Wage Effects of Unions and Industrial Councils in South Africa

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Abstract

Some argue that a high union wage premium and the industrial council system are important causes of inflexibility in the South African labor market. We estimate union premia on the order of 20 percent for African workers and 10 percent for White workers. We also find that African nonunion workers who are covered by industrial council agreements receive a premium of 6-10 percent; the premium is positive but not statistically significant for Whites. In addition, although the union gap is smaller inside of the industrial council system than outside of the system for Africans, the total union premium for union members covered by an industrial council agreement is similar to the union premium outside of the industrial council system. Among Africans, the industrial council and union wage gaps are largest among low wage workers.

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I. Introduction

Unions played a crucial role in South Africa's historic transition from the apartheid era. Now, however, they are coming under fire as major contributors to inflexibility in the South African labor market. Some argue that an unusually high union wage premium and highly centralized collective bargaining are important causes of this inflexibility (Boccara and Moll 1997). As of 1994, about 33 percent of Africans employed in the formal sector belonged to unions, as did 23 percent of Whites. And, by one estimate, among Africans, union members earn 60 percent more than nonunion workers, on average (Schultz and Mwabu 1998). This union premium is not necessarily limited to union members, for the cornerstone of collective bargaining in South Africa, the industrial council system, operates under "*ergo omnes*" rules which extend union wage agreements to nonunion workers (Bendix 1989). Critics claim that the rigidity of the collective bargaining system places a special burden on small employers, increases business failures and discourages start-ups, and contributes to South Africa's extremely high unemployment rate.[1]

Others argue that recent estimates of the union wage premium are implausibly high and the fact that unions garner a wage premium for their workers does not necessarily mean they are responsible for inflexibility in the South African labor market. Although the centralized bargaining system does, in theory, allow union agreements to be extended to nonunion workers, in practice parties are often granted exemptions from them (Sender, and Weeks 1996). In addition, wage premia earned by African workers have widespread benefits because each African worker tends to support

[1] By some estimates, the unemployment rate is as high as 30 percent overall (Fallon and Lucas 1996, Simkins 1997, Klasen and Woolard 1999), and a plurality of unemployed Africans under age 35 have never held a formal job (Baskin 1997).

many individuals who are not working.[2]

In this paper we address two key issues necessary to help disentangle these competing views of the role of unions and industrial councils in the South African labor market. The first is the direct effect of unions on workers' wages. A time honored question about the union wage gap is whether it represents a true wage effect, or simply reflects the fact that workers who are in unions are different from those who are not (c.f. Freeman and Medoff 1984). We address this selection issue in two ways: first, we condition on a variety of covariates (including education, industry, occupation) and estimate the union coefficient across households. Next, we estimate the union gap controlling for household fixed effects. We find that among Africans, union members earn about 20 percent more than nonunion workers, using either the across- or within-household estimates. The union premium among Whites is about 10 percent.

Much of the policy debate in South Africa hinges on whether the industrial council agreements force affected employers to pay union wages for nonunion workers. Thus, the second question we ask is whether there is evidence that such *ergo omnes* rules are binding and union agreements are extended to nonunion workers. We find evidence of an industrial council premium on the order of 6-10 percent for African nonunion workers, suggesting that industrial council agreements do affect nonunion workers; the premium is positive but not statistically significant for Whites. Thus, the industrial council system is associated with higher wages for African nonunion workers who are covered. However, a sizeable union wage gap persists within the industrial council sector suggesting that industrial councils do not create a situation where all workers covered by an

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[2] See Klasen and Woolard (1998) for a discussion of unemployment and the extent to which workers support numerous household members.

industrial council agreement receive the same compensation, regardless of their union status. The total premium earned by union members covered by industrial council agreements (the industrial council premium plus the union premium) is similar to the union premium outside of the industrial council sector. This suggests that unions bargain within the industrial council, which sets wages that are extended to all workers, and then negotiate for supplemental awards at the plant level. The result is that union members inside and outside the industrial council system receive similar wage increases. The industrial council and union wage gaps are largest for the least skilled group – African laborers.

In the next section we discuss the collective bargaining environment in South Africa. In section III, we describe the data and provide descriptive statistics. Section IV presents our empirical strategy. Section V investigates the union – nonunion income gap and the gap between those inside and outside the industrial council sector. Section VI concludes with a discussion of the results.

II. Industrial Councils in South Africa

A. Labor Market Regulation in South Africa

Three laws formed the basis for the major regulations governing the South African labor market in the early to mid-1990s. These were the Basic Conditions of Employment Act (BCEA) of 1983, the Labour Relations Act (LRA) of 1956, and the Wage Act of 1957. These three laws intersect, and so anyone involved in setting labor market minimum standards must consider all three. In general, agreements struck by industrial councils take precedence over minimum standards

guaranteed in the other provisions. However, where no industrial council exists, workers are typically covered by requirements contained in the BCEA or the Wage Act (Standing, Sender, and Weeks 1996). Here we focus on industrial councils because they are considered the cornerstone of collective bargaining in South Africa and the other two wage setting acts are not considered to be major sources of inflexibility in South Africa (Standing, Sender, Weeks 1996).[3]

B. What Are Industrial Councils?

Although originally established in 1924 as part of the Industrial Conciliation Act, industrial councils today are governed by the regulations stemming from the Labour Relations Act of 1956 (previously known as the Industrial Conciliation Act of 1956).[4] Industrial councils are established when one or more registered employer associations voluntarily agree to bargain with one or more registered trade unions (Bendix 1989, Standing, Sender, and Weeks 1996). After agreeing on a constitution, which governs the procedures of the industrial council, the interested parties submit an application to the Minister of Manpower to represent a particular area, industry, trade or occupation. The Minister then publishes a notice in the *Government Gazette* and invites objections to the formation of the industrial council to be registered. At this time the Minister must also determine whether the petitioners are "sufficiently representative" of the parties the industrial council intends

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[3] As Boccara and Moll (1997) note, however, a complete assessment of these laws would consider the extent to which they discourage firms from operating at all.

[4] Recent legislation, the Labor Relations Act of 1995, was designed to strengthen centralized bargaining (Standing, Sender, and Weeks 1996). This Act also renames Industrial Councils "Bargaining Councils." In this paper, however, we will refer to the more familiar term, "Industrial Councils," as our data date from before the new legislation.

to represent. Although the definition of "sufficiently representative" is left to the discretion of the Minister, it usually means that the parties represent the majority of employers or employees in an area, industry, occupation, or trade.[5] Finally, the Minister determines whether the industrial council agreement will be extended to non-parties in the area, industry, trade or occupation for which the industrial council is registered, whether or not the employers and employees are party to the council. In order to extend the agreement the Minister must be satisfied that non-extension would result in "unfair competition" from employers not subject to the agreement (Bendix 1989).[6]

C. Race and the Industrial Council System

In the Industrial Conciliation Act of 1924, which set up the industrial council system, only employees who belonged to registered unions were represented in the industrial council negotiations, and the 1924 act excluded Africans from the definition of employee.[7] Since Africans were formally excluded as employees, their unions had no place at the industrial council bargaining table making their unions "unregistered," although not illegal under civil law. In 1979, the Industrial Conciliation

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5 For employers the question is whether a "majority" should be determined by a simple head count, or weighted by the number of employees. Before the late 1980s, the Minister seemed to prefer the weighted count (such that it would suffice if 10 percent of employers belonged to the industrial council and they represented more than 50 percent of the relevant workforce). More recently, the Minister has preferred a head count (Bendix 1989).

6 The Minister can also extend some or all of the agreement to employers and employees who are outside of the jurisdiction for which the council is registered (Bendix 1989 and Standing, Sender, and Weeks 1996).

7 Technically, the original Act excluded "pass-bearing natives" from the definition of an employee. Since Black females and some African men in the Cape were not obliged to carry a pass, they were covered by the legislation. However, the Labour Relations Act of 1956 excluded all "Bantu" including Black women from registration (Bendix 1989).

Amendment Act extended the definition of employee to legal residents of the Republic of South Africa. This excluded workers from the "independent" homelands, such as Transkei, and the "non-independent" areas, such as Kwazulu. Thus for many years, the collective bargaining process for White South African workers was highly centralized, while that for African workers was decentralized.

Increased African participation in the industrial council system began in the early 1980s when the Labour Relations Amendment Act of 1981 removed race from the definition of employee. Around this time, the many unregistered African unions were encouraged to register and begin to work within the existing system. Nevertheless, many African unions continued to view the industrial council system as allied with the older White unions and preferred to work outside the system.

