Did Speculation in Land Pay Off for British Investors?
Buying and Selecting Land in South Australia, 1835-1850

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30 August 2018

Abstract

In 1834, Britain's Parliament passed the South Australia Act establishing South Australia as a colony. By December 1835, 130 British investors had purchased 437 priority land orders (PLO) at £81 per order, allowing selection of a surveyed one-acre lot in the capital city of Adelaide and 80 surveyed country acres. In March 1837, PLO investors selected 437 lots from 1,000 surveyed Adelaide lots, with remaining lots sold one week later at auction. Investors who sold city lots in 1838/1839 earned on average 59 times initial investment, while investors who held until 1850/1852 saw the average assessed value of Adelaide lots and buildings increase by 16 times the initial investment in the lot. Initial Investors were able to identify higher-value lots, as higher prices paid for lots in 1837 predict higher sales prices in 1838/1839 and early selection of lots and higher prices paid for lots in 1837 predict higher assessed property values in 1850.

For Presentation
Dept. of Economics, University of Colorado
Wednesday, Sept. 5, 2018 at 3 pm

*We thank Lyndon Wester and participants in seminars at the University of Hawaii, University of Arizona, and the 2018 Asia Pacific Economic and Business History Conference for helpful comments and suggestions. We also thank staff at the State Library of Victoria, State Library of New South Wales, State Library of South Australia, the National Archives of Australia, and State Records of South Australia for their help in locating sources.

I. Introduction

Did British investors earn supra-competitive returns from their investments in British colonies during the nineteenth century? Michael Edelstein (1982) and Lance Davis and Robert Huttenback (1986) both found small premiums in returns to British empire investment over returns to investment in Great Britain.[1] For example, for extractive and agricultural industries in the 1875-1912 period, Davis and Huttenback (1986:102) found that empire firms had annual returns of 11.3 percent compared to returns of 9.5 percent for domestic firms. For all industries in the 1870-1914 period, Edelstein (1982:126) found that British overseas firms had annual returns of 5.7 percent compared to returns of roughly 4.5 percent for domestic firms. Less work has been done to calculate returns on domestic, empire, and foreign investment in the post-Napoleonic war period, 1815-1870. Edelstein (1982:21-28) noted that only about 10 percent of British savings (i.e., 1-1.2 percent of British GNP) was devoted to colonial and foreign asset formation during the 1830s and 1840s, with a large part of these funds devoted to building railroads in Europe and to lending to South American governments rather than to British colonial ventures. Leland Jenks (1927:104) underscored the very small portion of empire investment devoted to Australasian colonies when he noted that "the sporadic undertakings" in New Zealand and Australia over the 1830-1850 period "relieved England of little of her capital" and "did not … earn her dividends until Australia became a synonymous for gold." The very small size of empire investment in

[1] Recent scholarship has also debated whether there was a discount paid by borrowers in the London financial markets for investment made within the second empire. See Ferguson and Shularick (2006) and Accominotti, Flandreau, and Rezzik (2011).

Australasia may be partly responsible for the dearth of studies that specifically address returns to investments in British empire ventures in Australasia during the 1830-1850 period. This article aims to fill this gap by using a unique data set on prices and valuations of land from 1837 to 1852 in the city of Adelaide, the capital of the British colony of South Australia, to estimate short-term and medium-term returns to selections and purchases of newly surveyed city lots at Adelaide's founding in March 1837.

South Australia only appeared on the radar of advocates for new British colonization ventures when reports of Captain Charles Sturt's exploratory expedition along Australia's southern coast reached London in 1830. South Australia (SA) was comprised of thousands of miles of land located between penal colonies on Australia's east and west coasts that had aboriginal settlements of unknown location and size. Sturt conveyed the news that a "magnificent" river reached the sea in SA, and this raised private interest in promoting colonization of the area (Pike, 1967:55). Sturt's report helped revive the National Colonization Society, a group formed in 1829 that brought together influential members of Parliament, businessmen, radicals, and investors swayed by visions of big profits to be earned from investing in land in new colonies. The Society was heavily influenced by Edward Gibbon Wakefield's writings on colonization, particularly the pamphlet, *A letter from Sydney* (1829), which advocated concentrated settlement of limited land areas, with land sold at a sufficiently high price to prevent laborers from becoming land owners too quickly and the use of revenue from land sales to subsidize emigration of laborers to the colony. Wakefield endorsed SA as the place

where his new scheme of systematic colonization could best be carried out. After several initial colonization plans developed by his supporters were rejected by the British government, a compromise was developed that preserved the essentials of Wakefield's colonization scheme. In August 1834, Parliament approved the colony's establishment with its passage of the South Australia Act (4 & 5 Will. IV c. 95) which conditioned government approval of the new colony on the sale of £35,000 worth of land as well as the raising of a loan of £50,000 via public tender.

The Act charged eight colonial commissioners with selling "preliminary land orders" (PLOs) for unseen and unexplored locations in a new, yet-to-established colony more than 5,000 miles from Britain. Preliminary land orders (PLO) were to be sold in packages entitling the owner to choose a one-acre rectangular lot in the capital city and 80 acres of country land for £1 per acre. By the end of 1835, 437 land orders worth £35,000 had been sold and the process of settlement could begin.

In March 1836 the colony's surveyor general and a team of surveyors sailed from England to select sites for a capital and port, lay out lots in the capital, and survey lands in the country. Settlers left soon after, arriving in SA in November 1836. They were expecting that the capital city would be staked out for parcel selection and that sufficient country lands would be surveyed to allow selection of their rural parcels shortly after arrival. William Light, the colony's surveyor-general, was, however, slow to select sites for the port and capital and settlers arriving in SA in November 1836 found neither city nor country lands surveyed. In February 1837, Light completed staking out 1,042 one-acre rectangular lots that fully encompassed the new city of Adelaide, with 42

lots reserved for various public purposes. PLO rights holders who had migrated to the colony, family members acting as their agents, professional agents, and the other recently-arrived migrants were able to walk around the staked-out lands to gather information before PLO lots were selected or purchased in the subsequent auction. In the morning of March 23 the colony's resident commissioner held a lottery to determine the order in which the owner of each PLO would choose a town lot. In the afternoon PLO rights holders or their agents selected 402 lots within the city boundaries. Sequential English auctions with an upset price of £1 per acre were then held for each of the remaining 593 lots on March 30.

Our analysis focuses on two overarching questions. The first question is whether speculation in SA land paid off for the PLO investors and the buyers of city lots at auction. In the 1835-1837 period, there was considerable uncertainty regarding whether the colony would be a success and, if so, when. The disastrous outcomes observed in the West Australia colony just a few years earlier provided a particular note of caution. PLO investors made their decision to buy land in SA in 1835 without any information what-so-ever as to the location of the capital, its port, outlying country lands, and the productivity of SA lands in pastoral and agricultural industries. Their decision to invest rested on the report from Captain Sturt's expedition showing that the Murray River, the largest river system in Australia, reached the Indian Ocean in South Australia and on the incorporation of Wakefield's principles of systematic colonization into the colony's organization. That investor expectations were not particularly strong is reflected in the Colonization Commission's decision to reduce the price of land, from 20 to 12 shillings

per acre, after initial sales of colony land in the summer and fall of 1835 were well short of the South Australia Act's requirement that £35,000 of land be sold prior to colonization.

The second central question is how well investors choose between Adelaide lots in the PLO selection process and the subsequent auctions of the remaining city lots. Did the PLO rights holder who drew the first choice in the lottery—Samuel George Smith—pick the most valuable of the l,000 available city lots? Ditto for the rights holder—Daniel Bushnell Major—who drew second choice in the lottery: Did this person pick the most valuable lot from the 999 remaining lots? In a world with perfect information, we would expect this pattern of picking the most valuable remaining lot to continue until the last of the PLO lots had been selected. With respect to auction participants, we expect that in a world of perfect information the highest price paid at auction for one of the remaining 593 lots would mean that this lot would be the 403rd most valuable, ranking behind the 402 lots selected by PLO holders. The next highest price paid at auction would make this lot the 404th most valuable, and so on. Information on prospects for the City of Adelaide and the value of particular lots was, however, far from perfect, and investors and their agents clearly had incentives to gather information on the lots and on other settlers' and investors' valuations of the lots.[2] Obtaining information on

[2] The auction process can be more formally characterized as a sequence of first-price auctions (with a minimum upset price) of a finite set of heterogeneous objects with a common but uncertain value. One of the few clear theoretical results pertaining to this type of auction is that revenue maximization by the seller is more likely when auctions of lots are held sequentially rather than simultaneously. See Hortaçsu and McAdams (2018) for a survey of empirical work testing auction theory.

specific lots was, in part, facilitated by the exhibition of a map of the town after survey had been completed (Stephens, 1839: 101). In the period between the completion of the staking out of the city into lots (March 10) and their selection (March 23) and purchase at auction (March 30), were investors and their agents able to gather enough information to rank the lots by their relative future values?[3]

To answer our two central research questions, we develop five more specific questions relating to the purchase and selection of land in Adelaide. First, once land parcels in Adelaide became available for selection, which land features were more highly valued by investors holding the 437 PLOs? Did investors who bought the remaining 593 parcels in the subsequent auction value land features differently? Second, did investors with multiple parcels scatter or cluster their claims? Third, did investors with lower lottery numbers select lots that would be more valuable than lots selected by investors with higher lottery numbers? We evaluate this by estimating the relationship between the order of PLO selection and assessed valuations of lots in 1850, the first year in which the Adelaide Council assessed properties to levy rates. Fourth, we then apply the same analysis to investors who purchased the remaining 593 parcels at auction. Did investors who paid higher prices at auction select lots that realized higher market prices in 1838 and 1839 and higher assessed values in 1850? Finally, we apply the same analysis to a unified data set of priority land orders and auction sales to evaluate whether the highest valued lands were chosen by the first 437 PLO investors,

[3] The process of staking out the city started on January 11 and some investors and agents could have been gathering information from that date.

thereby leaving lower-valued lands to investors who purchased at the March 30 auctions.

To answer these questions, we assemble a data set with six types of variables: (1) geographic characteristics of the 1,000 parcels available for selection and purchase in Adelaide in March 1837; (2) the sequential choice of each of 402 PLO parcels; (3) prices paid at auction for each of the remaining 593 parcels; (4) characteristics of selectors and purchasers, including their gender, occupation, and SA migration status; (5) transaction prices from 1838 and 1839 for a sample of Adelaide lots sold at auction in 1837; and (6) assessed values for South Adelaide lots in 1850 and North Adelaide lots in 1852.

Our econometric analysis yields five clear results. First, British investors who speculated in SA land in 1835 earned exceptionally high returns, regardless of whether they resold their town lots in 1838/1839 or held their lots until 1850/1852. Average prices in 1838/1839 had increased by a factor of 59, while average valuations in 1850/1850 for lots sold at auction in 1837 had increased by a factor of 16. Second, we find a positive and statistically significant relationship between the price paid at auction in 1837 for a town lot and the price paid for the same lot in both 1838 and 1839. A 10 percent increase in the price paid at auction in March 1837 is associated with an 11 percent increase in price in 1838 and 1839. Third, we find a positive and statistically significant relationship between an earlier selection of a PLO lot and its assessed value in 1850/1852. Results from regressions using categorical variables for the PLO selection order show the positive association with assessed property value in 1850/1852 is limited to the initial 90 PLO ballot holders. Fourth, we find a positive and statistically significant

relationship between the price paid at auction for a lot in March 1837 and its assessed value in 1850/1852. Finally, we find that the first 402 PLO selectors were successful in choosing only 163, or 41 per cent, of the 402 lots in Adelaide with the highest assessed values in 1850, with the remaining 241 of these lots purchased by investors at the March 30 auction.

