

## Earnings and Welfare after Downsizing: Central Bank Employees in Ecuador

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*This article measures the earnings and welfare losses experienced by displaced employees of the Central Bank of Ecuador. It links these losses to individual characteristics such as gender, education, seniority, and salary in the public sector. Data are from a survey of displaced employees that included subjective evaluations of well-being in addition to information on activity and earnings. The welfare losses of separated employees are not highly correlated with their earnings losses, partly because some of them (especially women) withdrew from the labor force after separation. Earnings and welfare losses also vary depending on the nature of displacement, which was voluntary for roughly half the employees and involuntary for the rest. Overall, the losses were larger for employees with less education and more seniority, but not necessarily larger for employees with higher salaries. However, compensation for displacement was based on a rule of thumb that involved only salary and seniority and was applied across-the-board. For those employees who left voluntarily, the resulting compensation package was, on average, about 20 percent higher than the welfare loss. The article derives the implications of these findings for the design of assistance programs for displaced workers and, more specifically, for the tailoring of compensation packages to their individual characteristics.*

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Public sector downsizing is an increasingly important component of economic reform, both in industrial and in developing countries. Nowhere is the need to trim public sector employment more obvious than in formerly planned economies. But it is also considerable in Latin American countries, where a long history of populist economic policies has led to bloated bureaucracies and over-staffed state-owned enterprises. A good case in point, the Central Bank of Ecuador (BCE) had 5,800 relatively well-paid employees in the early 1990s. While their work is now done by some 2,700 (better-paid) employees, many other public sector agencies and firms around the world have yet to start moving in this direction.

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One of the main obstacles to public sector downsizing is the large welfare loss that displaced workers may experience. Typically, some of these workers spend long periods unemployed or out of the work force. Others move to activities characterized by lower pay, less income security, and higher levels of effort than the jobs they used to hold. The extent of their welfare loss depends on the nature of the alternatives to their public sector job, the value they attach to income security, and their aversion to work effort. Not being able to predict these losses, or to defuse the resistance to downsizing, governments sometimes offer overly generous severance pay packages. Many potential losers are thus transformed into winners, and public sector downsizing ends up being a very expensive endeavor.

In this article we measure the individual losses experienced by displaced BCE employees and link these losses to their observable characteristics. Although the exercise focuses on a relatively narrow group of public sector workers, its implications go beyond their particular case. To date, there have been few studies on this topic, and policymakers willing to assess the amount of resources needed to compensate displaced public sector workers, or to predict the harshness of resistance to downsizing in the absence of such compensation, have little on which to build. Moreover, these studies seldom refer to white-collar workers in middle-income countries, a group that will face significant job losses in the coming years.<sup>1</sup> Because these workers tend to be highly vocal and politically influential, compensation issues will certainly be of paramount importance in their case.

This article should not serve to justify the complete compensation of displaced workers. Many public sector employees get rents from their jobs, and these rents are paid for by the rest of society. On fairness grounds, it would seem that they should bear some of the cost of adjustment. Moreover, public sector employees are rarely among the poorest segments of the population. Therefore, a government concerned about poverty alleviation could find better uses for its scarce resources than the complete compensation of this particular group. But to compensate displaced employees even partially, the government would need information about the cost of complete compensation. And this information may be relevant for predicting the fierceness of the resistance to restructuring. Finally, in some countries public sector employees cannot legally be fired, which implies that the government has to "buy" them out. In those countries, an accurate estimate of the losses from displacement may help to reduce the cost of downsizing.

Our main contribution in this article is methodological. Attempts to estimate the losses experienced by displaced workers usually involve a comparison of

1. Alderman, Canagarajah, and Younger (1996) analyze the case of government employees in Ghana, most of whom moved to agriculture after being retrenched. Tansel (1997) focuses on blue-collar workers in Turkey. Assaad (in this issue) compares workers in and out of the Egyptian public sector, taken as a whole. Only the study by Robbins (1996) considers a group of workers similar to ours. Other studies of downsizing are descriptive in nature, with no attempt to quantify the loss experienced by individual workers.

earnings in two different states, such as in and out of the public sector or before and after separation. But as important as the change in earnings may be, it represents only one aspect of the welfare loss. The disutility from lesser income security and (possibly) higher effort levels, as well as the utility from additional leisure time (if any), also need to be taken into account. We use discrete measures of earnings losses and welfare losses reported directly by the displaced employees, in addition to more traditional measures of earnings losses. We use regression analysis to estimate the link between these measures and the observable characteristics of the employees. These characteristics include salary and seniority in the public sector, which are the two main attributes considered in the rules of thumb on which compensation is usually based, but they are not restricted to these two variables.

