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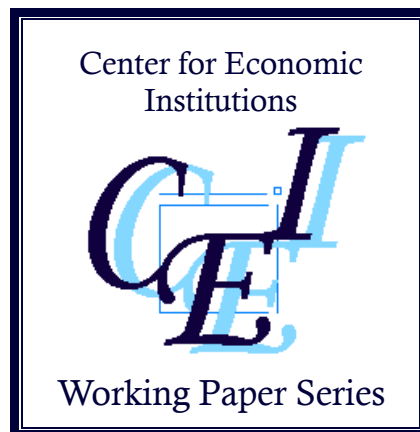
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“Share Portfolios and Risk Management in the Early
Years of Financial Capitalism: London 1690-1730”

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Share Portfolios and Risk Management in the Early Years of Financial Capitalism:
London 1690-1730

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Abstract

The dramatic expansion of public and private financial markets in the aftermath of the Glorious Revolution has received extensive attention. Despite interest in the operation of the capital market, much less is known about how ordinary individual investors managed risk within this framework. Using a newly constructed data set of share ownership for each company listed in the financial press of the day, we reconstruct individual portfolio holdings for every investor in these companies. We examine individual portfolio holdings first for the decade after the Glorious Revolution and then for the years around the South Sea Bubble of 1720. We also examine holdings over time. Despite a fivefold increase in the number of unique individuals in the market between the 1690s and the 1720s, we find that in each period roughly eighty per cent of those active in the equity market owned shares in only one company, even though most shareholders had the capacity or wealth to diversify their share portfolios. We also find some continuity in the market with forty per cent of those who owned stock in 1690 holding stock two decades later. This level of stock market activity suggests that individuals were diversifying against idiosyncratic liquidity risk. Overall, however, there is limited evidence that individuals were using their financial portfolios to increase return or reduce risk or to protect themselves against diversifiable shocks. Clearly some part of this behaviour can be explained by low levels of financial literacy, for many, however, company specific voting rules with their attendant effects on firm governance drove market activity.

Introduction

On her death in 1730, Mary Broughton of Hatton Garden Middlesex, a widow of many decades, bequeathed a portfolio of stocks to her daughter, Mary Studwick: stocks that had gained prominence in the three decades since the Glorious Revolution.¹ The end of the seventeenth century had witnessed a dramatic expansion of financial markets both private and public which, by 1720, were well established. Although predating the Glorious Revolution, the stock market flourished in its immediate aftermath, helped by well-defined ownership rights in shares, ease of purchase and sale, and transparency in pricing promulgated by the rise of the financial press (Carlos, Key and Dupree, 1998; Dickson, 1967; Murphy, 2009; Neal 1990). By 1720, the stock market was well entrenched as a tool of commerce and savings. Companies used the market for initial public offerings or net additions to their capital stock (Scott, 1951). The government used the market to rationalize its public debt through a series of debt-for-equity swaps, mediated through the so-called money companies: Bank of England, New East India Company, United East India Company and the South Sea Company (Broz and Grossman 2004; Neal 1990; North and Weingast 1989; Scott, 1951). Individual use of the market for shares expanded greatly from the Glorious Revolution through 1720. Indeed it was because of the thousands of individuals who participated in the market that companies were able to float their stock and of the government to organize its public accounts.²

The literature now provides an extensive understanding of many aspects of market activity. From the stock records of an individual company, we know who bought and sold that particular stock. From company ledgers and transfer accounts as well as private business records, we know how certain individuals mediated activity in the market as brokers. From stock ownership and dividend records and probate inventories, we know the pattern of activity

by gender and by size of transaction (Dickson, 1967; Carlos and Neal 2004, 2006; Hancock, 1994; Murphy, 2009). Because of this focus on the individual firm records, we know who bought or sold particular company shares, but not the market portfolio by individual. This paper expands our understanding of how individuals used the market. The narrow question asked and answered is the extent to which Mary Broughton exemplifies market practice with respect to her share portfolio. Was she representative of other investors in holding a diversified portfolio of shares, or was she an outlier? The broader question is what guided ownership of shares by individuals.

Our data set is unique. It comprises share holdings by person for all the major joint-stock companies in operation in the 1690s and from 1719-1723 listed in the financial press. We examine the extent to which those who purchased shares in one company were also active in other companies both within each time period and over the course of the intervening two decades. Given our data, we can determine how many unique individuals were involved in the market, the value of market transactions; how many of these individuals owned shares in more than one company, and what exactly was the nature of the cross-ownership or the individual share portfolio. We begin by creating a market-matching portfolio based on share prices and returns to provide a basic comparison against which to judge individual portfolios. Purchase of a stock helped protect investors against idiosyncratic liquidity shocks. We also explore the extent to which these investors also diversified across share options to minimize cross-sectional and inter-temporal risk.³

Despite a dramatic increase in the level of individual participation, we find little change in how an individual interacted with the market between the 1690s and the years around 1720. Our data show a fourfold increase in the number of unique individuals in the share market, from

roughly 6,000 to nearly 24,000, in the twenty years between these two periods, with a commensurate increase in the value and number of trades. However, we find little evidence of share portfolio diversification. Mary Broughton was quite unique. Roughly 80 per cent of all participants owned stock only in one company, both in the 1690s and two decades later.

The paper is structured as follows. We begin with a discussion of why financial market development matters, followed by a description of the London market. We then describe the data used in the analysis. First we use share prices from Castaing's *Course of the Exchange* to create a portfolio that just matches the market to provide a benchmark against which to measure individuals' use of the market. We then present our unique data set with its resultant portfolio holdings for the 1690s and from 1719-23. Finally we explore why such low levels of diversification exist. Rather than suggesting that these outcomes merely reflect low levels of financial literacy on the part of investors, we argue that company specific voting rules with their attendant requirements for share ownership combined with the benefits from mercantile power and patronage led to concentration of ownership within an individual firm.

Financial and Share Markets

Financial market developments in early modern England encouraged a shift from personal to more impersonal financial relations. The purchase of a share was an impersonal transaction in that the stock market allowed for anonymous and gender-neutral activity potentially independent of family, kin, religious or social connections. Ownership of stock thus provided another avenue for managing risk and unanticipated shocks.⁴ However, the transition to using newer facilities was, however, not linear: it occurred at differing speeds depending on the type of activity involved, with individuals making use of the stock market, bills of exchange,

banks, bullion and family financial arrangements at different rates and at different times (Laurence, 2008; Green, Maltby, Owens and Rutterford, 2010).

Levine (2005) argues that financial systems provide five basic functions: produce information ex ante about possible investments and allocate capital; monitor investments and exert corporate governance after providing finance; facilitate the trading, diversification, and management of risk; mobilize and pool savings; and ease the exchange of goods and services.⁵ The stock market in the aftermath of the Glorious Revolution clearly provided a mechanism to mobilize and pool savings that was used by companies and by the government. This paper, however, focuses on the second and third criteria: corporate governance after providing finance; and the trading, diversification and management of risk. Indeed, we argue that through its voting rules, corporate governance directly affected diversification in the share market.

A stock market potentially allows an individual to ameliorate various forms of risk. The first is liquidity risk. The London market, as discussed below, increased the speed with which an agent could convert financial instruments into purchasing power at agreed upon and transparent prices. Second, the share market allowed for cross-sectional risk diversification in that it allowed an investor to diversify against the specific risk associated with an individual asset. To the extent that an individual investor wanted to minimize risk and maximize return, owning a diversified portfolio of assets increased the likelihood of that outcome.⁶ Finally, the stock market allowed those with a longer term perspective to smooth income or consumption over time. In addition to the benefits of risk diversification, the purchase and ownership of shares provided other attributes. First, due to transparent pricing and ease of sale, stock could be used as collateral (Gelderblom and Jonkers, 2004; Temin and Voth, 2008). Second, share ownership potentially provided a potential stream of income through dividend payments and perhaps capital gains

(Scott, 1951). Finally from their articles of incorporation, share ownership invested individuals with potential governance power. Before focussing on the data and investor decisions, we contextualize the development of the London stock market.

The emergence, in the first decades of the 1600s, of limited liability, joint-stock, chartered companies in which an individual owned a share in the capital stock of the company, rather than a part of a voyage, cargo or ship, slowly generated a secondary market in shares. In England, dating from the creation of the English East India Company (EIC) in 1601, the joint-stock form was used to finance long-distance trading companies: the various African or Guinea companies (1618, 1630, 1662), the Royal African Company (1672) and the Hudson's Bay Company (1670). As Scott (1951) documents, this form was subsequently used for financial companies - the Bank of England (1694), Bank of Scotland (1695), and the Million Bank (1695) - in addition to a range of colonizing companies, fisheries, mines, street-lighting companies, manufacturing companies and insurance. The numbers of companies, both large and small, issuing shares grew and by the end of the seventeenth century, the joint-stock form was widely used.⁷

It was, however, the larger companies that issued shares available in sufficient in volume to allow for a liquid secondary market. Transactions could take place at company headquarters but by the last quarter of the century, Exchange Alley and its coffee houses—Jonathon's and Garroway's in particular— operated as local exchanges. In addition, individuals and private bankers played dedicated roles as broker/jobber/dealers either in a particular stock or in all shares; with private bankers facilitating the purchase and sale of shares for customers and allowing shares to be used as collateral for loans (Carlos, Neal and Wandschneider, 2009; Laurence, 2008; Murphy, 2009; Quinn, 2001; Temin and Voth, 2004, 2008). The existence of a

secondary market in shares changed the nature of asset holding; individuals could now add shares to ownership of more traditional but more illiquid assets such as land, mortgages, bills, and tallies.⁸

As has been well documented, the chartered nature of the company led to a connection between the government and company. The joint-stock form allowed for the mobilization of large pools of savings which, in turn, became the mechanism allowing the government to borrow large sums of money in the face of fiscal crisis. The founding of the Bank of England (1694) as a joint-stock company created the link between public finance and the equity market. This was further strengthened with the re-chartering of the Bank of England in 1697, the chartering of the New East India Company (1698), the amalgamation of the Old and New East India Companies in 1708 and the creation of the South Sea Company in 1711. In each case, these companies lent money to government based on a new stock issue, or undertook a debt-for-equity swap. In return, each received a stable stream of interest payments that were used for dividend payments. (Dickson, 1967; Broz and Grossman, 2004; Neal, 1990; North and Weingast, 1989) As a result, these companies are known in the literature as the ‘monied’ companies.