Over the 1980s, the African union movement gained strength and along with this increased strength grew even greater support for participation in the industrial councils. At the 2nd Congress of African unions in April 1982, many of the larger unions pressed for a wider ranging form of collective bargaining, claiming that it would be more effective than the plant-by-plant strategy that had been followed to date. The Federation of South African Trade Unions – the largest federation of independent trade unions at that time – agreed to participate in the industrial council system on several conditions, among them: 1) workers should be able to join the union of their choice and 2) industrial council bargaining should not preclude bargaining at the individual plants (International Confederation of Free Trade Unions).[8]

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[8] That centralized bargaining should not preclude further bargaining at individual plants is a fairly common occurrence in other countries with centralized collective bargaining, such as Sweden and Australia. In Australia, for example, unions often engage in establishment-level bargaining after centralized agreements have been made. At these establishment-level bargaining sessions, unions negotiate for "overawards," which are wages and fringe benefits

By the early 1990s, many African trade unions were struggling to have an industrial council in their sector. As noted above, an industrial council cannot be established unless it would represent a majority of workers in the registered area, industry, trade or occupation, and would represent a majority of employers. This requirement conveys substantial power to groups of small employers. For example, in the early 1990s the Transport and General Workers Union (TGWU) organized the contract cleaning sector and struggled with the National Contract Cleaners' Association (NCCA) over the institution of an industrial council. Although some of the larger contract cleaning companies were in favor of the industrial council, because it would enforce wage agreements throughout the industry and prevent their competitors from undercutting them, some of the smaller companies were opposed (Keet 1992). In fact, the Minister of Manpower was on the verge of approving an industrial council when several of the companies withdrew their membership from the NCCA. This withdrawal prevented the Minister from approving the industrial council because the NCCA no longer represented the contract cleaning sector nationwide. Similarly, by 1994, some employers were threatening to pull out of other major industrial councils, such as the Transvaal Building Industry industrial council and the Motor Industry industrial council, because employers claimed the industrial councils lacked flexibility.[9]

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above the levels set by the initial award (Kornfeld 1993). Further, an earlier literature on "wage drift" was concerned about increases in the real wage rate brought about by negotiations (or other arrangements) outside of the usual wage-setting process. The problem of wage drift has been more commonly found in countries with centralized collective bargaining (see, for example, Brown (1962) for a nice overview of the literature).

[9] According to Von Holdt (1994), the main complaints by employers centered on the "...closed shop provisions, the limited trading hours, and the rigid ratio clause, which specifies how many non-artisans may be employed for every artisan."

D. Industrial Councils Today

Although industrial councils form an important component of industrial relations in South Africa, little empirical work has examined their impact on compensation.[10] The main reason is that the data on how many industrial councils exist and the number of workers they cover are imprecise and hard to come by. Standing, Sender, and Weeks (1996) cite Department of Labour data that in 1994, there were 81 industrial councils, covering about 1 million workers and 54,000 employers. Seventy-eight of these councils covered all types of workers. Ten were national in scope, 10 regional, 2 multi-regional, 38 sub-regional, and 21 local. Thus, according to their estimates, industrial councils cover only about 10 percent of the labor force and most of them are quite limited in their geographic coverage.

In addition, as described in the introduction, the value of the extension of industrial council agreements to non-parties is hotly debated. Ninety percent of the agreements in 1994 had extensions to non-parties (Standing, Sender, and Weeks 1996). The extensions are designed to insure minimum wages (within job grade) and decent working conditions for workers and to shield participating employers from competition by others who can offer lower wages and less generous benefits.[11] Some believe that the extensions prevent wide-spread exploitation including low wages, long hours, and unhygienic conditions (Finnemore and van der Merwe 1987). In addition, the extensions help to strengthen the employer associations and thereby maintain sectoral bargaining. Without the extensions employers could find themselves at a competitive disadvantage and therefore conclude

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[10] See Moll (1995, 1996) for a theoretical model of the effect of industrial councils on wages.

[11] More poignantly the extensions were designed to protect White workers from competition

that the costs of participating in the employer association outweigh the benefits. Critics argue that the extensions are particularly burdensome to small employers, leading to closures and discouraging start-ups, and generally interfere with the normal dynamics of the labor market (Moll 1996, Standing, Sender, and Weeks 1996).[12] A key question is, therefore, the extent to which these extensions are binding.

One reason the agreements may not be a major source of inflexibility in the South African labor market is that exemptions from them are not uncommon.[13] At least 7 of the 81 industrial councils in existence in 1994 had exemptions for small businesses (it was unclear whether an additional 7 had exemptions). Of employers subject to an industrial council agreement, 17.3 percent had applied for and been granted an exemption (most of which were exemptions from portions of the agreement); 1.8 percent of employers had applied for an exemption and been refused. Interestingly, large employers are more likely to apply for an exemption than are small employers as about 35 percent of employers with more than 400 workers applied for one compared to only about 12 percent of employers with 50 or fewer workers (Standing, Sender, and Weeks 1996). Because of the exemptions, some workers may be compensated less than the amount set by the industrial councils. In addition, it is difficult to enforce the extension of the agreements to non-parties.

A second contested issue is the extent to which unions conduct a second tier of bargaining

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from African workers.

12 Katz (1993) notes that in cases where industry-wide bargaining "cartelizes" the industry, low-cost competition is driven out of the market.

13 We note, however, that Boccara and Moll (1997) argue many employers are discouraged from applying for exemptions fearing that it will lead to an "investigation" and that many exemptions are for relatively minor policies such as the time of a tea break.

at the plant level, generating "recognition agreements." While these agreements generally formalize the relationship between the trade union and the particular employer and the industrial relations procedures that will prevail at the plant, they can also negotiate over substantive issues, such as wages (Bendix 1989). Many plant-level negotiators will attempt to improve the wages and working conditions agreed upon at the industrial council level. In fact, many unions argue that industrial councils are mostly concerned about the wages of skilled workers while the unions at the plant-level primarily represent unskilled and semi-skilled workers. Therefore, at the plant level, union negotiators often focus on increasing the lowest wages and narrowing the wage gap between skilled and unskilled workers (Bendix 1989, Finnemore and van der Merwe 1987). Clearly this plant-level negotiating would raise the wages of some workers above those set in the agreement.

The extent to which the "*ergo omnes*" rules are binding, and thus create inflexibility in the South African labor market, and the extent of plant-level bargaining can be investigated empirically. However, in order to investigate this question, one needs microdata that indicates who is covered by an industrial council agreement. Because no such data exist, researchers have used anecdotal evidence or various proxies, such as defining an industry as being covered by an industrial council agreement if 50 percent of the workers in that industry belong to a union or identifying coverage by whether or not the worker receives particular benefits common to industrial council agreements (Moll 1995, Moll 1996, Boccara and Moll 1997). These proxies have a few drawbacks. First, nonunion workers in heavily unionized industries may receive higher wages and fringe benefits even in countries without a centralized collective bargaining system, if, for example, firms raise wages and benefits in an effort to keep unions out (Rosen 1969). Secondly, the "industries" covered by industrial councils are actually better described as "sectors" which are defined by a combination of

occupation, industry, and geography. For example, in 1992 there was an industrial council agreement covering workers in the retail meat trade in Witswatersrand and Pretoria. (See Appendix Table 1 for a list of industrial councils).

Fortunately, it is possible to improve on the identification of industrial council coverage. As mentioned above, industrial council agreements are published in the *Government Gazette*. Godfrey (1992), in his *Industrial Council Digest*, surveys these primary sources and catalogs these agreements. His book describes the basic elements of the agreements, the employers' associations involved, the union(s) involved, and the industries, occupations, and geographic regions affected by the agreements. We used this excellent resource to define industrial council coverage based on magisterial district of residence, and the most detailed industry and occupation codes available in the *October Household Survey*.[14] We then use this definition – which captures more than simple union density – to investigate whether the industrial council agreements are associated with higher wages for nonunion workers.

If industrial councils operate as described in Section II, there are several implications for the wage structure. First, workers who are nonunion members but are covered by industrial council agreements should have higher wages than other similar nonunion workers. If industrial councils are mostly concerned about wages of skilled workers, then we should see large industrial council premia at the top, but not the bottom of the income distribution. In addition, we would expect to see

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[14] Of course, this definition also has problems. The *Digest* details agreements in place 3 years prior to the collection of our data. While many agreements are simply renewed year after year, we may have mis-classified some workers. In addition, while our definition is less coarse than those used earlier, it is still the case that the data available in the *October Household Survey* are not detailed enough to capture the precise descriptions in Godfrey's *Digest.* The computer code used to define industrial council coverage is available from the authors upon request.

union premia within the industrial council sector for workers at the bottom of the income distribution (or unskilled workers) if the unions that represent these workers are able to secure secondary agreements on a plant-by-plant basis.

III. Data and Descriptive Statistics

Our data are from the *October Household Survey* of 1995, a large annual survey conducted by the Central Statistical Service (CSS). The survey is designed to gather labor market information for both the formal and informal sectors, as well as information on births and deaths on over 130,000 individuals in over 29,000 households. For this sample, we included African and White individuals between the ages of 15 and 65.[15] Our measure of income is gross monthly income.[16] We have also used a measure of income that includes in-kind payments (such as food, shelter, clothing) which generates very similar results since these payments account for only about 1 percent of total income. In this analysis, we include only those with non-missing monthly labor income.

In addition to providing a large sample, the *October Household Survey* also has detailed industry categories (there are 50 of them) and 3-digit occupation codes. We take advantage of this detail to construct a measure of which workers are covered by an industrial council. As described

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[15] We exclude Asians and Coloureds from the analysis because four-way comparisons are very cumbersome and the sample sizes for Coloureds and Asians are relatively small. Broadly speaking, the results for Coloureds and Asians fall between those for Africans and Whites with Coloureds more similar to Africans and Asians more similar to Whites.