BCE gave about half of the displaced employees the choice of staying in their jobs and forced the rest to resign. Thus, self-selection is a key problem in evaluating the link between the losses ensuing from downsizing and the observable characteristics of the employees. Most likely, those who accept a severance pay package and leave the public sector are also, other things being equal, those who face the best outside alternatives or have the lowest aversion to risk and effort. Using the losses experienced by these workers to predict the losses of those who remain in the public sector may be misleading. We deal with this problem by replicating the analysis of welfare losses separately for BCE employees who had a choice and for those who did not. The differences observed between these two groups provide an indication of the extent and nature of the biases resulting from self-selection.

Section I narrates the downsizing process; including the mechanisms set up by BCE to compensate the displaced employees, as well as to decide which among them would be forced to resign and which would have the choice of staying. Section II describes the survey we implemented to gather information on the activity, earnings, and welfare of displaced employees from the Quito branch of BCE in the 15 to 18 months following their separation. Section III analyzes how displaced employees allocated the compensation they received and evaluates the returns on the investments they made with it. Section IV retraces employees' activity and earnings history after separation; it shows that unemployment rates were quite low, but the quality of the new jobs was low as well. Sections V and VI construct and analyze indicators of the actual and perceived earnings loss experienced by displaced BCE employees. Section VII focuses on indicators of the welfare loss and systematically links them to the observable characteristics of the displaced employees. Section VIII draws policy implications from the analysis, and section IX concludes.

## I. THE DOWNSIZING PROCESS

In the early 1990s it became apparent that BCE was overstaffed. Part of the growth in employment was due to political patronage, which had been particu-

larly intense during the 1980s. But bad management was to blame as well. Over the years, management did not restructure or suppress poorly functioning units; instead, it replicated them by creating other units with similar tasks. Moreover, financial liberalization reduced the scope for some of the activities traditionally performed by BCE, such as those related to credit allocation. Gradually, the management of BCE came to accept that a reduction in personnel was warranted. In 1991, it decided that the work force had to be cut by half. This target was intended to signal management's resolve to address the overstaffing problem. It was not set as the result of a careful analysis of the functions of BCE and the productivity of its staff.

The reduction in personnel took place over two distinct phases. A first round in 1992 led to the departure of 1,400 employees on a strictly voluntary basis. At that time, there was no appropriate legal framework for the downsizing. The compensation mechanism was set up by the monetary authority (Junta de Regulación Monetaria, or JRM) itself. This mechanism was based on two variables: salary and seniority. More specifically, the compensation offered to those willing to resign was 1.7 times their average monthly salary in 1992, multiplied by their number of years of service in BCE. The resulting figure could not fall below 5 million sucres or rise above 50 million sucres (Ecuador's currency is the sucre). This amounted to a range of \$3,600 to \$36,000 per employee in 1992 U.S. dollars. At that time, income per capita in Ecuador was about \$1,400 per year. Over a period of slightly less than three months, BCE offered these packages to all employees below retirement age. It gave a special committee discretionary power to reject applications by employees that it considered essential.

Chaos ensued, as most employees thought the compensation offered was too generous to last and applied for severance. Work effort dropped, as many started planning their impending exit. Still, the trade union representing BCE employees fought to improve the severance pay package, while employees above retirement age lobbied for access to it. The latter group saw its efforts rewarded less than one week after the mechanism was announced, under the condition of relinquishing the entitlement to an old-age pension. But later on, many of those who benefited from the severance pay package sued BCE to get their pensions paid anyway. Last but not least, employees whose applications were rejected (mainly tellers) managed to mobilize some politicians to gain access to the package.

Yet, not all politicians were supportive. Congress questioned the legitimacy of the mechanism set up by the JRM, considering it an abuse of government funds. Electoral competition placed the downsizing process under even more severe criticism. A parliamentary commission was created to investigate the issue, and the chair of BCE faced the possibility of a trial. The Ministry of Finance, in turn, succeeded in taxing severance payments as income, which led yet another group of former employees to sue BCE. In the meantime, labor productivity declined further, due to the lack of selectivity of the reduction in personnel. When the government changed, the chair of BCE was finally dismissed.