Carruthers (1996) has argued that share ownership had less to do with financial decisions and more to do with politics. Given the link between the government and the monied companies, share ownership provided an avenue to political power. Based on an analysis of a relatively small group of Bank of England and United East India Company shareholders in 1712 whose political persuasion he can discern, Carruthers argued that share transfers were politically endogamous, with Whig voters more likely to sell to other Whig voters.⁹ It may well be that the political leanings of an individual restricted his or her market with potential financial and

diversification implications or it could be that individuals decided which company shares to buy for other reasons and this determined market outcomes.

Joint-Stock Companies: Risk and Return

The data used in this analysis comes from two types of sources. The first, which has been used extensively, is John Castaing's *Course of the Exchange*. Beginning in March 1697, it appeared twice a week on Tuesdays and Fridays. Along with other financial information, each issue gave prices for the major joint-stock companies over the previous three days.¹⁰ As a result, prices for each of the major joint-stock companies was readily available both in London, in more outlying regions and overseas. The second data source comes from transfer and stock ledgers for each company listed by Castaing. These ledgers give the names of buyers and sellers, the date and book value of the stock transfer. For some companies, occupation and address are recorded. Although these transfer and stock ledgers have been used to examine activity within an individual firm, (Carlos, Key and Dupree 1998; Carlos and Neal, 2004 and 2006) this is the first time that aggregate activity for the stock market has been examined.¹¹

The data for the 1690s were compiled by Anne Murphy for her exploration of the *Origins of English Financial Market* (2010).¹² Her data for the Royal African Company ended in 1693; we expanded that to 1699. The stock ownership data for 1718-23 were collected and compiled by Ann Carlos and Larry Neal. In all but a few cases, we have the complete ownership record and for those few we have information on shareholders who were active in the market.¹³ The data for each period examined represent an unbalanced panel of years in terms of start and end dates but covers all those companies listed on the *Course of the Exchange*.¹⁴ During this period, the chartered joint-stock companies listed in the financial press dominated the secondary market. They were the East India Company (1601), the Hudson's Bay Company (1670), the Royal African Company (1672), the Bank of England (1694), the Million Bank (1695), the New East

India Company (1698), the Joint East India Company (1709), and the South Sea Company (1711).¹⁵

In each sub-period, although the samples are somewhat different, the companies represented were the major actors in the share market. The East India Company, the Royal African Company and the Bank of England are represented in both time periods. In the 1690s, the East India Company is the company chartered in 1601 (albeit, of course, with reorganizations) while in 1720, it represents the amalgamated old and new companies. The decade of the 1690s includes the Hudson's Bay Company and the Million Bank. The Hudson's Bay Company, due to low levels of market activity prior to the Bubble period was dropped from the *Course of the Exchange*. However, the African Company engrafted new issue of £1.5 million was listed separately from June 1720 and is added to the sample. The Million Bank is replaced by the South Sea Company for the later period. For the Million Bank we only have the names of those who chose to exchange government debt for equity holdings in the Million Bank which mirrors the data for the South Sea Company. As resolution of the South Sea Bubble, the capital stock of the South Sea Company was spilt in half: £16 million remained as stock in the company and £16 million became a fixed interest stock, the so-called "South Sea Annuities."¹⁶ Although the ledger books for the South Sea Company have not survived, the Annuities ledgers have and are housed in the Bank of England archives.¹⁷ Thus we have names and face value of the South Sea Annuities for all of those who held South Sea company shares at the end of the Bubble. A description of the data sources and years covered by period and company is given in Appendix A.

To benefit from diversification requires companies differ in terms of risk and return. Our companies differed along a number of dimensions. First by whether they were chartered before

or after the Glorious Revolution. The 'old' East India, Hudson's Bay, and Royal African companies had received royal charters, while those chartered after 1689 received parliamentary charters. This difference has been used to define the earlier companies as more Tory in their political affiliation and the later as more Whig. However, this simple delineation into pre- and post-Glorious Revolution is muddled by the amalgamation of the Old and New East India companies in 1709 and the more Tory (relative to the Bank of England) political construction of the South Sea company chartered in 1711 (Scott, 1951).

These companies differed also by activity. Some were trading companies such as the various East India companies, Royal African and the Hudson's Bay companies, or with trading aspirations such as the South Sea Company; others such as the Bank of England and the Million Bank provided financial services. The profitability of the trading companies was closely tied to demand and supply in foreign markets. War also affected profitability; the wars of the 1690s forced an end to the Royal African company monopoly of trade with Africa and the rise of licensed and then separate traders. At the same time, war increased the government's need for revenue and the ability of joint-companies to access a large market for loanable funds led to the tight connection between government and the monied companies: Bank of England, East India Company, South Sea Company.¹⁸ As a result of government interest payments, being a monied company increased the security of its dividend stream. Nonetheless, dividends differed even among the monied companies. In 1719, the Bank had a 7.5% dividend and a cash distribution of 10%, while the dividend issued by the South Sea Company was 6% and that of the East India Company 10% (Scott, vols. 2 and 3). In contrast, the Royal African Company issued essentially no dividends in the years prior to 1720.

Company shares were all issued with a face value of £100. Size of the capital stock determined the number of shares potentially available. For example, Bank of England with an initial capital stock of £2,201,171 had 22,011 shares potentially available for trade. Indeed a share in the Bank of England traded on average four times in the 1690s. Tables 1a and 1b provide summary statistics on capital stock, total transactions, book value of transactions and average book value of transactions in each period. In contrast to the face value of a share, the market price depended on the actual and anticipated success. Until publication of John Castaign's *Course of the Exchange* in 1697, share price data are spotty, so we only use share price data for the later period.¹⁹ Figure 1 shows share price in 1719, a normal year, especially when compared to the South Sea Bubble episode with its dramatic rise and fall in prices in 1720. Despite similar overall trends, prices across the companies were not perfectly correlated. Table 2 presents correlation matrices of share prices for 1719 and 1720 based first on monthly averages and then daily prices.²⁰ In 1719, using monthly averages, the Bank of England and East India Company market prices (0.8494) were most highly correlated. If we use daily prices, the East India Company and the South Sea company are most highly correlated at 0.8154. Correlation across all other combinations in 1719 is low and, when using monthly averages, sometimes negative. The negative correlation between the share prices of the Bank of England and the Royal African Company, and the East India Company and Royal African Company stems from price movements in April, when the RAC price rose and prices of the Bank and EIC fell. The data in Table 2 show that an individual shareholder could diversify some of the specific risk with a portfolio of shares formed from a number of different companies.²¹

Year-by-year calculations of returns also document a pattern of returns that are not perfectly correlated.²² In Table 3a and b, we show return year by year, with and without

dividends, using both a January to December year and a July to June year to take account of the South Sea Bubble that occurred in the middle two quarters of 1720. The impact of the Bubble in the middle months of 1720 is very evident. If we ignore the Bubble period and concentrate on the two years prior to 1720, the returns vary quite substantially. Although the South Sea Company, the Bank of England and the East India Company had a positive return for 1718, returns for the Bank and the East India Company declined in 1719, despite the Bank of England giving a £10 capital distribution in addition to its seven per cent dividend. The second panel shows the same information but on a July to June year. It too describes considerable variation in share prices over the course of each year and changes in the relative ranking of the companies.²³ This variation again argues for diversification within an individual investor's share portfolio.

To further examine whether a shareholder could benefit from diversification, we create a market capitalization index along the lines of the S&P 500. The intent here is to match the market, not necessarily to beat the market. Despite swings in the prices, the index is remarkably stable with regard to allocation, particularly for 1720, as prices tend to move together. The prices come from the *Course of the Exchange* and the market capitalization from Scott (1951). Figure 2 shows the portfolio structure for an investor following modern portfolio theory in the manner of today's S&P 500, or a market capitalization strategy. We include those assets for which we have full pricing information over the period 1719-1722 and for the greatest overlap of shareholder information. Figure 2 shows the cumulative allocation of stock across companies by year. The South Sea Company, with its large number of available shares and high prices throughout this period, dominates much of the suggested portfolio weight. Indeed, the South Sea Company demanded even higher levels of investment as the price rose dramatically in the run-up to the peak of the Bubble in 1720. Even without the Bubble, a diversified portfolio calculated in

this manner requires more than 50% of capital be invested in the South Sea Company, which would have left investors very susceptible to the bubble.²⁴ The Royal African Company gets a very small share of a diversified portfolio given its lower market capitalization, even after the engrafted issue of more roughly £1.5 million in May 1720. The Bank of England, often put forward as the ‘riskless asset’ commanded about 24% of the portfolio as did the East India Company, and the Million Bank a relatively constant 1.6%. Both the correlations and these market indices say that an investor would benefit from holding a diversified share portfolio. We now explore what portfolios people held.

Portfolio Holdings 1690s and 1718-1722

The summary statistics given in Tables 1a show that by the end of the 1690s, the Bank, East India and Royal African companies were similar in size, with the Hudson Bay Company significantly smaller.²⁵ Activity in the Bank of England includes those who initially subscribed in 1694 for the original £1,200,000 capital and then for the additional capital stock of £1,01,171 in 1697, constituting the £2,201,171 shown in Table 1a. However, even if one were to subtract out the initial capital subscriptions, there is considerably more activity in bank shares in this decade than in the other companies. Two decades later (Table 1b) the capital stock for all but the Royal African Company had grown. Due to its severe financial difficulties the Royal African had to write down its capital from £1,101,000 to £450,000 in 1712. By May 1720, however, it placed an engrafted issue of £1,569,000 on the market.²⁶ The scale of activity during 1720 relative to other years is evident in the Bank transactions, with nearly eight thousand transactions rather than just over the more representative two thousand transfers yearly.²⁷ Activity during the bubble year is also captured in the Annuities list which gives us a count of all those who owned,

bought (or exchanged government debts for) South Sea Company stock during 1720 and continued to hold to 1723.