[16] Some information is available on hours worked, but only the total number of hours worked in the last seven days. Thus, it is not possible to create a reliable hourly wage measure for most of the sample. When referring to our results we use the terms “income” and “wage” interchangeably.

above, we identify industrial council coverage using the *Industrial Council Digest* (Godfrey 1992).[17] According to our definition of industrial councils, approximately 16 percent of those who are employed are covered by an industrial council agreement.[18] In addition, 30 percent of workers in the broad category of manufacturing are covered (which is much lower than the 64 percent cited by Moll (1993) for 1985)) as are 55 percent of workers in construction, and 19 percent of workers in transportation. While mining is known as a sector with a strong union and high unionization rates, it has no industrial council. Similarly, the teachers' union in South Africa is powerful, but cannot have an industrial council by statute.

A significant disadvantage of the *October Household Survey* is that several magisterial districts in KwaZulu/Natal were not surveyed because they were considered too dangerous for the survey teams. The population in these areas is substantial (3 million), so the omission may be important. The survey weights were calculated to compensate for this problem (Simkins and Amm

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[17] We do not count any workers in the mining and agriculture industries as being covered by an industrial council agreement, even if their occupation may be covered, as these industries do not have industrial councils (agriculture is excluded by law).

[18] It is difficult to get a straight-forward estimate of the industrial council coverage rate from the literature. Boccara and Moll (1997) report that 805,133 and 1 million employees were covered by industrial council agreements in 1993 and 1994, respectively. Simkins (1997) reports the economically active population (including those seeking work) in 1993 and 1994 was 12,320,000 and 12,694,000, respectively. Combining these figures with estimates of the South African unemployment rate (as high as 30 percent overall by some measures, and higher for Africans, and African women, in particular) gives estimates of industrial council coverage on the order of 10 percent. Similarly, Standing, Sender and Weeks (1996) estimate that about 10 percent of the labor force was covered by industrial councils. Our overall estimate of the coverage rate is higher because our sample includes only those with reported monthly income from regular employment which is likely to include primarily the formal sector of the labor market and our estimate excludes the unemployed. In addition, to the extent that the occupation and industry codes available in the *October Household Survey* are coarser than those used to determine actual industrial council coverage, we will over-estimate industrial council coverage.

1997). However, the fact that these workers are not represented must be kept in mind when interpreting the results.

Tables 1a and 1b provide simple summary statistics for individuals, by union status. About 38 percent of the Africans belong to unions, compared to 24 percent of the Whites. The monthly income measure shows that Africans earn much less than Whites, whether unionized or not. Similarly, Africans have completed significantly fewer years of education than have Whites. Although Whites are less likely to belong to unions than are African workers, they are more likely to be covered by industrial council agreements, as would be expected given the history of these institutions.

The data also show that union members earn substantially more than nonunion members. Union members are also older, more likely to be married, and, among Africans, have completed more years of education. This leads one to ask whether these union–nonunion differences are simply due to worker characteristics, which the table demonstrates are different, or to an effect of unions. We address this question below.

IV. Empirical Framework

We estimate the following equation:

$$\log y_i = a + X_i b + gU_i + e_i$$

where $\log y_i$ represents the natural logarithm of monthly income for individual *i*, X_i represents a vector of individual characteristics, U_i indicates whether individual *i* is currently a member of a labor

union, and e_i is a normally distributed error term. The coefficient "g" represents the percentage gap between union members and nonunion members, the union wage or income gap.

Whether "g" represents the true union *effect*, the amount by which a randomly selected individual's income would increase if moved from a nonunion to union job, is a debate of long-standing in the large literature on union wage effects (c.f. Freeman and Medoff 1984). There are several reasons to suspect that the measured gap is not the true effect of unions. Nonunion firms may increase wages in order to thwart attempts at unionization (which would dampen the union wage effect) (Rosen 1969); or because of employment spillovers from the union to the nonunion sector, wages may be depressed in the nonunion sector (which would increase the union wage effect) (c.f. Lewis 1963). Furthermore, union workers may be different from nonunion workers as firms attempt to select the most productive workers to compensate for the above-market-clearing union wage. As a result, union members may have skills, both observable and unobservable, that would lead them to receive higher wages even in the absence of union representation.

While we cannot investigate what the nonunion wage would be in the absence of unions, we can investigate whether the union income gap is purely a matter of selection of better able individuals. First, we control for a variety of observable covariates. Second, we augment equation (1) to include a household specific term which captures unobservable characteristics such as the fact that more privileged households may be better connected and have more information about the job market:

$$\log y_{ij} = a + X_{ij} b + gU_{ij} + h_j + e_{ij}$$

where the subscript *i* represents the individual and *j* represents the household. Because households in South Africa often include several related adults, we can estimate a model that includes a

household fixed-effect to control for unobservable characteristics that may be correlated with both union membership and monthly income. We then compare the across-household to the within-household estimates. Once we have an (plausibly) unbiased estimate of the union income gap, we investigate the impact of unions and industrial councils.

We examine whether the wage agreements reached by industrial councils appear to affect nonunion workers by estimating an industrial council premium. We also investigate whether these agreements effectively cause workers to receive identical wages whether or not they are union members by calculating the union gap for workers covered by industrial council agreements and those not covered by estimating the following equation:

$$\log y_i = a' + X_i b' + d' IC_i + g' U_i + c'(IC_i x U_i) + e_{i'}$$

where IC_i indicates whether the individual is covered by an industrial council agreement, and $IC_i'U_i$ is an interaction between industrial council coverage and union membership. The coefficient d' indicates whether nonunion workers covered by an industrial council agreement earn more than similar nonunion workers who are not covered. We call this the industrial council premium. The coefficient g' estimates the union income gap among workers not covered by industrial council agreements, g' + c' indicates the union gap within the industrial council sector, and d' + g' + c' estimates the "total" union premium for union members covered by an industrial council agreement.

If d' is positive and statistically significant, this suggests that industrial council agreements are effectively extended to nonunion workers. If g' + c' is equal to zero then within the industrial council sector union members earn the same wage as nonunion members, also indicating that the agreements are extended and that unions do not obtain supplemental awards. However, if g' + c'

is positive and significant (and d' is also positive and significant) then it appears that unions win supplemental awards for their members at the plant level. Finally, d' + g' + c' = g' (or d' + c' = 0) suggests that unions attempt to win a certain wage increase for their members, irrespective of industrial council coverage, and that those unions that also negotiate at the industrial council level will supplement those agreements with plant-level awards if necessary. Due to data limitations (e.g., the fact that we would need within household variation in union status and industrial council status) we cannot estimate this equation using within-household variation. To control for individual characteristics that may be correlated with both union status and high wages, we include interactions between indicator variables for education and occupation (at the 1-digit level).

V. Union Income Gap

A. Selection Effects

Table 2a presents ordinary least squares (OLS) regression results for log monthly income for Africans. In column (1) we present the raw union wage gap, controlling for whether the worker is female. Union workers earn approximately 62 percent more than nonunion workers.[19] However, we know from the simple means that union workers have different observable characteristics than nonunion workers. Therefore, in column (2) we add controls for whether the individual is the head

[19] Throughout this paper we primarily interpret the coefficient estimate on the union dummy variable as the union income gap because we focus on estimates with smaller magnitudes. For larger magnitudes, the gap should be calculated as e^x-1 (Halvorsen and Palmquist 1980). In a few instances, we present this alternative calculation in order to compare our results to those reported by Schultz and Mwabu (1998).

of the household, sex, a quadratic in age, years of education, years of education interacted with whether the individual completed any post-secondary education, whether the individual is married, interactions of these variables with sex, and province dummies.[20] These controls reduce the union wage gap by almost one-half to 33 percent. This is still a very large premium, but clearly the fact that union members are different (based on observables) from nonunion members is responsible for a substantial amount of the raw union gap.

Union and nonunion workers also differ in their industrial and occupational distributions. Some industries have extensive union coverage as do some occupations. For example, teachers in South Africa have a particularly strong union. Therefore the observed union wage gap of 33 percent may actually be due to industry or occupation effects. Column (3) includes occupation dummies in which occupation is measured at the 1-digit level. This lowers the estimated union gap slightly to 29 percent. Column (4) includes interaction terms for education and occupation; these results are similar to those in column (3) in which we allowed education to vary by female. Finally, in column (5) we add (1-digit) industry effects. Adding these controls decreases the estimated union gap to about 18 percent, a magnitude similar to that estimated by Dabalen (2000).[21]

Before examining the rest of Table 2a, we turn to Table 2b. This table presents similar regressions for White workers. Column (1) shows that union workers earn 13.7 percent higher

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[20] We combine women and men because F-tests indicated that the union gap does not differ significantly by sex, at least for Africans. If we estimate column (5) in Table 2a for women the union wage gap is 0.207 and that for men is 0.173; the corresponding estimate for White women is 0.133 and that for White men is 0.061. The sex difference for Africans is not statistically significant; that for Whites is significant at the 5% level. The estimated union wage gaps using within-household variation by sex are of similar magnitude as those in column (6) of Table 2a.

