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IMPLICIT CONTRACTS AND ACQUISITIONS: AN ECONOMETRIC CASE STUDY  
OF THE NINETEENTH CENTURY AUSTRALIAN BANKING INDUSTRY

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**Implicit contracts and acquisitions: An econometric case study of the nineteenth century Australian banking industry**

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# **Implicit contracts and acquisitions: An econometric case study from the nineteenth century Australian banking industry**

## **Abstract**

It has been argued that hostile takeovers redistribute wealth from workers to shareholders by enabling the acquiring firm to revoke implicit contracts. This paper uses micro-data from personnel records to examine the consequences of the Union Bank of Australia's 1892 takeover of the Bank of South Australia. The evidence confirms that the lifetime earnings of older workers at the BSA declined because of the merger. They faced a high probability of losing their jobs immediately following the merger, lost specific human capital due to the closure of branches, faced a flatter salary profile over the remainder of their career, and received a reduced pension.

The industrial consolidations of the “first great merger wave” of the 1890s have generated considerable debate among economic historians on the consequences of reduced competition on consumer welfare and the regulatory response of government.<sup>1</sup> However, consumers were not the only stakeholders potentially adversely affected by the process of consolidation. If workers possessed specific human capital or were tied to their employers through long-term implicit contracts, mergers could have substantially reduced their lifetime incomes by allowing acquiring firms to renegotiate existing contracts. Recent research on the railroads and the banking industry suggest that there existed an environment of non-spot labor market arrangements in the 1890s, suggesting that it may have been possible for firms to forcefully transfer wealth from workers through acquisitions.<sup>2</sup>

This paper examines the consequences of mergers during the first great merger wave using the case study of the takeover of the Bank of South Australia (BSA) by the Union Bank of Australia (UBA) in 1892.<sup>3</sup> The banking industry is an excellent subject for the study of the labor market effects of mergers for several reasons. First, although caution should be taken when drawing inferences from a single case study, it is clear that the merger itself was unexceptional for the industry. In branch banking countries, mergers had been fairly common throughout the nineteenth century and increased in frequency following the depression of the 1890s.<sup>4</sup> For example in England, banking was dominated by several hundred single-office private banks until the mid-

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<sup>1</sup>For example, see Lamoreaux, The Great Merger Movement.

<sup>2</sup>See Hamilton and MacKinnon, “Long-Term Employment Relationships”; Sammartino, Human Resource Management; and Howlett, “Evidence” on railroads. See Seltzer and Merrett, “Personnel Practices”; Seltzer and Simons, “Salaries and Career Opportunities” on banks.

<sup>3</sup>Because the United States was dominated by unit banks, the first great merger wave largely bypassed the industry. However, in branch banking countries, such as Australia and the United Kingdom, banking mergers increased in size and frequency following the depression of the 1890s.

<sup>4</sup>See Butlin, ANZ on other mergers in the Australian banking industry. Also see Cassis, City Bankers, on English banking mergers in the 1890s.

nineteenth century. A series of mergers meant that by the end of the nineteenth century, there were fewer than 100 banks remaining and the average number of branches per bank exceeded 45.<sup>5</sup> By the end of the 1920s, most branches were operated by the “Big Five” banks, and the average number of branches per bank exceeded 600. Although consolidation was not as dramatic in Australia, which never had a tradition of single-office banks, mergers around the period of this study led to the industry being dominated by only four banks (ANZ, Westpac, National Australia, and Commonwealth). Second, the banking industry developed sophisticated internal labor markets well before the 1890s. Previous studies have shown that labor contracts at banks deviated substantially from what would be expected in a spot market.<sup>6</sup> Third, there is extremely high quality personnel data from the industry that makes it possible to undertake a more comprehensive analysis of the consequences of mergers for personnel practices than has heretofore been possible.

This paper utilizes the complete career histories of all BSA workers both prior and subsequent to the merger, and of an analogous cohort of workers who began their careers at the UBA. In addition to the personnel data there exists a wealth of descriptive studies of the industry, most notably Butlin’s official history of the ANZ Bank and primary documents from the ANZ Group Archive.<sup>7</sup> The starting point for this study is the UBA’s absorption of the BSA in 1892. The BSA, which had had been profitable well into the 1880s, collapsed after a series of poor business decisions that were remarkably similar to those leading up to the American Savings and Loans crisis

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<sup>5</sup>Capie and Weber, *A Monetary History*; Sheppard, *The Growth*.

<sup>6</sup>Seltzer and Merrett, “Personnel Practices”; Seltzer and Simons, “Salaries and Career Opportunities”. These studies use the Union Bank data, including the former-BSA workers, but do not address the consequences of the merger on workers’ careers.

<sup>7</sup>The Australia and New Zealand Banking Group Limited is the product of a series of subsequent mergers, most notably the 1951 merger of the UBA with Bank of Australasia. The ANZ Group Archive in Melbourne contains the records of all component banks.

in the 1980s.<sup>8</sup> Beginning in the early-1880s the BSA expanded rapidly; financing their expansion with loans secured by real estate and overseas borrowing. The consequences of this expansion became apparent in the late-1880s and early-1890s when Australia experienced its most severe depression, which brought about a collapse in property prices, a series of panics in the financial sector, and a one third drop in real GDP. By 1890 the BSA was under severe commercial pressure. They resisted absorption through 1891, but by 1892, merger into one of their competitors was the only alternative to bankruptcy. Following the merger in April 1892 virtually all of the BSA's business was taken over by the UBA. However, in the years that followed, the UBA liquidated much of the BSA's business. By 1895, 40 percent of former BSA branches had been closed or merged with existing UBA branches in the same location, virtually all of the BSA's London deposits had been paid off, and 37 percent of the BSA's 1891 workforce was gone.

The approach that I use to analyze the consequences of the merger for the BSA's workers is similar in spirit to a series of studies beginning with a seminal article by Shleifer and Summers.<sup>9</sup> They argue that the gains to shareholders from hostile takeovers may be a result of redistribution from employees to shareholders, rather than increased productivity. They examine reneging on implicit contracts following an acquisition. Managers in the acquired firm may have previously promised workers lifetime employment with deferred compensation, whereby young workers are paid less than their productivity and older workers are paid more than their productivity in the manner described by Lazear.<sup>10</sup> Following the hostile takeover, the new management does not honor late-career salary over-payments promised by the

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<sup>8</sup>See ERisk, "US Savings & Loan crisis" for a brief summary of the 1980s crisis.

<sup>9</sup>Shleifer and Summers, "Hostile Takeovers".

<sup>10</sup>Lazear, "Why?"

acquired firm. Reneging on over-payment may take the form of dismissing older employees, flattening of tenure-salary profiles, or reducing pensions. Empirical studies have generally confirmed that following hostile takeovers there is an above-normal turnover rate among older workers at the acquired firm, a flattening of the salary profiles of workers from the acquired firm, and an above normal rate of reversion of pension fund surpluses.<sup>11</sup> One drawback of this literature is that the takeovers being studied are relatively recent, and thus have on-going effects on many of the workers at the acquired firms. Another drawback is a focus on firm-level averages, rather than outcomes for individual workers.

The unique historical data set used in this study makes it possible to examine longer-term outcomes for individual workers. The basic empirical approach is to compare employment, salary, and pension outcomes of 1) BSA employees prior to 1892, 2) former BSA employees at the UBA from 1892, and 3) direct entrants to the UBA before and after 1892. In addition to the possibility that implicit contracts were not honored following the merger, I also consider whether some of the human capital possessed by the BSA's workers was not fully transferable after the merger. To test this hypothesis, I assume that specific capital was increasing in seniority, and, critically, that some human capital was specific to the individual branches (for example, knowledge of the local economy or of customers). This implies that senior BSA employees in branches that were closed or absorbed into existing UBA branches following the takeover would have lost more specific human capital than other employees.

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<sup>11</sup>See Bhagat, Shleifer and Vishny, "Hostile Takeovers" on the exit rate of senior workers; Bertrand and Mullainathan, "Is there Discretion?" and Gokhale, Groshen, and Neumark, "Do Hostile Takeovers?" on salary growth; Ippolito and James, "LBO's" and Pontiff, Shleifer and Weisbach, "Reversions" on pension fund reversions.