In the 1690s, the total book value of the transactions was over £12m across 23 thousand transactions. Two decades later the volume of activity had more than doubled. In total, there were at least 46 thousand transactions with a book value of these transactions was just short of £28m. The market value of these transactions was considerably higher as share prices rose above face value during 1720: Bank of England stock over £200; East India Company over £300 and even the Royal African Company over £100. South Sea Company share prices started and ended the year around £130 but reached over £800 in July 1720. This is an extraordinary level of financial activity and reaffirms the level of wealth in the hands of the mercantile and shop-keeping community.²⁸

Our data represent the most complete description of share activity in the early decades of the financial capitalism. Each company registered share activity and transfers. However, in order to move beyond within-company activity to an examination of cross-company portfolio holdings, we had to match individuals across the various company records. Matching was not trivial due to a lack of uniformity in spelling found in this period and by the fact that we had few identifiers other than name and social signifier if given (such as Sir, Duke, Lady). We began by imposing a standard spelling on both first and last names. For example, we chose one spelling of Ann and Anne, or Ester and Esther. For surnames, we standardized the use of double letters (Caldecott or Caldecot) and endings of ie or y. This methodology surely conflated two or even three people into one composite which we discuss below. It must have happened with respect to ‘John Smith’ but was less likely when we were dealing with more unusual names. When companies listed similarly named individuals as ‘John Smith’ senior and ‘John Smith’ Junior, or

gave occupation or address, we used this information to keep the ‘John Smiths’ separate in our accounting. Fortunately, the bias in the procedure is to generate a lower bound for the number of unique individuals in the market. What we gain from our standardization is the ability to reconstruct equity portfolio holdings by name across companies for each of the time periods.

1690s

We begin with an examination of market activity in the aftermath of the Glorious Revolution. Here we examine both the number of unique individuals in each company and then the number of unique individuals in the market. Much of the market activity was dominated by the newly chartered Bank of England with 4,782 unique individuals transacting in Bank stock in the 1690s. 900 unique individuals bought and/or sold Royal African Company stock, 860 in the East India Company, 219 in the Hudson’s Bay Company and 129 in the Million Bank as shown in Table 4. There are 6,890 shareholders summed across these companies. However, aggregating up from company level activity double counts those individual who had transactions in more than one company. Matching names across companies generates 5,815 unique individuals, of whom 725 were unique women.²⁹ Women comprise nearly 15% of those involved in the market. This is a non-trivial presence. Women, however, were unequally present in these different companies, comprising nearly 15% of Bank stock ownership, but significantly less in the other companies: 5.8% in the EIC, 2.3% in the RAC, 4.8% in the HBC and less than 1% of those on the subscription list of the Million Bank.³⁰

Portfolio holdings are shown in Table 5. Here we take an extremely loose measure of portfolio holdings. We aggregate across all company-years and ask only whether an individual owned shares in more than one company at any point in our period. This definition of a “portfolio” allows an individual to own shares in different companies serially rather than

contemporaneously which would, of course, be the truer measure of a diversified portfolio. Even under this extremely loose definition, the majority of shareholders in the market during the 1690s owned in only one company. Of the 5,815 unique individuals, 4,997, or 86%, owned shares in only one company. Bank of England shares dominated market activity with 4,077 individuals owning Bank stock. Some sixteen per cent of shareholders owned in more than one company: 572 men and 24 women held in two companies, 182 men and 2 women held in three, 35 men held in four and 2 men held shares in all five. Leaving aside the Million Bank, only 0.6% of all individuals active in the market during the 1690s owned shares(at any point in the decade) in the four largest companies.

The two men who owned in all five companies were neither from the aristocracy nor the elite but rather what Peter Earle has termed the middle class. Gabriel Glover was a Linendraper living in London, and Thomas Lake, esq. had an address in the Middle Temple. Both probably acted as broker/jobbers rather than merely holding on their own accounts. Those owning across four companies include Thomas Pitt, first Earl of Londonderry, and William Sheppard a well-known goldsmith. The occupation for the others was either merchant or some more defined trade such as draper or apothecary. The two women who held in three companies were both widows. Esther Estwicke of London owned shares in the Bank, East India and Royal African, while Sarah Wagstaffe from Middlesex owned in the Bank, East India and the Hudson's Bay Company. However, whereas Esther was a net buyer in the three companies, Sarah was divesting her holdings and had, by the end of the decade, sold all her Bank shares.

1718-1723

After three decades, market activity had expanded across all measures; number of transactions, value of transfers, and number of agents. So by 1723, 30,729 shareholders owned

shares aggregated across companies. See table 6. The largest group of investors were in the South Sea Annuities with over 17 thousand unique shareholder names on the Annuities list.³¹ What is perhaps important to note is the high percentage of female investors on the Annuities list. Just over 30% of the shareholders were women. This represents a significant feminization of the capital market. Although female participation in the nineteenth century Consols is known to be high, what we show here is that this feminization starts at least by 1720. Female participation in Bank stock was 17% and the East India Company 13%. Looking at only unique individuals, we calculate that there were nearly 24,000 unique individuals in the market at some point from 1718-23, representing a four-fold increase from the 1690s.

Even after two decades of stock market activity, the vast majority of shareholders still owned shares in only one company. Using the same loose definition, allowing ownership sequentially rather than contemporaneously, portfolio holdings are shown in Table 7. What is striking is that 79% of all shareholders still own shares in only one company. Of these individuals, the vast majority owned South Sea Company shares. The number of unique shareholders who own in more than one company declines rapidly. Sixteen per cent of men owned shares in two companies but only 9.4% of women. Of the roughly twenty four thousand unique individuals, the number of men owning in four companies (280 individuals) or five companies (81 individuals) is extremely small.³² If we ask how many men owned in each of these companies contemporaneously, there were only twenty four investors out of twenty four thousand.

Although no women owned shares in five companies, ten women owned shares in four. The ten women with the most diversified portfolios and the twenty four men are listed in Table 8. We use the ten women to explore the impact of our sorting procedure and its attendant biases.

Essentially, as noted earlier, our matching procedure conflates those with the same first and last name and generates a single portfolio for that composite person. This means that we overestimate the level of portfolio diversification occurring at any point in time. From the individual company documents we find only one Mary Baker, Susanna Clark, Elizabeth Hyland, Ann Legg, and Lady Anna Eleanor Shirley recorded in each company. Of course, these could be different persons in each case, but we feel reasonably comfortable with their assigned portfolios.³³ Conservatively, therefore, five of the ten women owned portfolios with four separate company stocks. In contrast, we found three Mary Boughtons who owned shares in the Bank of England but only one in each of the other companies. From the Bank Alphabet Ledgers, we know that one Mary Broughton lived in Chelsea, one in Hay Market and one in Hatton Garden. We know from her will that ‘our’ Mary Broughton lived in Hatton Garden and owned shares in multiple companies and so we keep her in this list of highly diversified portfolio holders.

In the case of the four remaining women, we are conflating different people. Take the example of Johanna Cock. Johanna Cock was a major broker/jobber of Bank of England and East India Company stock in the six year preceding 1720. She was also very active during the Bubble period but was declared bankrupt in November 1720. As a result, any shares she might have owned in South Sea Company stock would have been sold as part of the bankruptcy proceedings and so she would not appear, as her name does, in the South Sea Annuities list. However, her daughter was also named Johanna Cock. From the Bank of England records, we know that she too owned Bank of England shares and it is probably she who owned nearly £5000 book value of South Sea Annuities. Thus one Johanna owned a portfolio of three company shares and one with two company shares and so her name does not belong in this group. The

Annuities show two Elizabeth Bridges: one lived in the Strand and the other in Soho Square. The former owned £50 in the South Sea Annuities and the latter £14,380.75. Given this difference in wealth, we allocated ownership of East India Company, Royal African engrafted and Royal African senior to Elizabeth Bridges of Soho Square. Interestingly, neither woman owned any shares in the Bank of England, which was unusual. There are also two Elizabeth Matthews, one of whom owned only £27 in the South Sea Annuities. Again we allocated the large holdings in the Bank of England, and the two Royal African Companies to the Elizabeth Matthews who owned £1330 in the Annuities. The records show that there were four Elizabeth Turners all who owned in the Annuities but three of the four owned either very small or relatively small amounts: £5.15, £41, and £260. The fourth Elizabeth Turner, however, held £29,935 in the Annuities and so we allocated the large holdings in the Bank of England, East India Company and the Royal African Company senior to her. Thus our identification strategy generates an upper bound on the level of financial portfolio diversification for the period. These results reinforce how few shareholders had a portfolio close to that suggested by our market index. Even after three decades of market activity, there is little evidence of diversification of equity portfolios.

Stock markets provide opportunities not only to ameliorate cross-section risk but also to smooth income or consumption over time. Our data allow us to examine stock holding over time: to what extent did those who owned shares in the 1690s still own shares two decades later? Of course, given the methodology we are no doubt capturing father/son, mother/daughter pairs such as the two Johanna Cocks. However, this will only impart an upward bias on our results. Of the nearly 6,000 unique shareholders in the market in the 1690s, we found that over one-third or 2,000 unique first and last name combinations appear also in the 1720 data, of which 192 were

women. 1,652 shareholders owned some South Sea annuities in the later period which means that they were not merely passive holders, as the SSC was not chartered until 1711. We also find that there were 38 investors who owned shares in the 1690s owned in each of the five companies over 1718-1723. In fact half of the men listed in Table 8 were also shareholders in the 1690s.³⁴ Thus at the same time that the majority of individuals held shares in only one company, there is a very small sub-set of long-lived participants with diversified portfolios, many no doubt acting as agents or broker/jobbers.

Discussion

These market portfolios show how investors responded to the emerging market for shares. Between 1690 and 1720, thousands of individuals incorporated the newer equity instruments into their overall financial decision making, such that by the end of the South Sea Bubble, over 25,000 unique individuals had interacted with the market.³⁵ With a population of roughly five million, this means that roughly 0.5 per cent of the population of England had market interactions.³⁶ These investors were in a position to use the market to cope with unanticipated liquidity shocks. At the same time it is clear that these investors were not diversifying across their equity holdings to protect themselves from non-systemic risk. Share price correlations, year-by-year returns and our market capitalization index, shows that investors would have increased return and minimized risk by diversifying their stock portfolios.

This lack of diversification needs some explanation. Although the lack of diversification must have been the result of different forces playing out differently for different individuals, here we examine three broader explanations. The first is wealth constraints; the second financial illiteracy, and the third firm-governance issues.

Insufficient wealth would restrict the number of shares that an individual could purchase. Clearly, wealth would have been more of a constraint for women as a group than for men. In

addition, the market price of even one share was not trivial. While the market price of a Royal African company share was generally less than £100, the market price of the other companies was greater than its face value. Unfortunately, we do not have direct evidence on wealth holdings for each of the thousands of individuals in our population, but we do have indirect evidence. We know the book value of the block size of transactions by company. As can be seen from the cumulative distribution of share transactions in Figure 3 and from Table 9, the number and average block size of transactions was greater than £500 book value. This means that most transactions occurred at block sizes that would have allowed for diversification. Someone selling or buying £500 book value of any particular company stock could have as easily purchased three or four or even five £100 book value across a number of companies.³⁷ This pattern of transactions does not support a hypothesis of insufficient wealth as an explanation for the lack of stock diversification.