In sum, virtually all of the initial British investors in Adelaide lots earned exceptional returns, whether over a 2-3 year period or over a 13-15 year period. Investors had, however, much more limited success in ranking lots within Adelaide with respect to their future value in 2-3 or 13-15 years.

II. The Origins and Initial Settlement of the South Australia Colony

The National Colonization Society was led by two close associates of Wakefield, Robert Gouger and Major Anthony Bacon, and in 1832 the Society developed an initial plan for colonising SA that revolved around a powerful for-profit company with £500,000 in capital selling SA land and controlling the colonial government. The Colonial Office rebuffed this plan and the Society responded with a revised plan that retained a for-profit corporation, the SA Land Company, as the organization that would make and enforce rules for colonization. James Stephen, permanent counsel to the Colonial Office and from 1834 assistant under-secretary of state for the colonies, derided the new plan as “wild and impractical”. Hopes for approval increased with the change of government in 1833 and the appointment of Lord Stanley, a politician more sympathetic to rational colonization ideas, as Secretary of State for War and the Colonies. A revised plan nonetheless failed in March/April 1833 after renewed

objections from the Colonial Office (Pike, 1967:64-65). Later that year promoters of SA colonization offered a new plan based on a non-profit SA Association. In March 1834, the Association's governing committee submitted a draft of a bill to the Colonial Office that established a hybrid type of colony, "something between a Crown and a charted colony." It stipulated that the Association's governing committee would administer the Crown colony and have a role in nominating and replacing the colony's governors (Pike, 1967:68). Lord Stanley insisted the bill provide for immigration to the colony only after a loan of £50,000 was raised and £35,000 of land sold. A much amended version incorporating Lord Stanley's requirements passed through the Houses of Commons and Lords in August 1834 and was ratified by the King.

The government then appointed eight Colonial Commissioners comprising both Tories and Liberals who moved slowly over the next year to start the process of establishing the colony according to Wakefield's systematic colonization scheme (Bloomfield, 1961:137l; Price, 1967:30-31). At the heart of Wakefield's scheme was establishing a 'sufficient' price at which land would be sold. This was considered to be "the price which is necessary to secure such a supply of labor as may be sufficient to raise from the land and from other sources the greatest quantity of produce in proportion to the number of hands employed" (British Parliamentary Papers 1836: 447). Increases in labor supply would follow whenever new lands were sold, as proceeds from all land sold in the colony would be used to assist qualified migrants with passage.[4]

[4] Settlers applying for assisted passage to SA were required to complete a form detailing their occupation, age, marital status, and number of children. The form included the name of a recent employer who would vouch for the applicant as well as the minister of the local parish in

Migrants would provide a steady supply of wage labor that could be exploited by those owning land, thereby supporting profitable capital investment. For Wakefield's scheme to work, the price of land had to be sufficiently high that it would prevent immigrant labourers from purchasing land until two or three years after arrival in the colony (Bloomfield, 1961:135). In 1836, the *First Annual Report of the Colonization Commissioners of SA* provided a succinct and emphatic statement of these principles (p. 465): "The foundation and cardinal principle of the self-established and self-supporting colony of South Australia is, that the waste and unoccupied land shall be sold at a price sufficient to carry out the requisite supply of labor for its cultivation."

Initially, Wakefield quantified the sufficient land price at £2 per acre, and lobbied Parliament and, later, the Colonization Commission for that price to be adopted. Setting the price at which rights to Crown lands would be sold was more difficult than Wakefield envisioned because the Colonial Commissioners confronted two different and distinct subjects: the proper price to satisfy Wakefield's general principles and the actual price that might be practicable to realise under existing circumstances. The outcome was a compromise between the two pricing principles: The SA Act set the minimum price of land at 12s per acre and the Commissioners decided to sell priority land orders in London for 20s per acre, i.e., just half of Wakefield's proposed price of 40s per acre.

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which they resided. Preference was given to married couples and those with trades that would be required in the colony, including, for example, agricultural laborers, coopers, smiths, boat-builders, tanners, and brickmakers (*First Annual Report of the Colonization Commissioners of South Australia*, 1836:27-28). Of the 9,422 applications for assisted passage between 1836 and 1840, embarkation orders were issued to 5,070, about 54 percent of applicants (Pike, 1967:154).

Wakefield criticised the 20s price as far too low and, from that point, distanced himself from the SA colonial experiment (Mills, 1915:237-238).

Land was sold in bundles of 80 country acres and 1 city acre for a total price of £81. Regulations governing country land sales and leases as well as selection of PLO city lots and auction of remaining city lots were issued in June 1835 and sales of 81-acre claims were initiated.[5] By August 1835, land sales had stalled, with just over half of the required amount sold. The essential difficulty was pointed out by the Secretary of the SA Colonization Commission, Rowland Hill: "[I]t was one thing for a monied man to exhibit enthusiasm about an abstract proposition at a public meeting, and quite a different thing for him to give substantial proof of the lasting qualities of that feeling by tabling down money for land which, no one knew anything about" (Sutherland, 1898:36). It soon became apparent that 20s per acre was considered to be too high a price by the public, particularly since rural lands were available for sale in New South Wales at 5s per acre (*First Annual Report of the Colonization Commissioners of SA*, 1836:4). To prevent the collapse of the SA colonization scheme, three investors—George Fife Angas (a Commission member), Thomas Smith, and Henry Kingscote—formed the SA Company which offered to buy the remaining 81-acre bundles at a reduced price of 12s per acre. Their offer prompted a surge of buying activity at the 20s per acre price by other parties, bringing the number of packages sold to 335, still far

[5] Those who purchased land could also secure free passage for one servant for every £20 subscribed (Bloomfield, 1961:138). Pike (1967:150) stated that "the land-buyers' privilege was freely used." Two examples include the South Australian Company, which sent out 350 laborers, and Sir Montague Chapman, who "sent out 213 of his tenants and laborers, rendered homeless by enclosures in Ireland … to work under direction of his agent, the devout Captain Charles Harvey Bagot."

short of the required 437 packages (Price, 1924:33-34). To further stimulate buyers, the Commission reduced the price of land to the legal minimum, 12 shillings, and allowed the three main SA Company investors to purchase the remaining 102 lots and transfer them to the Company. Investors who had already purchased land packages (or put down deposits) were each compensated for the reduced price paid by the SA Company with an award of rights to an additional 54 acres of country land, thereby leaving them with one city acre and 134 country acres.[6]

By the end of December 1835, the Commission had received commitments for £35,000 in land sales and the requisite loan of £50,000 had been secured. The government then gave permission to the Commission to recruit emigrants and it moved aggressively in the winter of 1836 to undertake this activity. Ships carrying survey officials charged with choosing a city location, staking out city lots, and surveying country areas for selection by PLO investors left England in April 1836. Once the Surveyor-General arrived in SA with his (small) team of surveyors on August 17, 1836, exploration of the coastline ensued to identify a suitable location for a port and capital city.[7] This took several months and was further delayed as a result of disagreement between Surveyor-General Light and Governor Hindmarsh as to the most appropriate sites. Sites for the port and city were finalized in January 1837 after a public meeting

[6] Pike (1961) has an alternative view of the sluggish land sales and subsequent price reduction. He argues that prominent buyers of PLOs limited their purchases and the Colonial Commission put little effort into marketing PLOs in order to force a reduction in the price of PLO land, thereby conferring benefits ("a land job") to the initial buyers.

[7] The ship (*Cygnet*) carrying George Kingston, the assistant Surveyor-General, did not arrive until Sept. 11, 1836, thereby leaving Surveyor-General Light short-handed for almost a month during the exploratory phase of his mission.

voted to approve Light's site selection over the objections of Governor Hindmarsh and his supporters (Price 1924:62-63).

In July/August 1836, only four months after the departure of survey officials from England to SA, the first ships with emigrants sailed.[8] Some left ahead of schedule as they had wrapped up their affairs in England, travelled to the embarkation port, and were eager to get started with life in the new colony. These settlers arrived unexpectedly early, in November 1836, and were shocked to find that neither city nor country land site had been identified, let alone surveyed, and that long delays seemed likely before they would be in possession of city or country acres. The survey of 1,042 one-acre rectangular plots in Adelaide finally commenced from January 11, 1837 and completed on March 10. Douglass Pike (1924:174) observed that "the 437 preliminary land orders went originally to 130 buyers. But by the middle of March, when the survey of the town site of Adelaide was completed, only twenty-five original purchasers had reached the province, although fifty-six were represented by their relatives and most of the others by agents." Some buyers had purchased multiple PLOs, and Figure 1 provides a listing of these people, their holdings, and their occupations.

The SA Colonial Land regulations stipulated that allocation of city lots would be by lottery, with all PLO purchasers provided with a lottery draw for each PLO package to

[8] Ships with South Australian Company management and employees also left early. Any advantage from their early SA arrival was lost by the Company's decision to establish an initial settlement on Kangaroo Island, a place with little water or arable land.

determine the order of selection of city lots.[9] At a meeting of 17 March 1837, details of the lottery, selection and auction procedures were set.[10] Forty-two of the 1,042 lots were reserved for parks, schools, and other public purposes. The lottery took place in the morning of 23 March 1837 and selection of 402 lots in the afternoon. One week later, one-by-one, the remaining 593 lots were auctioned.[11] Fifty-seven investors participated in the auction; only 35 lots were purchased by PLO rights holders (Pike

[9] Why did the Colonial Commission use a lottery to allocate the order of selection for PLO city lots? The Commission may have been recognizing a problem that occurs when each package of city-country land must be sold at a single price, as mandated by the South Australian Act establishing the SA Colony. If the land packages are heterogeneous, then setting a price equal to their average value leaves all lands with a value below the average value unsold. If, however, lands are allocated via a lottery, then setting a price equal to the average value of land allows all land to be sold if buyers are risk neutral. Holding the lottery within a few hours of the lot selection would also serve to reduce rent-dissipating information-gathering activities.

[10] Owners of multiple PLOs were allowed to consolidate some or all of their choices around a single ballot, providing they gave sufficient notice to the Resident Commissioner prior to the lottery (South Australian Company, Business Record Group 42, Series 59-67 and *First Annual Report of the Colonization Commissioners of South Australia*, Appendix No. 1, 1836:18-20). Consolidation of some of the 437 PLOs reduced the number of draws in the lottery to 287. Perhaps to diffuse questions about its market power in the city, the SA Company decided to draw each of its 102 PLOs under separate draws. Before the lottery drawing, the SA Company had traded rights to 30 PLO choices in the city and country for a "special survey" that allowed them to choose 4,000 contiguous acres from an area of 20,000 country acres surveyed by the Commission. At a public meeting on February 10, a proposal by Governor Hindmarsh to allow PLO rights holders to select lots laid out at the port was approved and 29 PLO rights holders choose this option (Price 1924:63).

[11] Why did the Commission choose to specify an auction to allocate the remaining city lots? In its *Regulations for the Disposal of Land*, the Colonization Commission stated that it knew the town lots were worth more than £1 per acre. If the £1 fixed price applicable to sale of other colony lands was used for the sale of the remaining city lots, the Commission argued that a single buyer would likely buy all the city lots and thus capture their rents at resale. Sale of the remaining city lots at auction would allow the Colonization Commission to capture these rents and to apply them to the Emigration Fund where they would provide public benefits to land owners (*First Annual Report of the Colonization Commissioners of South Australia*, Appendix No. 1, 1836:20).

1967:174). The Durrant Family website provides us with information regarding the sequence in which the remaining lots were auctioned.

Surveyor General Light's map of Adelaide (Figure 2) shows the selection of lands made by priority land order holders. Figure 3 is our more stylized rendition of Light's map; in this figure, "R" designates roads and the acre numbers represent the order of selection made by PLO investors.