[21] Controlling for industry is more important than controlling for occupation. If we only include

monthly income than do nonunion workers, before controlling for other covariates. When we add standard demographic controls, the union premium drops to 12.4 percent. In columns (3)-(5) we include occupation dummies (column 3), interactions between education and occupation (column 4), and industry dummies (column 5). Union workers earn approximately 10-13 percent more than nonunion workers.

In a recent and widely cited paper on unions in South Africa, Schultz and Mwabu (1998) report that African workers in unions earn a 47 percent wage premium; White workers earn a 5 percent penalty. In contrast, we estimate a 20 percent union premium for Africans and a 10-13 percent premium for Whites.[22] One reason for the differences in our results is that their highlighted estimates do not control for the workers' industry and occupation. Researchers typically control for industry and occupation when estimating union wage gaps in order to more closely approximate an experiment in which randomly chosen workers are made union members without changing their occupation or industry. Once Schultz and Mwabu control for industry in their Table 5, they estimate the union wage gap for Africans to be 19.1 percent, which is much closer to our estimate. However, the results for Whites are quite different. In particular, they estimate that White union members earn 9.7 percent less than nonunion members (controlling for industry effects in their Table 5).

A second potential source of difference between our results and those of Schultz and Mwabu is that we use a measure of monthly income as the dependent variable whereas they use hourly wages. We used the *October Household Survey* because it has larger samples and better geographic

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industry effects the coefficient in column (5) in Table 2a is 0.187 and that in Table 2b is 0.09.

[22] As transformed by e^x-1, Schultz and Mwabu's estimates indicate a gap of 60 percent for Africans and 5 percent for Whites. When our estimates are transformed, the union gap for Africans is 22 percent and that for Whites is 11-14 percent.

identifiers which we need in order to conduct our subsequent analysis. However, a drawback of the *October Household Survey* is that it only contains information on hours worked last week, so we cannot calculate an hourly wage measure.[23] On the other hand, while we cannot create an hourly wage measure in the *October Household Survey*, we can create a monthly income using the same data source as Schultz and Mwabu, the *Living Standards Measurement Survey*.[24] Appendix table 2 shows the union premia for several different definitions of log hourly wage, and the corresponding definition of log monthly income. Regardless of the definition of income used, once industry and occupation controls are included in the regression, the union premium is nearly identical whether we use an hourly wages or monthly income measures. For Africans, these results are also very similar to those in our preferred specification using the *October Household Survey* log monthly income data. Thus, it is unlikely that our use of a monthly income as a dependent variable rather than hourly wages explains the differences.

A third potential reason for the different results for Whites between the *Living Standards Measurement Survey* in 1993 and the *October Household Survey* in 1995 is simply changes over time in the union wage gap for Whites. Using the 1995 wave of the *Living Standards Measurement Survey* and controlling for industry and occupation, Dabalen (2000) estimates a union wage gap of 17.3 percent for Africans and 10.4 percent for Whites, which are quite similar to our estimates in Tables 2a and 2b. And, while the wage gap for Africans appears to have been relatively stable for the 1993 and 1994 waves of the *Living Standards Measurement Survey* as well, Dabelen estimates

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23 When we control for hours last week in our log monthly income regression it takes a small and insignificant coefficient, likely because it is measured with a great deal of noise.

24 These data are also referred to as the SALDRU data. They were collected by the South African Labor and Development Research Unit at the University of Cape Town in

wage gaps of -6.9 percent and -3.7 percent in 1993 and 1994 (respectively) for Whites. Overall, we conclude that our results differ from those reported by Schultz and Mwabu because of our controls for industry and occupation (for Africans) and from changes over time in the union wage premium (for Whites).

Although we have attempted to control for observable differences between union and nonunion members, unobservable differences may remain. As discussed in the empirical framework section, if the unobservable characteristics are time invariant and are shared by household members, then we can account for the selection bias by including a household fixed-effect.[25] Returning to Table 2a, column (6) shows the estimated union wage gap when we include a household specific fixed-effect in the regression. This specification requires that there is more than one worker in each household, and that some households contain both union and nonunion workers. The estimated union wage gap of 20 percent for Africans is very close to the 18.4 percent estimated in column (5). Similarly, column (6) of Table 2b reports a within-household union wage premium of 11 percent for Whites which is also close to the cross-sectional estimate presented in column (5). In what follows, we can only use across-household variation in income to estimate the union and industrial council wage gaps. The evidence in Tables 2a and 2b suggests that this is (cautiously) justified as long as we are careful to control for appropriate covariates.[26]

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collaboration with the World Bank.

[25] Other techniques for controlling for selection bias, such as the model suggested by Heckman (1979) are inappropriate here as we do not have information that predicts union membership and could plausibly be excluded from the wage equation. In the absence of such an instrument, the Heckman correction is only identified off of functional form.

[26] That said, we acknowledge that the within-household estimates may suffer from other biases due to family labor supply decisions which would generate differences between the subset of households that supply our identifying variation (those with both union and nonunion

Before examining industrial councils, we estimate the union wage gap across the income distribution. Schultz and Mwabu (1998) find that both African and White unions appear to reduce inequality among their members as the union wage gap is largest for the lowest paid workers. In fact, they highlight that the union wage premium for African male workers in the bottom decile of the wage distribution is 145 percent compared to a premium of 19 percent for those in the top decile.[27] These union wage premia, however, do not account for differences in the occupations and industries of union and nonunion workers.

We conduct a similar exercise by estimating the model in column (5) of Tables 2a and 2b that controls for industry effects as well as interactions between education and occupation for each quintile of a predicted wage distribution.[28] The results are in Table 3.[29] For both Africans and Whites we also find that the union income gap decreases (although not necessarily monotonically)

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workers) and other households. We investigated whether the subset of households off of which we are identified are representative of all households. For Africans, our identifying variation comes from households with a higher fraction of females among the workers, higher average education levels, and a higher fraction of married adults. Among Whites, the identifying variation comes from households with a higher fraction female among the workers, a higher fraction of married adults, and lower average education and average age. There is no difference in the average household income between the identifying households and other households for either Africans or Whites. These differences suggest that even the within-household estimates may be too high for Africans and perhaps too low for Whites. We note, however, that if we limit the regressions in column (5) in Tables 2a and 2b to those in households in which there is within-household variation in union status, the estimated union gaps are about the same.

27 These percentages were calculated as e^x-1.

28 Appendix Table 3 shows the regressions used to calculate in which quintile of the predicted log income distribution workers fall.

29 It is important to note that because of the very different wage levels for Africans and Whites, the predicted quintiles for the two groups correspond to very different wages, as can be seen in Table 3.

as the predicted income of the worker increases.[30] In fact, the union wage gap among African workers in the fourth and fifth quintiles are 14 percent and 7 percent respectively compared to a premium of between 19-33 percent among the lower quintiles.[31] Among Whites the premium ranges from 2-3 percent in the upper two quintiles and from 10-21 percent among the lower quintiles. These patterns are consistent with those found by Schultz and Mwabu and suggest that unions decrease inequality.

B. Industrial Council Coverage

As discussed above, one of the controversies about the effect of unions on the South African labor market is the extent to which the industrial council system extends union wage agreements to all workers covered by that agreement and the extent of plant-level supplemental bargaining. We examine these questions, by estimating equation (3), in Tables 4a and 4b.[32]

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30 This pattern of a larger union wage gap at the lower end of the income distribution holds for women when we conduct the exercise separately by sex. In particular, among African women the union wage gap for the lowest quintle is 41 percent while that for the highest quintile is a statistically insignificant 3.9 percent; among White women the union wage gap is 22.5 percent in the lowest quintile and a statistically insignificant 8.3 percent in the highest.

31 Schultz and Mwabu's estimate of a union gap of 145 percent for African workers in the lowest decile has been transformed by e^x-1. For comparison, our estimate would imply a gap of 39 percent for the lowest quintile.

32 Because industrial council coverage largely depends on industry we cannot estimate our preferred specification (column (5) of Tables 2a and 2b), therefore we use the specification in column (4). To the extent that the more parsimonious specification inadequately controls for individual heterogeneity, the coefficients for both industrial council and union will be overstated. Tables 2a and 2b suggest the coefficients will be overstated by about 60 percent for Africans and 30 percent for Whites.