Recent surveys have sought to measure financial literacy both within country and across countries. The findings are less than reassuring. Guiso and Jaelli (2008) and Lusardi and Mitchell (2011) find extremely low levels of financial literacy across countries, in particular, respondents' answers indicate that current investors are not particularly savvy with regard to risk management.³⁸ In addition, despite a growth in the percentage of directly-held equity in mutual funds, forty per cent of households still hold shares directly and of these, over half own less than 15 shares and nearly one quarter own fewer than five shares (Vissing-Jørgensen, 1999).³⁹

It is perhaps too easy to say that if levels of financial literacy are low today, they must have been as low or lower in the early eighteenth century. It would be equally unrealistic to say that there were no financially illiterate investors in the market in the early eighteenth century. At the same time, many of those in the market were active in trade and owned a range of other

financial instruments, perhaps indicating a higher level of financial acumen. Indeed, in his sample of probates, Earle's decedents owned loans and mortgages, leases, government debt, shipping and company stocks and bonds. Earle also found a significant increase in the percentage of shareholding from 1665-89 to the period under study here, 1690-1720.⁴⁰ But while many of his decedents owned stock, he was looking at a small and select group of fewer than four hundred individuals.

We can also ask what individual investors could have known. To what extent did the equivalent of a 'stock market guide for dummies' exist? The late seventeenth and the eighteenth century was the period of Defoe and Swift and an intensely active pamphlet press. While much of this writing was directed at swaying government and public opinion, the print media also produced an array of books and pamphlets on various aspects of the financial market (Harrison, 2001, 2004). Glaisyer (2007) argues that "it was not just the fear of being cheated in the present that advice manual writers used to motivate their readers ..., but also the threat that appearing ignorant on such matters might result in a loss of face and exposure to be taken advantage of on a future occasion."⁴¹ Numerous books existed explaining how to calculate rates of return; simple and compound interest; books of tables showing return on loans of varying amounts at different rates for different period; and books to meet the needs of those trading in the stock market such as Richard Hayes' *The money's man's guide: or the purchaser's pocket-companion*.⁴² To the extent that individual investors sought advice, they would have found it. If they did not want to read the manuals, they could have used the services of a broker or a banker.⁴³

In order to understand perhaps a little more clearly market activity, we examine the relationship between risk, as measured by the price and variance of a given stock, and the level

of transactions. Due to the nature of the data, we perform simple OLS regressions on activity in the market to evaluate the role of price and risk in investors' decisions to buy into and or sell shares. Share prices are, as noted earlier, taken from Castaing's *Course of the Exchange* and we measure risk by variance in price for each share by month.⁴⁴ Obviously, the level of activity in any given company is related to the number of shares potentially available for sale, so we include the capital stock as a control. The inclusion of other factors, such as political affiliation of the company was either closely correlated with the capital stock or we lacked precise enough information to include it in the full regressions. We see the results discussed below as informative rather than definitive, and realize their limitations in assigning causality.

In the first set of regressions shown in Table 10a, we use total monthly transactions over the period 1718-1721 for all of the companies for which we have transactions information. We use the log of price given the large differences in the price from one stock to the next. Variance as noted is the variance in price for each share by month. In half of the regressions we include the percentage of transactions that were carried out by women. Women were an important group in the market, but they were a relative new group of investors and one might think less sophisticated. Although, as shown by Carlos and Neal (2004), as a group women earned capital gains on Bank of England stock over the course of the South Sea Bubble, while men as a group lost money. Yet women could have replaced men in the market. Columns 1 and 4 use all transactions, while columns 2 and 5 consider sale activity, and columns 3 and 6 purchase activity.

In each regression in table 10a, price is positive and significant in determining the level of transactions. In column 1, a one per cent change in the price is associated with 252.4 more transactions on average per month. When we examine sale and purchase decisions separately,

price is still significant but in sale activity (regression 2), the percentage of women in the market is a strong predictor of increased sale activity, leading to nine more sale transactions.⁴⁵ Variance, our proxy for risk, does not enter as strongly into decisions whether to buy or sell or overall. Because we are examining a highly volatile period with the large changes in prices over the South Sea Bubble, we might expect that there would be less incorporation of variance in decisions to buy and sell, as even the savviest investors might struggle to capture all of the available information. Thus rather than look at transaction behaviour over the whole of the period for which we have data, we restrict our analysis to the pre-bubble period.

Considering only this more stable period, the results in Table 10b show that price has an even more significant impact. Now a one per cent increase in monthly price leads to 585 more transactions per month. Variance now plays a significant role, as does the percentage of female investors, with an additional percentage of female investors leading to 71 more transactions per month. This suggests that the increased presence of women in the market increased the overall number of transactions, or level of activity, rather than just women displacing men. When we examine buy or sell decisions separately, the results suggest a difference in buy and sell decisions. Increases in price lead to more buy transactions as does an increase in the variance. However, these variables have little to say about sale decisions. If we think of these results as informative rather than definitive, they do suggest that we don't completely understand the forces determining the level of market activity.

The propensity to purchase only in one company could be the result of political affiliation by family and social networks as suggested by Carruthers (1996). Indeed, in tracking family names over the three decades we find that where one person owned in the earlier period, three, four or five individuals with the same family name owned shares in the same company in the

later period. These connections must have mattered for some. More important, however, than political affiliations, we argue, were company-specific rules with their attendant implications for share ownership.

Each joint-stock company had a charter which specified its organizational structure. The rules were similar across our companies. Each was run by an elected subset of shareholders called the Court of Assistants -or in modern parlance, a Board of Directors- which reduced the agency problems associated with the separation of ownership from control.⁴⁶ Eligibility to vote for or to be elected to the Court, or to be Governor or Deputy Governor, however, was conditional on owning a specific face-value of shares, as laid out in each company charter.⁴⁷ In the 1690s, a person had to own at least five shares or a £500 face value block of shares to vote in the annual election. This increased to £1000 face value for many companies by the second decade of the eighteenth century. If a shareholder wanted to be elected to the board of directors or the Court of Assistants, or to be Governor or Deputy Governor, he had to own at least £1500 to £2000 book value of shares to be a Board member and up to £4000 face value to be elected governor/deputy governor. Each company closely monitored share ownership to ensure these requirements held. Although these rules meant that companies were governed and monitored by their own shareholders, thus ameliorating the principal-agent problem that might arise with salaried managers, for many levels of wealth holding, these rules would significantly reduce an investor's ability to diversify.

For some companies, in addition to the share ownership requirements for sitting on the Court of Assistants, the face value of shares owned could also determine the number of votes a shareholder could cast. Not all companies had a one shareholder one vote rule. The East India Company, for instance, allowed one vote per specified block of shares held. With the

amalgamation of the Old and New East India companies in 1708, an upper bound was placed on the number of votes.⁴⁸ For one vote shareholders needed to own £1000 face value to a maximum of ten votes with £10,000 face value of shares owned. Concerns over ‘engrossing’ the stock led to a one-person one-vote rule in the Bank of England charter. But a shareholder was required to own a face value of £500 of stock to vote, £2000 face value to be a director and £4000 face value to be elected Governor. The South Sea Company required a face value of £1000 stock to vote, with two votes for £3000 face value to a maximum of four votes with £10,000 face value owned. £3000 face value was required to be elected to the Board of Directors (Scott, vols 2 and 3). Thus the voting rules in their various manifestations created an incentive to own blocks of shares in a single company as we see in the transfer activity in table 9 and would reduce diversification of an individual’s share portfolio.

Election to the Court of Assistants in any of these companies carried with it income and power. Board members were paid for each meeting they attended, although this was probably not a large component of overall income. More important were the connections to mercantile and political power and patronage. The Court of Assistants ran the company through its sub-committees, staffed by the Directors and ratified by the whole Court. These committees made decisions on hiring of personnel, buying of trade goods, ships, and sale of commodities; all decision-making power lay with them. Election to the Court of Assistants also provided potential for political patronage especially in the monied companies. Government requirements for funds or company requirements for a rechartering of the company created political links (Broz and Grossman). The benefits from voting and access to mercantile and political patronage were strong inducements for concentration of holdings.

Yet for a company with many thousands of shareholders and a Court of Assistants comprising only twenty four to thirty persons, could the right to vote be sufficient to induce the levels of non-diversification that we see? The voting rules in conjunction with the number of potential voters meant that anyone who wished to be elected to the Court of Assistants had to create a voting bloc from among the shareholders who were eligible to vote. Term limits for individual directors meant that these voting blocs would be constantly reforming. The size of these companies and their purchases in the London market, however, had large financial implications for even small shopkeepers not to mention large merchants, whether it was purchasing iron bar, textiles, ship supplies, or pen and ink. Staves (1998) has documented the patronage built into having a vote for the Court of Assistants even for women shareholders. Company connections were not trivial. For example, William Warren supplied nearly £40,000 of textile products to the Royal African Company over the course of nineteen years. Peter Joye, a major player in metals, supplied over £50,000 of metal bar to the company over the thirteen years. But even a one year contract was valuable. James Taylor and Samuel Skutt supplied glass products with a value of £200 and £118 respectively or even the £6 sale of false pearls by Samuel Heron. The companies had to purchase all their inputs whether materials or manpower. Even the smallest contract made it valuable to be an insider rather than an outsider.

Conclusion

The expansion of the stock market represents a shift from more personal financial interactions to more impersonal. An active secondary market existed both at the company houses or in Exchange Alley or through individual broker/jobbers. The existence of price lists meant that shares prices were broadly known and transparent. It is also clear from the data

presented here that individuals, both men and women, large merchants, small shopkeepers, gentlemen and the aristocracy made use of the market.

In this paper, we explored how the investors used the market. Ownership of stock clearly helped insure individuals against liquidity risk. At the same time, a sufficient volume of shares were available in the market to allow individual investors to diversify their equity portfolio to minimize risk and to maximize return. However, individual investors did not behave in such a fashion. Both in the decade in the aftermath of the Glorious Revolution and three decades later, shareholders did not hold diversified portfolios. Eighty per cent of shareholders owned only in one company. Such lumpiness in investment is striking. It could well be that individuals take time to adapt to the changing financial circumstances. But there is scant evidence of change over twenty to thirty years. At the same time, it is striking how similar this behaviour is to that of individual investor behaviour in the twentieth century stock market.