It is shown that the merger reduced the lifetime earnings of former BSA employees, particularly relatively senior employees. Prior to the merger, the salary profiles of BSA employees were similar to those of UBA employees. Following the merger, several senior BSA employees were not hired by the UBA and the subsequent salary profiles of those who were hired by the UBA flattened out considerably. On the other hand, the subsequent salary profiles of junior BSA employees hired by the UBA closely resembled those of direct entrants to the UBA. There is also some evidence of human capital destruction. Following the merger, senior employees at BSA branches that were closed or absorbed into existing UBA branches typically took a larger pay cut than otherwise similar employees who remained at the branch where they were employed before the merger. Finally, former BSA employees received a lower pension relative to their contributions than comparable direct entrants.

The outline for the remainder of this paper is as follows. Following the introduction, the second section describes the data. The third section provides an overview of the Australian banking industry and a brief history of the UBA's absorption of the BSA. The fourth section examines salaries, pensions, and other career outcomes at the BSA and UBA prior and subsequent to the merger. The fifth section concludes.

## **II. Data**

The primary data used in this study are the employment records of the BSA and UBA. The UBA records are drawn from three salary ledgers containing the entire career

histories of all workers in 1887 and all entrants to March 1900.<sup>12</sup> The BSA data is from a ledger containing annual cross-sections of all employees at the bank in 1864-1874 and 1879-1891.<sup>13</sup> The records provide an unusually rich source of data which have several advantages over the data used in other studies. First, because all workers in the sample retired by 1945, the Australia New Zealand Banking Group has imposed minimal restrictions on disclosure of information, with only the names of individuals remaining confidential. Second, the data set contains the entire career histories of most employees at the two banks both prior and subsequent to their merger, including the pensions received upon retirement.<sup>14</sup> This sort of data is ideally suited to testing models of career issues, such as deferred compensation and turnover. In addition, salaries and other outcomes are observed at the individual level, whereas much of the literature relies on firm or occupational averages.

The record keeping procedures used by the BSA and UBA differed slightly. The BSA records are arranged as a series of annual cross-sections of employment recorded once each year, usually in late autumn or early winter. The UBA kept a single record for each employee, containing the individual's career history. The records contain dates of birth; date of entry to the bank; and annual salary, position, and branch of employment. The UBA records also contain details of previous employment, date of and reason for exit, and the amount of any pension. To the extent possible, the data sets for the two banks were constructed in a comparable manner. In practice, this meant recording UBA salary, position, and branch details annually, as of October 1 each year, and dropping information from the UBA records where corresponding

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<sup>12</sup>Union Bank of Australia Limited, Register of Officers; Union Bank of Australia Limited, Officers Book; Australia New Zealand Banking Group, Male Staff.

<sup>13</sup>Bank of South Australia, Record of Colonial Staff.

<sup>14</sup>The BSA records contain no observations before 1864 or between 1875 and 1878. Approximately 3 percent of UBA employees are truncated in 1926 or 1932, and are thus missing pension information.

information was unavailable for the BSA. For example, 1,117 man-years of available data from the UBA covering the years 1850-63 and 1875-78 are not used in the analysis.

In addition to the personnel records, the ANZ Group Archive contains various documents that describe the business and personnel practices of the UBA. Among the record groups utilized by this paper are the rules of the Guarantee and Provident Fund, the Annual Reports of the UBA's branches, the Letters from Inspector & General Manager, and the Instructions to be Observed by Officers. Unfortunately, records for the BSA are far less comprehensive although the Agreement between the UBA and BSA outlines the fate of the BSA's assets and the Reports on Officers provides information about the BSA's staff, including pensioners. In addition to the archival materials, this paper also utilizes data from several published sources. Information on the balance sheets of all Australian banks prior to 1945 is drawn from Butlin, Hall, and White.<sup>15</sup> Data on the number of branches maintained by all Australian banks in each colony or state between 1817 and 1914 is from Butlin.<sup>16</sup> Finally, data on population are from the Commonwealth Yearbook and data on national economic statistics such as prices and the unemployment rate are from Australians: Historical Statistics.<sup>17</sup>

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<sup>15</sup>Butlin, Hall, and White, Australian Banking.

<sup>16</sup>Butlin, Australian Monetary System.

<sup>17</sup>Australia, Official Yearbook; Vamplew, Australians.

### III. A Tale of Two Banks

The Australian banking industry has from its beginning been dominated by a relatively small number of firms. Unlike the United States, Australia never had restrictions on branch banking and large multi-branch banks have dominated the industry since the mid-nineteenth century. The late-nineteenth century witnessed a rapid growth of the industry. In 1866 there were 12 trading banks, which had total assets of £31,100,000 and operated 329 branches.<sup>18</sup> In 1890, on the eve of the UBA's acquisition of the BSA, these figures were 31 trading banks, with assets of £155,200,000 (in 1866 prices) and 1,543 branches.

Both the UBA and BSA, had, by the standard of the Australasian colonies, long and illustrious histories prior to the 1890s. Though its head office and board of directors were situated in London, the UBA conducted virtually all of business in the Antipodes. From the time of its founding in 1837, the UBA was one of Australia's most successful banks. In 1890 it ranked third among Australian banks in assets and by 1900 it ranked second. Baxter wrote in 1883, "Although not first in the amount of business transacted, the Union Bank of Australia will by many be considered the chief Australian bank. Of the large Australian banks, it affords by far the broadest basis of security to its customers."<sup>19</sup> Relative to its main rivals, the UBA remained fundamentally conservative throughout the growth years of the 1880s; opening fewer new branches, maintaining greater reserves, and avoiding the use of property as collateral.<sup>20</sup> This conservatism undoubtedly strengthened its position during the

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<sup>18</sup>Butlin, Hall, and White, Australian Banking.

<sup>19</sup>Baxter, Banking in Australia, p. 12.

<sup>20</sup>Butlin, ANZ; Butlin, Hall, and White, Australian Banking, p. 133.

depression of the 1890s, and it was one of only 3 large trading banks to remain open throughout the 1893 banking panic.

The BSA, which also had its head office and board of directors in London, was among the first commercial enterprises in South Australia. It received its charter in 1836, a year before the arrival of European settlers to the colony, and operated in Adelaide from the time of initial settlement. Unlike most other Australian banks, the BSA was restricted to operating in a single colony under its original charter. It was the largest financial institution in South Australia into the 1860s and continued to increase in size through the late-1880s.<sup>21</sup> Baxter wrote of the BSA in 1883, “This Bank, in its comparatively narrow sphere, has achieved considerable success. In its present prosperous state the Bank of South Australia ... pays a dividend of ten per cent.”<sup>22</sup>

According to Butlin, the BSA went from a position of relative strength in the early-1880s to complete collapse less than a decade later due to a series of poor managerial decisions. In 1866 the BSA operated 12 branches and had deposits of £765,656 and advances of £1,266,649, ranking 10<sup>th</sup>, 10<sup>th</sup>, and 8<sup>th</sup> respectively of the 20 trading banks in Australia.<sup>23</sup> Despite a solid bottom line, the directors were concerned with the growth of rival banks and the relatively small size of the BSA. In their haste to expand, the Directors ignored basic prudence standards. Over the next 14 years the BSA more than doubled in size; by 1880 it operated 27 branches, held £1,742,166 in deposits, and issued £2,495,513 in advances.<sup>24</sup> Between 1880 and 1884 the value of

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<sup>21</sup>Butlin, *ANZ*, pp. 45-6, 182, 203-4, 266-7.

<sup>22</sup>Baxter, *Banking in Australia*, p. 14.

<sup>23</sup>The BSA ranked near the bottom of the medium to large banks. Most of the smaller banks were very small, operating fewer than 5 offices and possessing assets under £400,000.

<sup>24</sup>Butlin, *ANZ*, p. 266.

both deposits and advances increased by a further 50 percent.<sup>25</sup> Many of the new advances were secured by real estate, a practice that contemporaries fully understood was imprudent and proved disastrous when the property boom of the 1880s came to an end. The BSA was unable to obtain the capital needed to finance this expansion within South Australia and began borrowing heavily at high interest rates from Great Britain. By 1888, the London office held over half of the bank's total deposits. Another serious mistake was rapidly increasing their business in colonies where they had no prior experience. In 1884 the Bank of South Australia Act cancelled the original charter, and allowed it to operate in other Australian colonies. Against the advice of A. W. Anderson, a director who was sent to Australia to evaluate expansion prospects, the directors established a Melbourne branch in 1888 and a Sydney branch in 1890.<sup>26</sup> Further exposing the bank, the directors decided that both branches would be run autonomously without control from the Colonial manager in Adelaide. Within a year, the Melbourne branch had lent £605,000 to land dealers. According to Butlin, the BSA would have been in considerable trouble by this point, even had the boom economy continued into the 1890s. However, beginning in 1889 Australia entered its most severe depression, which lasted for 6 years and resulted in a one third decrease in real GDP. In late-1889 the property market collapsed, causing failures of numerous banks, mortgage companies, building societies, and real estate companies. One of these firms, the Imperial Banking Company, failed in 1891 with a £94,355 debt to the BSA.<sup>27</sup> Following the events in Australia and the collapse of Barings Bank in 1890,

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<sup>25</sup>Butlin, *ANZ*, p. 266. All figures on deposits and advances are nominal; however, the price level was virtually unchanged between 1866 and 1884, thus the real figures are similar to the values reported above.