The second phase of the downsizing took place in 1994 in a very different context. Under the new, more market-oriented government, parliament passed a law for "modernization of the state." This law provided a framework for the implementation of compensation packages. Moreover, the management of BCE decided that the second phase of the downsizing had to be based explicitly on the role and functions defined by the law for "monetary regulation and state banking" of May 1992. Thus reducing the overlap between units and the existing duplication of effort became a deliberate goal of the exercise. It was finally agreed that BCE had to return to its size prior to the great expansion of the 1980s, which amounted to taking some 1,500 extra employees off the payroll.

In practice, the second phase commenced with a classification of all personnel in three groups, labeled A, B, and C. BCE could not afford to lose employees in group A; they were therefore denied access to the new severance pay package. Employees in group C were clearly redundant. BCE could not legally fire them, however, so they were informed, on an individual basis, that new laws under preparation would eliminate job security for government employees and that next time the compensation package offered to them would be much less generous. This threat was very successful, in that all of the employees in group C agreed to leave BCE. Finally, employees in group B were given the choice to stay in BCE or to take the severance pay and leave. We refer to employees in group B as those who "had a choice" and to employees in group C as those who "had no choice."

The JRM set compensation at twice the average monthly salary in 1993, multiplied by the number of years of service with BCE. The resulting figure could not fall below 10 million sucres or exceed 400 times the national minimum wage, which effectively capped individual compensation at 26 million sucres. Severance pay thus ranged from \$4,800 to \$12,400 per employee (in 1993 dollars). From the outset, the government agreed not to tax severance pay as income. The total cost of the operation was on the order of 35 billion sucres (roughly \$17 million in 1993), and its financial payback period was estimated at 20 months. As before, the trade union and some politicians pressured the management of BCE, but overall the process went much more smoothly than in the first phase.

Compensation was the main component of the 1994 downsizing program, but not the only one. The program included a training mechanism to facilitate the transition out of the public sector. Courses on microenterprise management and financial investments were offered free of charge to any resigning employee willing to take them. Other courses were organized at the request of some of the parting employees who wanted to become insurance agents in the private sector. For those staying, BCE overhauled the pay structure and working conditions and introduced job descriptions and performance evaluations. BCE sold 9 of its 14 buildings in order to regroup personnel physically. Reportedly, the morale of those who stayed with BCE improved.

## II. A SURVEY OF DISPLACED EMPLOYEES

To assess the change in earnings, employment status, and welfare experienced, we interviewed a relatively large proportion of displaced BCE employees. Our survey focused on employees who had left BCE during the second phase of downsizing. When this research project started, employees who had left during the first phase had been out of BCE for more than two years already. Given the time needed to implement and run the survey, we were concerned that limited recall capabilities would lead to a distorted picture of employment and earnings histories. More important, unlike the second phase, the first phase was not characterized by a mix of voluntary and involuntary job separations, and this mix is key to controlling for self-selection. Due to budget constraints, we decided to survey the displaced employees who used to work in the Quito branch of BCE only. For this group of employees, the target was the entire population.

The management of BCE kindly provided us with copies of its own files for the 1,380 employees who left in February and March 1994, including 455 from the Quito branch. These records include information on gender, age, and years of experience both while working in BCE and before joining. They also include total earnings in 1992 and 1993. The management of BCE helped us to identify the appropriate person to run the survey. This person was the former social worker of the institution, who had been classified into the C group during the second phase of downsizing. One of the survey questionnaires filled was therefore hers. The personal knowledge she had of many employees of the Quito branch was crucial in securing a high rate of response. To minimize the risk that her personal involvement could unwittingly influence the responses, multiple-choice questions were used whenever possible.

Unfortunately, in the time elapsed since their resignation, many former BCE employees had moved, including 38 who could not be found, 31 who had left Quito, and 15 who had migrated out of the country. One of the former employees had died, and four others did not want to cooperate with the survey. Because the responses to three of the questionnaires were quite incomplete, in the end we got a sample of 366 displaced employees, of whom 359 answered all of the questions asked.

Roughly half of the surveyed employees were male, and three-quarters were married either legally or by common law. The average age was 37 years, and the average family size was slightly larger than five. Average schooling was 14 years, as almost two-thirds of the interviewees had received at least some postsecondary education. In fact, a mere 4 percent had not finished high school. Average experience was 11 years, with almost 70 percent of the sample reporting no work experience before joining BCE. An astounding 98 percent of the interviewees had been members of the trade union while still working for BCE. Finally, about 53 percent of the displaced employees declared that they had no choice but to leave BCE, while the rest could have stayed, had they wished to do so.