Similar as the outcomes are, the reasons for such choices may well be very different. Very low levels of financial literacy today do not imply similar levels in early eighteenth century London. Clearly there were some investors who were burned during the South Sea Bubble, but there were others for whom the market was a source of profit. Although the secondary market reflected a desire for liquidity on the part of individual investors, the ownership of a share provided more than the financial rewards of dividend payments or from potential capital gains. Company organizational structure created an additional incentive to own stock. It must be recognized that these incentives were set by the companies and not by the financial market. We have argued here that share ownership brought with it access to mercantile and political power and patronage. Indeed, we argue that some subsections of shareholders, and perhaps even a large

subsection, were responding to this access to mercantile power and patronage in their decisions to purchase a share more than a response to risk and return in their equity portfolio.

To the extent that individuals were buying shares for their access to company and mercantile connections, this creates a historical relationship between the and the individual stock-owning family that goes back to the emergence of the stock market. Perhaps it is this historical connection between share ownership and companies that has pervaded individuals' interaction with the stock market even to the present.

Bibliography

Primary Sources:

Bank of England, Bank of England Archives, Threadneedle St., London, England
Alphabet Ledgers, 1720-25, AC 27/430-433.
Stock Ledgers, 1720-1725, AC 27/6439-6450
Transfer Books 1720, AC 28/1545-1554

John Castaing *Course of the Exchange*, 1719-172 . Accessed at European State Finance Database. <http://esfdb.websites.bta.com/>

East India Company, India House, London, England
Ledger Book F, 1720-21, L/AG/14/5/4

Probate Records, National Archives, Kew, England
Mary Broughton, PROB. 11/635
Mary Pont, PROB. 11/708
Mary Stanley, PROB. 11/641

Royal African Company Records, T/70, National Archives, Kew, England.
Minute Books, Royal African Company: Court of Assistants, 1720-1721 T/70 90.
Minute Books, Royal African Company: General Court, 1678-1720 T/70 101.
Transfer Book, T/70 198, 199, 200, 201, 202.

South Sea Company, Bank of England Archives, Threadneedle St., London, England
Annuities Ledgers, 1723-1728, AC27/6439/6411/6452

Secondary Sources:

Barber, Brad M. and Terrance Odean, "Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment", *Quarterly Journal of Economics*, vol. 116, no. 1, February 2001, pp. 261-92.

Blume, Marshall E. and Irwin Friend, *The Changing Role of the Individual Investor* (A Twentieth Century Report), John Wiley, New York, 1978.

Broz, Laurence J. and Richard H. Grossman, "Paying for Privilege: The Political Economy of Bank of England Charters, 1694-1844," *Explorations in Economic History*, vol 41, no. 1, 2004, pp. 26-47.

Carlos, Ann M, Jennifer Key and Jill Dupree, "Learning and the Creation of Stock-Market Institutions: Evidence from the Hudson's Bay and Royal African Companies, 1670-1700." *Journal of Economic History*, June 1998, pp 318-344.

Carlos, Ann M., Nathalie Moyen and Jonathan Hill, "Royal African Company Stock Prices during the South Sea Bubble," *Explorations in Economic History*, January 2002.

Carlos, Ann M. and Larry Neal, "Women Investors in Early Capital Markets, 1720-1725." *Financial History Review*, vol XI, 2004, pp. 197-224.

Carlos, Ann M. and Larry Neal, "Capital Market Activity During and After the South Sea Bubble: Bank of England Shares 1720-1725". *Economic History Review*, August 2006, pp. 498-538.

Carlos, Ann M. and Larry Neal, "Amsterdam and London as Financial Centers in the Eighteenth Century." *Financial History Review*, 2011.

Carlos, Ann M., Larry Neal Kirsten Wandschneider, "Broker Networks In the Market for Bank of England Stock", working paper, University of Colorado Boulder, 2009.

Carswell, John, *The South Sea Bubble*, Stanford: Stanford University Press, 1960

Carruthers, Bruce G. *City of Capital: Politics and Markets in the English Financial Revolution*, Princeton: Princeton University Press, 1996.

Coleman, D. C., "London Scriveners and the Estate Market in the Later Seventeenth Century." *Economic History Review*, vol 4, no. 2, 1951, pp. 221-230.

Crafts, N. F. R., *British Economic Growth during the Industrial Revolution*, Oxford: Oxford University Press, 1985.

Davies, K.G. *The Royal African Company*, London: Longmans, 1957.

Davies, K.G. "Joint-Stock Investment in the Later Seventeenth Century." *Economic History Review*, vol 4, no. 3, 1952, pp. 283-301.

de Krey, G. S. *A Fractured Society: The Politics of London*, Oxford: Oxford University Press, 1985.

Dickson, P. G. M. *The Financial Revolution in England: a Study in the Development of Public Credit, 1688-1756*, London: Macmillan, 1967.

Earle, Peter, *A City Full of People: Men and Women of London, 1650-1750*. London: Methuen, 1994.

Earle, Peter, *The Making of the English Middle Class: Business, Society and Family Life in London, 1660-1730*. London: Methuen, 1989.

Gelderblom, Oscar and Joost Jonker, "Completing a Financial Revolution: The Finance of the Dutch East India Trade and the Rise of the Amsterdam Capital Market, 1595-1612," *Journal of Economic History*, vol 64, no. 3, 2004, pp. 641-672.

Glaisyer, Natasha, "Calculating Credibility: Print culture, Trust and Economic Figures in Early Eighteenth-Century England." *Economic History Review*, vol 60, no 4, 2007, pp. 685-711.

Grassby, Richard, *The Business Community of Seventeenth-Century England*, Cambridge: Cambridge University Press, 1995.

Grassby, Richard, *Kinship and Capitalism: Marriage, Family and Business in the English Speaking World, 1580-1740*, Cambridge: Cambridge University Press, 2001.

Guiso Luigi and Tullio Jappelli, "Financial Literacy and Portfolio Diversification", European University Institute, Working Paper, ECO 2008/31.

Hancock, David, "'Domestic Bubbling': Eighteenth-Century London Merchants and Individual Investment in the Funds," *Economic History Review*, vol XLVII, no 4, 1994 pp. 679-702.

Harrison, Paul, "Rational Equity Valuation at the time of the South Sea Bubble", *History of Political Economy*, vol 33, no 2, 2001, pp269-281.

Harrison, Paul, "What Can We Learn for Today from 300-Year-Old Writings about Stock Markets?" *History of Political Economy*, vol 36, no 4, 2004, pp. 667-688.

Laurence, Anne, *Women in England, 1500-1760: A Social History*, New York: St. Martin's Press, 1994.

Laurence, Anne, "Women Investors, "that nasty South Sea affair" and the Rage to Speculate in early Eighteenth Century England," *Accounting, Business and Financial History*, vol. XVI, 2006, pp. 245-264.

Laurence, Anne, "The Emergence of a Private Clientele for Banks in the Early Eighteenth Century: Hoare's Bank and Some Women Customers," *Economic History Review*, vol. 61, no.3, August 2008, pp. 565-586.

Levine, Ross, "Finance and Growth: Theory and Evidence", ch 12. *Handbook of Economic Growth*, Vol 1A, Edited by Philippe Aghion and Steven N, Durlauf, Elsevier North Holland, 2005.

Lindert, Peter, "Lucrens Angliae: The Distribution of English Private Wealth Since 1670," and "Appendices" Working Papers 18 & 19, Agricultural History Center, UC-Davis (February 1985).

Lindert, Peter, "Unequal English Wealth since 1670," *Journal of Political Economy*, 94:6 (December 1986), pp. 1127-62.

Lindert, Peter, "English Occupations, 1670-1811," *Journal of Economic History*, 40:4 (Dec. 1980), pp. 685-712.

Lusardi, Annamaria and Olivia S. Mitchell, “Financial Literacy Around the World: An Overview”, NBER Working Paper 17107, 2011.

Murphy, Anne L. *The Origins of English Financial Markets: Investment and Speculation before the South Sea Bubble*, Cambridge: Cambridge University Press, 2009.

Neal, Larry , *The Rise of Financial Capitalism: International Capital Markets in the Age of Reason*, Cambridge: Cambridge University Press, 1990.

Neal, Larry , “*I am not Master of Events*”: *the Speculations of John Law and Lord Londonderry in the Mississippi and South Sea Bubbles*, New Haven, CT: Yale University Press, 2011.

North, Douglass C. and Barry W. Weingast, “Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England ,” *Journal of Economic History*, vol 49, 1989, pp. 803-832.

Quinn, Stephen, “The Glorious Revolution’s Effect on English Private Finance: A Microhistory, 1680-1705,” *Journal of Economic History*, vol 61, no. 3, 2001, pp. 593-615.

Quinn, Stephen and Larry Neal, “Networks of Information, Markets, and Institutions in the Rise of London as a Financial Center, 1660-1720,” *Financial History Review*, vol 8, 2001, pp.7-26.

Rutterford, Jannette, David R. Green, Josephine Maltby, and Alastair Owens, “Who Comprised the Nation of Shareholders? Gender and Investment in Great Britain, c. 1870-1935,” *Economic History Review*, vol 65, no. 1, 2011, pp. 157-187.

Samuel, Edgar, “Manual Levy Duarte (1631-1714): An Amsterdam Merchant Jeweller and His Trade with London”, *Transactions of the Jewish Historical Society of England*, vol 27, 1982, pp. 11-31.

Scott, William Robert, *The Constitution and Finance of English, Scottish and Irish Joint-Stock Companies to 1720*, three volumes, New York: Peter Smith, 1951.

Staves, Susan, “Investments, Votes and “Bribes”: Women as Shareholders in the Chartered National Companies”, in Hilda Smith, ed. *Women Writers and the Early Modern British Political Tradition*, Cambridge: Cambridge University Press, 1998.

Temin, Peter and Hans-Joachim Voth, “Riding the South Sea Bubble,” *American Economic Review*, vol 94, 2004, pp. 1654-1668.

Temin, Peter and Hans-Joachim Voth, “ Private Borrowing during the Financial Revolution: Hoare’s Bank and its Customers, 1702-24,” *Economic History Review*, vol. 61, no.3, August 2008, pp. 541-564.

Vissing-Jørgensen, Annette, “Stock Prices and Fundamentals: A Comment”, NBER *Macroeconomics Annual*, vol 14, 1999, pp. 242-253.

