in the 18<sup>th</sup> and 19<sup>th</sup> centuries. It was common in the late 18<sup>th</sup> and early 19<sup>th</sup> centuries that canal, railway and insurance companies would issue new equity shares on a subscription basis. This practice was followed by a number of new and existing companies in 1720 as well. What we shall examine in this paper are the unique arbitrage possibilities when subscription shares were issued and traded in parallel with fully-paid shares.

This paper is the third in a series that concerns the role of subscription finance during the South Sea Bubble. The first paper (Shea (2007a)) was a correction to an analysis of South Sea Company subscription share values presented by Dale, Johnson and Tang (2005). After assuming that South Sea subscription shares were simply packages of fractional fully-paid South Sea shares and promised instalment payments to the firm, these authors then embarked upon an extensive econometric analysis to show that the required *linear* relationships between fully-paid and subscription share values could not be found in the data. They followed this analysis with conclusions about irrationality, hysteria, gambling mania, behaviour heuristics and the inevitable need for financial market regulation. But the results of their econometric analyses were simply predestined by their mistaken historical assumption about the nature of the South Sea subscription shares. It is abundantly clear in data that the dynamic relation between subscription share values and fully-paid share values was complex, but was a patently *nonlinear* relationship. Moreover, an analysis of the law and the subsequent history of the South Sea subscription shares suggested that the shares were regarded more like call options on South Sea shares, rather than packages of South Sea shares themselves.

In the second paper (Shea (2007b)) was developed and tested an explicit pricing theory for the South Sea subscription shares. With an option to default upon subscriptions that was widely perceived to be exercisable, the South Sea subscription

shares would theoretically have been priced as compound call options on the South Sea Company's fully-paid shares. A computational model closely mimicked the complex and nonlinear theoretical relationship between the fully-paid and subscription share values and demonstrated the existence of efficient arbitrage between the markets for these shares.

The objectives of this paper, the third paper, are several. The first explicit analysis of subscription share values in 1720 concerned the Royal African Company's subscription shares and did not concern those belonging to the South Sea Company. Carlos, Moyen and Hill (2002) conducted econometric analyses which established the existence of a close *linear* relationship between the values for Royal African subscription shares and their fully-paid counterparts. The objective in that paper was to explore the possible fundamental that was jointly driving the pair of Royal African share prices. Our objective here is wholly different. We wish to describe the mechanics of the Royal African subscription in 1720 in such a way to make clear why the linear dynamics discovered by Carlos et. al. appeared. The Royal African subscription had some features in common with the South Sea subscriptions shares, but they were different in very important ways and this will only become clear if a comparative study of the two Companies' shares is undertaken. We shall see that it was the different financial management policies followed by the two companies that determined why in one set of markets the Royal African share values followed a joint linear process and in other markets the South Sea share values followed a distinctly joint nonlinear process.

### **Royal African Company Subscription Shares**

The Royal African Company subscription share issue of 1720 arose from a capital enlargement scheme that was called an "engraftment". The engraftment was



first described very briefly, but quite accurately by DuBois (1938).<sup>2</sup> Our description of the details of the engraftment is more extensive than that given by DuBois, but we base our description on the same two important sources he used. The first is an indenture agreement between the Company and a group of trustees who would administer the engraftment. The scheme is completely described in this indenture agreement and, for citation purposes, we have reproduced it in full in Appendix 1.<sup>3</sup> The second important source is a 1724 report by the trustees to the Company on the effects and management of the engraftment up to that point. For citation purposes again, this document is reproduced in full in Appendix 2.<sup>4</sup>

The engraftment was devised by Joseph Taylor and several officers of the Royal African Company who are named in the indenture. The indenture agreement states that a new cash infusion was needed to remove a burden of debt and to reinvigorate the Company's trade (Appendix 1, lines 5-10). The Royal African Company had a venerable, but vulnerable, position in the legally sanctioned transatlantic slave trade. After years of losses and deteriorating trading conditions caused by competitors and war (see Carlos and Kruse, 1996), it sought to refinance and revive its trade in the buoyant stock markets of early 1720. The new capital was to be in the form of equity and the new equity was to be offered to the public. The Company was seeking to more than quadruple the number of shares issued and outstanding; the new subscribers would end up owning more than 3 shares for every original share outstanding. This is a very important respect in which the Royal African subscription share issue was different from the South Sea subscription share issues; subscribers to the Royal African shares would end up owning more than 75 p.c. of the firm's equity, whereas

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<sup>2</sup> DuBois (1938), n.68, page 394.

<sup>3</sup> The indenture is found in the minutes of the General Court for the 8 April, 1720. T70/101 *Minutes of the General Court, 1678-1720* [page 196 verso].

<sup>4</sup> T70/115/199, *Report of the Trustees of the Proprietors of the Old Stock, Submitted to the Committee of Accounts of the Royal African Company, April 30, 1724*.

South Sea subscribers could never expect to own more than 15 p.c. of South Sea equity.<sup>5</sup> Everywhere in the Royal African indenture and in its execution, we shall see that the company took the utmost care in protecting original shareholder rights and wealth - in glaring contrast to the haphazard management exercised by the South Sea Company of its subscription issues.

### **The Engraftment Defined**

The indenture makes the usual 18<sup>th</sup>-Century distinction between assets ("stock") and equity claims on assets ("shares"). It first declares that the present stock is £430,000, which the Company would like to make up to £2 million. Original shares in stock number 4,304, to which they would like to add 15,696 new shares - making 20,000 shares in all (A.1, lines 13-18). The original and newly engrafted capital will be assigned a new book value of £500,000. That is, each of the 20,000 shares will be rated at a value of £25 per share (p.s.) (A.1, lines 21-26). The subscribers will pay £25 p.s. for their 15,696 shares, making £392,400 the total new cash to be received by the Company (A.1, lines 49-51).<sup>6</sup> The indenture states that the best estimated value for all original assets is £240,000 (A.1, lines 38-39), but original shareholders will own only £107,600 of the £500,000 new book value, so they must be compensated £132,400 (= £240,000 - £107,600) out of the £392,400 paid by newly subscribing shareholders (A.1, lines 43-49).

The uses to which this £132,400 are to be put are also described. It is to be split into two basic funds - £80,000 and £52,400. The £80,000 is for the discharge of a long list of enumerated debts amounting to as much as £75,696. This sum is to be delivered

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<sup>5</sup> Supplementary Appendix 1 (Shea, 2007b) contains an analysis of the size of the South Sea Company's subscription share issues.

<sup>6</sup> By 1726 £387,967 had indeed been collected from subscribers (see T70/1186, *Rough Drafts and Copy Book A* [contra 142], "London April 1726, *An account of the several sums of money paid in originally and since the Company's establishment by subscriptions, calls or otherwise*").

by Joseph Taylor to a group of the Company's officers within 21 days of the indenture agreement [7 April, 1720] who will settle and discharge the debts (A.1, lines 55-70). The residual £4,304 from the £80,000 is intended to be Joseph Taylor's reward for devising and executing the scheme (A.1, lines 71-75). The other fund of £52,400 is to be delivered by Joseph Taylor to the Company by 1 December 1720 and it is to be put to two uses. If more debts are discovered or are undertaken by the original proprietors than can be paid for out of the £75,696 previously delivered to the Company, these debts will be paid out of the £52,400-fund. Secondly, once all such debts are satisfied, the residual of the £52,400 shall be distributed to the original proprietors in the form of a cash dividend up to £10 p.s. (A.1, lines 76-101). If the £52,400 are sufficient to pay all debts and to pay the maximum cash dividend of £10 p.s., then the residual can be used to compensate other Company officers for their efforts in administering the engraftment (A.1, lines 188-194).