The tables present the industrial council gap for nonunion workers, the union gap outside the industrial council sector, and the union gap within the industrial council sector. If industrial councils extend wage agreements to nonunion workers, we expect a positive and significant industrial council coefficient. If all workers within the industrial council sector receive the same wage regardless of their union status, we would expect to see no union premium within the industrial council sector. In contrast, we would expect to see a union premium if a) industrial council agreements are not extended to nonunion workers such that the industrial council premium *is* the union premium or b) industrial council agreements are extended and unions pursue supplemental awards on a plant-by-plant basis such that we would observe *both* an industrial council premium and a union premium.[33]

The first column of each table shows the results for all workers. We observe that African nonunion workers covered by an industrial council agreement earn about 10 percent more (or 6 percent more if adjusted, as noted in footnote 32) than those not covered by an industrial council agreement and the difference is statistically significant. In contrast, nonunion White workers covered by an industrial council agreement earn only about 2-3 percent more and the difference is not statistically significant. This provides some evidence that industrial council coverage is associated with higher incomes for African nonunion members. The union premium inside the industrial council is smaller, but the total gap -- the industrial council premium plus the relevant union premium -- is about 32 percent, which is not significantly different from the union gap for

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[33] Budd and Na (1999) conduct a similar exercise in the United States by examining whether there is a union premium for union members compared to workers who are covered by a union contract, but are not union members. Using *Current Population Survey* data, they find evidence of such a premium and attempt to distinguish among several potential reasons for it. They find some support for the idea that union members and nonmembers have different human capital characteristics, although this does not fully explain the results. They also find support for the notion that both employers and unions discriminate against nonmembers.

workers not covered by industrial council agreements. This result suggests that the unions to which African workers belong target a particular wage increase, negotiate for a minimum wage standard within the industrial council setting and then bargain for supplemental awards to attain the targeted wage increase for their members. For White workers the story is different. It does not appear that the industrial council agreements are extended to White nonunion workers since the coefficient on industrial council coverage is statistically insignificant and the union gaps are the same inside and outside the industrial council sector.[34]

As discussed above, the industrial councils originally covered workers in the types of jobs represented by the White unions. As a result, they were typically more concerned about the wages of skilled rather than unskilled workers. We investigate whether the industrial council wage premia differ by the skill level of the worker in two ways. We begin by estimating the union and industrial council premia by quintiles of the predicted wage distribution. If the industrial councils focus on negotiating contracts for more skilled workers then we should observe a larger industrial council premium in the top quintiles of the income distribution.

As shown in the remaining columns of Table 4a, the industrial council premium decreases across the income distribution for African workers, from a high of 43 percent for the first quintile to a low of a 21 percent penalty for quintile 5. The union premia inside of the industrial council sector are larger at the bottom of the wage distribution. It is worth noting, however, that workers

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[34] Unlike the case for African workers, it does not appear that the industrial council agreements extend to nonunion members. Therefore, we interpret the fact that the union wage gaps are similar inside and outside of the industrial council sector differently. Here, we believe that it does not imply that the White union workers achieve supplemental awards at the plant level. Rather, the union wage gap within the industrial council sector simply represents the gains made by the unions through the industrial council agreements.

who are both in industrial councils and belong to unions earn substantial wage premia. The combined industrial council and union premia for workers who belong to unions and are covered by industrial councils are statistically indistinguishable from the union premia outside the industrial councils. The combined premia are also largest at the bottom of the wage distribution, once again suggesting that in all sectors unions help equalize incomes between high and low skilled workers.

The results for Whites, in Table 4b, suggest little or no industrial council premium and there is no difference (statistically or economically) between the union wage gaps inside and outside of the industrial council sectors.

Some of these results square with perceptions of how industrial councils work and some do not. On one hand, among Africans we find that the total premia for unionized workers in industrial councils is about the same as the union premia for workers not covered by these agreements. We interpret this as evidence that the unions are pursuing supplemental awards on a plant-by-plant basis which accords with the demands put forth by African unions as a condition for agreeing to work within the industrial councils.

On the other hand, among Africans we find higher industrial council premia in the lower income quintiles than in the upper quintiles, contrary to expectations; among Whites we find no premium. This may have occurred because income quintiles do not accurately reflect the distinction between skilled and unskilled workers. Therefore, we pursue a second strategy for investigating the industrial councils: we estimate our basic specification within three occupations: craft-persons, operators, and laborers. Not only are these three relatively large occupations where industrial councils and unions have been particularly important, but crafts-persons are generally skilled workers, operators semi-skilled, and laborers unskilled. About 35 percent of African workers are

employed as laborers, 17 percent as operators, and 10 percent as craft-persons. Among White workers about 2 percent are employed as laborers, 5 percent as operators, and 15 percent as crafts-persons. Recall that historically industrial councils have been particularly important for (White) craft-persons. Because our samples (once again) become smaller, we limit the controls included in the regressions. In addition, note that within each occupation, the definition of who is covered by an industrial council is determined solely from geography and industry.

The top panels of Tables 5a and 5b present the results. Among Africans, for the operators and laborers, those who are covered by an industrial council agreement but are not members of a union earn about 17-35 percent more than nonunion workers who are not covered by an industrial council, providing evidence that industrial council agreements are extended to non-parties. While the differences are large, the true industrial council premia are likely about sixty percent of these, if the ratios between the within-household and across-household estimates (and between the estimates in columns (5) and (4)) in Table 2a can be applied here. In addition, we observe that the union gap is significantly smaller among workers who are covered by an industrial council. Again, the total premium for union members covered by industrial council agreements is about the same as for union members outside the industrial council system. For African crafts-persons and for Whites (Table 5b) the results are somewhat perplexing. There is no industrial council premium (contrary to expectations) which suggests that the agreements do not extend to nonunion workers. Before concluding our investigation of industrial councils, we note that because industrial council coverage is so highly correlated with industry, we cannot include industry effects. One would like to know whether imposing the industrial council system on a randomly chosen industry, occupation, and geographic area would generate the patterns in income presented above. To investigate whether the

industrial council premium is mostly identifying an industry effect, we estimated the specifications in Tables 5a and 5b for crafts-persons, operators, and laborers for only those industries in which there are some workers covered by industrial councils (manufacturing, construction, wholesale trade, restaurants and hotels, transportation, and public, domestic, and personal service). These results are presented in the bottom panels of Tables 5a and 5b. In this case, only among African laborers is the industrial council coefficient positive and statistically significant at the 10 percent level. For craft-persons and operators, the industrial council premium is insignificant, as it is for all three occupations among White workers. This exercise is hampered by small sample sizes that make inference difficult. Nevertheless, the results suggest that while industrial councils may operate in high wage industries, there is still some evidence that industrial councils increase the wages of nonunion workers, particularly among the least-skilled.

VI. Summary, Discussion, and Avenues for Future Research

There is little doubt that unions in South Africa, like Solidarity in Poland, played a historic role in the profound social, political, and economic changes that transformed the country in the last few decades of the 20th Century. As the challenges facing the South African government change, so too do questions about the role of unions. The labor market in South Africa is criticized for being unduly rigid, placing a great burden on businesses, stifling growth, and exacerbating unemployment. Unions, with exceedingly high wage premia, and industrial councils, which extend these premia to nonunion workers are singled out as emblematic of the problem.

The heated public policy debate hinges on two questions. Are the union wage premia

actually abnormally high in South Africa? And, do industrial council agreements actually extend these premia to nonunion workers?

The results in this paper suggest that while the union premia in South Africa are high, they are not nearly as high as previous estimates would suggest. Once we account for individual heterogeneity, we estimate an average union premium on the order of 20 percent for African workers; 10 percent for Whites. These estimates are roughly similar to estimates using data from other countries such as the United States and the United Kingdom that attempt to control for individual heterogeneity (Freeman and Medoff 1984).

Our results also shed some light on the question of whether the wages set by industrial councils extend to nonunion workers. Overall, African nonunion workers covered by an industrial council agreement appear to earn about 6-10 percent more than nonunion members not covered by an agreement; overall, there is no industrial council premium for Whites.[35] In addition, although the union premia inside the industrial council system are often significantly smaller than those outside the industrial council system, the total union premia inside the system (the industrial council premium plus the union premium) tend to be similar to those outside the system. These results provide evidence that industrial council agreements are extended to non- union workers, and that unions representing African workers negotiate for supplemental awards such that union workers receive the same compensation whether or not they are covered by the industrial council system.

These results are an important step in understanding what unions and industrial councils do

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[35] It is possible that our estimates of the industrial council effect are biased due to measurement error. However, because our measure of whether a worker is covered by an industrial council is a categorical variable, the measurement error is not classical such that one cannot sign the direction of the bias (Aigner 1973).

in the South African labor market. Of course, one would like direct evidence on whether these institutions cause businesses to fail, discourage small entrepreneurs from entering sectors covered by industrial councils, and create barriers to employment. While a direct empirical investigation of these questions is beyond the scope of this paper, we may be able to give some insight into the last question.