### III. THE COMPENSATION PACKAGE

The compensation package, as perceived by BCE employees who left in 1994, included up to three components. The most important was the severance pay established by the JRM, based on salary and seniority, but it was not the only one. BCE reimbursed all of the surveyed employees for past contributions to its own old-age pension fund. Many of them also recovered their contributions to the general unemployment insurance mechanism (Fondo de Reserva) managed by the Ecuadorian social security system. The top portion of table 1 indicates how many of the interviewees had access to each of these three components and the importance of each component in monetary terms. (All monetary figures in table 1 and hereafter are measured in millions of sucres at constant June 1995 prices. At that time, the exchange rate was 2,500 sucres per U.S. dollar.)

Strictly speaking, only severance pay represents a compensation for job loss. The other two components of the package, it could be argued, actually belong to the workers and only change hands at the time of their resignation. But this would be so only if two conditions held true. First, pensions and unemployment benefits would have to be based on actual contributions plus accrued interest. And second, BCE employees would have unrestricted access to credit. Under these two assumptions, the net wealth of displaced employees would not be affected when they cashed in their past contributions. However, neither of the two assumptions is likely to be true. It is usually agreed that salaried workers have limited access to credit, and there is no reason to believe that Ecuador is an

Table 1. *The Compensation Package and Its Use among Former Employees of the Central Bank of Ecuador, 1994-95*

| <i>Source and use of funds</i>          | <i>Number of former employees</i> | <i>Average value (millions of sucres at June 1995 prices)</i> |
|---|-----------------------------------|---|
| <i>Components of the package (1994)</i> |                                   |   |
| Basic severance pay package             | 363                               | 30.2  |
| Contributions to old-age pension        | 363                               | 18.6  |
| Contributions to unemployment insurance | 170                               | -2.4  |
| Total                                   | 363                               | 51.0  |
| <i>Use of the package (1994-95)</i>     |                                   |   |
| Current spending (food, clothing, etc.) | 178                               | 3.6   |
| Physical investment (car, house, etc.)  | 252                               | 21.5  |
| Repayment of debts                      | 85                                | 2.6   |
| Transfer to other family members        | 18                                | 0.7   |
| Financial investment                    | 160                               | 11.9  |
| Launching or expansion of business      | 140                               | 10.5  |
| Total                                   | 363                               | 51.0  |

*Note:* The average yearly salary before separation was 22.1 million sucres in June 1995 prices. All BCE employees received more than one type of compensation, and most spent it on more than one item. Individual amounts received and spent may not add up to the total due to rounding.

*Source:* Authors' calculations.

exception in this respect. More important, Ecuadorian social security programs are characterized by a very tenuous link between contributions and benefits.

There are several reasons for the weakness of this link. To begin with, individual pensions in Ecuador are based on age, years of experience, and salary at retirement, rather than on past individual contributions. Moreover, even the average pension may bear little resemblance to the average contribution because the Ecuadorian social security system is not financially viable. It is therefore likely that benefits will be eroded as the population grows older. (The BCE pension fund is independent of the social security system, but pressures could mount to merge them as the general old-age pension program runs out of resources.) The discounted loss from relinquishing an old-age pension today is therefore much smaller than the present value of the contributions that would be needed to gain access to that pension. As regards the unemployment insurance mechanism, any money deposited in it by BCE employees was likely to be considered lost, too, given the lifetime job security employees enjoyed. Because this third component is minor compared with the other two, the decision whether to count it as compensation should not affect the analysis.

The lower portion of table 1 describes how interviewees used their compensation packages. The breakdown refers to the sum of all cash payments they received as a result of their resignation, including severance pay, past contributions to the old-age pension, and, for some, past contributions to the unemployment insurance mechanism. The first column of the table indicates how many of the surveyed workers spent at least part of their package on each of a series of items. The second column reports the average spending by item. Because of the long period elapsed since displacement, the resulting breakdown probably reflects the equilibrium allocation, rather than a point in the transition toward equilibrium.