We know how some of the terms of indenture agreement worked out. At least we know how they worked out till the end of April 1724. Joseph Taylor got his £4,304 fee (A.2, lines 23-24), but the eventual debts of the Company were higher than at first expected and they were still awaiting payments on some subscription instalments (A.2, lines 21-22). The maximum £10 p.s. cash dividend was not realised and what original shareholders actually got was a little over £8 p.s. (A.2, lines 12-16). But the Royal African engraftment worked just about as planned: nearly the whole sums of monies projected to be raised, were raised; the costs of administering the engraftment were contained within the amounts budgeted and all old creditors to the company had been paid in full. This was all accomplished in the difficult financial conditions that followed with the collapse of the South Sea scheme.

### Provisions for Protecting Original Shareholder Wealth

New shareholders had the chance to subscribe for new shares at a subscription price of £25 p.s. and these shares would eventually stand equal to fully-paid shares. At the time the indenture was drawn up (early April 1720), Royal African fully-paid shares were valued at about £63 p.s. That would have made original shareholder wealth (gross)  $4,304 \times £63 \cong £271,200$  at that time. To this would be added £392,400 from new shareholders, making total value of Royal African equity equal to  $£271,200 + £392,400 = £663,600$ . Spread over 20,000 shares this eventually would make the expected value of equity about £33 p.s.<sup>7</sup> We thus conclude that if there were no mechanisms in the engraftment scheme for the protection of original shareholders' wealth, their wealth would have declined by about £30 (= £63 - £33) p.s.

The potential loss of £30 p.s. in shareholder wealth was precisely prevented by the terms of the indenture agreement. We do not know enough about the negotiations between Joseph Taylor and the Company's representatives to know how the mechanics of the scheme were determined, but we can surmise that the adjustment to book value of assets and the assignment of £240,000 to the value of original assets were numbers jointly chosen to avoid wealth losses to original shareholders. First, new shareholders directly relieved original shareholders of £75,696 in debts. This relief was worth about £18 p.s. Secondly, original shareholders were also given the fund of £52,400 (or about £12 p.s.) that could be used to either relieve them of any further debts or to pay a cash dividend up to £10 p.s. So, altogether these two funds did deliver the approximate £30 p.s. compensation to original shareholders. The indenture agreement, of course, also had to work well and completely or else original shareholders would lose. For example, Joseph Taylor was responsible for delivering

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<sup>7</sup> To be precise, the expected diluted share value would be calculated simply as,  $\frac{4,304 \times £64}{20,000} + \frac{15,696 \times £25}{20,000} = £33.4$  p.s.

funds to the Company's officers in full and in a timely fashion. If for any reason he failed in these tasks, the original shareholders would be the losers. We shall now look at some more features of the indenture agreement to see how these problems were overcome.

### **Making the Indenture Work – the Role of Underpricing**

The indenture agreement was clearly designed to maximise the chances that all its terms would be fulfilled. Joseph Taylor was allowed to collect subscriptions for new shares (A.1, lines 142-150). We do not know how he allocated new shares, but the offer terms were clearly designed to make sure the subscription would be filled. The task facing Mr. Taylor was to define a group of people who could subscribe for shares which, we have already calculated, would have an expected market value of about £33 p.s. These persons would have rights to these shares by paying the special price (the rights price) defined in the indenture agreement. By setting the rights price (£25 p.s.) to a number well below the expected value of shares, the writers of the indenture made sure that Mr. Taylor's solicitation of subscriptions would be easy. The second set of features of the subscription shares that would have made them popular is that they were issued in small denominations and in large numbers.

The indenture states that the original tranche of £75,696 along with another sum of £45,568 would be very soon delivered after the indenture was agreed. These payments would together amount to £8 per new share. In other words, the indenture stipulated that a £8 per new share deposit would very quickly be made to the Company (A.1, lines 102-116). Further instalments collected by Mr. Taylor would be due on or before 1 June (£5 per new share), 1 September (£5 per new share) and 1 December (£7 per new share) (A.1, lines 117-131). Relatively small instalments due from Mr. Taylor put relatively little pressure on the numerous subscribers in paying

their instalments. Finally, the indenture tried to define the company's rights to reclaim subscription shares and instalments already paid in the event of default on subsequent instalments (A.1, lines 162-171).

For a chartered company such as the Royal African, there was always the question of what actions and relations were legal if they were not explicitly mentioned in the Company's charter. The passage of the Bubble Act (6 Geo.1, c.18) in May 1720 made this problem more acute. The Royal African Company was chartered before 1718 and would have thus have been relieved of many of the strictures of the Bubble Act, but the Act stated, with strong emphasis, that chartered companies had to operate strictly within the confines of its charter. Given the hostility that the South Sea Company displayed towards other competing enterprises that were raising capital via subscriptions in 1720, it is not surprising that the Royal African was as careful as it was in defining its relations with its subscribers.<sup>8</sup>

### **Analysing the Market Values for Royal African Subscription Shares**

How can we assume that subscribers to subscription shares did not value the possible right to defaulting upon promised subscription instalments? It is apparent that such rights had substantial value in the case of South Sea subscription shares.<sup>9</sup> In November 1720 the Royal African Company even altered the terms of the instalment schedule on its subscription shares in order to forestall defaults.<sup>10</sup> It thus would have been reasonable to wonder if there was some default option value embedded in the

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<sup>8</sup> Again, the contrast with the South Sea Company is instructive. The Bubble Act itself is silent on most of the important aspects of the Company's relations with subscribers. Whilst it allowed for an easy transfer of subscription receipts, it said nothing about the Company's duties in facilitating that trade or what would happen if either subscribers or the Company did not fulfil their obligations under the subscriptions.

<sup>9</sup> Shea (2007a) makes the historical argument for the existence of these rights and Shea (2007b) explicitly models their values.

<sup>10</sup> 18 Nov 1720, T70/90, *Minute Book of the Court of Assistants*, pages 131-2.

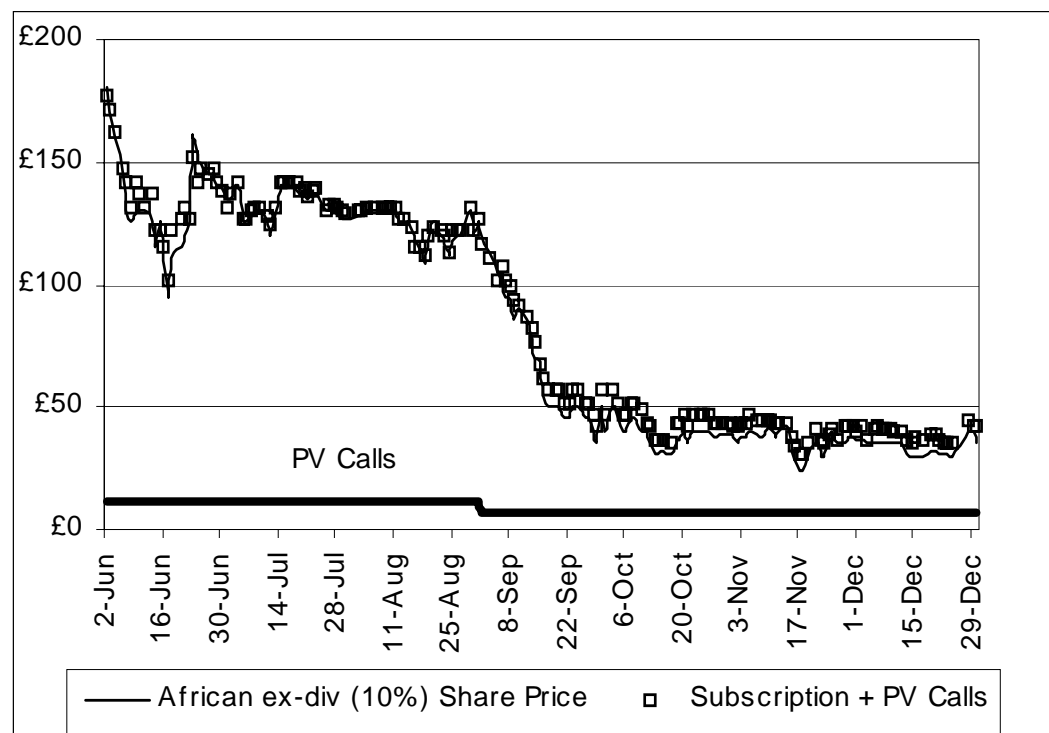
subscription share values. The fact that the new shares were being issued at below book value was of no concern to original shareholders as long as their original wealth was at least preserved. This was done by the arrangements we have described. But this still leaves open the question as to how the value of the subscription shares should subsequently have been related to the value of original shares.