Table 1a: Summary of Financial Statistics by Major Joint-Stock Company, 1688-1702

1688-1702				
Company	<u>Capital Stock (£)</u>	<u>Total Transactions (#)</u>	<u>Book Value of Transactions (£)</u>	<u>Average Book Value of Transactions (£)</u>
Bank of England (1697)	2,201,171	17,604	9,487,329	538.31
East India Company (1694-98)	1,574,608	3,163	1,710,130	540.67
Royal African Company (1697)	1,101,000	1,825	739,850	405.40
Hudson's Bay Company	31,500	680	164,186	241.45
Million Bank Subscriptions (1700)	500,000	129		

Source: See Appendix A and Scott, 1951.

Table 1b: Summary Statistics by Major Joint-Stock Company, 1719-23.

<u>1719-23</u>				
Company	<u>Capital Stock (£)</u>	<u>Total Transactions (#)</u>	<u>Book Value of Transactions (£)</u>	<u>Average Book Value of Transactions (£)</u>
Bank of England 1719-1721	5,559,995	12,580	10,342,091	822.11
Bank - 1719		2,294	2,286,064	996.54
Bank - 1720		7,915	6,645,266	839.58
Bank - 1721		2,371	1,410,762	595.01
United East India Company 1720	3,194,000	6,179	3,485,151	564.03
Royal African Senior &Engrafted(1720)	2,019,000	5,437	4,910,650	903.19
RAC Senior	450,000	1,102	666,610	604.91
RAC Engrafted	1,569,000	4,335	4,244,040	979.02
South Sea Company 1720	11,746,844			
South Sea Annuities 1723	16,787,100	21,561	16,787,167	778.59

Source: Appendix A and Scott, 1951.

Table 2: Correlation of Monthly and Daily Market Prices across Companies, 1719 and 1720

1719 Monthly Average	Bank of England	East India Company	Royal African Company	South Sea Company
Bank of England	1			
East India Company	0.8494*	1		
Royal African Company	-0.3132*	-0.1615**	1	
South Sea Company	0.2772*	0.3046*	0.6329*	1

*Significant at 1% **Significant at 5%

1719 Daily	Bank of England	East India Company	Royal African Company	South Sea Company
Bank of England	1			
East India Company	0.5462*	1		
Royal African Company	0.3065*	0.3572**	1	
South Sea Company	0.6553*	0.8154*	0.5287*	1

1720 Monthly Average	Bank of England	East India Company	Royal African Company	South Sea Company
Bank of England	1			
East India Company	0.9203*	1		
Royal African Company	0.8933*	0.8621*	1	
South Sea Company	0.9511*	0.9532	0.9207*	1

*Significant at 1%

1720 Daily	Bank of England	East India Company	Royal African Company	South Sea Company
Bank of England	1			
East India Company	0.5841*	1		
Royal African Company	0.6655*	0.7183*	1	
South Sea Company	0.6155*	0.8895	0.8235*	1

Source: John Castaing, *Course of the Exchange*, Accessed ESFDB

Table 3 Rates of Return 1718-1722

A. January-to-December Year

	Rates of Return – No Dividend				Rates of Return – with Dividend			
	South Sea Company	Bank of England	East India Company	Royal African Senior	South Sea Company	Bank of England	East India Company	Royal African Company▪
1718	-0.21	-0.48	2.17	-25.58	3.99	4.64	6.99	-25.58
1719	7.67	-3.66	-5.88	50.00	11.88	7.70**	-1.18	50.00
1720	55.79	-2.21	-15.11	87.50	63.58***	2.83	-10.11	87.50
1721	-50.75	-17.84	-15.44	-47.78				
1722	-7.08	-7.08	-4.63	-68.82				

Source: Share prices from Castaing's *Course of the Exchange*; Dividend data taken from Scott, *Constitution and Finance* which ends in 1720.

- Royal African Company issued no dividends during these years.
- ** Bank of England paid a 10 pound capital return in December 1719 in addition to dividend of 7.5%
- *** SSC paid a 10% dividend in stock in midsummer – taken here just as a straight 10% dividend

B. July-to June Year

	Rates of Return – No Dividend				Rates of Return – with Dividend			
	South Sea Company	Bank of England	East India Company	Royal African Senior	South Sea Company	Bank of England	East India Company	▪Royal African Company
1717/1718	2.50	0.34	8.80	-15.79	7.51	5.76	14.13	-15.79
1718/1719	3.42	3.21	-3.90	-25.00	7.84	10.49	0.98	-25.00
1719/1720	711.97	57.12	113.20	1141.67	722.44**	726.50	118.27	1141.67
1720/1721	-86.89	-45.59	-66.55	-79.66		-86.47***	-64.17	
1721/1722	-30.00	-8.69	5.19	-54.24				
1722/1723	7.32	0.43	-5.96	-9.26				

Source: Ibid.

- Royal African Company issued no dividends during these years
- ** SSC paid a 10% dividend in stock in midsummer – taken here just as a straight 10% dividend issued 25 June
- *** 4 pound dividend issued in Dec 1720. No data for 1721.

Table 4: Number of Unique shareholders by Company during 1690s.

Company	Total Unique Shareholders	Number of Unique Men	Number of Unique Women and Percent
Bank of England	4,782	4,145	637 (15.36%)
East India Company	860	813	47 (5.78%)
Royal African Company	900	880	20 (2.27%)
Hudson's Bay Company	219	209	10 (4.78%)
Million Bank	129	128	1 (0.78%)
Total: Unique Individuals by Company	6890		

Source: See text

Table 5: Portfolio Holdings by Unique Men and Women during 1690s

Number of Companies Owned	All Unique Shareholders	Unique Male Shareholders	Unique Female Shareholders
Owned in 1 only	4997 (85.9%)	4298 (84.4%)	699 (96.4%)
Owned in 2	596	572	24
Owned in 3	183	181	2
Owned in 4	35	35	0
Owned in 5	2	2	0
Total: Unique Investors in the Market	5813	5088	725

Source: See text

Table 6: Number of Unique Shareholders by Company 1719-23

Company	All Unique Shareholders	Number of Unique Men	Number of Unique Women and Percent
Bank of England	5,947	4,920	1,027 (17.26)
East India Company	3,699	3,204	495 (13.38)
Royal African Company Senior	950	870	80 (8.42)
Royal African Company Engrafted	2,690	2,439	251 (9.33)
South Sea Annuities	17,443	12,047	5396 (30.93)
Total: Unique Individuals By Company	30,729		

Source: See text

Table 7: Portfolio Holdings by Unique Men and Women 1719-23

Number of Companies Owned	All Shareholders	Men Plus Partnerships	Women
Owned in 1	18748 (79.0%)	13085 (75.5%)	5663 (88.6)
Owned in 2	3370	2769	601
Owned in 3	1245	1125	120
Owned in 4	280	270	10
Owned in 5	81	81	0
Total: Unique Investors in the Market	23,724	17,330	6,394

Source: See Text

Table 8: Investors with the most diverse portfolios in 1719-23 (Present also in 1690s)

<u>Men</u>	<u>Women</u>
Cornelius Backer	Mary Baker
Richard Baker	Elizabeth Bridges
Thomas Bridges	Mary Broughton
Peter Burrell (1690s)	Susanna Clark
John Clark	Johanna Cock
James Collier	Elizabeth Hyland
Edward Crull (1690s)	Ann Legg
Moses De Medina (1690s)	Elizabeth Matthews
Abraham Edlin	Anna Eleanor Shirley
Peter Fabrot (1690s)	Elizabeth Turner
Thomas Gibson (1690s)	
Alexander Gordon	
Moses Hart (1690s)	
John Humphreys (1690s)	
John Lambert (1690s)	
John Lewis (1690s)	
John Lloyd (1690s)	
John Lock (1690s)	
William Mead (1690s)	
John Puget	
John Roberts	
Joseph Taylor	
William Wilson (1690s)	
Thomas Woodward	

Table 10: Transfer Activity by Block Size of Face Value of Transfers

	Transactions (#)	Number <£100	Face value = £100 (#)	Face value = £500 (#)	Face value = £1000 (#)	Face value > £1000 (#)
Bank of England 1719-1721	12,580	.286	1035	3,762	2,893	1467
Bank – 1719	2,293	72	124	555	599	419
Bank - 1720	7,313	119	561	2415	2009	866
Bank - 1721	2,368	95	350	792	285	182
United East India Company 1720	13,558	265	719	4269	3338	2722
Royal African Senior & Engrafted 1720	5,437	160	1091	1243	1,163	662
RAC - Senior	1,102	151	147	291	259	58
RAC - Engrafted	4,332	9	844	952	904	604
South Sea Annuities	17,454	6,138	633	372	190	3,479

Source: Appendix A and text

Table 10A: Monthly Transactions over Whole Period: 1718-1721

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Sell	Buy	All	Sell	Buy
% Trans Women	1,813 (1.2)	909.7* (527.0)	151.9 (304.6)			
Log of Price	252.4** (97.23)	112.4** (45.57)	129.5** (62.30)	205.4** (92.64)	81.25* (42.23)	124.2** (61.18)
Variance	0.124 (0.135)	0.0701 (0.0622)	0.0436 (0.0899)	0.131 (0.136)	0.0890 (0.618)	0.0418 (0.0895)
Capital Stock	9.44e-06 (3.56e-05)	8.57e-06 (1.68e-05)	5.79e-06 (2.24e-05)	2.86e-05 (3.34e-05)	2.12e-05 (1.52e-05)	7.32e-06 (2.21e-05)
Constant	-963.2** (428.4)	-387.9* (197.4)	-385.9 (226.1)	-583.1 (388.1)	-231.2 (176.9)	-352.0 (256.3)
Observations	111	111	111	111	111	111
R-Squared	0.131	0.153	0.075	0.113	0.129	0.073