Physical investment, including the purchase of a car, a house, or an apartment, or the expansion of a previously owned house or apartment, was by far the preferred investment of displaced BCE employees. Almost 70 percent of the sample favored this type of spending, which amounted on average to more than 40 percent of the compensation package (table 1). A similar fraction of the sample either made financial investments or canceled previous debts, but the amount spent, on average, was smaller (less than 30 percent of the compensation package). The proportion of those who used some of their compensation package to start or expand an independent activity was considerable. For those who incurred this type of expenditure, the average spending was roughly 27.2 million sucres ( $10.5 \times 363 / 140$ ), equivalent to more than one year of salary at BCE. Finally, about half of the interviewees used part of the compensation to pay for consumption expenditures. For this group, the average consumption spending amounted to 7.3 million sucres ( $3.6 \times 363 / 178$ ), which is roughly a quarter of the income they would have earned since the separation date, had they not resigned.

The survey asked displaced employees to report their earnings from invested compensation. Because of the way the question was phrased, the answers do not

include imputed rent on any housing acquired or built for own use or on any other physical assets purchased, or capital gains or losses. Consequently, these answers refer only to cash returns. For financial investments, an adjustment was needed to infer real returns from the reported nominal returns because inflation was high in Ecuador at the time of the survey. The calculation is made under the assumption of a monthly increase in consumer prices of 2 percent. This figure is based on the actual inflation observed in the years surrounding the downsizing of BCE. Because such an adjustment would require heroic assumptions in the case of diversified portfolios, returns are evaluated for former employees who made either physical or financial investments, but not both.

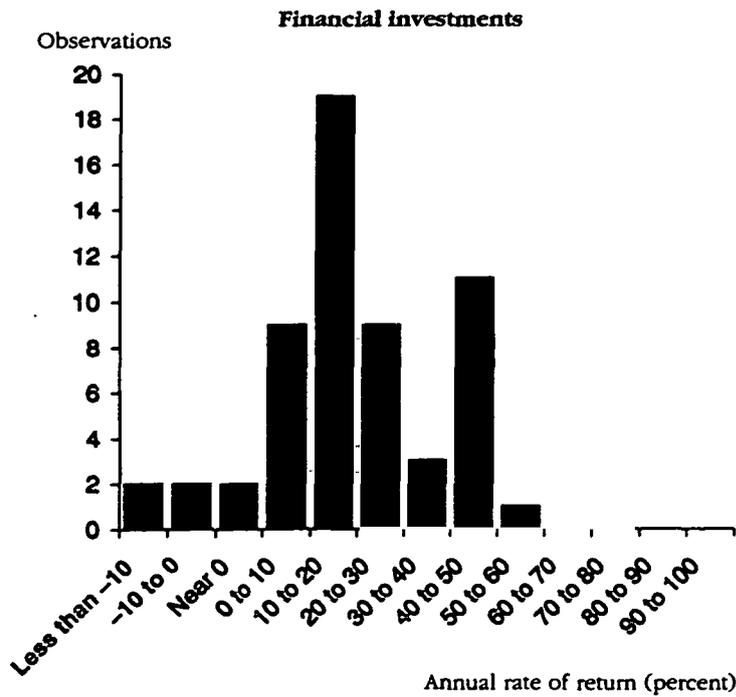
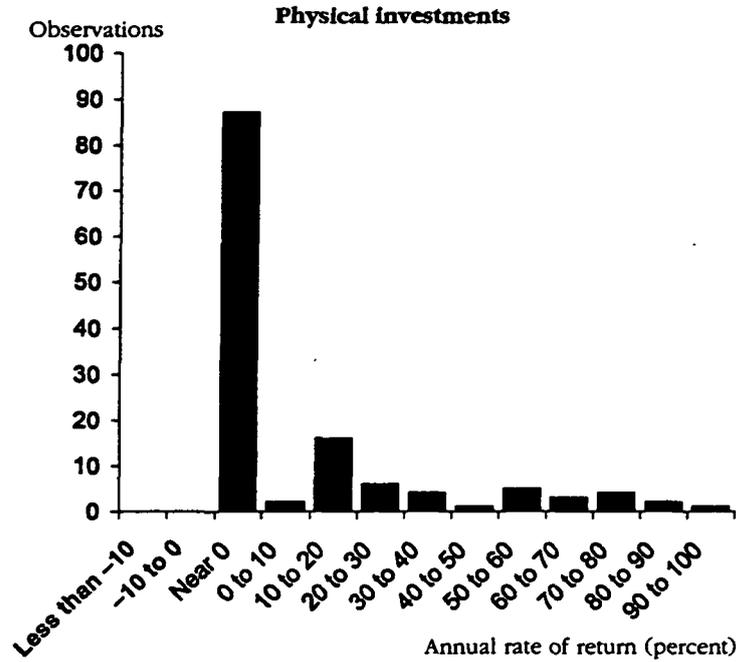
Figure 1 shows the distribution of real returns on invested compensation. The upper graph in the figure represents the rate of return on physical assets for those interviewees who made no financial investments. The lower graph corresponds to the rate of return on financial assets for those who made no physical investments. The distribution remains roughly unchanged if small investments (less than 1 million sucres at June 1995 prices) are set aside. The reported rates of return correspond to a 12-month period, under the assumption that the monthly returns observed at the time of the interview remain constant over time. As a result of this assumption, the variance of the observed returns is most likely overestimated.