Our analytical approach to understanding the prices of Royal African subscription shares uses a simple graphical device, which provides a direct measure of the value of an option to default upon subscription instalments. It is a graphical depiction of what can be called an arbitrage bound and it is complicated only by the existence of the uncertain dividend that was promised to original shareholders in the indenture agreement. We first pose a counterfactual situation in which the subscription shares were simply fractional claims upon ex-dividend fully-paid shares. To take an example, compare the value of subscription shares and fully-paid shares on 1 June, 1720. On that date a £5 instalment was due on the subscription shares, but there were still to be paid another £5 (due 1 September) and a final £7 (due 1 December). We suppose therefore that on 2 June a subscription share would represent a fractional ( $\frac{£13}{£25}$ ) claim on a fully-paid share that was shorn of its expected dividend; the value of that would be  $(\frac{£13}{£25}) \times (P_{\text{fully-paid}} - PV[£10])$ .<sup>11</sup> From this quantity we can construct an arbitrage lower bound on subscription share values and will argue that this bound would have to be obeyed, thus

$$(\frac{£13}{£25}) \times (P_{\text{fully-paid}} - PV[£10]) + PV(\text{instalments}) \geq P_{\text{fully-paid}} .$$

If the bound was not obeyed, anyone who could buy a subscription share and borrow the present value of the remaining instalments would be able to obtain the

equivalent of an original share at a cost smaller than that demanded in the market for original shares. If the bound appeared to be exactly binding, then we would have to conclude there was no possible value in the subscription shares attributable to a default option on instalments. In the figure below we depict the value quotations for African ex-dividend original shares and subscription shares plus the present value of the remaining instalments (calls).<sup>12</sup>



We can perhaps just persuade ourselves that the subscription shares have a slightly greater value than they should have if they did not contain default option values. This added value appears clearly only after late September and can perhaps be discerned in the middle of June as well. But if that added value is actually there, it is certainly very small. We must not forget, however, that in contemporary minds there

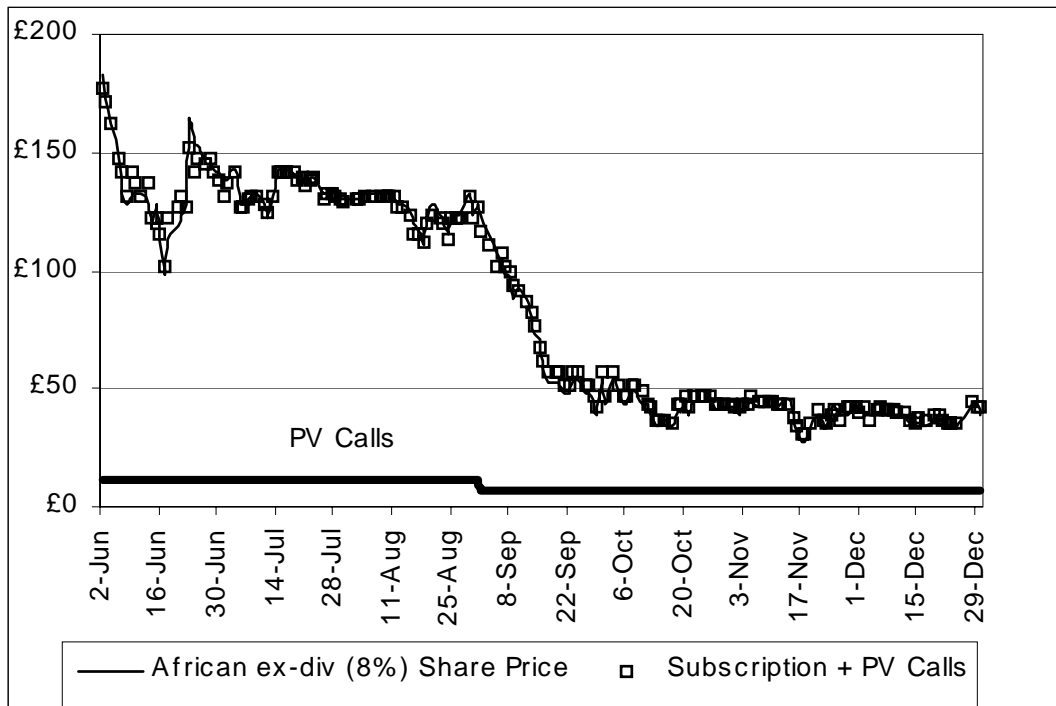
<sup>11</sup> We here assume momentarily that the promised £10 dividend was also the expected dividend.

<sup>12</sup> The present value of the instalments takes a slight step on 18 November (not perceptible in the graph) when the Company announced that only £4 would be due 1 December and not £7. The present value of the remaining £3 was calculated upon the assumption that it would not



was likely to be some confusion as to what an ex-dividend original African share would actually turn out to be. The expected dividend payout to original shareholders may well have been different from the promised £10 and was likely to be lower. This could happen because the Company could discover or incur additional debt obligations (this did happen) or because the subscription issue itself would fail to collect sufficient instalment payments to sufficiently fill the £52,400-trust fund out of which cash dividends would be paid (this did not happen). In one way or another, the definition of an ex-dividend share was uncertain.

Incorporating a little of that uncertainty into our picture above removes all doubt that the Royal African subscription shares did not contain default option values. The actual ex-post dividend paid to shareholders was a longer delayed approximate £8 dividend. If that could have been foreseen, then contemporaries could have persuaded themselves that ex-dividend original shares were a few pounds more valuable than we have depicted them above. The picture, modified for an expected 8% dividend, would be like the one below.



There is apparent not only the almost perfect correlation between original and subscription share values (noted by Carlos et. al.), but there is also almost no difference in the level of the respective share values. There is no suggestion of a noticeable default option value component to the subscription share values. This picture also makes it appear that the prices for subscription shares contained within them a very accurate forecast of the size that the promised dividend of 1721 would take. Unlike the South Sea subscription shares, any options to default on instalments in the Royal African shares were far out of the money and therefore worthless. There was no likely future collapse in Royal African asset or share values that would make such defaults attractive.

### South Sea Company Subscription Shares

At the probable height of equity values in late June 1720, subscription shares accounted for at least 10 percent of all South Sea Company equity value and could have eventually accounted for 15 percent of all South Sea equity. They were issued to

meet the immediate cash needs of the firm. Some of the cash would have had to be used in the exchange packages the Company was offering to government annuitants, but by far the largest use of the cash was in the form of loans to shareholders who were pledging their shares as collateral for loans.<sup>13</sup>

The subscription shares were shares issued to the public and they could be purchased in instalments.<sup>14</sup> The 1<sup>st</sup> Subscription series started 14<sup>th</sup> April 1720 and the 2<sup>nd</sup> series started soon thereafter. The 1<sup>st</sup> Subscription, for example, was for shares priced at £300 per share (p.s.). A £60 deposit was required and thereafter every two months a 10 percent or £30 instalment would be called. The 1<sup>st</sup> Subscription shares had a £30 call upon them due to be paid on 14<sup>th</sup> June. On that date the possession of a subscription share would represent 30 p.c. of an original share and the obligation or right to make 7 more bi-monthly instalments of £30 each until ownership in one full original share resulted. The 2<sup>nd</sup> Subscription required a 10 p.c. deposit on a share priced at £400. After the first £40 deposit, a further 9 £40 quarterly instalments would follow. The 3<sup>rd</sup> Subscription did not commence until 17 June and required a £100 deposit on a share that was to be priced at £1000. Nine further semi-annual instalments of £100 each would be required before a fully-paid share was credited to the owner.<sup>15</sup> The 4<sup>th</sup> subscription did not commence until 12 August and it too was priced at £1000 p.s.