<sup>26</sup>Butlin, *ANZ*, p. 268.

<sup>27</sup>Union Bank of Australia and Bank of South Australia, *Agreement*.

London depositors rushed to withdraw their money.<sup>28</sup> Although the BSA's Directors had previously resisted amalgamation, by early-1892 failure was imminent, and they approached the UBA with "cap in hand".<sup>29</sup>

The amalgamation was completed on April 12, 1892. The UBA agreed to take on all of the BSA's deposits and most of its advances. The UBA was the logical choice to take over the good business of the BSA for several reasons. First, both banks had their head offices in London and it is likely that the directors were personally acquainted. Second, because the UBA was among the soundest banks in Australia, it was in a position to expand even as the economy collapsed. Third, the UBA lagged well behind its competitors in South Australia. In 1891 the UBA operated only 3 branches and employed only 2 percent of its Australian staff in South Australia, the fourth largest of the colonies. By comparison, the UBA's main rivals – the Bank of Australasia; the National Bank of Australia; the English, Scottish, and Australian Bank; and the Bank of New South Wales – operated 8, 56, 24, and 2 South Australian branches respectively.<sup>30</sup> The BSA's 25 South Australian branches, still second most in the colony, provided an ideal opportunity for rapid expansion. In addition to gaining pre-existing business, the UBA also acquired the location-specific knowledge of the BSA staff.

Following the merger there was some downsizing of the BSA's business. At the time of the merger, the BSA held London deposits of £1.62 million. Within 16 months this

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<sup>28</sup>Although Australia was not directly involved in the Barings collapse, which was a result of land speculation in Argentina, the resulting loss of British confidence in overseas investments severely effected Australian capital formation. Dyster and Meredith, Australia in the International Economy, pp. 41-2.

<sup>29</sup>Butlin, ANZ, pp. 290-93.

<sup>30</sup>Butlin, Hall, and White, Australian Banking.

had been reduced by over two thirds.<sup>31</sup> In addition, the UBA followed a policy of aggressive branch closure after the merger. Five branches were shut at the time of the merger, 3 were absorbed into an existing UBA branch in the same location, and 4 were closed between 1893 and 1895. Many of the employees in the absorbed or closed branches were reassigned to other branches in the UBA's network. Of the BSA's 100 non-London employees in 1891, 6 entered the UBA before July 1892, 65 entered on July 1, 1892, and 5 entered between July 1892 and June 1893. However, the merger also resulted in staff reductions: 24 BSA staff were never employed at the UBA and another 24 left between 1892 and 1896.

#### **IV. Empirical Methodology and Results**

The main statistical objective of this paper is to compare the salary profiles of 1) BSA staff, while at the BSA, 2) BSA staff after moving to the UBA, and 3) UBA staff who started their careers at the UBA. The underlying methodological approach used to test this hypothesis is a series of Mincer-type salary regressions on the log of real annual salary. The basic form of the regressions is:

$$\ln(W_t) = \alpha + bX_t + \epsilon_t$$

As discussed in Section II, the BSA and UBA records contain virtually identical information, so it is possible to run essentially the same regressions for the two banks prior to their merger. For the baseline specification, the independent variables in the X matrix are as follows: TENURE (and its square, cube, and quartic); ENTRY AGE

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<sup>31</sup>Butlin, ANZ, p. 306-9.

(and its square); a set of dummy variables for the local population (TOWN = 10,000-50,000, CITY =50,000-500,000, and METROPOLIS = 500,000+); INFLATION; UNEMPLOYMENT (the annual trade union unemployment rate for Australia); YEAR = 1891; EMPLOYMENT AT BRANCH;<sup>32</sup> a set of position dummies (TELLER, ACCOUNTANT/TELLER, ACCOUNTANT, AGENT, MANAGER, INSPECTOR, and HEAD OFFICE);<sup>33</sup> the interaction of EMPLOYMENT AT BRANCH and MANAGER; a dummy for the HEAD OFFICE; and a set of location dummies (New South Wales, Queensland, South Australia, Western Australia, Tasmania, New Zealand, and London). The location dummies were dropped for the BSA regressions, as its only branches outside of South Australia were in the two metropolises of Melbourne and Sydney. These variables are a fairly standard set of individual-specific, position-specific, location-specific, and economy-wide attributes that would be expected to influence earnings. A description of the variables, summary statistics for the BSA and UBA (prior and subsequent to the merger), and the expected signs of their coefficients in regressions on salaries are shown in Table 1.

*i. Salaries before the merger*

The market for white-collar workers in Australia was highly competitive, at least at the time of initial hiring. A young man with secondary education could choose to work for a bank or from a range of other white-collar employers, such as the civil service, insurance companies, or railroads. These organizations maintained similar

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<sup>32</sup> EMPLOYMENT AT BRANCH is directly calculated from the BSA personnel records, which provide a complete cross section of workers at the bank for all years with available data. For the UBA it is taken from the 1930 Annual Reports, the latest year for which data is available for all branches.

<sup>33</sup> The hierarchical ranking, from lowest to highest level, is: clerk, teller, accountant, manager, inspector. At smaller branches the duties of tellers and accountants were combined. Seltzer and Merrett, "Personnel Practices". The BSA contracted out the running of a few small and remote branches to agents.

salary scales covering the first 5-10 years of employment.<sup>34</sup> Although scales for junior workers were similar, this does not necessarily imply that career-long salary profiles were similar across these same organizations. Many of the skills of banking were learned on-the-job, and some of these skills were employer specific, such as knowledge of record-keeping procedures, local economies, and customers. These skills did not transfer easily between employers and there is considerable evidence that employee mobility between banks was very low.<sup>35</sup> The absence of mobility may have resulted in salary profiles across organisations diverging over time due to differences in rent sharing associated with firm profitability, differences in the level of specific skills, or differences in the use of incentive contracts.

To examine salaries prior to 1892, I have run a series of Mincer-type regressions on the natural log of real annual salaries at the two banks. Table 2 shows the results of these regressions run separately for the two banks. Multiple specifications of the model are presented as a robustness check. The first and fourth columns show the regression results for a parsimonious specification, which does not include position dummies or individual fixed effects. The second and fourth columns show the results for specifications including position dummies. The third and sixth columns also include individual fixed effects (and thus exclude the time-invariant independent variables). Table 3 shows the results of similar regressions where the data from the two banks has been pooled and a dummy variable for BSA and interactions between BSA and each of the independent variables are added. Table 3 reports only the regression coefficients of the BSA dummy and interaction variables, as the

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<sup>34</sup>See Seltzer and Simons, "Salaries" on salary scales at other banks, the civil service, and the railroads.

<sup>35</sup>See Merrett, ANZ Bank on the lack of intra-industry mobility. The UBA records show that, with the exception of former BSA staff, virtually no employees had previous experience working at another Australian bank.

coefficients on the non-interacted variables are similar to those in the UBA regressions in Table 2.

The results in Tables 2 and 3 are strongly consistent with the expected signs shown in Table 1. Salaries were generally higher in the bigger cities, probably due to differences in the cost of living. Salaries increased with entry age. This likely reflects additional human capital acquired through outside experience, as the level of formal education varied little across the industry.<sup>36</sup> The variable YEAR=1891 is included to capture whether the BSA tried to stave off acquisition or bankruptcy by reducing its salary bill. The regression coefficients are significant in each specification; however, they are of the same sign and similar magnitude in the BSA and UBA regressions, suggesting that the variable captures a broader year effect rather than an attempt by the BSA to avoid bankruptcy. The variables INFLATION and UNEMPLOYMENT are included as controls for business cycle effects.<sup>37</sup> Higher-level positions were associated with higher salaries, either because salary was tied to rank as with tournament models or because ranks are correlated with unobserved heterogeneity in employee abilities.<sup>38</sup> The estimated coefficients on the position dummies remain positive when individual fixed effects are included in the regressions, but their magnitude and significance declines, suggesting that the relationship between position

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<sup>36</sup> Hill, From Subservience. Virtually all bank staff received some secondary education, typically to age 16. The banks gave prospective employees an entry exam consisting of basic secondary education subjects (maths, geography, history, writing, etc.) to further ensure homogeneity of formal training of their staff. The coefficient on entry age in the UBA regression becomes smaller and less significant when details of previous experience (years and type of employment) are added to the regressions.