Although the average rate of return on invested compensation is high, the median rate is quite moderate and is definitely insufficient to sustain household consumption. It is actually zero in the case of physical investments, which implies that the latter were mostly made for the individual's own use. It is 17.5 percent in the case of financial investments. Using 10-point intervals, the majority of those who actually get earnings from their investments lies in the 10–20 percent interval. The income stream from a 10 percent return on the average compensation package represents less than a quarter of the average salary before separation. Although not negligible, this figure clearly suggests that the compensation packages would not allow displaced BCE employees to finance their consumption expenditures out of rents only. Their ability to work remains key for them to make a living.

#### IV. ACTIVITY AND EARNINGS AFTER DISPLACEMENT

The retrenched employees scarcely used the support mechanisms implemented by BCE to facilitate the job transition. Only 12 percent of them took any of the training courses offered, although these were provided free of charge. Similarly, only one interviewee reported having received help from BCE in the search for a new job. That was the social worker identified by BCE management to assist us with the survey. It appears that the BCE trade union was not instrumental in facilitating the transition either, given that none of the interviewees received support from it. Displaced BCE employees were therefore on their own after they resigned.

Figure 1. Annual Rates of Return on Invested Compensation of Former Employees of the Central Bank of Ecuador, 1995



Source: Authors' calculations.

Table 2 reports the activities they performed in the months following their resignation. Because multiple answers were allowed, the monthly total in the table exceeds the sample size. A slight upward trend in the gap between the two indicates that multiple activities, and, more specifically, multiple jobs, became increasingly prevalent over time. A more significant trend concerns the public-private split in the jobs taken. Many interviewees kept doing work for BCE after separation, in one way or another, but almost all of this work was finished about eight months later. The number of interviewees holding salaried jobs in the private sector increased accordingly. The expansion of self-employment was even larger, with more than half of the sample moving to this category within one year of displacement.

The new jobs seem to be characterized by their relatively low quality, rather than by their scarcity. The unemployment rate, measured as the displaced employees who were unemployed as a proportion of those who either had a job or were actively searching for one, never exceeded 15 percent. It was down to 10 percent six months after separation and to only 6.5 percent by the end of the period. The relatively low unemployment rate was not due to a buoyant economy. (The growth rate of output was 4.3 percent in 1994 and 2.3 percent in 1995, implying almost stagnant output per capita, given how fast population grows in Ecuador.) But not all the new jobs were in compliance with labor laws. By six months after separation, less than a quarter of those employed were entitled to the "teen" salaries, which are the quintessential mandated benefit in Ecuador (see MacIsaac and Rama 1997). The thirteenth to sixteenth salaries are payments to be made to the worker at different times in the year, on top of the twelve monthly salaries. An equally small fraction of the employed was enrolled with social security, and barely 5 percent of those at work were unionized. These figures are hardly surprising in a context where most of the interviewees were self-employed, but they contrast sharply with the characteristics of former BCE jobs.

We calculated annual labor earnings after separation based on data corresponding to the month when the interview took place. The calculation included both cash earnings and payments in kind but excluded earnings from invested compensation. We added the benefits mandated by law to the resulting figure when the interviewees declared that they were entitled to "teen" salaries. Conversely, contributions to the social security system were subtracted for those who were enrolled in it. The rationale for this subtraction is the weakness of the link between contributions and benefits, as discussed in section II. In the end, the average labor earnings of those who had a job amounted to 12.3 million sucres per year (at June 1995 prices), which is roughly 55 percent of what they used to make at BCE.