The issue prices for subscription shares were at the level or slightly above the values for fully-paid shares at their respective dates of issue. The consequence of this is that,

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<sup>13</sup> In Add. Ms. 25,499, *South Sea Company. Court Minutes No. 6*, page 104, for 21 April 1720 we have one of the more remarkable statements from the directors of the Company concerning their intended financial management of the firm. The disposition of cash from the sale of subscription shares figures prominently in their statements.

<sup>14</sup> The 18<sup>th</sup> and 19<sup>th</sup> century usage of the term "call" often refers to a request for the payment from either a subscriber or an existing shareholder. That is how we shall use the term in this paper and not as reference to a call option.

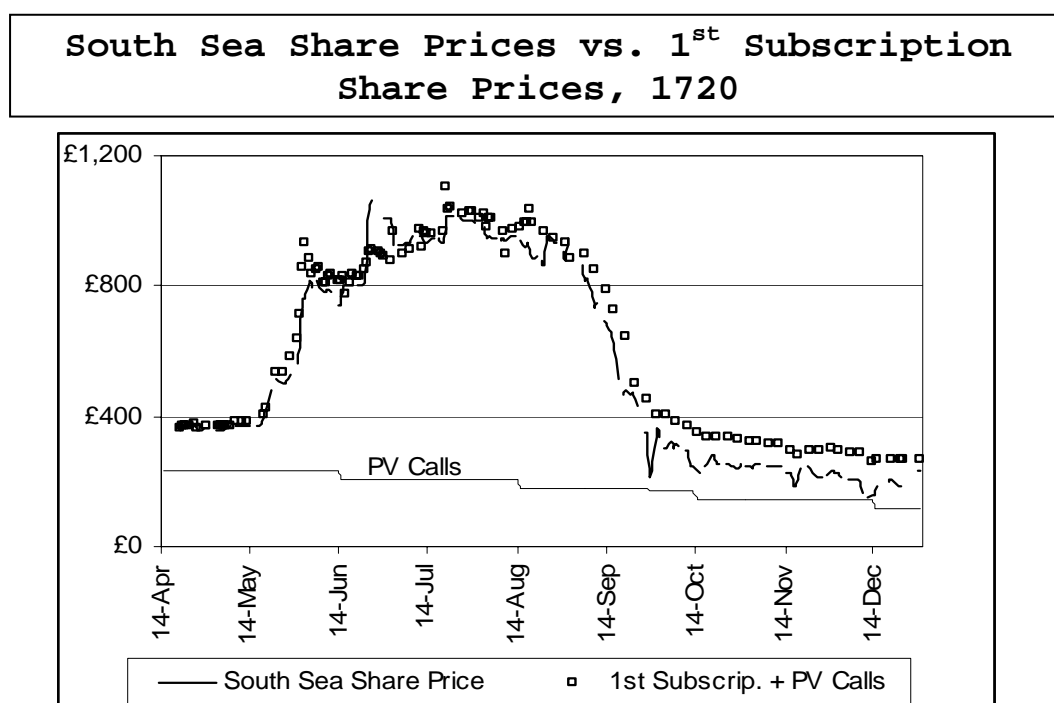
<sup>15</sup> A history of the instalment schedules for these shares is found in Supplementary Appendix 3 (Shea, 2007a).

throughout most of the subscription shares' subsequent trading lives, South Sea fully-paid share prices were actually very low relative to the subscription prices. This was quite different from the situation for the Royal African subscription shares, whose issue price was set much lower than the fully-paid shares' price at the time of issue. Another significant way in which the South Sea subscriptions differed from those of the Royal African Company was in their rights to dividends. Nearly from the beginning of their issue, the South Sea Company declared that subscription shares would share in any dividends equally with fully-paid shares. Table 1 summarises the salient differences between the South Sea Company's and the Royal African Company's subscription shares that we have noted so far.

|   | Royal African Subscription | South Sea Subscription 1 | South Sea Subscription 2 | South Sea Subscription 3 | South Sea Subscription 4 |
|---|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Date of Issue   | 21 April 1720              | 14 April 1720            | 17 April 1720            | 17 June 1720             | 12 August 1720           |
| Issue Price   | £25 p.s.                   | £300 p.s.                | £400 p.s.                | £1000 p.s.               | £1000 p.s.               |
| Fully-Paid Share Price at Time of Issue                 | £64 p.s.                   | £334 p.s.                | £348 p.s.                | £806 p.s.                | £950 p.s.                |
| Lowest Fully-Paid Share Price after Subscription Issue  | £27 p.s.                   | £154 p.s.                |                          |                          |                          |
| Average Fully-Paid Share Price after Subscription Issue | £64 p.s.                   | £551 p.s.                | £551 p.s.                | £566 p.s.                | £412 p.s.                |
| Maximum possible share in equity ownership of the firm  | 75 p.c.                    | 15 p.c.                  |                          |                          |                          |
| Rights to Dividends?                                    | No.                        | Yes.                     |                          |                          |                          |

An arbitrage bound on South Sea share values can be constructed much as we have done for the Royal African Company shares. The present value of the subscription shares' instalments or calls ( $PV_{calls}$ ), when added to the market price of subscription shares themselves, should clearly exceed the value of fully-paid shares. The arbitrage argument follows as before; if the fully-paid share values exceed this sum, then profitable arbitrage would exist and persons could obtain fully-paid shares

at a lower than market cost by simply purchasing a subscription share and by paying the present value of all the remaining instalments. We have derived and discussed this bound in our previous two papers, so it will suffice here to illustrate it in the context of only one of the South Sea subscription share issues – the 1<sup>st</sup> issue. The bound  $P_{\text{subscription share}} + PV_{\text{calls}} \geq P_{\text{fully-paid}}$  should not be breached and the figure below clearly shows that it is not. It shows as well the substantial option value of default that was built into the subscription shares' value, especially in the late summer and autumn of 1720.



The option to default is a put option, but we have not tried to model directly its value. The principle of put-call parity, however, does state that when we have a put option, we can define a corresponding call option that has the same exercise price as the put, whose value is directly calculable from the value of the put. It is that corresponding call option whose values we have successfully modelled and estimated in our previous work (Shea, 2007b). The call option is identified with the South Sea subscription shares themselves, which we have modelled as compound call options. It

is on the basis of the success we have had in modelling the values of the South Sea subscription shares with the compound call option model that allows us to conclude that we have also successfully explained the value of the default/put option possessed by South Sea subscription shares.

## **Conclusions**

Textbook exercises in corporate finance show the student the many ways in which new equity can be raised in efficient markets without any adverse effects upon original shareholders' wealth. A good example is the issue of shares by rights to original shareholders. It makes no difference what the rights price is, whether it is above market value or book value of shares, the effects of the rights issue are always wealth-neutral because the firm's equity remains 100 percent-owned by the original shareholders.<sup>16</sup> The problem of the refinancing of the Royal African Company in 1720 was that its original owners were not numerous enough nor wealthy enough to provide the four-fold expansion in equity that was required by the firm's management. The Royal African's solution to this problem was the issue of an innovated security that was priced and managed in ways that allowed it to be sold to such large numbers of new capitalists so that it could raise a fund to compensate original shareholders for the foreseeable declines in the value of their shares. The new equity raised was transparently applied to extinguish debts and to make a cash payout to original shareholders so that their wealth was unaffected and, most importantly, could be foreseen to be unaffected. The result was that an easy-to-understand arbitrage relationship between original shares and the innovated subscription shares was established. The evidence shows that any profitable arbitrage opportunities were efficiently extinguished in the stock markets of 1720. A close modern parallel to the

Royal African case is the efficient arbitrage between fully-paid shares and instalment receipts found in many Commonwealth countries today (see Pinder, 1998 and Charupat and Prisman, 2004).