<sup>37</sup> Although implicit contracts over the business cycle are not the focus of this study, it is necessary to control for their potential effect on salaries. Over the period of this study inflation ranged from -14.8 to 11.0 percent and unemployment ranged from 0.67 to 7.76 percent per annum.

<sup>38</sup> See Lazear and Rosen, "Rank Order Tournaments" on the tournament model. The omitted position variable is CLERK, the lowest hierarchical rank, thus one would expect a positive coefficient on each of the position dummies.

and salaries was primarily due to the banks assigning higher ability employees to upper-level positions.

The most important results pertain to the tenure variables. The regressions use a quartic tenure specification, which allows for non-linear returns to tenure, i.e. for rapid salary growth and slow down at multiple points in the career.<sup>39</sup> Elsewhere I have shown that careers at the UBA were characterized by rapid salary growth early in the career, followed by a slowdown in salary growth, followed by a later acceleration of salary growth, followed by a leveling off of salaries shortly before retirement.<sup>40</sup> The coefficients on the tenure variables suggest strong positive net returns at both banks. The coefficient on each of the tenure variables is strongly significant, and these variables alone explain about 60 percent of the variation in UBA salaries and 75 percent in BSA salaries. In all specifications, the estimated coefficients imply large late-career real salary increases, strongly suggesting the importance of deferred compensation. Alternative explanations of upward sloping profiles, such as selective exits (i.e. relatively poorly compensated employees remaining at the banks for shorter periods of time), are inconsistent with the robustness of the coefficients to the inclusion of individual fixed effects.<sup>41</sup>

The results of greatest interest to this study are the relative slopes of the salary profiles prior to the merger. Table 3 shows the coefficients on the BSA dummy and a

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<sup>39</sup> See Murphy and Welch, "Empirical" on the slope of earnings profiles.

<sup>40</sup> Seltzer and Merrett, "Personnel Practices"; Seltzer and Simons, "Salaries".

<sup>41</sup> As a robustness check on the tenure coefficients, I have estimated the UBA profile using only employees who remained for at least 30 years. This approach avoids the problem of the tenure coefficients potentially being driven by selective exits. The slope of the estimated salary profile is similar to those shown in Tables 2 and 5 and Figure 1. It is not possible to run regressions for the BSA using only employees remaining for at least 30 years because the cell size (7 employees) is too small to produce meaningful conclusions.

set of interactions between the BSA dummy and other independent variables in order to determine whether the underlying salary policies at the two banks were the same prior to the merger. The individual coefficients are significantly different across the two banks, but the estimated net returns to tenure are broadly similar over workers' careers. This can be seen more clearly in Figure 1, which shows the salary profiles constructed from the regression results in Table 2 columns 1 and 4 (panel A) and columns 2 and 5 (panel B). In the specification with position controls, the estimated profiles of the two banks are virtually identical, while in the specification without controls the BSA profile is slightly steeper than the UBA profile.

*ii. Salaries after the merger*

To examine the short-run implications of the merger I have run a regression on the change in the natural log of real salary between December 1891 and October 1892, using the sample of former BSA staff who were hired by the UBA after the merger. The independent variables in the regression include some fairly standard individual characteristics (TENURE, TENURE<sup>2</sup>, AGE AT ENTRY, RURAL) and two additional variables capturing their change of status as a result of the merger: BRGONE\*TENURE (where BRGONE is a dummy equalling one if the employees 1891 branch of employment was either closed or merged into an existing UBA branch at the same location) and Ln (REAL SALARY<sub>1891</sub>). These additional variables are included to capture the effects of lost human capital as a result of branch closings and of changes to implicit contracts resulting from the merger.

The standard OLS regression approach is unsuitable for this regression, as not all former BSA staff were hired by the UBA and the attrition is unlikely to have been random. The exit rate of BSA employees reached its historical high in 1892. Between 1879 and 1891 the exit rate averaged approximately seven percent per year; however, 26 percent left in 1892. To control for the possibility of non-random exits, I have estimated changes in log real salaries using the Heckman two-stage process treating individuals who left at the time of the merger as censored cases. This model is estimated as  $\text{Ln}(\text{real salary}) = X + u$ , where  $X$  is a vector of controls and  $u \sim N(0, 1)$  is a random error. Observations are only observed if  $(Z + \mu) \geq 0$ , where  $Z$  is a vector of characteristics determining whether the employee was hired by the UBA. The first stage of the estimation procedure uses a probit regression to determine which employees went to the UBA. The second stage estimates salaries using the inverse mills ratio,  $f(z)/[1 - f(Z)]$ , as a selection correction. The independent variables used in the selection equation are BRANCH CLOSED (1 if the branch was shut in 1892), BRANCH ABSORBED (1 if the BSA branch was absorbed into an existing UBA branch at the same location in 1892), CLERK, and OVER45 (1 if the employee was aged 45 or older on December 31, 1891). The selection variables capture lost human capital due to branch closures and the effects of the UBA's pension rules, which contained separate provisions for employees entering above age 45.<sup>42</sup>

Table 4 shows selection-corrected estimates of the change in log real salary in the year following the merger. In the selection regression only OVER45 is statistically significant; older BSA workers were less likely to go over to the UBA. Clearly more

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<sup>42</sup>The additional rules concern pension contributions for late-in-life appointments. While not specifically mentioning the BSA, the rules govern appointments of individuals between ages 35 and 45 and over age 45. Apart from BSA employees, this sort of appointment was only made to a small handful of high-level staff. See Union Bank of Australia, Guarantee, pp. 7-8.

senior workers would have taken the largest pay cut by entering the external labor market and thus it is almost certain that the exit decision was made by the UBA rather than the employees. Recent studies have also shown that senior workers are disproportionately laid off following hostile takeovers.<sup>43</sup> The results of the regression also suggest that the merger resulted in the loss of specific human capital. The coefficient on BRGONE\*TENURE is negative, implying that, all else equal, senior workers at branches that ceased independent trading took a pay cut.

It is not possible to estimate the effects of tenure on changes in salary using just the tenure coefficients from Table 4 and holding the values of other variables constant because, as shown in Table 2 and Figure 1, tenure was the primary determinate of Ln (REAL SALARY<sub>1891</sub>). Thus to evaluate the total impact of tenure, including its impact that works through its effect on BSA salary, I have used the coefficients on tenure from Table 2 to estimate real salaries in 1891 and used this along with the results in Table 4 to estimate the total effect of tenure on the change in salary following the merger. Figure 2 shows this estimated relationship separately for employees in branches that were closed or absorbed and for employees in branches that remained open. The predicted change in salary was positive, although relatively small, for employees with 22 or fewer years of tenure at branches that continued to operate. The predicted change was smaller for employees at branches which were closed or absorbed, and was negative for these employees if they had over 10 years tenure at the BSA. Figure 2 also shows that very senior employees took a large pay cut, regardless of whether their branch continued to operate after the merger.

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<sup>43</sup>Bhagat, Shleifer and Vishny, "Hostile Takeovers"; Gokhale, Groshen, and Neumark, "Do Hostile Takeovers?"

To examine the longer-term consequences of the merger, I have pooled the UBA data from 1892 forward and run OLS regressions on the natural log of real annual salaries. The independent variables are the same as in Table 2 with exceptions of adding several variables to capture the differences between former BSA employees and direct entrants to the UBA. These variables are YEARS BSA, (YEARS BSA)<sup>2</sup>, TENURE\*YEARS BSA, TENURE\*(YEARS BSA)<sup>2</sup>, YEARS BSA\*BRANCH CLOSED, YEARS BSA\*NEW BRANCH, and BSA MANAGER.

The variables YEARS BSA and (YEARS BSA)<sup>2</sup> are directly analogous to the tenure variables for direct entrants. If tenure at the BSA was treated the same way as tenure at the UBA then the net effect of YEARS BSA and (YEARS BSA)<sup>2</sup> would be the same as the net effect of the tenure variables for direct UBA entrants. The variables TENURE\*YEARS BSA and TENURE\*(YEARS BSA)<sup>2</sup> capture whether subsequent tenure at the UBA was treated differently for former BSA staff. The variables YEARS BSA\*BRANCH CLOSED and YEARS BSA\*NEW BRANCH capture the effects of the destruction of specific human capital.