III. Method and Analysis

The people who purchased the 437 priority land orders in England made their investment without any information what-so-ever as to the location of the capital, its port, or the country acres. Nor did PLO investors understand that they would choose their town lot(s) based on a ballot number(s) drawn in a lottery conducted in the colony. Assuming investors were profit maximisers, this implies that PLO rights holders chose the city lots they believed would yield the highest returns to them. We note that investors' choices became increasingly constrained as early PLO ballot holders claimed lots, thereby restricting the pool of town lots from which the next PLO investors could select. For example, if individual X drew ballot number 7, her choice would be limited to the acres remaining after the previous six selectors exercised their choices from the 1000 lots available. Using the empirical data from Adelaide, this means that X would not be able to pick acres 267, 306, 202, 335, 378, 303 but could opt for any other lot from the 994 remaining parcels.

A central question is whether the parcels picked by early PLO ballot holders had the highest future valuations. To answer this query, we make use of two sets of data measuring the value of Adelaide lots: Market prices of lots in 1838 and 1839 and assessed values of lots in 1850 and 1852. Our first data set documents a massive increase in transaction prices of Adelaide lots in 1838 and 1839. After the distribution of town lots in March 1837, owners were frustrated by infighting between officials appointed by the Colonial Commission and those appointed by the Colonial Office which led to the slow survey and allocation of country lands to PLO holders and subsequent purchasers. Surveyed country lands slowly become available to selectors in 1838 and 1839, but fewer than 8 acres were cultivated in 1838 and many migrants remained in Adelaide without substantive work. The slow start to the Colony did not deter Adelaide residents from speculating in town lots. In his 1839 book on the South Australia Colony, John Stephens (1839:102) observed that "[t]hrough the demand by new comers from England, or from the surrounding colonies, [town lots] have sold at 50*l*. per acre". Some lot prices exceeded £1,000 in the second half of 1838 and 1839. The sharp increases were partly driven by the 13,842 migrants who arrived in SA from Europe between November 1836 and August 1840 and needed housing in Adelaide given the lack of rural opportunities.[12] With the British government's suspension of migration in August 1840 and large increases in the number of farms between 1840 and 1842, the population of Adelaide, the port, and surrounding villages declined, from 9,196 in 1840 to 7,427 in

[12] An unknown number of additional migrants also came to SA from Western Australia, New South Wales and van Diemen's Land from 1837 to 1839.

1842 (South Australian Statistician 1840; 1842). Pike (1967:243) concluded that the mania "died down" in the summer of 1840-1841 "through the withdrawal of support by backers in England and in the neighbouring colonies."[13] The change in support from backers in the other Australian colonies was in large part due to the 1841-1843 depression that hit all colonies.

Our task of analysing lot prices is complicated by the lack of any systematic recording of market prices for town acres sold during these years. To fill this gap, we have compiled a sample of transaction prices for lots sold in 1838 (58 transactions) and 1839 (27 transactions). Data come from three primary sources: (1) residents' correspondence and personal papers, (2) newspaper reports, and (3) two documents from the South Australian Company (SACo) archive entitled 'Description of town buildings belonging to the SACo' and 'Accounts of value of town acre allotments.'

Our second data set consists of the assessed values of South Adelaide and North Adelaide lots in 1850 and 1852, respectively. Under ordinance 12 enacted by the Governor and Legislative Council, land valuations for South Adelaide commenced in 1847 and 1852 for North Adelaide. The rated valuation was the net capital value of the land minus 10 per cent for repairs and the like (City of Adelaide 1849). For South Adelaide we use valuations from 1850, just prior to the 1851 Australia-wide shock of

[13] Another likely factor behind the end of the price mania was the retrenchment in government spending in late 1840 and 1841 on public works in and around Adelaide. This occurred when it became apparent in mid-to-late 1840 that that the Colony's government had incurred debts far beyond its capacity to pay. In 1842, the British Parliament passed a reform act to consolidate SA's split executive (with officials appointed by the Colonial Commission responsible for matters related to surveying, land sales and leases, and immigration, and officials in the Colonial Government responsible for law enforcement, justice, public works, defence, etc.) into a more traditionally structured British colonial government with a unified executive.

gold discovery in New South Wales and Victoria. For North Adelaide we use valuations from the year they commenced, 1852.[14]

From the overall economic progress of the colony over the 1837-1850 period, there are good reasons to believe that lots in Adelaide would have experienced a general appreciation by 1850. The Colony's initial seven years were rocky, beginning with a period of slow growth (1837-1839) followed by a period of prosperity (1839-1841) and then retrenchment (1842-1843).[15] Prospects improved greatly from late 1843, as a succession of positive developments raised colonial output, population, and

[14] Whether or not the assessed values for 1852 in North Adelaide would be greater or less than (unobserved) 1850 values depends on two partly offsetting impacts of the gold shock on the Adelaide land market. The rush of SA residents to Victoria in the 1851-1853 period to participate in the gold rush reduced demand for all residential parcels in Adelaide. This decline could have been at least partly offset by an increase in the income of remaining residents derived from increases in demand for wholesale-transportation-finance services based in Adelaide to service exports of food and other goods and services to the gold fields.

We use rate assessment data in our analysis because there was no systematic recording of market prices at the sale of Adelaide properties in the 1840s. We have discovered a few incidental reports in SA newspapers of the sales prices of particular parcels in the late 1840s and use them as a rough check on the assessment data. For example, in 1848, J.B. Neales sold town acres 913, 914, and 915 – all in North Adelaide – for a total of £180 (*South Australian*, 25 April 1848: 2). Valuations for the same acres in 1852—after the Victorian gold rush had commenced—were £13.50, £35.17, and £71.83, respectively, or about two-thirds of the 1848 market value.

[15] The Colony's slow start in the 1836-1839 period culminated with the Colonial Office's removal of Governor Hindmarsh in late 1838. Its prospects seemed much brighter from 1839 to 1841 when Governor Gawler pushed surveyors to complete country land surveys for PLO holders, invested heavily in infrastructure projects in Adelaide and the city's new port, and provided poor relief to the thousands of recently arrived migrants without work. However, these prospects dimmed when colonists and the British government discovered Governor Gawler had incurred massive debts to undertake these projects. London responded quickly by removing him from office in late 1841. Gawler's successor, Governor George Grey (1841-1845), implemented a program of austerity and cuts in poor relief, leading many Adelaide residents with suddenly reduced near-term prospects to move to the country and work on newly established farms. The exodus meant that about a third of newly-built homes in Adelaide were unoccupied in December 1842 (Price, 1924:223; Parliamentary Papers, House of Commons, 1843:246).

demand for Adelaide lands. Dominating all other factors was the discovery of copper in 1843, which was followed by the opening over the next five years of several very large mines, located 50 to 150 kilometres north of Adelaide. By 1850, SA was producing and exporting more than 10 per cent of the world's copper supply and Adelaide was providing key services for the copper industry as well as growing wool and wheat industries.[16]

Before we conduct a formal econometric analysis of the choices of PLO ballot holders, we first conduct a lot-by-lot analysis of the first 20 parcels chosen by PLO holders by comparing them with land valuations for all lots in South Adelaide in 1850 and North Adelaide in 1852. This analysis reveals that none of the first 20 choices made by PLO ballot holders were even close to the 20 lots with the highest assessed values in 1850. For example, using the first PLO ballot, Samuel George Smith chose acres 267 and 306, both adjacent to Victoria Square, a large area of parkland in the centre of South Adelaide. In 1850 these lots were assessed at £76 and £63 respectively. Assessed valuations of these parcels pale in comparison to assessments for the two highest valued parcels at £2,320 and £1,224 for acres 47 and 79 chosen by William Stuckey and Samuel Payne with PLO ballot numbers 36 and 37, respectively. Both lots were still chosen early in the ballot selection (i.e., the top 9 per cent of PLO ballots), and had

[16] Three other positive shocks in the 1840s contributed to economic growth in SA: The British Government's decision to absorb most of the large debt generated by the SA Colonial Government under Governor Gawler and Governor Gray; the end of the global and New South Wales recession in 1844; and the gradual repeal over the 1846-1849 period of British tariffs on corn imported from Australian colonies.

probably become so valuable due to their location on the main road leading from South to North Adelaide over the River Torrens.

If we extend the analysis to the first 50 parcels chosen by PLO holders, the average assessed value of these parcels was £249.52 compared with an average of £382.53 for the first 50 parcels purchased at auction. By 1850, only five parcels chosen by PLOs holders were valued above £500 compared with 14 parcels sold at auction. If we extend the analysis to consider parcels valued above £100, only 18 of the 404, or 4.5 per cent of parcels chosen by PLO holders reached this value in 1850 compared with 43, or 7.25 per cent of the parcels sold at auction.

Further, property in South Adelaide was assessed at more than twice the value (£122.22) than property in North Adelaide (£55.17). PLO ballot holders choose only 64 of 342 acres in North Adelaide, or 18.7 per cent of the total. Amongst these 64 acres the highest valuation in 1850 was £213.17 for acre 724 chosen by John Morphett (a prominent land agent) with ballot number 342. However, of these 64 selections in North Adelaide, only 15 were assessed at over £100 in 1852, while 54 of the remaining 278 parcels purchased at auction in North Adelaide reached this threshold in 1852. In fact, acre 783 in North Adelaide, purchased by Governor Hindmarsh at auction for just £4.20, recorded the highest assessed value in North Adelaide, £291.37. In total, only 40 per cent of the first 404 most valuable lots as assessed in 1850/1852 were originally chosen by PLO holders.

Who were the people who chose the blocks with the highest assessed values in 1850/1852? In total, 145 people with 37 occupations owned the 404 highest valued lots

in 1850. Of these, nine were owned by investors, nine by merchants, eight by clergy, seven by military (including retired personnel), seven by bankers, six by doctors, five by lawyers, four agriculturalists, four printers, three involved in shipping, and three labourers. A total of 15 government officials and those involved with the Colonization Commission also chose blocks amongst the highest 404 in 1850. A number of government officials held multiple lots in the 404 including, Governor Hindmarsh who purchased 13, the colonial treasurer, Osmond Gilles who bought 15 acres, and Colonial Secretary Robert Gouger who owned two acres. Four Colonization Commission-appointed surveyors also purchased lots with the Surveyor-General, William Light, buying three. Further, several individuals involved with the Commission also had lots amongst the 404 highest valued, including former Colonization Commissioner John Wright. The SACo did relatively well in its choices, with 33 of their 72 PLO choices in the city, or 46 per cent, included in the 404 most valued.[17] The most prominent individual purchaser was a merchant, John Barton Hack, with 31 lots.

To better understand the influence of geographic features on PLO selection and auction prices paid, we identify ten geographic features that could have affected the value of an Adelaide land parcel. Each of the features is measured as a binary variable. We have excluded two geographic characteristics that would usually be employed in this type of analysis: distance to the nearest road and elevation. Distance to the nearest road is excluded because all Adelaide parcels have road frontage. Surveyor-General

[17] At the March 30 auction, the SA company purchased 23 acres in South Adelaide and 18 acres in North Adelaide.