In the South Sea Company's case the innovated securities, the subscription shares, had a bit different design and were certainly applied to very different uses than were the Royal African subscription shares. Yet the evidence shows that these securities were also the objects of no less efficient arbitrage than were the Royal African subscription shares. The South Sea subscription shares fall somewhere between modern instalment receipts and the shares of modern no-liability (NL) mining companies (Morris, 1997). In the pricing of modern instalment receipts there is a detectable cost to preventing default, but it is very small. The largest component of any premium that is commanded by modern instalment receipts stems from the leverage they embody for any investor who might be credit-constrained (Charupat and Prisman 2004). It appears that South Sea subscription shares were similarly attractive to credit-constrained investors (Shea 2007a). But unlike modern instalment receipts, the costs of preventing instalment defaults on South Sea subscription shares were huge. In this way they were more like instalment shares in NL mining companies, for which there is no provision for the prevention of default (Morris 1997). Because the South Sea Company set issue prices so very high relative to the market value of fully-paid shares, the default option contained within their subscription shares became quite valuable. Yet it appears that these options too were adequately valued so that no profitable arbitrage opportunities arose between South Sea subscription shares and fully-paid shares.

We conclude that the best evidence collectible on arbitrage in 1720 suggests that, upon a comparison of two distinct, but related markets for innovated securities,

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<sup>16</sup> Brealey and Myers (2006) is but a typical textbook containing such exercises.

the stock markets were efficient. This does not say that we have identified an intertemporal fundamental that was driving the South Sea Bubble, not does it say that we have indirect evidence that such a fundamental was being efficiently priced. But it does say that at least a simple form of market efficiency was present and made sure that the *relative* prices of identifiable, but not perfect, security substitutes were efficiently determined.

## REFERENCES

Additional Manuscripts, British Library (Add. Ms.).

Treasury Papers, Class T70, National Archives (NA Kew).

Papers of the Committee of Secrecy, Parchment Collection, House of Lords Record Office (HLRO).

The Course of the Exchange, issues published by John Castaing, 1720.

The Price of Several Stocks etc., issues published by John Freke, 1720-21.

Altorfer, Stefan, "The Canton of Berne as an Investor on the London Capital Market in the 18th Century," working paper, Department of Economic History, London School of Economics, 2004.

Brealey, R.A. and Myers, S.C., 2006. Principles of Corporate Finance. (New York: McGraw-Hill Irwin, 2006).

Carlos, Ann M. and Kruse, Jamie Brown, "The decline of the Royal African Company: fringe firms and the role of the charter," *Economic History Review* 49 (1996), 291-313.

Carlos, Ann M., Moyen, Nathalie and Hill, Jonathan, "Royal African Company Share Prices during the South Sea Bubble," *Explorations in Economic History*, 39 (2002), 61-87.

Charupat, N. and Prisman, E.Z., "An Essay on Financial Innovation: The Case of Instalment Receipts," *Journal of Banking and Finance*, 28 (2004), 129-156.

Dale, Richard S., Johnson, Johnnie E.V., and Tang, L., "Financial markets can go mad: evidence of irrational behaviour during the South Sea Bubble," *Economic History Review*, 58 (2005), 233-71.

DuBois, Armand Budington, *The English Business Company after the Bubble Act 1720-1800* (Columbia University Press, 1938, reprinted New York: Octagon Books, 1971).



Neal, Larry, 1994. "For God's Sake, Remitt me": The adventures of George Middleton, John Law's London goldsmith-banker, 1712-1729. *Business and Economic History* 23, 27-60.

\_\_\_\_\_, 2000. The money Pitt: Lord Londonderry and the South Sea Bubble; or, how to manage risk in an emerging market. *Enterprise & Society* 1, 659-674.

Murphy, Antoin E., *Richard Cantillon: Entrepreneur and Economist* (Oxford: Clarendon Press, 1986).

Pinder, S.M., "The relative pricing of Commonwealth Bank shares and instalment receipts," *Accounting Research Journal*, 11 (1998), 293-296.

Shea, Gary S., "Financial market analysis can go mad (in the search for irrational behaviour during the South Sea Bubble)," forthcoming *Economic History Review*, 60 (2007a).

Shea, Gary S., "Understanding financial derivatives during the South Sea Bubble: the case of the South Sea subscription shares," *Oxford Economic Papers*, 59 (2007b), 73-104, doi:10.1093/oep/gpm031.

Shleifer, A., 2000. *Inefficient Markets: An Introduction to Behavioral Finance*. Oxford University Press, Oxford.

Temin, Peter and Voth, Hans-Joachim, "Riding the South Sea Bubble," *American Economic Review*, 94 (2004), 1654-68.

## Appendix 1

T70/101 *Minutes of the General Court* 1678-1720

[page 196 verso]

Gen.<sup>l</sup> Court of y.<sup>e</sup> 8.<sup>th</sup> of Aprill 1720 Continued

Then the Indenture of Agreement was read under the Common Seal of this Company made the Seventh day of this Instant Aprill between the Company of one part and the said Joseph Taylor of the other part as follows. Viz.<sup>t</sup>

1 This Indenture made the Seventh day of Aprill in the Sixth Year of the Reign of Our  
 2 Sovereign Lord George by the Grace of God of Great Britain - France and Ireland  
 3 King Defender of the faith cr(?) Anno. Dom. 1720. Between the Royall African  
 4 Company of England of the one part and Joseph Taylor of London Gent.<sup>n</sup> of the other  
 5 part Whereas by reason of many Losses sustained by the said Company during the  
 6 late Warrs and other Casualtys the Stock of the said Company hath been so Impaired  
 7 that after payment of their just Debts there would not remaine Sufficient for carrying  
 8 on the Trade to Africa And Whereas the said Company are greatly desirous that all  
 9 their Debts may be speedily and fully satisfied and that there may be a sufficient clear  
 10 Stock made up for carrying on the said Trade in its utmost Extent the said Company  
 11 Have for that purpose Agreed with the said Joseph Taylor And it is by these presents  
 12 agreed by and between the said Company and the said Joseph Taylor as follows viz.  
 13 That the present Capitall Stock of the said Company being Four hundred Thirty  
 14 Thousand and four hundred pounds [page 197] or Four Thousand three hundred and  
 15 four Shares shall be made up two Millions or Twenty Thousand Shares by Ingraftm.<sup>t</sup>  
 16 or addition of the sume of One Million five hundred Sixty nine Thousand Six  
 17 hundred pounds new Stock or Fifteen Thousand Six hundred and ninety Six new  
 18 Shares which said new Stock or fifteen Thousand Six hundred and ninety Six new  
 19 Shares is and are hereby Created and Added to the said present Capitall Stock or four  
 20 thousand three hundred and four Old Shares and make up the said two Millions or  
 21 Twenty Thousand Shares And That upon the said Ingraftment the Dead and Quick  
 22 Stock to be used and imployed in and for the immediate carrying on of the said Trade  
 23 shall be made up Five hundred thousand pounds in such manner as is hereafter sett