Standard errors in parenthesis

***p<0.01, **p<0.05,*p<0.1

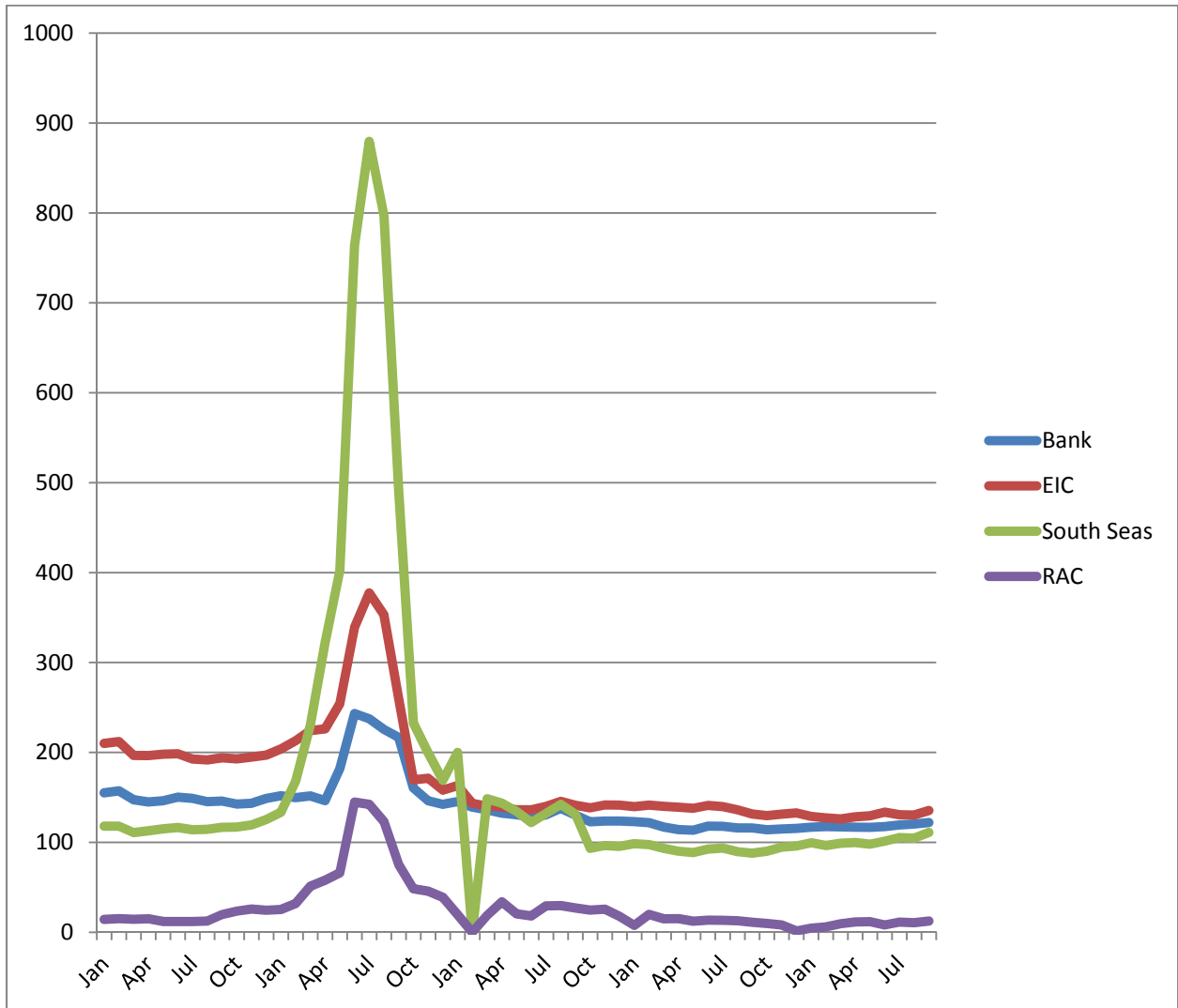
Table 10b: Monthly Transactions in pre-Bubble period

	(1)	(2)	(3)	(4)	(5)	(6)
	All	Sell	Buy	All	Sell	Buy
% Trans Women	7,109*** (1.287)	1,224* (617.0)	3,383.0*** (1,005)			
Log of Price	585.5*** (108.5)	35.87 (55.24)	603.4*** (131.8)	536.7*** (167.7)	-33.34 (45.71)	570.0*** (160.5)
Variance	16.67*** (3.873)	-0.592 (1.701)	21.40*** (4.596)	21.58*** (5.789)	-2.262 (1.578)	23.84*** (5.543)
Capital Stock	-8.25e-05 (3.57e-05)	1.30e-06 (1.40e-05)	-5.94e-05 (4.18e-05)	5.32e-05 (4.02e-05)	2.02e-05* (1.09e-05)	3.30e-05 (3.84e-05)
Constant	-2,857*** (584.2)	-101.2 (294.5)	-3,031*** (709.9)	-2,730*** (905.5)	260.5 (246.8)	-2,990 (866.9)
Observations	25	25	25	25	25	25
R-Squared	0.771	0.407	0.671	0.420	0.290	0.484

Standard errors in parenthesis

***p<0.01, **p<0.05,*p<0.1

Figure 1: Share Prices by month, 1719-1723



Source: Castaing, *Course of the Exchange*, EFSDB

Figure 2: Optimal CAPM Portfolios with five assets 1719-1722

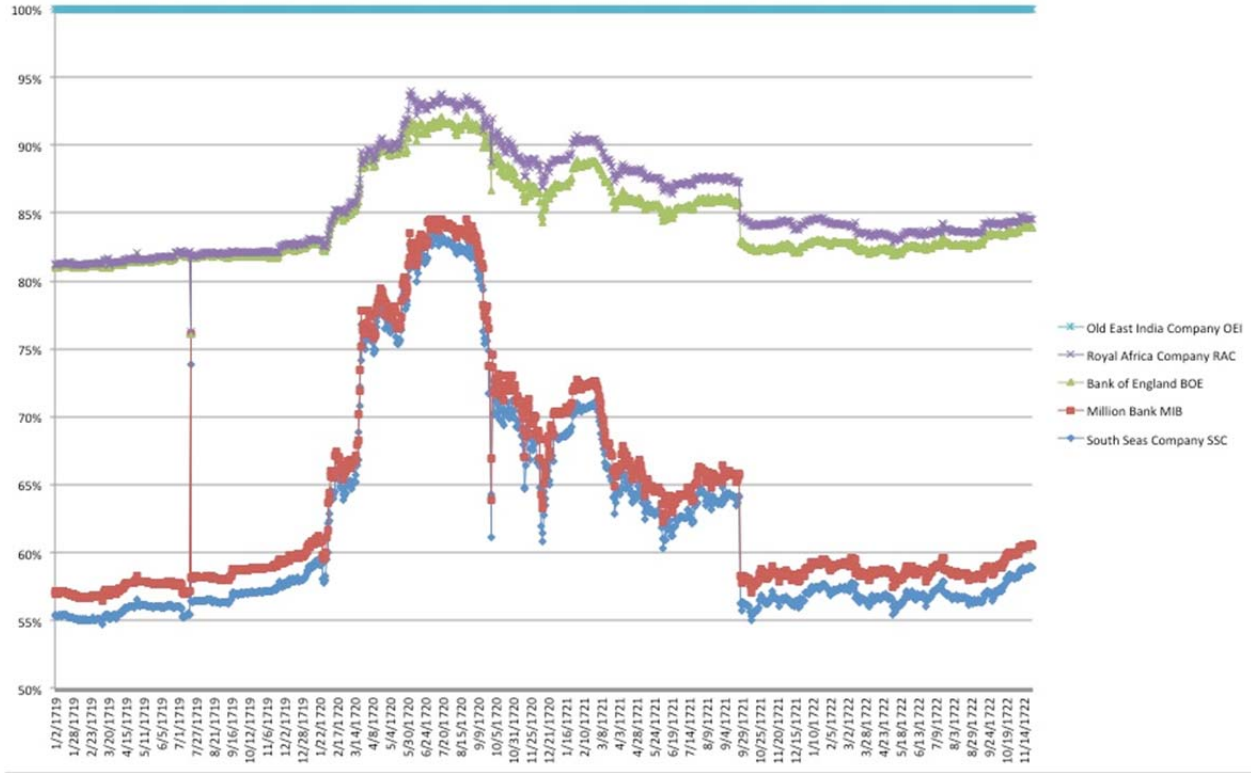
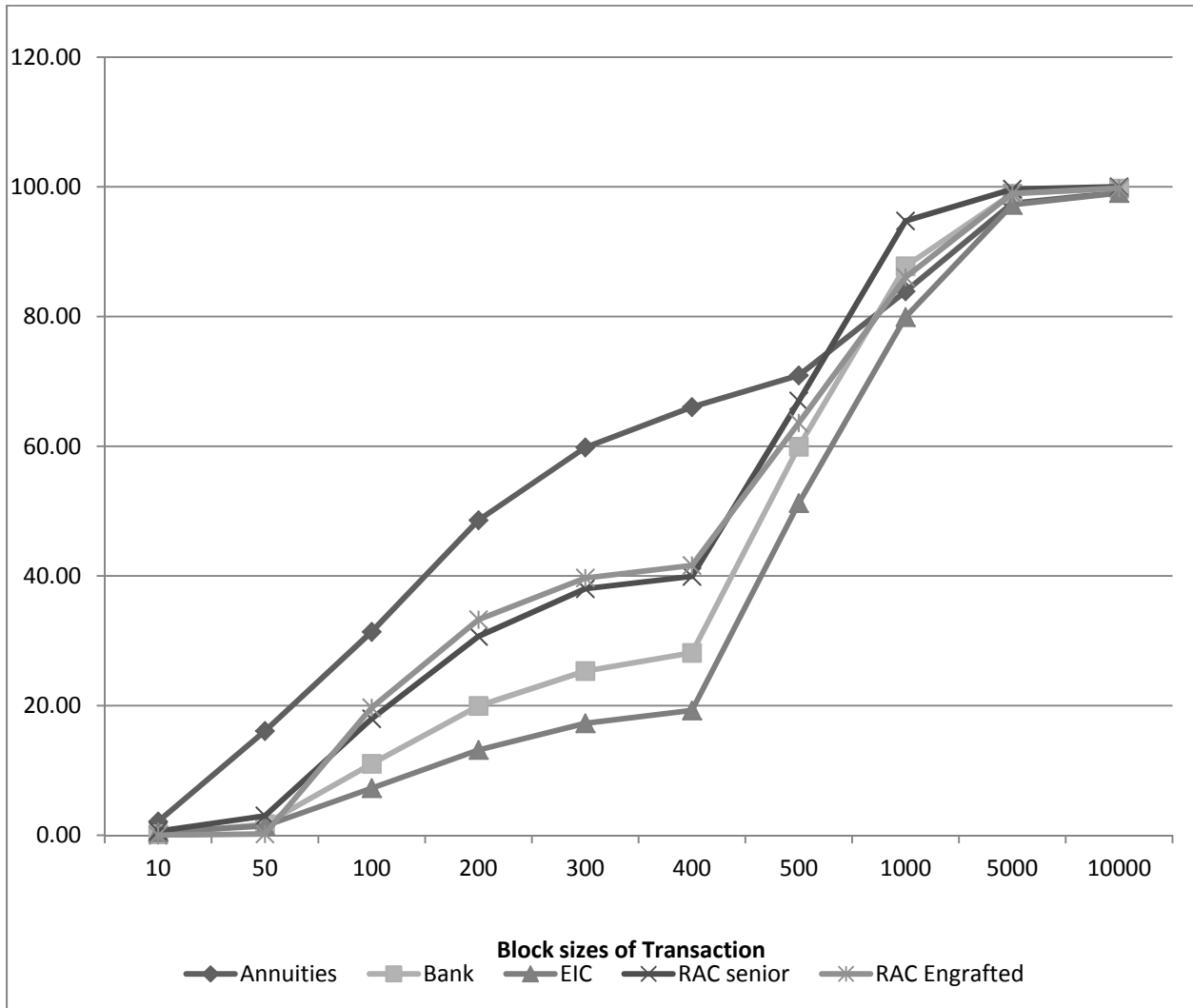