Light designed Adelaide such that land was grouped in bundles of 16 one-acre parcels with a road vertically intersecting each group of 16 as well as horizontally above and below each group (refer to Figure 3). Elevation is excluded because the city is relatively flat, and the small variation in elevation across parcels is unlikely to drive property value.[18]

Our econometric analysis begins with an analysis of the relationship between ten different geographic features of lots and lot selection by PLO holders. All are binary variables. *NAcorner* equals 1 if the lot is on the corner of a road in North Adelaide, *NApark* a lot bordering on North Adelaide's single park, and *NAborder* a lot on the city boundaries, i.e., with at least one side facing the parklands surrounding the city. Three corresponding variables measure the same features for South Adelaide: *SApark* for South Adelaide's five parks, *SAcorner*, and *SAborder*. Three binary variables mark the three discrete areas in North Adelaide: the large square area (*NAsquare*), the diagonal

[18] For example, measuring elevations in South Adelaide at a central location as well as at the north-east, north-west, south-east, and south-west corners gives the following elevations in metres: 54, 50, 45, 55, and 50 respectively (http://en-au.topographic-map.com /places/Adelaide-1013/ [Accessed 4 May 2017]).The exact locations these elevations were measured at were: Central, at the intersection of Wakefield and King Williams Streets; north-east, at the intersection of Frome Street and North Terrace; north-west, at the intersection of Morphett Street and North Terrace; south-east, at the intersection of Hutt Street and South Terrace; and south-west, at Morphett Street and South Terrace. Undertaking the same exercise for North Adelaide, we find the following elevations for central, north-east, north-west, south-east, and south-west: 50, 60, 45, 61, and 46 (http://en-au.topographic-map.com/places/Adelaide-1013/ [Accessed 4 May 2017). The exact locations at which these elevations were taken are: Central, at the intersection of Molesworth, Jeffcott, and Tynte Streets; north-east, at the intersection of Prospect Road and Barton Terrace; north-west, at the intersection of Hill Street and Barton Terrace West; south-east, at the intersection of Ward Street and Prospect Road; and south-west, at Ward and Hill Streets. From these data it can be seen that it would be difficult to include elevations in our analysis in a way that could effectively distinguish between minor variations in elevation across the blocks chosen by the first 437 PLO holders.

right side (*NAdiagonal*), and the left quadrant (*NAleft*) (refer to figure 3). Nineteen binary variables are specified to represent the approximate distance of South Adelaide lots from the River Torrens. *Rowj* represents the row numbers for South Adelaide, with *row1* being the horizontal row of lots closest to the river and *row20* being the horizontal row of lots farthest from the river (see Figure 3). We specify a regression equation to estimate which land features were most highly valued by PLO selectors, and run variations with various combinations of the specified land characteristics:

$$Ballot = \beta_0 + \beta_1 NAsquare + \beta_2 NAdiagonal + \beta_3 NAquadrant + \beta_4 NAcorner + \beta_5 NApark + \beta_6 NAborder + \beta_7 SAcorner + \beta_8 SApark + \beta_9 SAborder + \sum_{j=1}^{20} \beta_{j+9} rowj + \varepsilon \quad (1)$$

where *Ballot* is the order in which acre i was selected, and the next 29 variables are the binary geographic variables discussed above.

Next we specify a regression to investigate whether the order in which lot *i* was selected by a PLO rights holder is associated with the log of its assessed value in 1850/1852 (ln*Value1850*):

$$\ln Value1850 = \beta_0 + \beta_1 Ballot + \beta_2 NA + \beta_3 Resident + \varepsilon \quad (2)$$

where *Ballot* is the lottery number drawn by a PLO rights holder and used to select lot *i*, *Resident* is a binary variable that equals one when a PLO rights holder or owner of auctioned city lots migrated to South Australia, ln*Value1850* is the log of 1850 assessed property value for South Adelaide and 1852 assessed property value for North Adelaide,

and *NA* is a binary variable indicating the lot is in North Adelaide.[19] Because *Ballot* is a categorical variable, we group ballots into sets of 18-19 ballots and re-estimate the OLS regression to determine whether decomposing *Ballot* into 21 categorical variables (Catj, where j=1, … 21) affects regression estimates. We use a likelihood ratio chi-square test to determine which specification is more appropriate.

Next, we repeat the regressions specified in (1) and (2) above using the sample of city lots purchased at auction. In these regressions, the 1837 auction price of the lot (*Price*) and its log (ln*Price*) replace *Ballot* and ln*Ballot:*

$$\ln Price1837 = \beta_0 + \beta_1 NAsquare + \beta_2 NAdiagonal + \beta_3 NAquadrant + \beta_4 NAcorner + \beta_5 NApark + \beta_6 NAborder + \beta_7 SAcorner + \beta_8 SApark + \beta_9 SAborder + \sum_{j=1}^{20} \beta_{j+9} rowj + \varepsilon \quad (3)$$

$$\ln Value1850 = \beta_0 + \beta_1 \ln Price1837 + \beta_2 NA + \varepsilon \quad (4)$$

We note that if a geographic characteristic is valued in the PLO sample, it will have an estimated coefficient with a negative sign (denoting earlier selection) whereas if it is valued in the auction sample, it will have an estimated coefficient with a positive sign (denoting a higher price paid).

Next we analyse three samples of city lots purchased in the 1837 auction and resold in 1838 or 1839. For the 1838 sample, we specify a regression to examine the relationship between a lot's 1838 transaction price and its 1837 auction price:

$$\ln Price1838 = \beta_0 + \beta_1 \ln Price1837 + \beta_2 NA + \beta_3 PartLot + \varepsilon \quad (5)$$

[19] We include a dummy variable for North Adelaide (*NA*) in regressions on 1850/1852 valuations because South Adelaide valuations were conducted in 1850 and North Adelaide valuations in 1852.

PartLot is a dummy variable equal to one when the transaction price per acre is extrapolated from a sale of a portion of the original lot. We run the same regression specification using a sample of 1839 transaction prices (ln*Price1839*) and repeat using a combined sample of 1838 and 1839 transaction prices (ln*Price1838/39*). Regressions using the combined sample include a dummy variable for observations in the 1838 sample (*Year1838*).

Finally, we run the following OLS regression to conduct an analysis of the log of 1850 valuation with a combined sample of PLO and auction parcels:

$$\ln Value1850 = \beta_0 + \beta_1 FullBallot1837 + \beta_2 NA + \beta_3 PLO + \beta_4 Resident + \varepsilon \quad (6)$$

where *PLO* is a binary variable indicating a lot selection by a PLO rights holder. *Fullballot* is constructed by ordering the PLO lots by order of selection and assigning to each lot the number associated with its order of selection, from 1 to 404. Auction lots are then ranked by their purchase price, with the highest price assigned *Fullballot* number 405, the next highest price *Fullballot* number 406, and so on. In some specifications, we include *Resident* to determine whether the use of an agent to select or purchase lots in March 1837, and possibly to manage them afterwards, had an effect on the lots' 1850/1852 valuations. Because *Fullballot* is a categorical variable, we also run a second specification in which we group ballots into blocks of 18 or 19 ballots. We then re-estimate the base regression to determine whether treating *Ballot* as categorical improves regression estimates.

IV. Results

Which lot characteristics were most highly valued by the PLO rights holders? Table 2 reports results from OLS regressions of the PLO selection order (*Ballot*) on the characteristics of the chosen lot. Column 1 includes dummy variables to control for the three discrete land areas comprising North Adelaide (as seen in Figure 3): the large square area (NA*square*), the diagonal right side (NA*diagonal*), and the left quadrant (NA*left*). Column 2 reports results using the three North Adelaide dummy variables and six dummy variables to control for six other geographic features of a lot: *NAcorner, NApark*, and *NAborder* in North Adelaide and *SAcorner, SApark*, and *SAborder* in South Adelaide. *Corner*, *Park*, and *Border* are defined more precisely in Table 1. Column 3 steps in 19 dummy variables *Rowj,* with j denoting the jth horizontal row of lots in South Adelaide. *Row1* is the horizontal row of lots closest to the river, *row20* is the horizontal row of lots farthest from the river, and *Row11* is the excluded row.

In the specification with just the three North Adelaide dummy variables (column 1), the estimated coefficients on *NAsquare* and *NAdiagonal* are both positive and statistically significant, indicating that lots in these two parts of North Adelaide were less likely to be chosen later than lots in South Adelaide. The positive and statistically significant estimated coefficients for two of the three North Adelaide dummy variables (column one) are not surprising as many PLO rights holders expected South Adelaide to become the economic and business hub of the capital and they picked their first 71

selections from South Adelaide.[20] However, when other geographic characteristics are stepped into the regression, the estimated coefficients on the three North Adelaide dummy variables turn negative and are all statistically insignificant at the ten percent level.

In the two specifications with SA*corner*, SA*park*, SA*border*, and corresponding North Adelaide variables (columns 2 and 3), the signs of the estimated coefficients for these six variables are consistent across the two specification but for the estimated coefficient for SApark, for which the sign changes from negative to positive when rowj variables are stepped in (column 3). PLO rights holders' preference for corner and border lots in South Adelaide (*SAcorner* and *SAborder* have negative and statistically significant estimated coefficients) was expected, but we are unsure why PLO rights holders avoided corner lots in North Adelaide (*NAcorner* has a large positive and statistically significant coefficient).

Distance from the Torrens River, which runs between North and South Adelaide, was also an important determinant of selection order for South Adelaide lots. Estimated coefficients for the *rowj* variables (column 3) vary in sign for the first 10 rows, whereas estimated coefficients for *row12* to *row20* are positive, with all but one (row14) being statistically significant at least at the five percent level. These results indicate that lots

[20] See Price (1924:111) and Woodforde (1894). The early preference for lands in South Adelaide by PLO investors could be due to the South Australian Company concentrating its selections in South Adelaide. One advantage of South Adelaide relative to North Adelaide was that the roads from the port, 10 kilometres away, connected to South Adelaide at its northwest edge. Thus, goods from the port did not have to cross a bridge over the Torrens River to reach their destinations in South Adelaide.

closer to the river in rows 1-10 were more preferred (i.e., selected earlier) than lots farther from the river in rows 12-20.[21]

Did the PLO rights holders with the early ballots choose well? Did they choose lands that were more valuable in 1850/1852 than lands picked by those with later ballots? Table 3, Panel A, reports results from OLS regressions of the log of 1850/1852 lot value (ln*Value1850*) on three linear and nonlinear specifications of the ballot order. Column 1 reports results from a regression of ln*Value1850* on *Ballot*. The estimated coefficient on *ballot* is -0.001 and statistically significant at the five per cent level. See Figure 4 for a scatterplot of *Ballot* on ln*Value1850v*. Estimates with a quadratic specification for *Ballot* (reported in column 2) reveal a negative but diminishing relationship with *Ballot* that remains negative throughout the range of *Ballot* (1, …, 402). Column 3 reports results from a regression of ln*Value1850* on ln*Ballot*. The estimated coefficient on ln*Ballot* is -0.164 and statistically significant at the one per cent level. This implies that a 10 per cent decrease in the ballot number assigned in 1837 is associated with a 1.64 per cent increase in assessed property value in 1850/1852.

The regressions discussed above were run under the assumption that *Ballot* is a continuous variable. Do our results change if we replace *Ballot* with a vector of categorical variables in which each group of 18-19 ballots is coded as a separate binary variable? Table 3, Panel B, reports results from a regression using 21 categorical *Ballot* variables, with the last 19 ballot choices forming the omitted reference group. Estimated coefficients on *cat1*, *cat2*, *cat3*, and *cat5* are all positive and statistically

[21] *Row11* is the left-out geographic dummy variable in all regression specifications in this paper.

significant at least at the ten percent level, indicating that early PLO ballot holders were able to choose lots that had substantially higher assessed property values in 1850/1852 than other lots. Estimated coefficients on *cat6* through *cat21* vary in sign, are relatively small, and fail to reach statistical significance at the ten percent level but for the estimated coefficient on *cat16*. These results indicate that the first 90 PLO rights holders were able to identify high-value lots, but that PLO holders with ballots between 90 and 404 typically had little success in distinguishing between high and low value lots.