24 forth which is after the rate of Twenty Five pounds for and in respect of each Share or  
25 one hundred pound Stock of and in the said Capitall Stock of Two Millions and  
26 according to that rate the proportion to be Continued in the said Trade for and in  
27 Respect of the said Four thousand Three hundred and four Old Shares amounts to  
28 One hundred Seven thousand Six hundred pounds and the proportion to be made  
29 good for and in Respect of the said fifteen thousand Six hundred and Ninety Six new  
30 Shares amounts to Three hundred ninety two thousand and four hundred pounds  
31 [page 197 verso] And that the propriety of all the Countrys Dominions Lands  
32 Franchises Privileges and other things granted by Charter to the said Company w.<sup>th</sup>  
33 all Forts Factorys and Settlements and all Stores Aminition furniture Castle Slaves  
34 and other materialls and things commonly reported or called the Dead Stock of the  
35 said Company shall be Estimated at Two Hundred Thousand pounds and the present  
36 Quick Stock of the said Company consisting of Goods Merchandize Shipping &  
37 Debts oweing to the said Company in England Africa and the plantations and  
38 elsewhere shall be Estimated at Forty Thousand pounds making together two hundred  
39 and forty thousand which is hereby agreed to be the Value of the present Quick and  
40 Dead Stock belonging to the Proprietors of the said four Thousand three hundred and  
41 four Old Shares and is agreed from henceforth to belong to the Proprietors of the said  
42 Two Millions or Twenty thousand shares which said Sume of Two hundred and forty  
43 thousand pounds being One hundred Thirty two Thousand four hundred pounds  
44 above the said Sume of One hundred Seven Thousand and Six hundred pounds the  
45 proportion to be continued in the said Trade for and in [page 198] respect of the said  
46 Four thousand three hundred and four Old Shares as aforesaid the sume of One  
47 hundred Thirty two thousand four hundred pounds is to be paid or satisfied in such  
48 manner as is hereinafter mentioned to or for y.<sup>e</sup> Use or benefit of the said Proprietors  
49 of the said four thousand three hundred and four Old Shares by and out of the said  
50 Sume of Three hundred ninety two thousand four hundred pounds which is to be paid  
51 for and in respect of the said Fifteen thousand Six hundred & ninety Six new Shares  
52 as is also hereinafter mentioned And That the Sume of Eighty Thousand pounds  
53 part of the said Sume of One hundred thirty two Thousand four hundred pounds to be  
54 paid or made good to or for the Use or benefit of the said proprietors of the said Old  
55 Shares as aforesaid shall be paid or satisfied as followeth (that is to say) the Sume of  
56 Seventy five thousand Six hundred and ninety Six pounds part of the said Sume of

57 Eighty Thousand pounds shall be paid by the said Joseph Taylor to Henry Neale  
58 James Blake Andrews Hopegood & Rich.<sup>d</sup> Lockwood of London Esq.<sup>s</sup> and Jacob  
59 Watchter of London Merchant within one and twenty daies next after the day of the  
60 date of the presents upon Trust [page 198 verso] That the said to Henry Neale James  
61 Blake Andrews Hopegood Richard Lockwood and Jacob Watchter and the Survivor  
62 & Survivors of them & the Exec.<sup>s</sup> and Administ.<sup>s</sup> of such Survivors shall forthwith  
63 pay over and apply the same towards discharge of the debts now due from the said  
64 Company in England and particularly mentioned in a Schedule hereunto Annexed &  
65 procure Sufficient Releases or discharges of the said Debts and deliver the same to  
66 the Court of Assistants of the said Company and the said Henry Neale James Blake  
67 Andrews Hopegood Richard Lockwood and Jacob Watchter and the Survivors &  
68 Survivor of them and the Exec.<sup>s</sup> and Administ.<sup>s</sup> of such Survivor is and are hereby  
69 empower'd to settle and adjust such of the said Debts as are not yet adjusted and  
70 thereupon to pay the Same and take Releases or Discharges and deliver over the same  
71 as aforesaid And the Sume of £4,,304,, residue of the s.<sup>d</sup> Sume of £80,,000,, shall be  
72 deducted and retained by the said Joseph Taylor for his own Use and benefitt in full  
73 Satisfaction as well of all the Costs Charges and Expences the said Joseph Taylor has  
74 been put to as in [page 199] Recompense for the Great Pains and trouble he hath  
75 taken and undergone in Setting on foot carrying on and perfecting this Agreement  
76 And That the sume of Fifty Two Thousand four hundred pounds residue of the said  
77 sume of One hundred Thirty Two Thousand four hundred pounds shall be paid by the  
78 Court of Assist.<sup>s</sup> of the said Company for the time being to the said Henry Neale  
79 James Blake Andrews Hopegood Rich.<sup>d</sup> Lockwood and Jacob Watchter or the  
80 Survivors or Survivor of them or the Exec.<sup>s</sup> or Administ.<sup>s</sup> of such Survivor out of the  
81 Sume of £109,,872 hereinafter mentioned to be paid to the Court of Assistants on the  
82 1.<sup>st</sup> day of Dec.<sup>r</sup> next Ensueing the date of these Presents Upon Trust That if any  
83 further debts now due from the said Company in England and not mentioned in the  
84 said Schedule shall within the Space of One Year from the day of the date of these  
85 presents appear to remain unsatisfied then the said Henry Neale James Blake  
86 Andrews Hopegood Richard Lockwood and Jacob Watchter and the Survivors and  
87 Survivor of them and the Executors and Administrators of such Survivor shall pay  
88 and Satisfie such debts out of the said Sume of £52,400 and take sufficient Releases  
89 [page 199 verso] or discharges for the same and deliver such Releases and discharges

90 to the Court of Assistants of the said Company which s.<sup>d</sup> further Debts the said Henry  
 91 Neale James Blake Andrews Hopegood Richard Lockwood and Jacob Watchter and  
 92 the Survivors and Survivor of them and the Executors and Administrators of such  
 93 Survivor is and are hereby also impower'd to Settle and adjust and after Satisfaction  
 94 of all such Debts as aforesaid shall pay and devide of the Surplus of the s.<sup>d</sup> Sume of  
 95 £52,400 for the said intire Sume of £52,400 in case no such further Debts shall appear  
 96 together with the Surplus of the said Sume of £75,696 if any Surplus there shall be  
 97 after payment of the said Debts to and amongst such as at the Closing of the  
 98 Companys Bookes in Order to the Next Election of Sub Gov.<sup>r</sup> Dep.<sup>t</sup> Gov.<sup>r</sup> or  
 99 assistants shall appear to be ?? Proprietors of the said £430,400 Old Stock or 4,304  
 100 Old Shares or their respective Exec.<sup>s</sup> Adm.s or Assignes ratable and in proportion to  
 101 their Severall and Respective Interests of and in the said Old Stock or Shares And it  
 102 is further agreed that the said sume of £392,400 [page 200] New Shares as afores.<sup>d</sup>  
 103 shall be paid or Satisfied by af.<sup>d</sup> Jos Taylor or his Ass.<sup>s</sup> in manner following that is to  
 104 Say the said sume of £4304 being the proportion to be made good for and in Respect  
 105 of the said £15,696 part of the said Sume of £80,000 being deducted and retained to  
 106 himselfe as aforesaid and the Sume of £75,696 pounds residue of the said Sume of  
 107 £80,000 being paid by the said Joseph Taylor to the said Henry Neale James Blake  
 108 Andrews Hopegood Richard Lockwood and Jacob Watchter In Trust as aforesaid  
 109 the further Sume of £45,568 pounds shall be also paid by the said Joseph Taylor  
 110 within Three dayes next after a New Choice of Sub Gov.<sup>r</sup> Dep.<sup>t</sup> Gov.<sup>r</sup> and Assistants  
 111 shall be made as is hereinafter mentioned unto Such Court of Assistants to and for the  
 112 Use of the said Company and to be Employed towards carrying on of the said Trade  
 113 w.<sup>ch</sup> said Two Sumes of £80,000 and forty five Thousand five Hundred Sixty Eight  
 114 pounds make the Sume of One Hundred Twenty five Thousand five hundred Sixty  
 115 Eight pounds which is after the rate of Eight pounds part of the said Twenty five  
 116 pounds to be paid for and in respect of each Share, or one hundred pounds Stock of  
 117 the s.<sup>d</sup> 15,696 new Shares or £1,569,600 new Stock and the Sume of [page 200 verso]  
 118 £266,832,, residue of the said Sume of £392,400 shall be paid by the said Joseph  
 119 Taylor or his respective Assignes in Proportion to Each of their respective Shares or  
 120 Interests in the said New Stock of £1,569,600, or 15,696 new Shares to the Court of  
 121 Assistants of the said Company for the time being in manner following (that is to say)  
 122 the Sume of £78,480 part thereof being after the rate of five pounds for and in