The results of the regressions are shown in Table 5. The results provide strong evidence that the merger reduced longer-run salaries for senior and even fairly junior former BSA staff. The net effect of YEARS BSA is considerably smaller than the effect of tenure at the UBA. The coefficient on TENURE\*YEARS BSA is negative and statistically significant. The effects of tenure at the UBA and BSA can be illustrated with predicted salary profiles constructed from the regressions in Tables 2 and 5. Figure 3 shows the predicted profiles for four hypothetical employees with different sets of characteristics. The predicted profiles of a hypothetical 1891 entrant

to the BSA and a hypothetical 1892 direct entrant to the UBA are very similar. However, these profiles are very different from the profiles of a hypothetical 1881 entrant to the BSA in two important ways. First, the 1881 BSA entrant would have taken a sizeable pay cut at the time of the merger. Secondly, the salary profile of the 1881 BSA entrant would have had a very different slope than the profile of a direct UBA entrant. After the initial decline in pay following the merger, senior former BSA employees experienced substantial catch-up salary growth for about 10 years. However, the salary profiles of these employees flattened out after about 25 years of tenure at the UBA, whereas direct UBA entrants experienced substantial late-career salary growth.

### *iii. Pensions*

Another consequence of mergers that has received considerable attention in the literature is their impact on pensions. Studies by Ippolito and James and by Pontiff, Shleifer and Weisbach have shown that surpluses in the acquired firm's pension fund are likely to revert to the acquiring firm following hostile takeovers.<sup>44</sup>

The available records do not show the BSA's pension rules, thus it is not possible to compare the pensions received by former BSA staff to what they would have received had the BSA continued to operate. However, the rules of the UBA's Guarantee and Provident fund have survived and can be used along with the estimated salary profiles to examine the pensions that would have been received by former BSA staff and direct entrants to the UBA. Former BSA workers retained a pension on their

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<sup>44</sup>Ippolito and James, "LBO's"; Pontiff, Shleifer, and Weibach, "Reversions".

contributions to the BSA fund; however, this was capped at £200. This cap was binding for 4 existing BSA pensioners in 1891 who had been receiving amounts up to £335.<sup>45</sup> Former BSA staff who went over to the UBA before age 35 accumulated a UBA pension at the standard rate ( $N/160 * AVGSAL$ , where N is the number of half-years employed at the UBA and AVGSAL is the average salary over the final 10 years of the career), but based only on the years served at the UBA.<sup>46</sup> Former BSA employees entering at age 35 or older had to pay higher annual contribution rates.

Even ignoring the £200 cap, the policy of vesting the BSA pension and counting only service at the UBA going forward was costly for former BSA staff because a substantial portion of their total pension was based on a mid-career salary. In addition, the contribution rate was higher for late-career appointees and, as shown previously, late-career salaries were reduced by the merger. Table 6 shows the pension contributions and entitlements under the Guarantee and Provident Fund's 1927 rules for three hypothetical employees, entering either the BSA or UBA at age 18 and retiring at age 60, using salary profiles constructed from Table 2. The estimated lifetime contributions of the two former-BSA employees are virtually identical, at approximately 75 percent of those made by the 1891 UBA entrant. However, the estimated real value of the pensions received by the 1875 and 1881 BSA entrants are only 36.4 and 29.5 percent respectively of the pension received by the 1891 UBA entrant.

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<sup>45</sup>Union Bank of Australia, Reports.

<sup>46</sup>Union Bank of Australia, Guarantee. I have found no documentary evidence concerning the UBA's treatment of service at the BSA, but it is clear from the actual pensions received by former BSA employees that only years at the UBA counted toward a UBA pension.

#### *iv. Interpretation of results*

The obvious interpretation of the results presented above is that the UBA renegotiated existing implicit contracts with former BSA staff following the merger. An alternative explanation for the observed salary profiles is that former BSA staff were somehow worse than direct entrants in terms of unmeasured employee attributes. On the face of things this would be surprising because, as shown above, there was considerable selection in terms of which staff were ultimately hired by the UBA. As a simple test of employee quality, Table 7 compares non-salary outcomes of former BSA employees to direct entrants to the UBA collectively and split by age at the time of the merger. The evidence suggests that former BSA employees, particularly those who were at least 25 years old in 1892, were actually more capable than direct entrants. Former BSA employees were more likely to reach the level of manager or higher and typically remained at the UBA longer than direct entrants.

## **VI. Conclusions**

Mergers and firm failures potentially impact workers as well as consumers. This paper examines the salary, employment, and pension consequences to workers in the First Great Merger Wave using the case study of the Union Bank of Australia's 1892 takeover of the Bank of South Australia. The evidence suggests that the UBA did not fully honor the implicit contracts that the BSA had with its employees. Prior to the takeover, salary profiles at the UBA and BSA were very similar, both increasing in tenure in a manner consistent with Lazear-style deferred compensation. Following the takeover, younger workers at the BSA were treated by the UBA in much the same

way as direct entrants. However, older BSA workers faced several separate shocks to their lifetime income. First, workers over age 45 at the time of the merger were considerably less likely to be given positions in the UBA. Secondly, BSA employees who worked at branches that were closed or absorbed into existing UBA branches in 1892 lost branch-specific human capital, and consequently took a pay cut. Third, the salary profiles of BSA employees with even modest tenure flattened midway through their careers and they did not receive large late-career salary increases like other UBA employees. Fourth, the UBA's pension rules disadvantaged former BSA employees by 1) requiring higher contribution rates of older workers, 2) not counting years served at the BSA toward pensionable years of service, and 3) basing the pension on the late-career salary at the UBA, which was substantially higher for direct entrants than former BSA employees.

## References:

Australia, Commonwealth Bureau of Census and Statistics. Official Yearbook of the Commonwealth of Australia. Canberra, 1907.

The Australia New Zealand Banking Group. Male Staff Record Cards, 1932-1970. ANZ Group Archive, Mt. Waverley, Australia (Z/87/7, Z/87/8, Z/87/9).

The Bank of South Australia. Record of Colonial Staff. ANZ Group Archive, Mt. Waverley, Australia (SA/20/1).

A. B. Baxter. Banking in Australasia. London: Blades, East & Blades, 1883.

Marianne Bertrand and Sendhil Mullainathan. "Is there Discretion in Salary Setting? A Test Using Takeover Legislation." Rand Journal of Economics, 30, 3 (1999): 535-554.

Sanjai Bhagat, Andrei Shleifer, and Robert Vishny. "Hostile Takeovers in the 1980s: The Return to Corporate Specialization." Brookings Papers on Economic Activity: Microeconomics, 1 (1990): 1-72.

S. J. Butlin. Australia and New Zealand Bank. Croydon: Longmans, 1961.

S. J. Butlin. The Australian Monetary System 1851-1914. Sydney: Ambassador Press, 1986.

S. J. Butlin, A. R. Hall, and R. C. White. Australian Banking and Monetary Statistics, 1817-1945. Reserve Bank of Australia, Occasional Paper No. 4A. Sydney, 1971.

Forest Capie and Alan Weber. A Monetary History of the United Kingdom, 1870-1982. George Allen & Unwin: London, 1985.

Barrie Dyster and David Meredith. Australia in the International Economy in the Twentieth Century. Oakleigh, VIC.: Cambridge University Press, 1990.

Jagadeesh Gokhale, Erica Groshen, and David Neumark. "Do Hostile Takeovers Reduce Extramarginal Salary Payments?" Review of Economics and Statistics, 77, 3 (1995): 470-85.

Barton Hamilton and Mary MacKinnon (1996), "Long-Term Employment Relationships in the Early Twentieth Century: Evidence from Personnel Data", Labour Economics, 3 (1996): 357-383.

John Hill, From Subservience to Strike: Industrial Relations in the Banking Industry, St Lucia: University of Queensland Press, 1982.

Peter Howlett. "Evidence of an Internal Labour Market in the Great Eastern Railway Company, 1870-1905." Business History, 42, 1 (2000): 21-40.

Richard Ippolito and William James. "LBO's, Reversions and Implicit Contracts." Journal of Finance, 47, 1 (1992): 139-67.

Naomi Lamoreaux. The Great Merger Movement in American Business, 1895-1904. New York: Cambridge University Press, 1985.

Edward Lazear. "Why is there Mandatory Retirement?" Journal of Political Economy, 87 (1979): 1261-64.

Edward Lazear and Sherwin Rosen. "Rank Order Tournaments as Optimum Labor Contracts." Journal of Political Economy, 83 (1981): 841 - 64.