Next we look at parallel regression results for the sample consisting of 593 city lots sold at auction. Table 4 reports results from three OLS regressions of ln*Value1850* on the characteristics and location of each lot. In the specification with just the three North Adelaide area variables (column 1), estimated coefficients on *NAsquare, NAdiagonal*, and *NAleft* are all negative and estimated coefficients on *NAsquare* and *NAdiagonal* are statistically significant at the one percent level. This indicates that investors paid less for lots in these two parts of North Adelaide than for lots in South Adelaide. When other geographic characteristics are stepped into the regression (column 2), results for the three North Adelaide area variables are unchanged. When row variables are stepped into the regression, the estimated coefficient on the *NAleft* variable becomes positive and statistically significant at the five percent level.

In the two specifications with SA*corner*, SA*park*, SA*border*, and corresponding North Adelaide variables (columns 2 and 3), signs of estimated coefficients for these variables are consistent across the two specification: Investors paid more for corner lots in South and North Adelaide and park lots in North Adelaide, and paid less for border

lots in North Adelaide. The estimated coefficient on *SApark* switches signs from negative to positive when row variables are stepped in and retains its statistical significance at the one percent level. Distance from the Torrens River is an important determinant of price paid at auction for South Adelaide lots (column 3). Estimated coefficients for the *rowj* variables are positive for all rows but row 20 and are statistically significant at least at the five percent level for rows 2-16. These results indicate that investors paid less for lots in rows 17-20 than lots in the index row (row11).

Next we consider whether investors who paid more for lots at auction in 1837 chose lands well? Were their lots assessed at higher values in 1850/1852 than lands purchased by investors who paid less money? Table 5 reports results from three OLS regressions of ln*Value1850* on the log of the price paid at auction for the lot (ln*Price*) and the North Adelaide dummy variable (*NA*). In the base regression in column 1, the estimated coefficient on ln*Price* is 1.59 and statistically significant at the one per cent level. This implies that a 1 percent increase in the price paid for the lot in 1837 is associated with a 1.59 percent increase in value in 1850/1852. See Figure 5 for a scatterplot depicting the relationship between ln*Price* and ln*Value1850*. Column two reports estimate for regressions with a dummy variable for North Adelaide. This lowers the estimated coefficient on lnPrice to 1.11, implying that a 1 percent increase in the price paid for the lot in 1837 is associated with a 1.11 percent increase in value in 1850/1852. Column 3 reports similar results for a linear specification of *Price*.

Next we run regressions on three samples of city lots purchased at auction in 1837 that were resold in 1838 and 1839 to examine the relationship between the prices

paid at auction in March 1837 and the transaction prices received 2-3 years later. Our sample of transaction prices for 1838 and 1839 comprises 12.6 per cent of the lots sold at auction in 1837.[22] The average price paid in 1837 for a lot in our 1838 sample was £5.5, while the average market price paid in 1838 was £216.9; the auction price paid in 1837 for a lot in the 1839 sample was £6.9, while the average market price paid in 1839 was £644.7. Thus, those buyers who sold just 10-21 months after the initial purchase made, on average, more than 39 times the purchase price, while those who sold 22-33 months after the initial purchase made, on average, more than 93 times the purchase price. Figures 6 and 7 provide scatterplots relating the 1837 price paid at auction and the resale price for the 1838 and 1839 samples, respectively.

Table 6 reports regression estimates for the three samples of market prices. Our goal is to investigate the extent to which initial auction prices are positively correlated with 1838 and 1839 resale prices. The constant terms in these two regressions indicate that investors in 1838 and 1839 both realized exceptional returns independent of the initial price paid, with 1838 investors realizing a base price of £33.4 and 1839 investors a base price of £11.82. The estimated coefficients for ln*Price* are 0.67 in the 1838 sample and 1.65 in the 1839 sample, with both statistically significant at the one percent level. In both samples, investors who paid more for their lots in 1837 realized higher transaction prices in 1838 and much higher transaction prices in 1839

[22] We do not analyze the seven PLO transactions for 1838 and the two PLO transactions for 1839 as the samples are not large enough to draw inferences. PLO transactions are a small part of the 1838 sample (7/58 observations) and the 1839 sample (2/27 observations). It is unclear whether they represented a disproportionately small part of overall transactions or whether our sample underrepresents them.

than investors who paid less for their lots in 1837. Nonetheless, all investors who resold in 1838 and 1839 realized exceptional returns on their investments.

Next we examine the relationship between the log of lot valuations in 1850/1852 and a ranked measure of lot selection for our full sample of 402 PLO lots and 590 lots sold at auction. We use the following methodology to merge the *Price* and *Ballot* variables into a single ranked measure of property value in 1837, *Fullballot*. Since the 437 priority investors should have picked the 404 most valuable lots in order of their relative values, *Fullballot* is assigned the same value for each PLO lot as *Ballot*. We then rank the lands sold at auction by the price paid for the lot, assigning the lot with the highest price paid *Fullballot*=405, the next highest price paid *Fullballot*=406, etc.

Table 7 reports results from two OLS regressions of ln*Value1850* on *Fullballot* and ln*Fullballot;* both regressions include a control variable (*PLO*) that equals one if the lot was a PLO selection. We find that the estimated coefficient on ln*Fullballot* is -0.46 and is statistically significant at the one per cent level (column 1). This implies that a 1 per cent decrease in *Fullballot* was associated with a 0.46 percent increase in the assessed value of the lot in 1850/1852. Results for the specification using *Fullballot* rather than ln*Fullballot* were qualitatively similar. See Figure 8 for a scatterplot depicting ln*Value1850* and *Fullballot*.

Regressions reported in Table 7 were run under the assumption that *FullBallot* is a continuous variable, i.e., that the difference between each ballot rank is constant. Do regression results change if we replace *FullBallot* with a vector of categorical variables which groups 18-19 ballots together? Table 8 reports results from regressions using 51

categorical variables, with the last 19 choices (982-1000) forming the omitted reference group. As we expected, estimated coefficients on *cat1* through *cat21* follow the same pattern as those reported in Table 3, i.e., estimated coefficients on *cat1*, *cat2*, *cat3*, and *cat5* are positive and statistically significant at least at the ten percent level. This indicates that the PLO rights holders with the first 90 ballots were mostly able to choose lots that had substantially higher assessed property values in 1850/1852 than the reference group comprised of the 19 lots with the lowest prices paid at auction. Estimated coefficients on the next group of variables, *cat6* through *cat21*, vary in sign, are relatively small, and fail to reach statistical significance at the ten percent level. This indicates that PLO rights holders with ballots between 90 and 404 had little success in 1837 identifying lots with a higher future value in 1850/1852.

The groups comprised of lots sold in the 1837 auctions begin with *cat23*, which contains the buyers who paid the highest prices for their lots. Estimated coefficients on *cat23* through *cat27* are all positive, greater than one, and statistically significant at the one percent level, indicating that buyers who paid the most at auction generally chose lots that would have substantially higher assessed property values in 1850/1852. The next group of people who bought lots at auction were much less successful in picking higher value lots, as estimated coefficients on *cat29* to *cat45* vary in sign and are, with one exception (*cat40*), statistically insignificant at the ten percent level. Surprisingly, estimated coefficients on *cat46* through *cat51* are negative and statistically significant at the one percent level. We speculate that buyers of the lowest priced lots may have encountered a winner's curse. All that said, examination of actual prices paid for these

lots at auction in 1837 and assessed property values in 1850/1852 still shows large positive appreciation.

V. Conclusion

We posed two central research questions, with the first being whether initial investors gained from their decision to invest in the SA colony. Our market transaction data for 1838/1839 and assessed value data for 1850/1852 both suggest that each and every person who purchased a priority land order for an Adelaide lot or purchased lots in the March 1837 auction realized exceptional increases in the value of their investment. In 1837 each PLO investor paid £0.60 for a lot and by 1850 the average PLO property was assessed at £172.[23] For auction buyers the average auction price paid for land was about £7 in 1837 and by 1850 the average property was assessed at £138.

Our second central question is whether investors choose their lands wisely. Did PLO investors with early ballots choose the lots that would be the most valuable in 1850? Regression estimates using categorical grouping of 18-19 PLO holders show that people with priority ballots ranging from 1 to 54 and from 73 to 90 were more successful in choosing lots that had relatively high assessed property values in 1850. They also reveal that PLO holders with ballots ranging from 55 to 72 and 91 to 404 were generally unable to capitalize on their ballot priority, with their choices consistent with random draws from the remaining sample of Adelaide lots.

[23] Of course, the return on the outlay of £81 for one town lot and 134 country acres cannot be calculated without knowing the value of the investor's country lands in 1850, and we have not assembled data on prices of country lands for this paper.

What about investors who bought lands at auction? Auction buyers who resold lots in 1838 or 1839 realised exceptionally high prices.[24] The average price paid in 1837 for a lot in the resale sample had large gains and the empirical evidence shows those who paid higher prices at auction obtained higher transaction prices in 1838 and 1839. Regression results show that those who paid a higher price at auction for their lots had higher valuations in 1850. Moreover, much like PLO investors, auction buyers who resided in Adelaide did better at choosing lots that would yield higher values by 1850 than buyers who resided in Great Britain. Surprisingly, among the 404 most valuable properties, 241 ended up in the hands of the 39 investors who purchased land at the March 30 auction.

In sum, initial British investors in Adelaide earned exceptional returns. However, they performed far less well in identifying the particular lots that would be the most valuable 2-3 years later or 13-15 years later. The first 90 PLO investors choose much better than the remaining 304 PLO investors, and investors who purchased the 114 highest priced lots at auction also realized higher returns than the purchasers of the remaining 451 lots.

[24] Governor Hindmarsh criticized Resident Commissioner Fisher for choosing to auction all of the remaining town lots on a single day less than five months after settlers first arrived in the colony (Price 1924:114; John Hindmarsh, Despatches to the Colonial Secretary, London, January 1837 – July 1838, despatch dated November 1, 1837).

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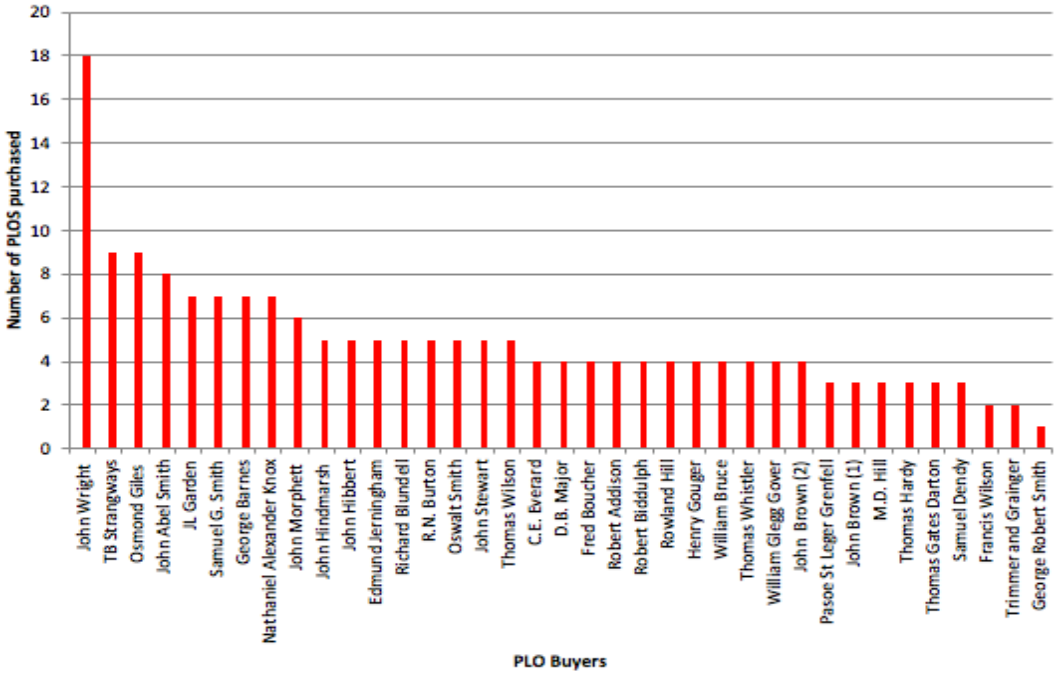
Figure 1: Histograms of identities and occupations of multiple PLO buyers

Panel A: identities



Note: The histogram omits the 102 lots purchased by Angas, Kingscote, and Smith that they transferred to the South Australian Company.