123 Respect of each Share of the said 15,696 new Shares on or before the first day of June  
124 now next ensuing £78,480 more thereof (being also after the rate of £5 p Share) on or  
125 before the first day of Septemb.<sup>f</sup> now next ensuing and £109,872, residue of the said  
126 £266,832, (being after the rate of Seven pounds per Share) to make up the said  
127 Twenty five pounds per Share on or before the first day of Decemb.<sup>f</sup> now next  
128 ensuing out of which said last mentioned Sume of £109,872 the Court of the  
129 Assistants of the said Company shall pay the said Sume of £52,400 to the said Henry  
130 Neale James Blake [page 201] Andrews Hopegood Richard Lockwood and Jacob  
131 Watchter or the Survivors or Survivor of them or the Executors or Administrators of  
132 such Survivor In Trust as aforesaid and in full Satisfaction of the said Sume of  
133 £132,400 to be made good to the said Proprietors of the said 4,304 Old Shares as  
134 aforesaid And the s.<sup>d</sup> Sume of £132,400 being so paid and made good to or for the  
135 Use or benefitt of the said Proprietors of the said 4,304 Old Shares out of the said  
136 Sume of £392,400 as aforesaid and being deducted from the said Sume of £39,400  
137 there will remain the Sume of £260,000 to and for the use of the said Company which  
138 being added to the said Sume of £240,000 the Value of the present Dead and Quick  
139 Stock of the s.<sup>d</sup> Company as aforesaid makes up the said Sume of £500,000 intended  
140 to be Used and Employed in and for the imediate carrying on of the said Trade as  
141 aforesaid And it is hereby further agreed by and between the said Company and the  
142 said Joseph Taylor That upon Payment of the said Sume of £75,696 by y.<sup>e</sup> s.<sup>d</sup> [page  
143 201 verso] Joseph Taylor to the said Henry Neale James Blake [page 201] Andrews  
144 Hopegood Richard Lockwood and Jacob Watchter within One and Twenty days now  
145 next Ensuing as aforesaid The said £1,569,600 new Stock or fifteen Thousand Six  
146 hundred & Ninety Six New Shares hereby Created as aforesaid shall be and the Same  
147 is and are hereby agreed to be from henceforth vested in the s.<sup>d</sup> Joseph Taylor and the  
148 said Joseph Taylor shall have Creditt for the Same in the said Company Books the  
149 better to Enable him to transfer the same in Books to be prepared for that Purpose to  
150 Such person and persons and in such proportions as he shall think fitt Subject and  
151 Lyable to such further paym.<sup>t</sup> in respect of each Share as aforesaid or in default of  
152 such Payments to such forfeiture as is hereinafter mentioned for which Transfers so  
153 to be made by the said Joseph Taylor the Cost of the Stamps only shall be paid by y.<sup>e</sup>  
154 person who shall Accept the said Stock [page 202] And That y.<sup>e</sup> person or persons  
155 to whome the s.<sup>d</sup> Joseph Taylor shall Assigne or Transfer any of the said £1,569,600

156 new Stock or 15,696 new Shares as aforesaid shall upon their respective acceptance  
157 thereof be admitted into the freedom of the said Company (taking the usual Oath)  
158 and from the time of such admission shall have the Privilege of Voating in any Gen.<sup>ll</sup>  
159 Court of the said Company and shall be capable of being Elected Sub Gov.<sup>r</sup> Dep.<sup>t</sup>  
160 Gov.<sup>r</sup> or Assistant if qualified by having Credit for so much Stock as is Requisite for  
161 those respective purposes according to the By Laws of the said Company **Provided**  
162 nevertheless and it is hereby agreed that of default shall happen to be made of or in  
163 payment of any of the s.<sup>d</sup> Subsequent Payments of £5, £5, & £7 per Share as aforesaid  
164 or any part thereof at any of the respective times herein before Limited for Paym.<sup>t</sup>  
165 thereof Then and in such case the respective Share and Shares only wherein or in  
166 respect of which such default shall happen to be made and all such moneys as shall  
167 have been paid to y.<sup>e</sup> s.<sup>d</sup> Company upon Account of such Share and Shares [page 202  
168 verso] Respectively shall be and remain forfeited to and for the benefitt of the said  
169 Company And the person & persons so making default shall from henceforth forfeit  
170 and Loose the said privilege of Voting and be disabled from being Elected or  
171 Continuing Sub Gov.<sup>r</sup> Dep.<sup>t</sup> Gov.<sup>r</sup> and Each Member of the present Court of  
172 Assistants shall at any time or times after payment of the said Sume of Seventy five  
173 thousand Six hundred ninety Six pounds by the said Joseph Taylor to the said Henry  
174 Neale James Blake Andrews Hopegood Richard Lockwood and Jacob Watchter as  
175 aforesaid upon the request of the said Joseph Taylor disqualify themselves  
176 respectively to hold the s.<sup>d</sup> Respective Offices so as that new Elections may form  
177 time to time be made by the Gen.<sup>l</sup> Court of the Proprietors of the said Capitall Stock  
178 of £2,000,000 or Twenty Thousand Shares according to the method prescribed by the  
179 said Companys Charter to Supply such Vacancys as shall be made by such  
180 disqualifications and [page 203] fill up the said Court of Assistants **In Witness**  
181 whereof to one part of these presents The said Royal African Company of England  
182 have caused their Comon Seale to be put and to the other part of these presents the  
183 said Joseph Taylor hath sett his hand and Seal the day and year first above written.

*{There then follows a schedule of the Company's debts to the end of page 204. Then on page 204 verso the concluding text resumes.}*

184 **Whereupon** It is ordered Nemine Contradicente that the Thanks of this Court be  
185 given to the Court of Assistants for their care and trouble in negotiating the said  
186 Agreement with M.<sup>r</sup> Joseph Taylor and bring the Same to a happy Conclusion.

187

188 And it is Order'd that the said Sume of £9,360 residue of the said Sume of £52,400 or  
189 so much thereof as shall remain after Satisfaction of the said Sume of £43,040, as  
190 aforesaid shall be paid by the said Trustees to the said Henry Neale Esq.<sup>r</sup> Andrew  
191 Hopegood Esq.<sup>r</sup> and Robert Wood D.L.L. as a Compensation for their pains and  
192 Trouble in Negotiating and perfecting the Agreement with the said M.<sup>r</sup> Joseph Taylor  
193 and to Enable them to gratifye such Persons as in their Judjment have been servicable  
194 to the Company in such manner as they in their discretions shall think fitt.



## Appendix 2

T70/115/199, *Report of the Trustees of the Proprietors of the Old Stock, Submitted to the Committee of Accounts of the Royal African Company, April 30, 1724*

[page 119]

At a Committee of Accounts Thursday April 30 1724

Pursuant to an Order of the Court of Assistants of the 27 day of June last to Us the Committee of Accounts to Examine the accounts of the Trustees for the Old Proprietors and to Report how far we find the said Trust has been perform'd, and what remains to be done to Compleat the Performance thereof-----

*{A lengthy précis of the Indenture Agreement described in Appendix 1 then follows to the bottom of page 121 verso, which is then followed by}*

And We have examined the accounts of the Trustees which they have laid before us in a Book mark'd **A** containing forty Pages and Intituled

[page 122]

|    |  |           |
|----|--|-----------|
| 1  | The Account of Henry Neale, James Blake, Andrew Hopegood,                                |           |
| 2  | Richard Lockwood of London Esq. <sup>rs</sup> and Jacob Wachter Merch. <sup>t</sup> , of |           |
| 3  | their application and payment, and also of what remains unpaid of the                    |           |
| 4  | moneys received by them; in pursuance of an Indenture dated 7 <sup>th</sup> April        |           |
| 5  | 1720, made between the Royal African Company of England, and                             |           |
| 6  | Joseph Taylor of London Gentleman upon the trust therein                                 |           |
| 7  | mention'd.....   |           |
| 8  | Whereby We find they have charged themselves with the said                               |           |
| 9  | Sum of £75,696 in account of Cash received of the said Mr. Taylor                        |           |
| 10 | pursuant to the said Indenture of Agreement  | £.,75,696 |