On the surface at least, the proportion of workers who are affected by industrial council agreements is too small to be the primary reason for the vast unemployment numbers in South Africa. Overall, only about 10-16 percent of workers are covered by industrial council agreements. Operators and laborers — groups for whom we find the most evidence that industrial councils extend wage agreements to nonunion workers — are about 26 percent of African workers. However, only about 13 percent of African operators and laborers are covered by industrial council agreements.[36]

Second, the textbook prediction that administratively determined wages (such as minimum wages) necessarily generate unemployment is based on competitive models of the labor market. While the archetypal monopsony model (the company town) may not apply (although in some sectors it may be a reasonable model), it is equally difficult to think of the sectors covered by industrial council agreements in South Africa as fitting the textbook model of a perfectly competitive labor market. The industrial council system was quite explicitly designed to minimize competition among employers. Recent work on monopsony models in the labor market discuss how some institutions may foster collusive agreements which give firms some market power. For example, in

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[36] We emphasize that this is only a partial equilibrium description – if another effect of the industrial council system is to discourage firms from operating in certain sectors this would also reduce employment (Boccara and Moll 1997).

his paper studying the market for nurses in the United States, Sullivan (1989) uses the example of the wide-spread "wage-standardization" programs adopted by hospital groups as collusive agreements that give hospitals monopsonistic characteristics. It is possible that the industrial councils perform a similar role for South African employers. They enforce wage standardization agreements which create monopsonistic characteristics at the industry level. If industrial councils create a monopsonistic environment, then employment and wages are lower than in a more competitive setting. Nevertheless, if monopsonistic rather than competitive models of the labor market are applicable to South Africa, the policy implications are quite different. To increase employment, policies should focus on increasing competition among employers within sectors, rather than increasing competition among workers by attempting to reduce union power. Future research might fruitfully investigate the testable implications of monopsony in the South African labor market.

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Table 1a

Mean Individual Characteristics by Race and Union Status
[standard deviation]

	Africans		Whites	
	Union	Non-Union	Union	Non-Union
Female	0.285 [0.452]	0.313 [0.464]	0.295 [0.456]	0.449 [0.497]
Years of Education	9.281 [3.892]	7.629 [4.277]	12.060 [1.763]	12.518 [1.919]
Years of Education ×Higher Education	2.327 [5.311]	1.207 [4.025]	3.430 [6.221]	4.743 [6.954]
Age	38.350 [9.447]	36.569 [10.598]	36.577 [10.365]	36.405 [11.416]
Married	0.632 [0.482]	0.498 [0.500]	0.792 [0.406]	0.710 [0.454]
Head of Household	0.627 [0.483]	0.575 [0.494]	0.683 [0.465]	0.520 [0.500]
Net Monthly Income (RAND)	1885 [1229]	1243 [1319]	4829 [4044]	4416 [4502]
Number of Observations	5350	10008	1204	4082

Table 1b

Union Membership and Industrial Council Coverage, by Race[†]

Africans

	Not a Union Member	Union Member	Total
Not Covered by an Industrial Council	54.0 (62.8) [86.9]	31.9 (37.2) [84.4]	85.9 (100.0) [85.9]
Covered by an Industrial Council	8.2 (58.0) [13.1]	5.9 (42.0) [15.6]	14.1 (100.0) [14.1]
Total	62.1 (62.1) [100.0]	37.9 (37.9) [100.0]	100.0 (100.0) [100.0]

Whites

	Not a Union Member	Union Member	Total
Not Covered by an Industrial Council	63.0 (78.7) [82.5]	17.0 (21.3) [72.1]	80.1 (100.0) [80.1]
Covered by an Industrial Council	13.3 (67.0) [17.5]	6.6 (33.0) [27.9]	19.9 (100.0) [19.9]
Total	76.4 (76.4) [100.0]	23.6 (23.6) [100.0]	100.0 (100.0) [100.0]

Notes: These figures are weighted. The sample includes all individuals aged 15-65 with non-missing income.

[†]The top percentage represents the cell percentage, the percentage in parentheses represents the row percentage, and the percentage in brackets represents the column percentage.

Source: Authors' calculations using the 1995 *October Household Survey*.

Table 2a
Estimated Union-Non-union Log Monthly Income Gap for Africans

	Across Households					Within Households
	(1)	(2)	(3)	(4)	(5)	(6)
Union	0.616 (0.013)	0.329 (0.011)	0.293 (0.010)	0.292 (0.010)	0.184 (0.010)	0.204 (0.020)
Female	-0.006 (0.014)	-0.480 (0.148)	-0.436 (0.139)	-0.329 (0.136)	-0.376 (0.127)	-0.157 (0.164)
Head of Household		0.046 (0.016)	0.054 (0.015)	0.054 (0.015)	0.144 (0.014)	0.147 (0.023)
Age		0.055 (0.004)	0.045 (0.004)	0.046 (0.004)	0.033 (0.004)	0.029 (0.006)
Age^2 (÷ 100)		-0.053 (0.005)	-0.043 (0.005)	-0.044 (0.005)	-0.032 (0.004)	-0.030 (0.007)
Years of Education		0.083 (0.002)	0.058 (0.002)			0.013 (0.003)
Years of Education × Higher Education		0.029 (0.002)	0.011 (0.002)			0.007 (0.003)
Married		0.184 (0.015)	0.147 (0.014)	0.148 (0.014)	0.104 (0.013)	0.023 (0.028)
Head of Household × Female		0.120 (0.027)	0.093 (0.026)	0.091 (0.025)	-0.006 (0.024)	-0.118 (0.046)
Age × Female		0.005 (0.008)	0.007 (0.007)	0.009 (0.007)	0.012 (0.007)	-0.003 (0.009)
Age^2 × Female (÷ 100)		0.005 (0.008)	-0.006 (0.009)	-0.010 (0.009)	-0.015 (0.009)	0.005 (0.011)
Years of Education × Female		0.028 (0.003)	0.013 (0.003)			0.005 (0.004)
Education × Higher Education × Female		-0.001 (0.003)	0.002 (0.002)			0.009 (0.003)
Married × Female		-0.121 (0.029)	-0.114 (0.024)	-0.105 (0.023)	-0.051 (0.022)	-0.062 (0.030)
Constant	6.737 (0.009)	4.792 (0.081)	5.350 (0.077)	5.828 (0.075)	6.210 (0.077)	5.901 (0.169)
Province Dummies	No	Yes	Yes	Yes	Yes	No
Occupation Dummies	No	No	Yes	No	No	Yes
Occupation × Education‡	No	No	No	Yes	Yes	No
Industry Dummies	No	No	No	No	Yes	Yes
Household Dummies	No	No	No	No	No	Yes
R^2	0.121	0.479	0.542	0.555	0.613	0.946
Number of Observations	15358	15358	15358	15358	15358	15358

Table 2b
Estimated Union-Non-union Log Monthly Income Gap for Whites

	Across Households					Within Households
	(1)	(2)	(3)	(4)	(5)	(6)
Union	0.137 (0.023)	0.124 (0.018)	0.132 (0.018)	0.128 (0.018)	0.096 (0.018)	0.110 (0.035)
Female	-0.578 (0.019)	0.537 (0.257)	0.354 (0.248)	0.332 (0.169)	0.362 (0.167)	0.884 (0.324)
Head of Household		0.322 (0.037)	0.305 (0.035)	0.316 (0.035)	0.293 (0.035)	0.114 (0.063)
Age		0.113 (0.007)	0.099 (0.007)	0.099 (0.007)	0.096 (0.006)	0.117 (0.012)
Age^2 (÷ 100)		-0.125 (0.008)	-0.110 (0.008)	-0.110 (0.008)	-0.107 (0.008)	-0.126 (0.015)
Years of Education		0.156 (0.010)	0.115 (0.010)			0.067 (0.017)
Years of Education × Higher Education		-0.012 (0.003)	-0.011 (0.003)			-0.007 (0.005)
Married		0.144 (0.031)	0.134 (0.029)	0.134 (0.029)	0.113 (0.029)	0.143 (0.075)
Head of Household × Female		-0.114 (0.055)	-0.106 (0.053)	-0.123 (0.053)	-0.110 (0.052)	0.050 (0.113)
Age × Female		-0.032 (0.010)	-0.028 (0.010)	-0.028 (0.010)	-0.028 (0.010)	-0.045 (0.013)
Age^2 × Female (÷ 100)		0.034 (0.013)	0.032 (0.012)	0.032 (0.012)	0.033 (0.012)	0.052 (0.017)
Years of Education × Female		-0.012 (0.016)	-0.001 (0.016)			-0.023 (0.021)
Education × Higher Education × Female		0.003 (0.004)	-0.001 (0.004)			0.005 (0.006)
Married × Female		-0.084 (0.047)	-0.071 (0.044)	-0.068 (0.044)	-0.054 (0.044)	-0.106 (0.063)
Constant	8.349 (0.014)	3.659 (0.163)	4.481 (0.162)	5.850 (0.115)	6.007 (0.129)	5.004 (0.355)
Province Dummies	No	Yes	Yes	Yes	Yes	No
Occupation Dummies	No	No	Yes	No	No	Yes
Occupation × Education‡	No	No	No	Yes	Yes	No
Industry Dummies	No	No	No	No	Yes	Yes
Household Dummies	No	No	No	No	No	Yes
R^2	0.157	0.459	0.510	0.522	0.538	0.877
Number of Observations	5286	5286	5286	5286	5286	5286

Notes: The dependent variable is log (monthly income). Standard errors are in parentheses. All regressions are weighted. All regressions except for those in column (1) include interactions between female and head of household, a quadratic in age, and marital status. Columns (2) and (3) also include an interaction between female and years of education and years of education interacted with whether completed any higher education. The occupation and industry dummies are based on 1-digit occupation and industry codes. There are 1580 individuals in households for which there is variation in union status (i.e., the households off of which the estimates in column (6) of Table 2a are identified); there are 739 individuals in such households in column (6) of Table 2b.