Panel B: Occupations

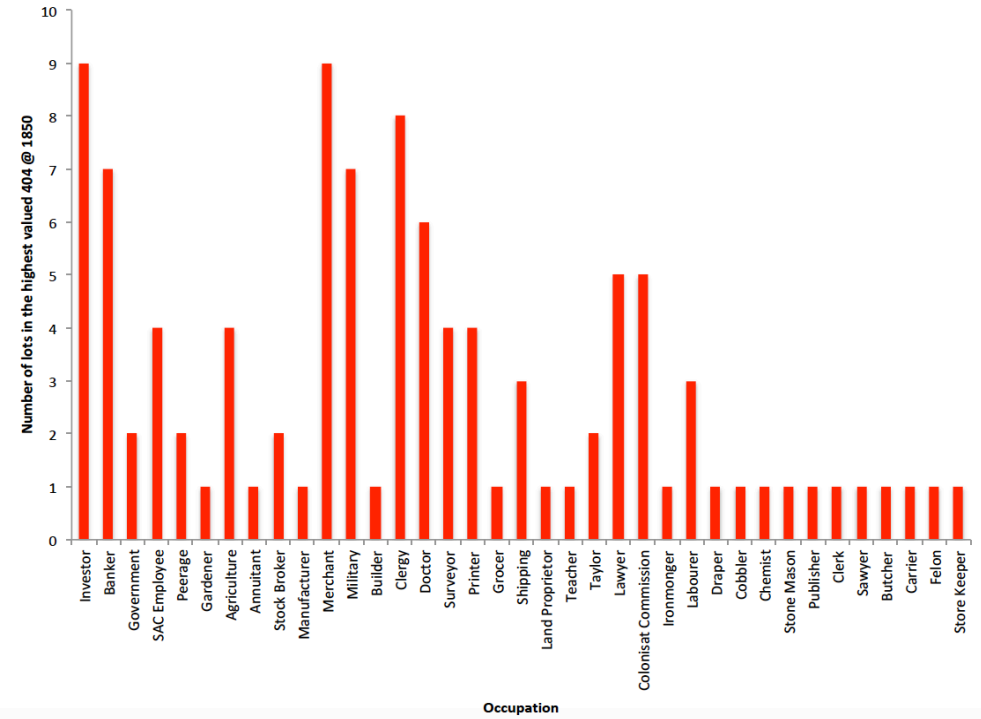
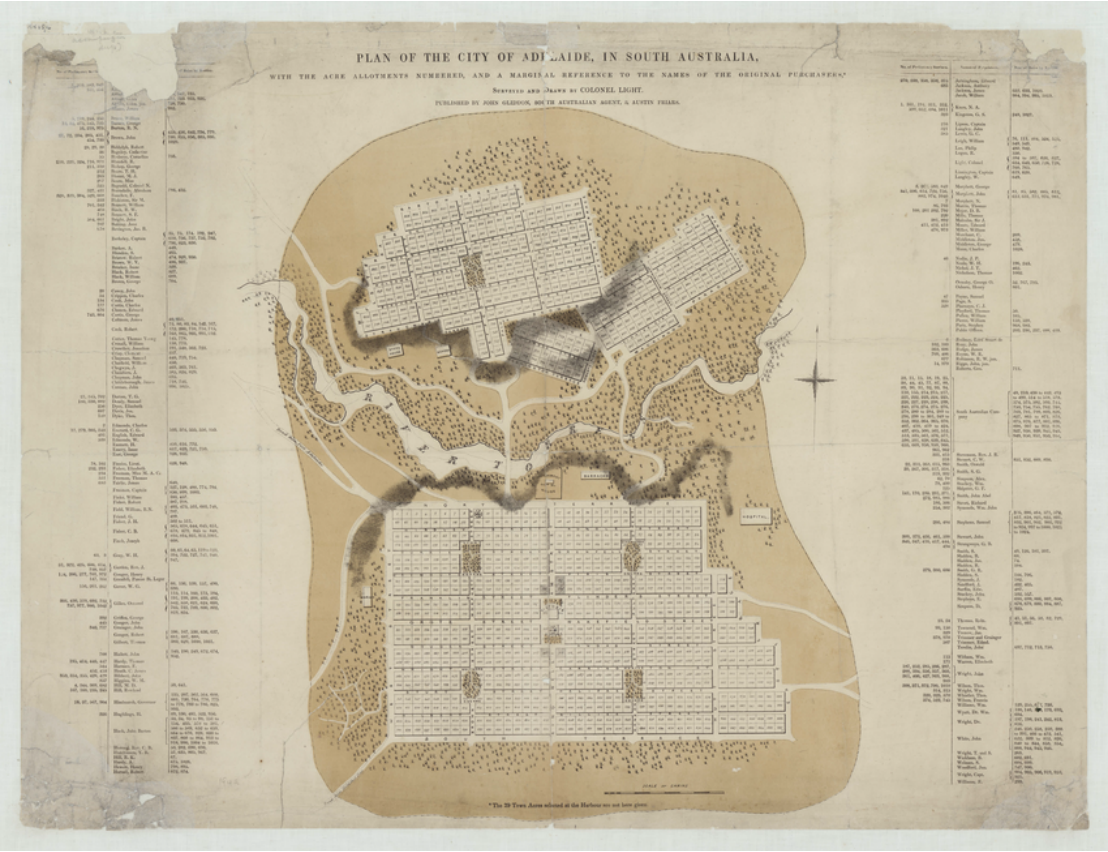


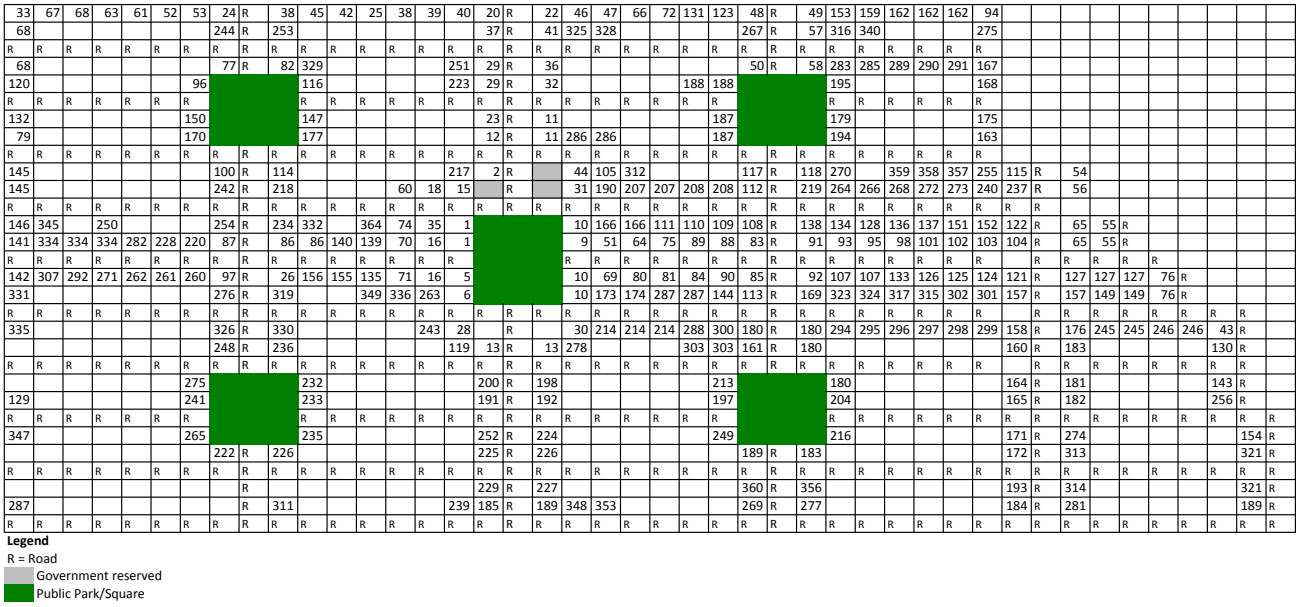
Figure 2: Surveyor-General Light's Map of Adelaide, 1840



Source: http://adelaidia.sa.gov.au/panoramas/lights-plan-of-adelaide-140 [Accessed 20/4/2017].