Figure 3: Cumulative Transfer of Shares by Block Size



Source: See Table 11

Appendix A

Company	Years	Source
Bank of England	1694 – 1702	Transfer Books, List of Subscribers for 1694 and 1697
East India Company	1691 – 1702	Ledger Books
Royal African Company	1688 – 1698	Transfer Books
Hudson’s Bay Company	1688 – 1702	Transfer Books
Million Bank	1700	List of Subscribers
Bank of England	1719 – 1721	Transfer Books, Alphabets to Stock Ledgers
United East India Company	1719 – 1720	Ledger Book F
Royal African Company-Senior	1720	Minute Books, Transfer Books
Royal African Company - Engrafted	1720	Minute Books, Transfer Books
South Sea Annuities	1723	Bank of England Annuities Ledgers

See Bibliography for further details.

Endnotes:

¹ Mary Broughton, as did many widows, acquired these shares in Bank of England, East India Company, Royal African Company and South Sea Company on the death of her husband in 1713. National Archives, PROB. 11/635.

² As Davies argued so eloquently: “It was the same propensity to invest that the Government was able to turn to good account, and it was on the same tide of optimism that the National Debt put to sea and floated to success.” “Joint-Stock” p. 301.

³ No doubt many shareholders were adding to these shares to a portfolio of other assets owned, such as, land, houses, mercantile activities, bills of exchange, mortgages, rents and loans. Although we have some information for a small number of individuals, the data do not exist to look at overall aggregate financial portfolios for stock holders.

⁴ In addition, the increased use of new banking structures, in turn, facilitated the purchase of stock. See Lawrence, 2008; Melton, 1986; Neal, 2011; Temin and Voth 2008.

⁵ In this context, financial development “occurs when financial instruments, markets, and intermediaries ameliorate – though not necessarily eliminate – the effects of information, enforcement, and transactions costs, and therefore do a correspondingly better job at providing the five financial functions.” (p.869) Financial systems can be divided into market-based or bank-based: each will provide these functions but do so in varying and different ways. Thus links between agents will depend on the structure of the financial system.

⁶ Systematic risk common to all securities could not be diversified away and is equated with the risk (or standard deviation) of the market portfolio.

⁷ Unlike the chartered joint-stock companies, few of these other companies had limited liability.

8. Tallies, life annuities, land were all less liquid due to the higher transactions costs in holding and selling such assets. See also Carlos and Neal (2011)

⁹ Carruthers, *City of Capital* ch. 6.

¹⁰ See Neal, *Financial Capitalism*, for a more extensive discussion.

¹¹ In work on the Bank of England Alphabet Ledgers, Carlos and Neal (2006) determined that the market for Bank of England shares was broad and deep: broad in the sense that individuals living in all counties in England and overseas owned Bank shares; deep in that individuals from all strata in society from elites, merchants, tradespersons, shopkeepers, to apothecaries, wiredrawers or servants owned stock. Access to the market was further enhanced as many of these companies allowed the purchase of part or a share or joint ownership of a share.

¹² We are extremely grateful to Anne Murphy for her generosity in sharing her data.

¹³ We have only the transfer data for the Royal African Company for 1720, but the complete ownership records for the engrafted issue.

¹⁴ Castaing only provided data on those companies for which there was an active market. He lists prices for Hudson’s Bay Company stock at the end of the 1690s but the company is not listed in the 1719-1723 period.

¹⁵ These are the dates of the formal charter. Some like the Royal African Company developed from earlier companies such as the Guinea Company.

¹⁶ The agreement in 1722 between the Bank and the South Sea Company is known as the Bank Treaty. As part of the Bank Treaty, the capital stock of the Bank was also increased.

17. The company's books disappeared in the aftermath of the Bubble. Some suggest that the books were taken to Europe with fleeing company officials.

¹⁸ Beginning with the chartering of the Bank of England in 1694 when the government received a £1,200,000 loan. Then in return for a £2,000,000 loan in 1698, Parliament incorporated the *English Company trading to the East Indies*. This company is known as the "New company" or "English company" to distinguish it from the "Old company" or the "London company" (Scott, vol. 2, pp. 162-8). By 1710, the costs of the war had again put public finances under severe strain and neither the Bank of England nor the United East India Company was willing to lend to the government. Two options were available to Parliament. The first was to charter a new company on the same basis as the Bank and the East India Company, with the share capital being lent to the government in return for a charter and a guaranteed annual interest payment. The second strategy, which had been used with the chartering of the Million Bank in 1695, was to incorporate some owners of existing government debt into a company through which debt holders would swap their debt for an equity position in the company, with a grant of trading privilege as the inducement to accept a lower rate of interest. This second strategy was chosen and the South Sea company was incorporated in September 1711 with £9,471,325 of debt converted to equity, with the company received 6% interest annually and the right to trade in Spanish South America. See Scott, vol. 3, pp. 293-295.

¹⁹ Share prices from Castaing's Lists were accessed from the European State Finance Data Base.

²⁰ Some companies had days with few or zero transactions.

²¹ In a recent working paper examining only Bank of England and East India Company stock ownership, Shea (2011, p. 30) shows that a shareholder could reduce total risk over the 1719-1721 period by owning in both Bank and East India companies.

²² Returns are measured as $P_{t+1} - P_t / P_t + D / P_t$.

²³ Price information comes from the European State Finance Database. Dividends come from Scott which unfortunately ends with 1720.

²⁴ This market index speaks to a serious gap in our understanding of the South Sea Company in the years prior to 1720.

²⁵ The decade of the 1690s was one of considerable market activity. As a response to what was perceived as excessive activity in the share market, Parliament passed legislation restricting the number of sworn brokers to 100. See Murphy (2010) and Carlos, Key and Dupree (1998). The number of transactions is somewhat dependent on the capitalization. Activity in the Bank of England includes those who initially subscribed in 1694 for the original £1,200,000 capital and then for the additional capital stock of £1,01,171 in 1697, constituting the £2,201,171 shown in Table 1a. However, even if one were to subtract out the initial capital subscriptions, there is considerably more activity in bank shares in this decade than in the others.

²⁶ Due to its arrangements with existing shareholders, the company kept separate records of its transactions in both the senior and engrafted stock.

²⁷ The data include the first few months of 1721.

²⁸ These data reconfirm Earle and Lindert's separate finding of deep wealth holdings across the social structure in London.

²⁹ Even if we were to allow each 'John Smith' to be a single individual, this would increase the number to no more than 6,000 unique people.

³⁰ It is possible that the Million Bank list reflects a tight network of individuals interested in setting up this Bank whereas activities in the other companies reflect actual market transactions.

³¹ Although the Annuities were fixed income instruments and not equity, the allocation was wholly dependent on ownership of South Sea shares in 1720. Thus those who are listed as the first annuity holders had bought South Sea shares at some time. This could have happened between the end of 1720 and 1723, but the majority of shares would have been acquired either during the Bubble or in the years preceding it.

³² A number of the men in this group of eighty one were well-known in financial circles as agents, market makers or brokers, such as Humphreys, Mead, Wilson and Woodward who were goldsmith bankers; Edlin and Hart sworn brokers; Cornelius Backer and Peter Burrell, agents for the Dutch community in Amsterdam; and a Joseph Taylor who was likely the Joseph Taylor responsible for the placement of the RAC engrafted stock issue in May 1720.

³³ Without more information on location, marital status, or occupation, we cannot be certain, of course. Address is only recorded in the Bank of England alphabet ledger books.

³⁴ Many of those present in the 1690s and two decades later are major brokers, goldsmith bankers and agents for the Amsterdam communities, both Dutch and Jewish.

³⁵ Because we are only counting those in the market in the 1690s and from an unbalanced panel over 1719-1723, the number of unique individuals is an underestimate of the true number.

³⁶ Dickson estimates that foreigners comprised about 15% of Bank of England shares. But total foreign ownership aggregated over all companies was most likely less than this.

³⁷ What any individual could purchase depends on which company stock was involved. A £500 book value of Royal African Company shares has a lower market value than a similarly sized block of Bank or East India or South Sea shares.

³⁸ Their results show that individuals today across many countries do not understand the difference in risk between a stock and a mutual fund, suggesting they also lack understanding of the role played by diversification.

³⁹ This pattern of holding is also supported by anecdotal evidence. In the aftermath of the banking crisis in Ireland, for example, many bank shareholders believed themselves diversified because they owned shares across a number of different banks.

⁴⁰ Earle, *Making of the Middle Classes*, p.146 Table 5.3.

⁴¹ Glaisyer, "Calculating Credibility" 2008, p. 688.

⁴² The currently first extant volume of Hayes' book is 1726. As Glaisyer (691) notes, Hayes gives examples of how to calculate dividends from the East India company and Bank stock among other things.

⁴³ See Murphy, Laurence and Quinn on the use of individual brokers or bankers.

⁴⁴ We undertook the analysis using daily and weekly prices; however, there are many days with zero transactions and at the weekly level variance is so low for each stock that it is highly correlated with price.

⁴⁵ The results for women are in proportionate form and so have to be divided by 100.

⁴⁶ Company rules also term limited the Governor, Deputy Governor and the Court of Assistants.

⁴⁷ The companies paid particular attention to share ownership by the board and the governors and could and sometimes did ask the individual to step down if shareholding fell below the required amount. The charter also defined length of term of office, thus, generating turn over in board personnel.

⁴⁸ This was done to reduce a popular perception of engrossment of the stock by particular individuals.