David Merrett, ANZ Bank: A History of the Australia New Zealand Banking Group and its Consistent, Sydney: Allen & Unwin, 1985.

Kevin Murphy and Finis Welch. "Empirical Age-Earnings Profiles." Journal of Labor Economics, 8 (1990): 202-29.

Jeffrey Pontiff, Andrei Shleifer, and Michael Weisbach. "Reversions of Excess Pension Assets after Takeovers." Rand Journal of Economics, 21, 4 (1990): 600-13.

André Sammartino. Human Resource Management Practices and Labour Market Structures in the Victorian Railways 1864-1921. Ph.D. Dissertation. University of Melbourne, 2002.

Andrei Shleifer and Lawrence Summers. "Hostile Takeovers as Breaches of Trust." In Alan Auerbach, ed. Corporate Takeovers: Causes and Consequences. Chicago: University of Chicago Press, 1988.

Andrew Seltzer, "Codebook for the Union Bank of Australia Micro-Data Set", Unpublished Manuscript, 2015.

Andrew Seltzer and David Merrett. "Personnel Practices at the Union Bank of Australia: Panel Evidence from the 1887-1900 Entry Cohorts." Journal of Labor Economics, 18, 4 (2000): 573-613.

Andrew Seltzer and Kenneth Simons. "Salaries and Career Opportunities in the Banking Industry: Evidence from the Personnel Records of the Union Bank of Australia," Explorations in Economic History, 38 (2001): 195-224.

D.K. Sheppard. The Growth and Role of U.K. Financial Institutions, 1880-1962. Methuen: London, 1971.

The Union Bank of Australia Limited. Annual Report, Victoria and Tasmania, New South Wales, Queensland, South Australia, Western Australia, New Zealand, 1900-30. ANZ Group Archive, Mt. Waverley, Australia (U/218, U/219, U/220, U/221, U/222, U/223).

The Union Bank of Australia Limited. Register of Officers, 1887-93. ANZ Group Archive, Mt. Waverley, Australia (U/271/1, U/271/2, U/271/3).

The Union Bank of Australia Limited. Officers Book, ANZ Group Archive, Mt. Waverley, Australia (U/205).

The Union Bank of Australia Limited. Guarantee and Provident Funds, 1929. ANZ Group Archive, Mt. Waverley, Australia (U/277).

The Union Bank of Australia Limited. Colonial Staff, Letters From Inspector & General Manager. ANZ Group Archive, Mt. Waverley, Australia (U/258/1).

The Union Bank of Australia Limited. Instructions to be Observed by Officers. ANZ Group Archive, Mt. Waverley, Australia (U/195/1).

The Union Bank of Australia Limited. Reports on Officers, 1892. ANZ Group Archive, Mt. Waverley, Australia (U/288/1).

The Union Bank of Australia Limited and The Bank of South Australia. Agreement. ANZ Group Archive, Mt. Waverley, Australia (U/298/1).

Wray Vamplew, ed. Australians: Historical Statistics. New South Wales: Fairfax, Syme & Weldon Associates, 1987.

**Table 1**  
**Variable Definitions, Summary Statistics, and Expected Signs**

Variable	definition	Mean (BSA)	Mean (UBA, before 1892)	Mean (UBA, from 1892)	Expected Sign
Ln(Real Wage)	Natural log of real salary (1911 prices)	5.094 (0.62)	5.028 (0.65)	5.407 (0.65)	Dependent variable
TOWN	Dummy: 1 if 10,000<POP≤50,000	0.124	0.311	0.201	?
CITY	Dummy: 1 if 50,000<POP≤500,000	0.401	0.179	0.208	+
METROPOLIS	Dummy: 1 if POP>500,000	0.029	0.286	0.315	+
INFLATION	National inflation rate	-1.03 (6.11)	-1.55 (6.25)	0.792 (4.96)	-
UNEMPLOYMENT	National unemployment rate	3.23 (1.34)	3.273 (1.27)	5.673 (4.82)	?
YEAR = 1891	Dummy: 1 if year = 1891	0.097	0.124	---	-
ENTRY AGE [(ENTRY AGE) <sup>2</sup> ]	Age (and squared) at time of first employment	18.44 (3.58)	20.293 (4.63)	20.782 (5.40)	+ in aggregate
TENURE [TENURE <sup>2</sup> , TENURE <sup>3</sup> , TENURE <sup>4</sup> ]	Tenure at current employer (and squared, etc)	10.07 (8.02)	8.275 (7.55)	17.097 (11.50)	+ in aggregate
EMPLOYMENT AT BRANCH	Number of staff employed at the branch	13.23 (14.58)	24.20 (32.56)	24.28 (33.45)	+
TELLER	Dummy: 1 if occupation is teller	0.046	0.045	0.062	+
ACCT/TELLER	Dummy: 1 if occupation is accountant/teller	0.031	0.00022	0.062	+
ACCOUNTANT	Dummy: 1 if occupation is accountant	0.163	0.090	0.0754	+
AGENT	Dummy: 1 if occupation is agent	0.122	---	---	+
MANAGER	Dummy: 1 if occupation is manager	0.171	0.179	0.295	+
INSPECTOR	Dummy: 1 if occupation is inspector	---	0.011	0.027	+
EMPLOYMENT*MANAGER	Interaction of EMPLOYMENT AT BRANCH and MANAGER	0.752 (3.40)	1.966 (9.51)	2.942 (11.00)	+
HEAD OFFICE	Dummy: 1 if employed at the head office	0.005	0.001	0.00096	+
Number of Staff		100	667	1276	
Number of Observations		1034	5612	19809	

Note: Standard deviations shown in parentheses for continuous variables.

Source: See Seltzer, "Codebook" for a detailed description of the UBA data.

**Table 2**  
**Determinants of Salaries at the UBA and BSA Before 1892, Separate Regressions**

	BSA	BSA	BSA	UBA	UBA	UBA
TOWN	-.0640* (2.09)	-.0112 (0.44)	.0173 (1.31)	.0081 (0.57)	.0545** (4.15)	.0097 (0.92)
CITY	.0077 (0.18)	.0192 (0.55)	.0274 (1.65)	.0984** (5.12)	.1760** (9.93)	.0438** (3.02)
METROPOLIS	.0921 (1.56)	.1659** (3.35)	.2183** (7.47)	.0472 (1.79)	.1300** (5.41)	.0639** (3.01)
INFLATION	-.0005 (0.21)	.00016 (0.08)	-.0019* (2.43)	-.0059** (4.39)	-.0061** (5.10)	-.0048** (7.10)
UNEMPLOYMENT	.0435** (6.04)	.0375** (6.20)	.0254** (10.09)	.0256** (6.11)	.0281** (7.59)	.0113** (5.20)
YEAR = 1891	-.0944* (2.00)	-.0832* (2.12)	.0714** (4.20)	-.0547* (2.16)	-.0561* (2.52)	.0902** (6.66)
ENTRY AGE	.0371** (2.78)	.0492** (4.32)		.0165* (2.38)	.0645** (9.78)	
(ENTRY AGE) <sup>2</sup>	-.00038 (1.28)	-.00071** (2.74)		.00084** (5.82)	-.00047** (3.37)	
TENURE	.1531** (9.99)	.1534** (11.79)	.1196** (20.09)	.2860** (35.76)	.2850** (40.22)	.2530** (55.11)
TENURE <sup>2</sup>	-.0054** (2.75)	-.0082** (4.89)	-.0050** (6.64)	-.0213** (19.02)	-.0234** (23.40)	-.0185** (29.41)
TENURE <sup>3</sup>	.00011 (1.17)	.00022** (2.81)	.00012** (3.69)	.00076** (13.84)	.00085** (17.31)	.00061** (20.02)
TENURE <sup>4</sup>	-.00000066 (0.49)	-.0000018 (1.60)	-.0000014** (2.75)	-.0000098** (11.25)	-.000011** (14.02)	-.0000074** (15.36)
EMPLOYMENT AT BRANCH TELLER	-.0021 (1.50)	.0059** (4.55)	-.0009 (1.48)	-.00034 (1.21)	.0002 (0.85)	.00054** (2.63)
ACCOUNTANT/TELLER		.2571** (6.41)	.0382 (1.93)		.1900** (8.84)	.0277 (1.92)
ACCOUNTANT		.4966** (10.13)	.0406 (1.65)		-.4030 (1.41)	-.0476 (0.26)
AGENT		.2767** (10.13)	-.0022 (0.15)		.1950** (11.22)	.0135 (1.12)
MANAGER		.3257** (10.05)	.0475** (2.62)			
EMPLOYMENT AT BRANCH*MANAGER HEAD OFFICE		.6674** (17.04)	.1451** (6.81)		.3200** (16.97)	.0316* (2.13)
INSPECTOR		-.0028 (0.98)	.0005 (0.37)		.0081** (14.83)	.0028** (6.56)
State Dummies		1.1951** (10.24)	.0786 (1.31)		.8540** (6.04)	-.3430** (3.12)
Individual Fixed Effects					1.1390** (17.77)	.5900** (11.12)
CONSTANT	NO	NO	NO	YES	YES	YES
F	NO	NO	YES	NO	NO	YES
Adjusted R <sup>2</sup>	3.4872** (23.08)	3.2098** (25.27)	0.0164** (5.17)	3.205** (38.50)	2.727** (35.02)	.000094 (0.04)
Sample Size	275.15**	286.91**	516.46**	721.15**	720.71**	727.23**
	.7766	.8480	.9003	.7660	.8170	.8060
	1026	1026	1028	4191	4191	4197

Notes: \*, \*\* = significance at the 5 per cent and 1 per cent levels, dependent variable is Ln (REAL SALARY), absolute value of t-statistics in parentheses.