Table 3
The Estimated Union-Non-union Log Monthly Income Gap
by Predicted Wage Quintile, Using Across-Household Variation,
Controlling for Occupation × Education Cells

	Predicted Income Quintile				
	1	2	3	4	5
	Africans				
Union Gap	0.327 (0.029)	0.254 (0.023)	0.192 (0.022)	0.139 (0.021)	0.067 (0.020)
R^2	0.424	0.389	0.340	0.346	0.386
Range of Log(Income)	2.996 - 8.974	3.807 - 9.236	4.205 - 9.105	5.011 - 9.931	4.605 - 10.127
Number of Observations	3915	3446	2985	2517	2495
	Whites				
Union Gap	0.149 (0.046)	0.213 (0.046)	0.097 (0.039)	0.021 (0.035)	0.027 (0.040)
R^2	0.269	0.266	0.245	0.280	0.322
Range of Log(Income)	4.477-9.249	2.303-10.195	5.572-9.732	4.007-11.109	5.991-11.607
Number of Observations	1175	1067	998	1144	902

Notes: The dependent variable is log (monthly income). Standard errors are in parentheses. All regressions include a constant, female, the head of the household a quadratic in age, marital status, 1-digit industry dummies, province dummies, interactions between occupation and education, and interactions between female and head of household, a quadratic in age, and marital status. The occupation × education dummies are based on 1-digit occupation codes. All regressions are weighted. The regressions in this table are analogous to those in column (5) of Tables 2a and 2b.

Source: Authors' calculations using the 1995 *October Household Survey*.

Table 4a

The Estimated Union-Non-union Log Monthly Income Gap for Africans by Industrial Council Coverage and Predicted Wage Quintile, Using Across-Household Variation

		Predicted Income Quintile				
	Overall	1	2	3	4	5
Industrial Council Wage Gap for Non-union Workers	0.101 (0.019)	0.430 (0.043)	0.128 (0.039)	0.030 (0.039)	0.008 (0.040)	-0.202 (0.051)
Union Gap, Outside of Industrial Council Sector	0.305 (0.011)	0.606 (0.031)	0.439 (0.025)	0.291 (0.025)	0.189 (0.024)	0.071 (0.020)
Union Gap, Inside of Industrial Council Sector	0.224 (0.025)	0.260 (0.078)	0.319 (0.056)	0.294 (0.053)	0.193 (0.051)	0.195 (0.062)
p-value of Difference Between Union Gap Outside of Industrial Council Sector and Total Union Gap Inside of Industrial Council Sector†	0.339	0.257	0.870	0.454	0.769	0.088
R^2	0.556	0.333	0.278	0.243	0.261	0.367
Proportion Unionized	0.379	0.165	0.309	0.399	0.471	0.549
Proportion in Industrial Council Sector	0.141	0.101	0.147	0.177	0.180	0.098
Number of Observations	15358	3915	3446	2985	2517	2495

Table 4b

The Estimated Union-Non-union Log Monthly Income Gap for Whites by Industrial Council Coverage and Predicted Wage Quintile, Using Across-Household Variation

		Predicted Income Quintile				
	Overall	1	2	3	4	5
Industrial Council Wage Gap for Non-union Workers	0.028 (0.023)	0.005 (0.051)	0.083 (0.057)	-0.001 (0.052)	-0.001 (0.052)	0.034 (0.055)
Union Gap, Outside of Industrial Council Sector	0.124 (0.021)	0.189 (0.052)	0.258 (0.051)	0.136 (0.045)	0.055 (0.040)	0.005 (0.046)
Union Gap, Inside of Industrial Council Sector	0.134 (0.035)	0.177 (0.089)	0.284 (0.097)	0.157 (0.076)	0.113 (0.066)	0.051 (0.075)
p-value of Difference Between Union Gap Outside of Industrial Council Sector and Total Union Gap Inside of Industrial Council Sector†	0.253	0.945	0.263	0.787	0.358	0.277
R^2	0.523	0.248	0.225	0.205	0.224	0.284
Proportion Unionized	0.236	0.167	0.203	0.256	0.302	0.253
Proportion in Industrial Council Sector	0.199	0.186	0.178	0.205	0.215	0.212
Number of Observations	5286	1175	1067	998	1144	902

Notes: The dependent variable is log (monthly income). Standard errors are in parentheses. All regressions include a constant, sex, a quadratic in age, head of household, or married, interactions between sex and these 4 variables, province dummies, and dummy variables indicating interactions between education and occupation. The regressions are weighted. See text for the determination of industrial council coverage.

† The Total Union Gap Inside of Industrial Council Sector includes both the Industrial Council Wage Gap and the Union Gap Inside of the Industrial Council Sector.

Source: Authors' calculations using the 1995 *October Household Survey*.

Table 5a
The Estimated Union-Non-union Log Monthly Income Gap for Africans
by Industrial Council Coverage for Selected Occupations

	Occupation		
	Craft	Operators	Laborers
	All Industries		
Industrial Council Wage Gap for Non-union Workers	-0.039 (0.041)	0.173 (0.041)	0.352 (0.039)
Union Gap, Outside of Industrial Council Sector	0.251 (0.041)	0.348 (0.027)	0.482 (0.020)
Union Gap, Inside of Industrial Council Sector	0.133 (0.055)	0.138 (0.049)	0.196 (0.054)
p-value of Difference Between Union Gap Outside of Industrial Council Sector and Total Union Gap Inside of Industrial Council Sector†	0.005	0.354	0.113
R^2	0.317	0.336	0.385
Proportion Union	0.422	0.474	0.255
Proportion in Industrial Council Sector	0.405	0.223	0.085
Number of Observations	1513	2378	5854
	Industries with Any Industrial Council Activity‡		
Industrial Council Wage Gap for Non-union Workers	0.029 (0.050)	-0.039 (0.040)	0.072 (0.041)
Union Gap, Outside of Industrial Council Sector	0.294 (0.058)	0.161 (0.032)	0.270 (0.029)
Union Gap, Inside of Industrial Council Sector	0.131 (0.057)	0.172 (0.046)	0.216 (0.052)
p-value of Difference Between Union Gap Outside of Industrial Council Sector and Total Union Gap Inside of Industrial Council Sector†	0.037	0.474	0.673
R^2	0.319	0.291	0.296
Proportion Union	0.343	0.511	0.425
Proportion in Industrial Council Sector	0.0567	0.323	0.222
Number of Observations	1047	1502	1932

Table 5b
The Estimated Union-Non-union Log Monthly Income Gap for Whites
by Industrial Council Coverage for Selected Occupations

	Occupation		
	Craft	Operators	Laborers
	All Industries		
Industrial Council Wage Gap for Non-union Workers	-0.009 (0.048)	-0.172 (0.097)	0.204 (0.227)
Union Gap, Outside of Industrial Council Sector	0.198 (0.051)	0.190 (0.100)	0.528 (0.172)
Union Gap, Inside of Industrial Council Sector	0.124 (0.057)	0.144 (0.131)	0.214 (0.310)
p-value of Difference Between Union Gap Outside of Industrial Council Sector and Total Union Gap Inside of Industrial Council Sector†	0.159	0.105	0.687
R^2	0.395	0.522	0.495
Proportion Union	0.414	0.326	0.227
Proportion in Industrial Council Sector	0.447	0.324	0.156
Number of Observations	758	234	143
	Industries with Any Industrial Council Activity‡		
Industrial Council Wage Gap for Non-union Workers	0.041 (0.060)	-0.151 (0.099)	0.187 (0.287)
Union Gap, Outside of Industrial Council Sector	0.210 (0.083)	0.216 (0.120)	0.451 (0.353)
Union Gap, Inside of Industrial Council Sector	0.113 (0.062)	0.157 (0.131)	0.090 (0.347)
p-value of Difference Between Union Gap Outside of Industrial Council Sector and Total Union Gap Inside of Industrial Council Sector†	0.503	0.152	0.610
R^2	0.419	0.574	0.661
Proportion Union	0.338	0.300	0.263
Proportion in Industrial Council Sector	0.629	0.382	0.315
Number of Observations	505	196	62

Notes: The dependent variable is log (monthly income). Standard errors are in parentheses. All regressions include a constant, sex, a quadratic in age, whether head of household, or married, interactions between these variables and sex, and education and province dummies. The regressions are weighted. See text for the determination of industrial council coverage.

† The Total Union Gap Inside of Industrial Council Sector includes both the Industrial Council Wage Gap and the Union Gap Inside of the Industrial Council Sector.

‡ Only workers employed as craft-persons, operators, and laborers in the manufacturing, construction, wholesale, restaurant and hotel, transportation, or public, domestic, and personal service industries are included.

Source: Authors' calculations using the 1995 *October Household Survey*.