Figure 3: Selection of Priority 437 Adelaide Lots by Ballot number

A. South Adelaide (Lots 1-700)



Legend
R = Road
Government reserved
Public Park/Square

B. North Adelaide (Lots 701-1042)

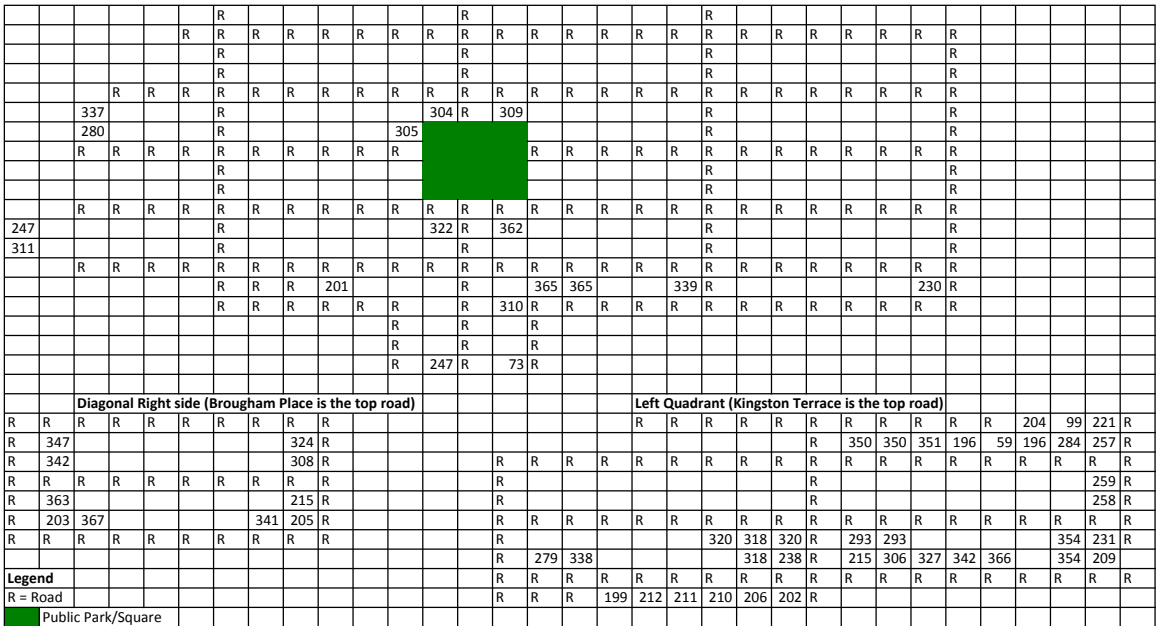


Figure 4: Scatterplot of Ballot on lnValue1850
PLO Sample

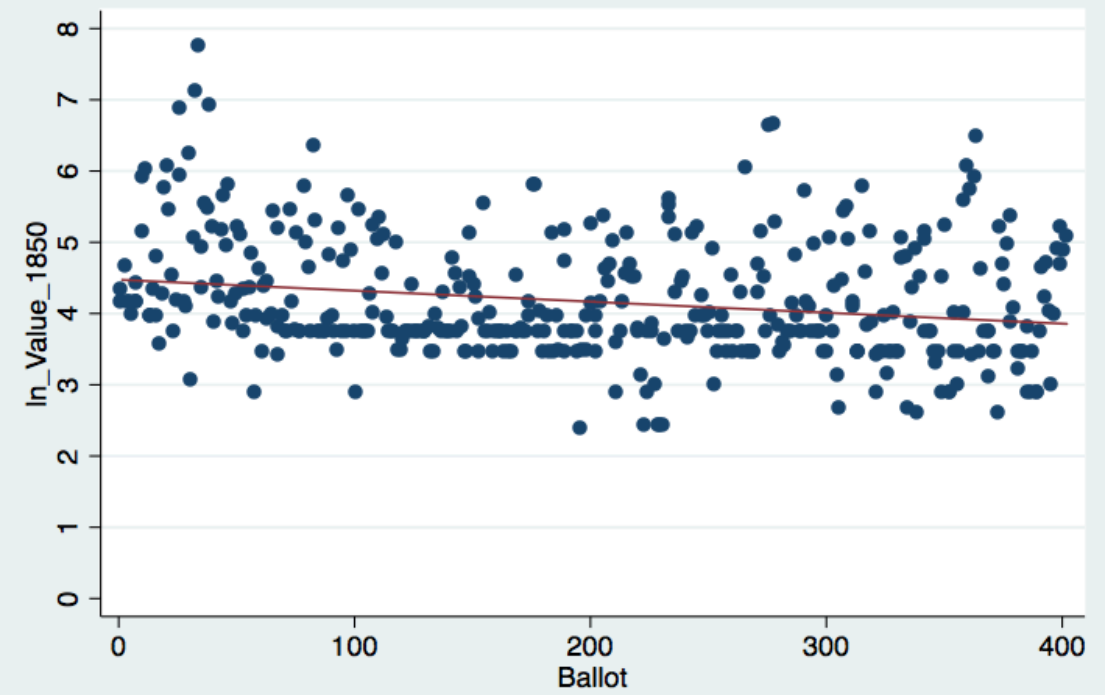


Figure 5: Scatterplot of lnPrice1837 on lnValue1850,
Auction Sample

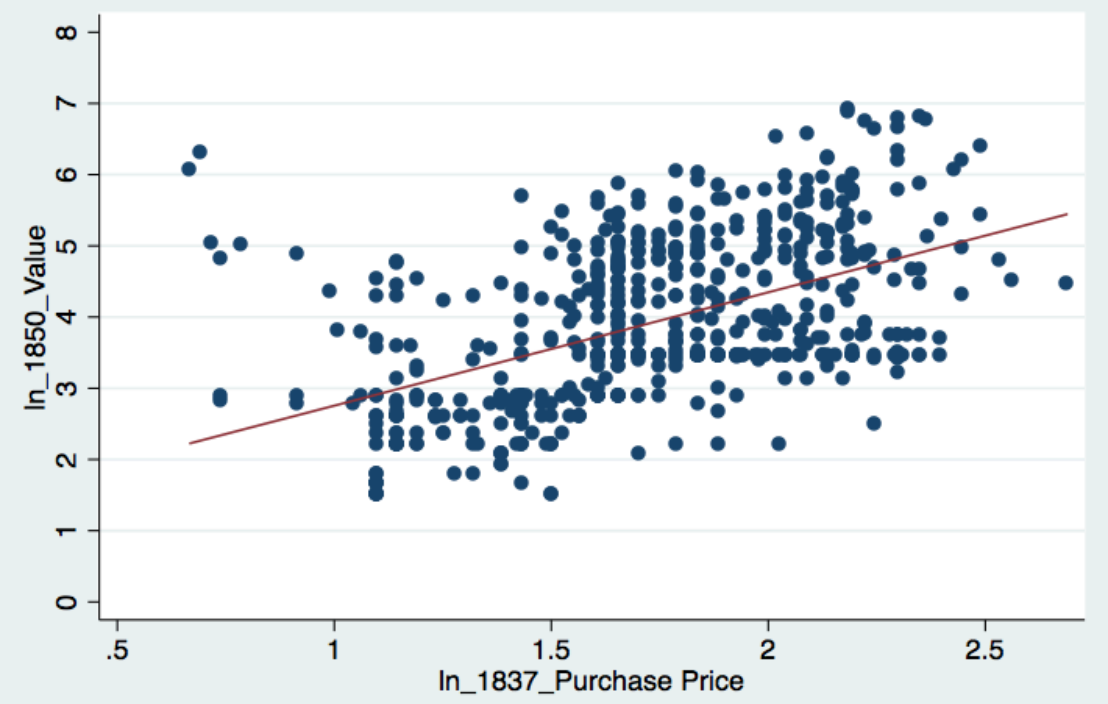


Figure 6: Scatterplot of lnPrice1837 on lnPrice1838, Auction Sample

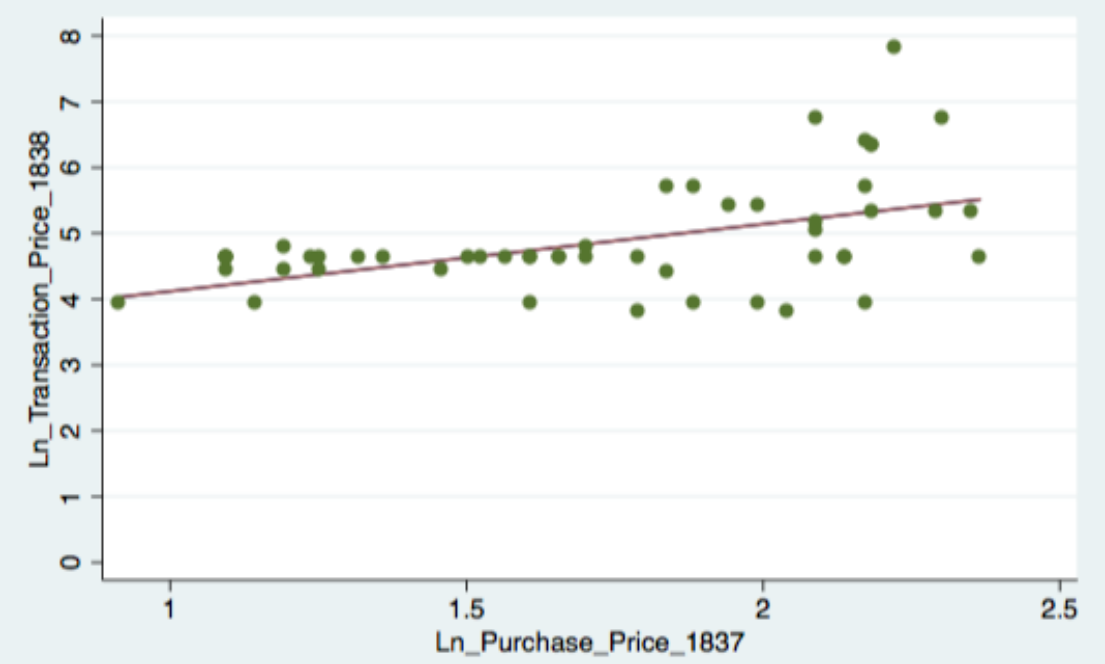


Figure 7: Scatterplot of lnPrice1837 on lnPrice1839, Auction Sample

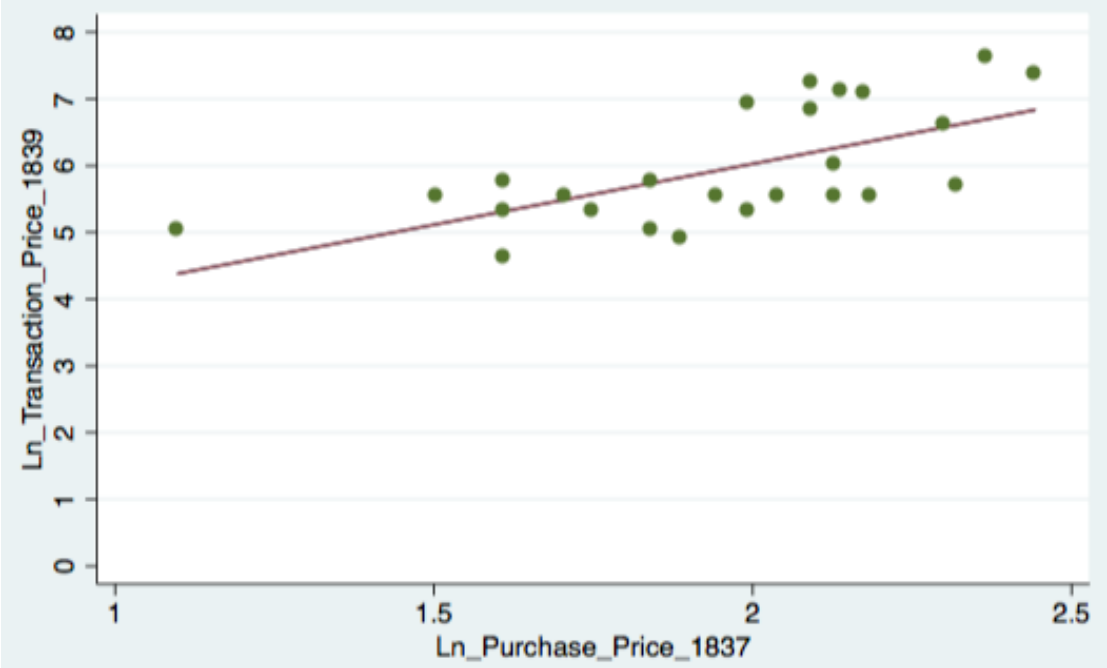


Figure 8: Scatterplot of FullBallot on lnValue1850, Combined PLO and Auction Sample

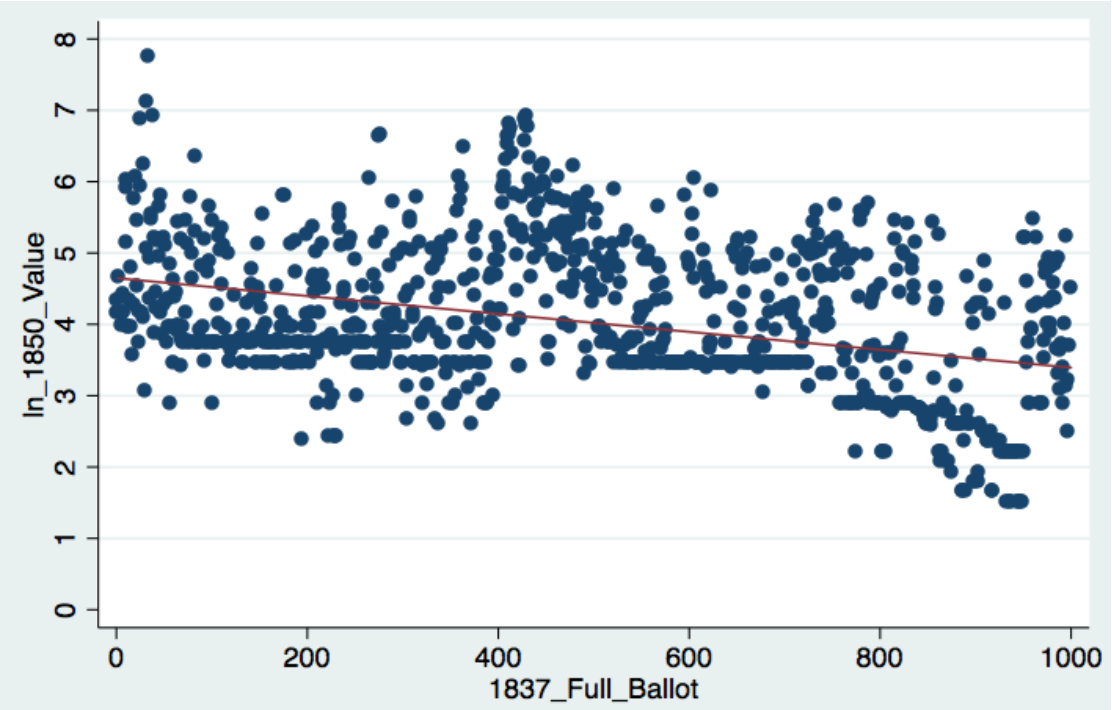


Table 1: Summary Statistics

(a) Sample of Lots Chosen with Preliminary Land Orders

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Ballot	402	187.01	103.32	1	367
Value1850	402	103.40	172.02	10.8	2320
Resident	402	0.96	0.20	0	1
NA	402	0.13	0.34	0	1
NASquare	402	0.08	0.27	0	1
NALeft	402	0.04	0.21	0	1
NADiagonal	402	0.02	0.14	0	1
NAcorner	402	0.11	0.32	0	1
NAborder	402	0.07	0.25	0	1
NApark	402	0.09	0.29	0	1
SAcorner	402	0.75	0.43	0	1
SAborder	402	0.45	0.50	0	1
SApark	402	0.21	0.41	0	1