**Table 3**  
**Determinants of Salaries at the UBA and BSA Before 1892, Pooled Regressions**

	1	2	3	4
BSA	0.401*	0.420*		
	(2.15)	(2.47)		
TOWN	-0.078*	-0.097**	-0.002	0.004
	(2.13)	(2.90)	(0.07)	(0.18)
CITY	-0.094	-0.194**	-0.022	-0.014
	(1.84)	(4.22)	(0.70)	(0.45)
METROPOLIS	-0.125	-0.142*	0.174**	0.180**
	(1.65)	(2.08)	(2.79)	(2.88)
INFLATION	0.0050	0.0058*	0.0020	0.0025
	(1.78)	(2.29)	(1.54)	(1.71)
UNEMPLOYMENT	0.016	0.009	0.012*	0.012*
	(1.75)	(1.08)	(2.50)	(2.58)
YEAR = 1891	-0.026	-0.019	-0.010	-0.018
	(0.46)	(0.37)	(0.33)	(0.56)
ENTRY AGE	0.025	0.010		
	(1.55)	(0.66)		
(ENTRY AGE) <sup>2</sup>	-0.0013**	-0.0008*		
	(3.71)	(2.52)		
TENURE	-0.112**	-0.122**	-0.129**	-0.116**
	(6.02)	(7.18)	(12.09)	(10.60)
TENURE <sup>2</sup>	0.012**	0.014**	0.013**	0.011**
	(5.06)	(6.12)	(9.49)	(8.07)
TENURE <sup>3</sup> * 1000	-0.448**	-0.534**	-0.446**	-0.392**
	(4.00)	(5.25)	(7.17)	(6.18)
TENURE <sup>4</sup> * 1000	0.0053**	0.0070**	-0.0050**	0.0044**
	(3.16)	(4.60)	(5.42)	(4.72)
EMPLOYMENT AT BRANCH TELLER	-0.0025	0.0053**	-0.0022*	-0.0021*
	(1.55)	(3.37)	(2.36)	(2.12)
ACCOUNTANT/TELLER		0.058		0.029
		(1.11)		(0.89)
ACCOUNTANT		0.834**		0.017
		(2.79)		(0.44)
MANAGER		0.072*		-0.029
		(1.94)		(1.40)
EMPLOYMENT AT BRANCH*MANAGER INSPECTOR/HEAD OFFICE		0.242**		0.103**
		(4.85)		(3.46)
State Dummies	YES	YES	YES	YES
Individual Fixed Effects	NO	NO	YES	YES
F (regression)	546.99**	537.38**	721.38*	600.66**
F (BSA + interactions)	17.46**	13.82**	37.11*	20.66**
Adjusted R <sup>2</sup>	0.768	0.815	0.606	0.613
Sample Size	5598	5598	5606	5606

Notes: Coefficients shown are for the interactions of BSA and the variable of interest. All regressions include controls for each of the main variables of interest. A full set of results is available on request from the author. Other notes the same as Table 2.

**Table 4**  
**Determinants of Initial Change in Salaries after Moving to the UBA**

Independent Variable	Coefficient
TENURE	.0153 (1.58)
TENURE <sup>2</sup>	-.00045* (2.28)
BRANCH GONE * TENURE	-.0060* (2.48)
RURAL	-.0335 (0.39)
ENTRY AGE	.0053 (1.41)
Ln (RS <sub>1891</sub> )	-.1646** (3.17)
Constant	.7113** (4.11)
Likelihood ratio	14.8604
Wald $\chi^2$	113.49**
Sample size	100
Censored cases	24
Selection Regression	
BRANCH CLOSED	-.5014 (0.82)
BRANCH ABSORBED	-.2377 (0.65)
CLERK	.1280 (0.43)
OVER45	-.9709* (2.10)
CONS	.8657** (3.06)

Notes: Dependent variable is Ln (REAL SALARY<sub>1892</sub>) - Ln (REAL SALARY<sub>1891</sub>), other notes are the same as Table 2.

**Table 5**  
**Determinates of Salaries at the UBA, 1892-1945**

TOWN	.0310** (4.20)	-.0233* (2.94)
CITY	.1053** (12.90)	.0222* (2.70)
METROPOLIS	.0681** (7.15)	.0318* (3.15)
INFLATION	-.0101** (18.23)	-.0098** (15.58)
UNEMPLOYMENT	.0031** (4.94)	.0036** (5.14)
ENTRY AGE	.0289** (10.78)	.0260** (8.57)
(ENTRY AGE) <sup>2</sup>	.00009 (1.74)	.00028** (4.60)
TENURE	.2313** (80.40)	.2199** (67.83)
TENURE <sup>2</sup>	-.0146** (49.85)	-.0125** (37.60)
TENURE <sup>3</sup>	.00040** (36.93)	.00032** (26.24)
TENURE <sup>4</sup>	-.0000037** (29.02)	.0000028** (19.34)
EMPLOYMENT AT BRANCH	.00034* (3.41)	-.00097** (9.17)
BSA MANAGER <sup>91</sup>	.0723* (3.07)	.3243** (12.33)
YEARS BSA	.0433** (16.54)	.0535** (17.95)
(YEARS BSA) <sup>2</sup>	-.0011** (9.50)	-.0016** (11.72)
TENURE * YEARS BSA	-.0021** (12.11)	-.0024** (11.93)
TENURE * (YEARS BSA) <sup>2</sup>	-.00000036 (0.04)	.0000029 (0.27)
YEARS BSA * BRANCH CLOSED	-.0077** (4.60)	-.0193** (10.29)
YEARS BSA * NEW BRANCH	.0023 (1.57)	-.0018 (1.07)
State dummies	YES	YES
Position dummies	YES	NO
CONSTANT	3.2722** (96.42)	3.3541** (87.13)
F	2082.40**	1901.52**
Adjusted R <sup>2</sup>	.8259	.7734
Sample Size	14,478	14,478

Notes: All notes are the same as Table 2.

**Table 6**  
**Estimated Pension Contributions and Entitlements**

	UBA –1891 entrant	BSA – 1881 entrant	BSA –1875 entrant
Contribution rate first 5 years	4.1%	4.1%	7.0%
Contribution rate remaining years	4.1%	4.1%	5.0%
Predicted total contributions	£720.40	£543.81	£541.58
Years pensionable service	42	30.5	24.5
Average salary based on final ___ years	20	20	12
Predicted average nominal salary	£375.01	£255.65	£227.87
Predicted nominal pension	£248.90	£99.07	£66.49
Real value at the time of retirement (1911- 12 pounds)	£188.56	£68.63	£55.63

Notes: Individuals are assumed to enter at age 18 and retire at age 60. Predicted salaries follow Figure 2. Predicted contributions are calculated using a 3 percent discount rate.