The survey also asked displaced BCE employees to compare their total household earnings in each of the months after separation with the household earnings they had when they worked for BCE. In what follows, we identify this subjective assessment as the perceived earnings. More specifically, all interviewees

**Table 2. Activity Following Separation from the Central Bank of Ecuador, by Month after Separation, 1994-95**  
(percentage of former employees)

| <i>Activity</i>                           | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Private employee                          | 9.7   | 10.2  | 11.3  | 12.9  | 15.2  | 16.5  | 17.5  | 20.1  | 21.5  | 21.2  | 24.2  | 24.8  | 27.0  | 27.9  | 29.4  |
| Public employee                           | 12.7  | 14.6  | 13.2  | 10.7  | 9.4   | 8.3   | 4.7   | 0.6   | 0.3   | 0.3   | 0.0   | 0.0   | 0.3   | 0.3   | 0.3   |
| Self-employed                             | 28.0  | 29.2  | 34.7  | 38.6  | 41.0  | 41.6  | 43.5  | 47.4  | 47.4  | 48.5  | 52.1  | 52.6  | 51.5  | 51.0  | 50.7  |
| Unpaid family<br>worker                   | 5.2   | 5.5   | 6.3   | 6.9   | 6.3   | 6.6   | 6.9   | 6.9   | 6.9   | 6.3   | 4.4   | 4.4   | 3.9   | 3.6   | 4.2   |
| Unemployed                                | 9.7   | 9.4   | 9.4   | 9.6   | 9.1   | 8.5   | 8.3   | 8.0   | 7.7   | 7.2   | 7.7   | 7.7   | 7.7   | 6.7   | 5.9   |
| Study                                     | 6.0   | 6.9   | 6.6   | 6.1   | 5.5   | 5.5   | 6.1   | 6.1   | 6.1   | 6.3   | 6.9   | 7.2   | 6.9   | 6.1   | 6.6   |
| Home care                                 | 26.1  | 25.9  | 26.2  | 26.7  | 26.2  | 26.7  | 27.1  | 27.0  | 26.7  | 26.2  | 24.5  | 24.8  | 24.8  | 24.8  | 23.1  |
| Retirement                                | 0.7   | 0.6   | 0.6   | 0.6   | 0.6   | 0.6   | 0.6   | 0.8   | 0.8   | 0.8   | 1.1   | 1.1   | 1.1   | 1.1   | 0.7   |
| Rest, travel,<br>and other                | 18.7  | 15.2  | 10.5  | 8.5   | 7.7   | 5.8   | 6.4   | 6.6   | 5.5   | 6.3   | 4.7   | 3.3   | 2.5   | 2.2   | 1.7   |
| Total                                     | 116.8 | 117.4 | 118.7 | 120.7 | 120.9 | 120.1 | 121.1 | 123.4 | 122.9 | 123.1 | 125.6 | 125.9 | 125.6 | 123.7 | 122.7 |
| Sample size<br>(number of<br>individuals) | 268   | 363   | 363   | 363   | 363   | 363   | 361   | 363   | 363   | 363   | 363   | 363   | 363   | 359   | 286   |

*Note:* The total exceeds 100 percent due to multiple answers by some of the interviewees. The sample size is smaller at the beginning of the period because several interviewees saw month 1 as a transition point and did not answer questions about it. The sample declines at the end of the period because the first interviews were carried out during month 15.

*Source:* Authors' calculations.

were asked to rank their monthly household earnings from 1 (much lower than when in BCE) to 5 (much higher), with 3 corresponding to the status quo. For those households with no earnings at all in a particular month, a 0 was reported. The answers to this question thus provide an indication of the overall earnings distribution over the 15 months following the downsizing. Table 3 summarizes them.

Few interviewees had no household earnings at all in any particular month after separation. There were, however, some changes in the level of those earnings over time. The proportion with much higher household earnings than before declined very quickly in the months following separation. This trend could reflect a selective memory, whereby past times look better as they become more distant, but it is more likely to result from the gradual completion of public sector jobs reported in table 2. Indeed, the proportion of those who declared much higher household earnings than when they worked for BCE dropped by half in the first eight months after separation, which is roughly the time period over which pending assignments with BCE were finalized. The proportion with household earnings similar to those they had before increased steadily over time. By the end of the period considered, the weighted average of the answers was 2.7, which is not too far from the status quo. The perceived earnings loss thus appears to be smaller than the actual earnings loss.