Appendix Table 1

A Listing of Industrial Councils (Based on Godfrey (1992))

Industrial Council for the Cinematograph and Theatre Industry
Industrial Council for the Diamond Cutting Industry
National Industrial Council for the Iron, Steel, Engineering and Metallurgical Industry (NICISEMI)
Industrial Council for the Leather Industry
Industrial Council for the Motor Industry
Ophthalmic Optical Manufacturing Industry
Industrial Council for the Textile Manufacturing Industry
Industrial Council for the Building Industry (East London)
Industrial Council for the Building Industry (East Cape)
Industrial Council for the Building Industry (Kimberley)
Industrial Council for the Building Industry (Kroonstad)
Industrial Council for the Building Industry (Pietermaritzburg and Northern Areas)
Industrial Council for the Building Industry (Port Natal)
Industrial Council for the Building Industry (Western Province)
Industrial Council for the Building Industry (North and West Borland)
Industrial Council for the Building and Monumental Masonry Industry (Bloemfontein)
Industrial Council for the Building and Monumental Masonry Industry (Transvaal)
Industrial Council for the Clothing Industry (Cape)
Industrial Council for the Clothing Industry (Eastern Province)
Industrial Council for the Clothing Industry (Natal)
Industrial Council for the Clothing Industry (Orange Free State and Northern Cape)
Industrial Council for the Knitting Industry (Transvaal)
Industrial Council for the Electrical Contracting and Servicing Industry (Cape)
Industrial Council for the Electrical Contracting Industry (Transvaal)
Industrial Council for the Electrical Industry (East London)
Industrial Council for the Electrical Industry – Electrical Contracting Section (Natal)
Industrial Council for the Furniture Manufacturing Industry (Border)
Industrial Council for the Furniture Manufacturing Industry (Eastern Cape Province)
Industrial Council for the Furniture Manufacturing Industry (Natal)
Industrial Council for the Furniture Manufacturing Industry (Orange Free State)
Industrial Council for the Furniture Manufacturing Industry (South Western Districts)
Industrial Council for the Furniture Manufacturing Industry (Western Cape)
Industrial Council for the Furniture and bedding Manufacturing Industry (Transvaal)
Industrial Council for the Hairdressing Trade (Border)
Industrial Council for the Hairdressing Trade (Cape Peninsula)
Industrial Council for the Hairdressing Trade (Natal)
Industrial Council for the Hairdressing Trade (Pretoria)
Industrial Council for the Hairdressing Trade (Port Elizabeth)
Industrial Council for the Hairdressing Trade (Southern and Western Transvaal)

Industrial Council for the Laundry, Cleaning and Dyeing Industry (Cape)
Industrial Council for the Laundry, Cleaning and Dyeing Industry (Natal)
Industrial Council for the Laundry, Cleaning and Dyeing Industry (Transvaal)
Industrial Council for the Liquor and Catering Trade (Cape)
Industrial Council for the Liquor and Catering Trade (Pietermaritzburg)
Industrial Council for the Liquor and Catering Trade (South Coast, Natal)
Industrial Council for the Liquor, Catering, and Accommodation Trade (Border)
Industrial Council for the Motor Transport Undertaking (Goods)
Industrial Council for the Sugar Manufacturing and Refining Industry
Industrial Council for the Grain Co-operative Trade (not yet published agreement)
Industrial Council for the Contract Cleaning Industry (not yet published agreement)
Industrial Council for the Biscuit Manufacturing Industry
Industrial Council for the Canvas and Ropeworking Industry
Industrial Council for the Canvas Goods Industry
Industrial Council for the Chemical Industry
Industrial Council for the Commercial Distributive Trade
Industrial Council for the Jewellery and Precious Metal Industry
Industrial Council for the Meat Trade
Industrial Council for the Millinery Industry (Cape)
Industrial Council for the Millinery Industry (Transvaal)
Industrial Council for the New Tyre Manufacturing Industry
Industrial Council for the Passenger Transportation Trade
Industrial Council for the Retail Meat Trade (Witwatersrand)
Industrial Council for the Retail Meat Trade (Pretoria)
Industrial Council for the Road Passenger Transport Industry (Port Elizabeth)
Industrial Council for the Storekeeping Trade
Industrial Council for the Sweetmaking Industry (Cape)
Industrial Council for the Sweetmaking Industry (Johannesburg)
Industrial Council for the Tearoom, Restaurant and Catering Trade (Pretoria)
Industrial Council for the Tearoom, Restaurant and Catering Trade (Witwatersrand)
Industrial Council for the Worsted Textile Manufacturing Industry
Industrial Council for the Local Government Undertaking
Industrial Council for the Local Authority Undertaking of the Cape of Good Hope
Industrial Council for the Local Authority Undertaking of Kimberley
Industrial Council for the Bloemfontein Municipal Undertaking
Industrial Council for the OFS Goldfields Local Authority
Industrial Council for the Pretoria Municipal Undertaking
Industrial Council for the Johannesburg Municipal Undertaking
Industrial Council for the Municipal Undertaking of Port Elizabeth

Appendix Table 2
Estimated Union-Non-Union Wage/Income Gap for Africans and Whites,
Using the 1993 *Living Standards Measurement Survey*

	Africans			Whites		
	(1)	(2)	(3)	(4)	(5)	(6)
	Log Hourly Wage, net of taxes, including benefits & profit sharing					
Union	0.463	0.170	0.178	-0.121	-0.113	-0.117
	(0.033)	(0.031)	(0.031)	(0.052)	(0.054)	(0.054)
	Log Monthly Income, net of taxes, including benefits & profit sharing					
Union	0.339	0.146	0.154	-0.143	-0.094	-0.093
	(0.024)	(0.022)	(0.022)	(0.048)	(0.050)	(0.050)
	Log Hourly Wage, gross of taxes, including benefits & profit sharing					
Union	0.550	0.232	0.240	-0.037	-0.031	-0.050
	(0.034)	(0.032)	(0.032)	(0.052)	(0.055)	(0.054)
	Log Monthly Income, gross of taxes, including benefits & profit sharing					
Union	0.426	0.208	0.216	-0.060	-0.011	-0.026
	(0.025)	(0.023)	(0.024)	(0.049)	(0.051)	(0.051)
	Log Hourly Wage, gross of taxes, including benefits, profit sharing, and in-kind payments					
Union	0.558	0.248	0.255	-0.043	-0.037	-0.056
	(0.033)	(0.031)	(0.032)	(0.053)	(0.055)	(0.055)
	Log Monthly Income, gross of taxes, including benefits, profit sharing, and in-kind payments					
Union	0.433	0.224	0.231	-0.065	-0.018	-0.031
	(0.024)	(0.023)	(0.023)	(0.050)	(0.052)	(0.051)
Occupation Dummies	No	Yes	No	No	Yes	No
Occupation × Education Dummies	No	No	Yes	No	No	Yes
Industry Dummies	No	Yes	Yes	No	Yes	Yes

Notes: All regressions include a constant and are weighted. Standard errors are in parenthesis. The regressions in columns (1) and (4) include controls for: female, head of household, age, age squared, married, years of education, years of education interacted with whether completed any higher education, interaction between all of these and female, urban residence, 9 province dummies, an indicator for whether the individual is the respondent, and for whether the individual is a usual resident of the household. Columns (2) and (5) include these same controls and add indicators for industry and occupation. Columns (3) and (6) include similar controls except that instead of controlling for a spline in education and occupation dummies separately, interactions between years of education and occupation are included. There are 4251 observations in the regressions for Africans and 1230 observations in the regressions for Whites.

Source: Authors' calculations using the 1993 *Living Standards Measurement Survey*.

Appendix Table 3
Log Monthly Income Equation Used to Determine Income Quintiles

	Africans	Whites
Female	-0.835 (0.229)	0.555 (0.591)
Years of Education	0.088 (0.008)	0.143 (0.029)
Year of Education × Higher Education	0.035 (0.003)	-0.018 (0.004)
Age	0.060 (0.006)	0.115 (0.012)
Age, squared (÷ 100)	-0.059 (0.007)	-0.137 (0.012)
Years of Education × Age (÷100)	0.009 (0.019)	0.086 (0.061)
Head of Household	0.042 (0.023)	0.325 (0.052)
Married	0.211 (0.021)	0.156 (0.045)
Years of Education × Female	0.045 (0.014)	0.003 (0.045)
Years of Education × Higher Education × Female	0.001 (0.004)	0.008 (0.006)
Age × Female	0.021 (0.011)	-0.038 (0.019)
Age2 × Female (÷ 100)	-0.020 (0.013)	0.050 (0.017)
Years of Education × Age × Female (÷ 100)	-0.049 (0.035)	-0.055 (0.099)
Head of Household × Female	0.137 (0.038)	-0.137 (0.073)
Married × Female	-0.151 (0.035)	-0.109 (0.063)
Constant	4.667 (0.122)	3.624 (0.381)
Province Dummies	Yes	Yes
R^2	0.470	0.459
Number of Observations	8840	3390

Notes: The dependent variable is log (monthly income). Standard errors are in parentheses. Both regressions also include a constant and are weighted. The samples include only non-union workers (both men and women) not covered by an industrial council agreement.

Source: Authors' calculations using the 1995 *October Household Survey*.