|    |   |  |
|----|---|--|
| 11 |   |  |
| 12 | 33,080,,15,,8   |  |
| 13 | 1,555,,18,,3  | And with the sum of £35,595,,7,,11 for Dividend Warrants     |
| 14 | 653,,14   | Paid by the Company to Sundry Proprietors of Old Stock, the  |
| 15 | <u>105</u>  | Particulars whereof are set forth in the said Book A page 14 |
| 16 | 35,595,,7,,11   | to page 40 inclusive.....£35,595,,7,,11                      |
| 17 |   |  |
| 18 | And Cash received of the Company.....   | <u>10,000,,-,-</u>   |
| 19 |   | <u>45,395,,7,,11</u>   |
| 20 | So that the whole sum receiv'd by the said Trustees is.....                         | 121,091,,7,,11   |
| 21 | And there remains unpaid by the Company to compleat the                             |  |
| 22 | said £52,400 the sum of.....  | 7,004,,12,,1   |
| 23 | Which with the sum retain'd by Mr. Taylor pursuant to                               |  |
| 24 | the said Indenture of Agreement being   | <u>4,304</u>   |
| 25 |   |  |
| 26 | Makes up the Sum mentioned in the said Agreement to                                 |  |
| 27 | Be paid for the Benefit of the Proprietors of Old Stock....                         | <u>132,400.....</u>  |
| 28 |   |  |
| 29 | And in Discharge of the said Sum of £121,091,,7,,11 so received by the              |  |
| 30 | said Trustees as aforesaid Wee find by their said accounts that                     |  |
| 31 | towards satisfaction of the said Debts mentioned in the Schedule                    |  |
| 32 | annex'd to the said Indenture of Agreement which with Interest                      |  |
| 33 | amounted to £75,359,,.....,10 3/4   |  |
| 34 | They have paid several sums the Particulars whereof are set forth in the said Book  |  |
| 35 | Mark'd A page 1 to 4 inclusive....  | £71,427,,9,,2 3/4  |
| 36 | And for charges in the Execution of the Trust....                                   | <u>30,,11...</u>   |
| 37 |   | 71,458,,.....,2 3/4  |
| 38 | And to several Proprietors of the said 4,304 old shares for their Dividend of £10 p |  |
| 39 | Cent thereon, the Particulars whereof are set forth in the said Book Mark'd A       |  |
| 40 | [page 123] page 14 to page 40 inclusive   | £35,395,,7,,11   |
| 41 | and to Mr Neale, Mr Hopegood, and Dr Wood pursuant to                               | } <u>9,360</u>   |
| 42 | the said Order of the General Court   |  |
| 43 |   | <u>44,755,,7,,11</u>   |

|    |  |                      |                            |
|----|--|----------------------|----------------------------|
| 44 | The several Sums so paid by the Trustees amount to...  |                      | 116,213,,8,,1 3/4          |
| 45 | And they are to pay the company for Balance of their Account..                               |                      | <u>4,877,,19,,9 1/4</u>    |
| 46 | And that makes up the sum wherewith the Trustees stand charged being...                      |                      | <u>£121,091,,7,,11</u>     |
| 47 | Which sum to be paid by the Trustees to the Co. viz <sup>t</sup> . the sum of                |                      | £4,877,,19,,9 1/4          |
| 48 | being added to the Sum the Co. have paid short of the  |                      |                            |
| 49 | £52,400 to the Trustees which is....   |                      | <u>£7,004,,12,,1</u>       |
| 50 | Will make the Sum in the Company's hands...  |                      | <u>£11,882,,11,,10 1/4</u> |
| 51 |  |                      |                            |
| 52 | Which is for the following accounts viz <sup>t</sup> .                                       |                      |                            |
| 53 | Of the Debts mentioned in the Schedule annexed to the said Indenture of Agreement            |                      |                            |
| 54 | computed at £73,463,,1,,10 and amounting with Interest to £75,359,,.....,10 3/4 there        |                      |                            |
| 55 | are several which have not been called for and it is doubtful whether all of them are        |                      |                            |
| 56 | due, but if they should be demanded and made out, the Company is answerable for              |                      |                            |
| 57 | 'em the Particulars whereof appear in the said Book Mark'd A Page 1 to pa: 4                 |                      |                            |
| 58 | Inclusive & amount to.....   |                      | £3,481,,11,,8              |
| 59 | And there are three Sums amounting to £450 charged as Debts which upon                       |                      |                            |
| 60 | Examination were found to be owing viz <sup>t</sup> .  |                      |                            |
| 61 | Lent ni 1718 to be paid in Guinea...   | £200                 |                            |
| 62 | Borrowed of Mr. Richard Mead ni 1719   | 200                  |                            |
| 63 | Due to Several Persons on the Loan £50,000 w <sup>ch</sup> .                                 |                      |                            |
| 64 | was but £49,950 so there is overcharged } <u>50</u>  |                      | £450,,.....                |
| 65 | And the forementioned Sums amounting to  | £3,931,,11,,8        |                            |
| 66 | And what the Trustees paid on Account of   |                      |                            |
| 67 | the Debts in the said Schedule being } 71,427,,9,,2 3/4                                      |                      |                            |
| 68 | and for Charges in Execution of the Trust.... } <u>30,,11</u>                                |                      |                            |
| 69 | making together.....   | 75,389,,11,,10 3/4   |                            |
| 70 | fall short by.....   | <u>306,,8,,1 1/4</u> |                            |
| 71 | of making up.....  | <u>75,696,,.....</u> |                            |
| 72 | Which the Trustees receiv'd of Mr Taylor, and therefore there remains } <u>306,,8,,1 1/4</u> |                      |                            |
| 73 | for the use of the Company that Sum of .....   |                      |                            |
| 74 | And as the Trustees have charged the Sum of  | £43,040              |                            |
| 75 | the Amount of the Dividend of £10 p. Cent on   |                      |                            |
| 76 | the Old Stock no more paid than..... } <u>35,395,,7,,11</u>                                  |                      |                            |
| 77 | there remaining  | 7,644,,12,,1 which   | £4,237,,19,,9 1/4          |

78 [page 124]

79 Which the Company is to pay when demanded the particulars whereof are  
 80 in the s<sup>d</sup>. Book Mark'd A page 1 to 40 inclusive.... }

7,644.,12.,1

81 & this makes up the before mention'd Sums in the Company's hands...

£11,882.,11.,10 1/4

82

83 And upon Examination Wee find that Discharges as well for the said Debts paid  
 84 By the Trustees amounting to £71,427.,9.,2 3/4 as also for the s<sup>d</sup>. Dividend of £10  
 85 p Cent. Amounting to.....£35,395.,7.,11 are Lodged with the Company's Accountant  
 86 or Cashier --- And We do not find, that any further Debts due from the Company in  
 87 England at the time of the said Agreement have appear'd to remain unsatisfied,  
 88 Except the three following Debts viz<sup>t</sup>.

|    |   |   |                   |
|----|---|---|-------------------|
| 89 | To Duncan M'Laughn late Sailor in the Dorothy   | } |                   |
| 90 | as p Warrant No. 2205 of 8 August 1723.....   |   | 17.,11            |
| 91 | Thomas Brown Att <sup>o</sup> . to Rob <sup>t</sup> . Aylmer Adm <sup>r</sup> . to Ger <sup>d</sup> . | } |                   |
| 92 | Aylmer late Surgeon of the Union deceas'd as p  |   | 55.,15.,5         |
| 93 | Warrant No. 2331 of the 3 <sup>d</sup> . October  |   |                   |
| 94 | Eliz <sup>a</sup> . Bennet Exexcu <sup>x</sup> . to John Bennet who was                               | } |                   |
| 95 | Adm <sup>r</sup> . to Tho: Bennet late Factor at Accra  |   | <u>71.,18</u>     |
| 96 |   |   | <u>£145.,4.,5</u> |

97

98 Which are to be paid by the Company out of the beforemention'd monys in their  
 99 hands. And therefore, Wee are of the Opinion that the said Trustees have so far  
 100 perform'd their said Trust, that there remains only the said Sum of £4,877.,17.,9 1/4 to  
 101 be paid by them to the Company, for the Uses and purposes afores<sup>d</sup>. to compleat the  
 102 Performance thereof: All which is nevertheless submitted to the Judgement of the  
 103 Court.

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Alex Trew  
Castlecliffe, School of Economics and Finance  
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