(b) Sample of Auction Lots with 1838 Market Prices

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Price1837	58	5.54	2.89	10.65	
Price1838	58	216.85	343.86	45	2424.2
PartLot	58	0.19	0.40	0	1

(c) Sample of Auction Lots with 1839 Market Prices

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Price1837	27	6.86	2.70	0.6	11.5
Price1839	27	644.67	600.03	100	2000
PartLot	27	0.48	0.51	0	1

(d) Sample of Lots sold at Auction in 1837

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
FullBallot	590	664.07	171.46	368	962
Price1837	590	6.06	2.15	1.95	14.7
Value1850	590	98.31	138.48	4.5	994.5
Resident	590	0.79	0.40	0	1
NA	590	0.42	0.49	0	1
NASquare	590	0.32	0.47	0	1
NALeft	590	0.07	0.26	0	1
NADiagonal	590	0.04	0.20	0	1
NAcorner	590	0.12	0.33	0	1
NAborder	590	0.11	0.31	0	1
NApark	590	0.12	0.32	0	1
SAcorner	590	0.01	0.11	0	1
SAborder	590	0.07	0.26	0	1
SApark	590	0.07	0.26	0	1

Table 2: OLS: Land Selections of 437 Priority Investors

	(1) Ballot	(2) Ballot	(3) Ballot
NAsquare	124.56***	-8.37	-14.33
	(12.44)	(40.94)	(41.91)
NAleft	19.21	-50.77	-58.05
	(30.13)	(39.82)	(40.51)
NAdiagonal	113.85***	-3.14	-9.48
	(37.67)	(45.99)	(46.68)
NAcorner		126.56***	128.83***
		(40.04)	(42.45)
NAborder		-17.95	-17.35
		(19.12)	(19.67)
NApark		-20.28	-18.79
		(21.59)	(21.41)
SAcorner		-19.08	-26.24*
		(18.21)	(15.39)
SAborder		-25.07**	-85.42***
		(12.34)	(12.16)
SApark		-23.74	49.82**
		(15.45)	(19.31)
row1			-158.19***
			(26.90)
row2			85.93**
			(36.21)
row3			35.99
			(30.00)
row4			-9.58
			(29.38)
row5			-20.44
			(30.71)

row6			22.54
			(34.46)
row7			24.60
			(32.08)
row8			9.41
			(29.69)
row9			-17.13
			(26.14)
row10			-53.68**
			(24.26)
row12			68.82**
			(26.60)
row13			73.57***
			(26.91)
row14			45.41
			(31.05)
row15			89.86***
			(26.53)
row16			81.93***
			(26.08)
row17			132.78***
			(27.67)
row18			128.08***
			(25.57)
row19			191.55***
			(32.70)
row20			95.10***
			(29.09)
Constant	188.46***	223.68***	226.35***
	(6.12)	(19.21)	(20.87)
N	402	402	402
R-sq	0.10	0.14	0.42
adj. R-sq	0.09	0.12	0.37

Standard errors in parentheses. * p<.1, ** p<.05, *** p<.01

Table 3: OLS: 1850 Valuation of Lots Chosen by 437 Priority Investors

A. *Ballot* treated as a continuous variable

	(1) Ln*Value1850*	(2) Ln*Value1850*	(3) Ln*Value1850*
Ballot	-0.00102**	-0.00677***	
	(0.000410)	(0.00149)	
NA	-0.548***	-0.598***	-0.536***
	(0.136)	(0.134)	(0.133)
Resident	-0.136	-0.138	-0.0741
	(0.186)	(0.195)	(0.197)
$Ballot^2$		0.0000144***	
		(0.00000347)	
lnBallot			-0.164***
			(0.0478)
Constant	4.570***	4.960***	5.127***
	(0.186)	(0.220)	(0.278)
N	402	402	402
R-sq	0.09	0.13	0.10
adj. R-sq	0.08	0.12	0.09

Standard errors in parentheses
* p<.1, ** p<.05, *** p<.01

B. Ballot treated as categorical variable: *cati*, i=1, … 21

cat1	0.465*		(0.205)	cat16	0.458*
	(0.245)	cat9	0.0551		(0.297)
cat2	1.227***		(0.233)	cat17	0.0154
	(0.357)	cat10	0.0377		(0.249)
cat3	0.914***		(0.252)	cat18	0.143
	(0.273)	cat11	-0.145		(0.276)
cat4	0.151		(0.244)	cat19	0.0713
	(0.241)	cat12	0.274		(0.261)
cat5	0.502*		(0.249)	cat20	0.228
	(0.275)	cat13	-0.307		(0.340)
cat6	0.169		(0.300)	cat21	-0.0387
	(0.257)	cat14	0.358		(0.256)
cat7	0.220		(0.236)	_cons	3.961***
	(0.245)	cat15	-0.180		(0.189)
cat8	-0.104		(0.245)		

N=402 R-sq= 0.16 adj. R-sq= 0.12

Table 4: OLS: Land Selections of Auction Investors

	(1) Ln*Value1850*	(2) Ln*Value1850*	(3) Ln*Value1850*
NAsquare	-0.55***	-0.64***	-0.39***
	(0.02)	(0.03)	(0.04)
NAleft	-0.01	-0.06	0.11**
	(0.05)	(0.05)	(0.05)
NAdiagonal	-0.20***	-0.32***	-0.09
	(0.03)	(0.05)	(0.06)
NAcorner		0.16***	0.17***
		(0.03)	(0.03)
NApark		0.44***	0.44***
		(0.07)	(0.07)
NAborder		-0.37***	-0.36***
		(0.08)	(0.09)
SAcorner		0.09	0.06
		(0.08)	(0.06)
SApark		-0.10***	0.18***
		(0.03)	(0.06)
SAborder		omitted	omitted
row1			omitted
row2			0.29**
			(0.11)
row3			0.46***
			(0.04)
row4			0.41***
			(0.10)
row5			0.46***
			(0.09)
row6			0.41***
			(0.04)

row7			0.31***
			(0.04)
row8			0.56***
			(0.06)
row9			0.35
			(0.24)
row10			omitted
row12			0.51***
			(0.05)
row13			0.44***
			(0.06)
row14			0.36***
			(0.05)
row15			0.20***
			(0.04)
row16			0.21***
			(0.05)
row17			0.05
			(0.04)
row18			0.06
			(0.04)
row19			0.00
			(0.04)
row20			-0.06
			(0.06)
Constant	1.92***	1.93***	1.68***
	(0.02)	(0.02)	(0.04)
N	590	590	590
R-sq	0.49	0.52	0.66
adj. R-sq	0.49	0.52	0.64

Standard errors in parentheses; * p<.1, ** p<.05, *** p<.01

Table 5: OLS: Assessed Value in 1850 of Lots Purchased at Auction in 1837

	(1) ln1850Price	(2) ln1850Price	(3) ln1850Price
NA		-0.60***	-0.60***
		(0.12)	(0.11)
lnPrice1837	1.59***	1.11***	
	(0.14)	(0.19)	
Price1837			0.187***
			(0.026)
Constant	2.24***	1.16***	3.04***
	(0.37)	(0.26)	(0.19)
N	590	590	590
adj. R-sq	0.26	0.30	0.30

Standard errors in parentheses; *** p<.01

Table 6: OLS: 1838 and 1839 Market Prices of Lots Purchased at Auction in 1837

	(1) ln1838/39Price	(2) 1838Price	(3) ln1839Price
lnPrice1837	0.92***	0.67***	1.65***
	(0.18)	(0.18)	(0.48)
PartLot	0.90***	1.19***	0.58**
	(0.22)	(0.34)	(0.26)
Year1838	-0.63***		
	(0.18)		
Constant	3.74***	3.51***	2.47***
	(0.33)	(0.28)	(0.87)
N	76	51	25
R-sq	0.61	0.51	0.54
adj. R-sq	0.60	0.49	0.49

Standard errors in parentheses; * p<.1, ** p<.05, *** p<.01

Table 7: OLS: Full Sample Analysis of Assessed Value of Adelaide Lots in 1850, Fullballot treated as a continuous variable

	(1) lnvalue1850	(2) invalue1850
lnFullballot	-0.46*** (0.05)	
Fullballot		-0.0034*** (0.0002)
PLO	-0.45 (0.10)	-1.37*** (0.11)
Constant	6.92*** (0.33)	6.18*** (0.13)
N	992	992
R-sq	0.09	0.25
adj. R-sq	0.09	0.24

Standard errors in parentheses. * p<.1, ** p<.05, *** p<.01

Table 8: OLS: Full Sample Analysis of Assessed Value of Adelaide Lots in 1850, Fullballot treated as a categorical variable

cat1 -	cat13	cat25	cat37
0.544*	-0.228	1.400***	-0.151
(0.233)	(0.290)	(0.265)	(0.205)
cat2	cat14	cat26	cat38
1.306***	0.437	1.226***	-0.152
(0.348)	(0.223)	(0.216)	(0.204)
cat3	cat15	cat27	cat39
0.992***	-0.102	1.102***	-0.00529
(0.262)	(0.232)	(0.255)	(0.228)
cat4	cat16	cat28	cat40
0.230	0.537	0.598**	0.790***
(0.228)	(0.287)	(0.219)	(0.218)
cat5	cat17	cat29	cat41
0.581*	0.0941	0.374	0.274
(0.265)	(0.237)	(0.249)	(0.278)
cat6	cat18	cat30	cat42
0.248	0.221	-0.0810	-0.117
(0.245)	(0.265)	(0.207)	(0.307)
cat7	cat19	cat31	cat43
0.298	0.150	0.325	-0.319
(0.233)	(0.249)	(0.234)	(0.271)
cat8	cat20	cat32	cat44
-0.0253	0.307	-0.345	-0.474
(0.190)	(0.331)	(0.181)	(0.275)
cat9	cat21	cat33	cat45
0.134	0.0401	0.321	-0.0980
(0.220)	(0.244)	(0.279)	(0.288)
cat10	cat22	cat34	cat46
0.117	0.0788	0.152	-0.850***
(0.240)	(0.256)	(0.239)	(0.250)
cat11	cat23	cat35	cat47
-0.0664	1.796***	-0.164	-1.167***
(0.231)	(0.276)	(0.211)	(0.258)
cat12	cat24	cat36	cat48
0.353	1.689***	0.190	-1.140***
(0.237)	(0.304)	(0.240)	(0.252)

cat49	cat51	
-1.024***	-1.170***	Constant
(0.296)	(0.323)	3.883***
		(0.173)
cat50	cat52	
-1.702***	0.140	.
(0.221)	(0.249)	

N	992
R-sq	0.44
adj. R-sq	0.41

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001