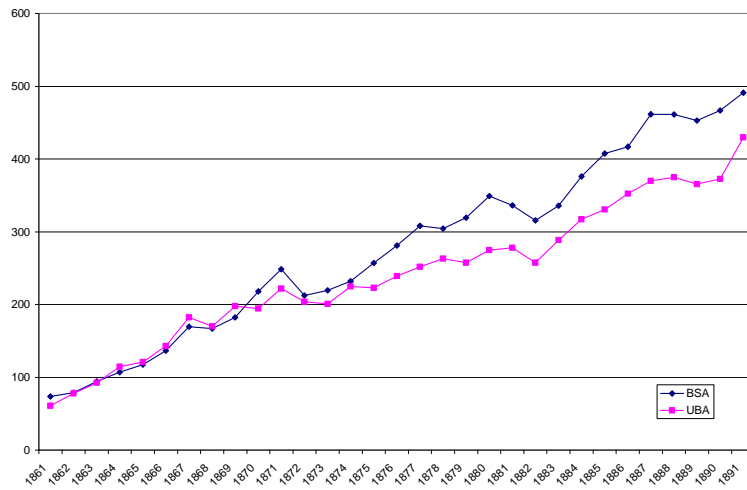
**Table 7**  
**Career Advancement at the UBA**

	BSA Employees	BSA Employees, Age < 24	BSA Employees, Age ≥ 24	UBA Employees
Observations	76	16	60	874
Age at entry to UBA	31.4	19.4	34.6	19.8
Entered as a manager	26.3%	0.0%	33.3%	0.1%
Entered as a clerk	67.1%	100.0%	60.0%	99.5%
Reached branch manager	48.7%	37.5%	55.0%	22.4%
Reached manager of large branch	11.8%	12.5%	11.7%	4.1%
Reached inspector	8.1%	12.5%	6.7%	3.2%
Average career length	15.56	15.44	16.6%	14.40
Career ends in resignation	34.2%	56.3%	28.3%	54.1%
Career ends dismissal or forced Resignation	11.8%	12.5%	11.7%	12.4%
Career ends retirement or death	52.6%	25.0%	60.0%	30.0%

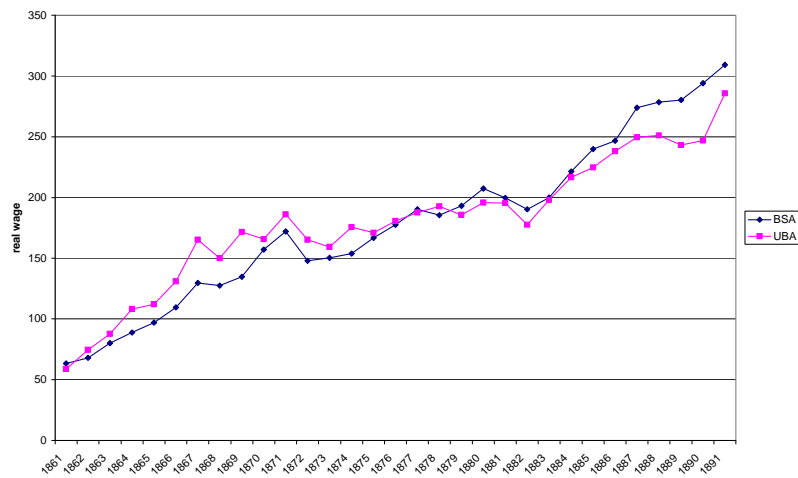
Notes: Career ends in resignation, dismissal or forced resignation, and retirement or death do not sum to 100% because a small number of observations are censured in 1926 or 1932. Age of BSA employees is as of October 1, 1892.

**Figure 1**  
**Predicted Salary Profiles at the UBA and BSA Prior to the Merger**

**A. No Position Controls**

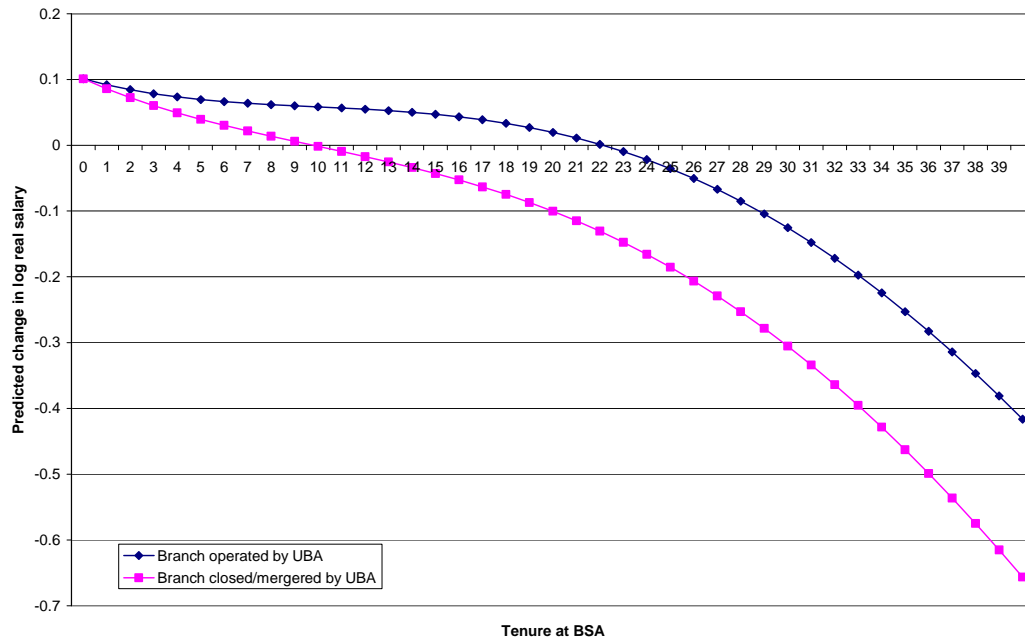


**B. Position = Clerk**



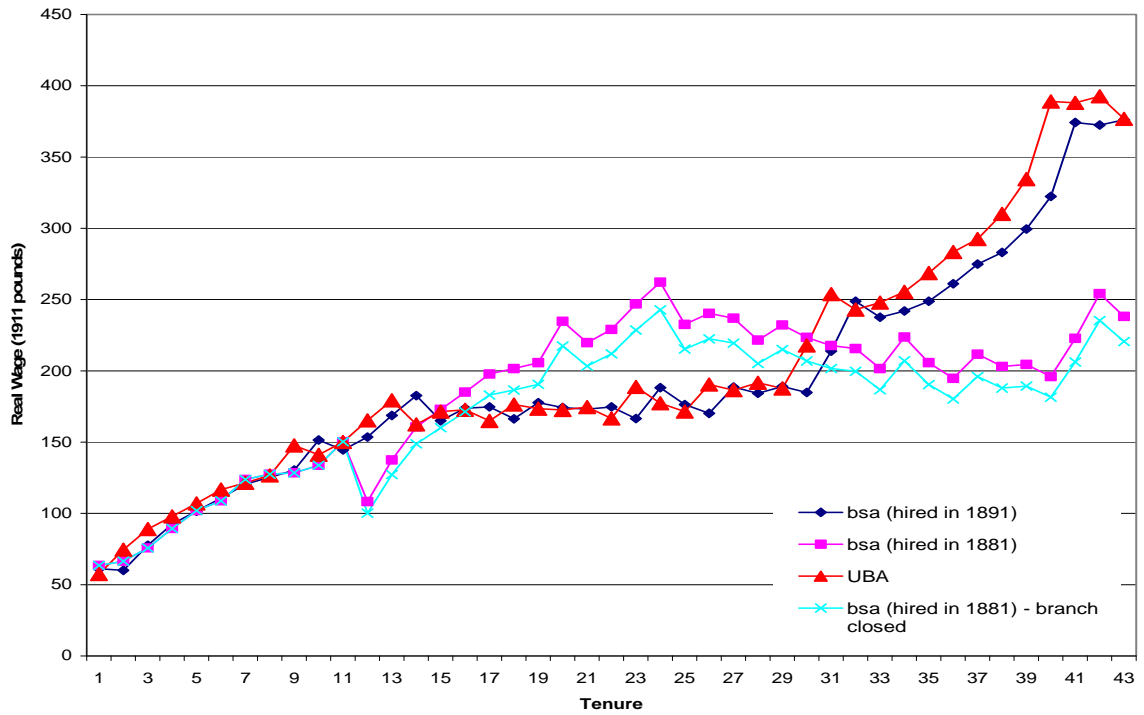
Notes: Values calculated assuming individuals entered in 1870 at age 18 and worked their entire careers as clerks in a rural South Australian branch with 5 employees.

**Figure 2**  
**Estimated Changes in Log Real Salary Following the Merger**



Note: Values calculated assuming individuals entered at age 18 and worked as a clerk at a rural South Australian branch with 5 employees in 1891 and 1892.

**Figure 3**  
**Predicted Salary Profiles of UBA Employees After the Merger**



Note: Values calculated assuming individuals entered at age 18 and worked their entire career as a

clerk at a rural South Australian branch with 5 employees.