The question remains whether earnings 15 months after separation, either actual or perceived, provide an adequate measure of future earnings. For instance, studies suggest that displaced U.S. workers experience a drop in earnings at first, but a gradual recovery over time (see Hamermesh 1989; Topel 1990; Jacobson, LaLonde, and Sullivan 1993). In the case of BCE employees, the analysis in section VI indicates a similar trend in earnings, at least for those who had no choice, but this recovery takes place at declining rates and is negligible by the time of the survey. More important, the recovery can be expected to be partial anyway because pay at BCE was probably out of line with private sector pay to begin with. An important rent component in BCE salaries would make it difficult for displaced employees to find similar deals subsequently. Therefore we assume that the losses from displacement had materialized fully by the time of the survey.

## V. THE ACTUAL EARNINGS LOSS

The most straightforward indicator of the loss experienced by displaced employees is the change in their annual earnings, excluding returns from invested compensation. This indicator could be criticized on the grounds that earnings before separation do not provide an appropriate counterfactual. A case could be made that the appropriate comparison is with the earnings these employees would have received had there been no downsizing. If the situation prior to downsizing was unsustainable, it could be argued, earnings would have declined in any event. Alternatively, if the situation was sustainable, some of these employees would

**Table 3. Earnings Following Separation Compared with Previous Earnings from the Central Bank of Ecuador, by Month after Separation, 1994-95**  
(percentage of former employees)

| <i>Relative earnings<sup>a</sup></i>      | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Much higher (5)                           | 19.5  | 16.3  | 13.5  | 12.2  | 10.8  | 10.8  | 11.3  | 10.7  | 10.5  | 9.9   | 8.3   | 8.0   | 8.9   | 8.1   | 7.4   |
| Higher (4)                                | 21.0  | 22.9  | 23.4  | 23.8  | 23.3  | 23.2  | 23.4  | 22.9  | 22.4  | 22.1  | 21.9  | 22.2  | 21.2  | 21.1  | 22.0  |
| Similar (3)                               | 18.4  | 18.2  | 20.1  | 21.3  | 21.6  | 21.8  | 22.0  | 24.2  | 24.4  | 25.4  | 26.9  | 27.1  | 26.7  | 26.4  | 24.5  |
| Lower (2)                                 | 26.2  | 27.5  | 27.5  | 27.6  | 28.5  | 27.3  | 27.8  | 27.3  | 27.7  | 27.6  | 26.3  | 26.0  | 25.6  | 26.7  | 28.7  |
| Much lower (1)                            | 11.2  | 12.1  | 12.4  | 12.2  | 12.5  | 13.0  | 11.3  | 10.5  | 10.5  | 11.0  | 12.7  | 12.7  | 13.1  | 13.2  | 12.1  |
| No earnings (0)                           | 3.7   | 3.0   | 3.0   | 3.0   | 3.3   | 3.9   | 4.1   | 4.4   | 4.4   | 3.9   | 3.9   | 3.9   | 4.5   | 4.5   | 5.3   |
| Total                                     | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Sample size<br>(number of<br>individuals) | 267   | 363   | 363   | 362   | 361   | 362   | 363   | 363   | 361   | 362   | 361   | 361   | 359   | 356   | 282   |

*Note:* The sample size is smaller at the beginning of the period because several interviewees saw month 1 as a transition point and did not answer questions about it. The sample declines at the end of the period because the first interviews were carried out during month 15.

a. The value in parentheses is the rank given to the category of relative earnings.

*Source:* Authors' calculations.

have gotten pay raises and promotions in the 15 months elapsed since separation. More generally, the appropriate comparison would be between the lifetime earnings profile after separation from BCE and the corresponding earnings profile in the case of no separation. But this comparison would require heroic assumptions, so that it is safer to stick to observed earnings before and after separation.

We define the actual earnings loss of individual  $i$  ( $AEL_i$ ) as:

$$(1) \quad AEL_i = \log E_i^G - \log E_i^P$$

where  $E_i^G$  is the average annual salary at BCE in the two years preceding separation and  $E_i^P$  represents annual labor earnings 15 to 18 months after separation. This indicator overestimates the loss in earnings when public sector employees hold multiple jobs, including moonlighting and daylighting activities. But multiple job holding was not all that common among the relatively well-paid BCE employees. Note that when  $E_i^G$  and  $E_i^P$  are not too far apart,  $AEL_i$  can be interpreted as a percentage change in earnings. Both  $E_i^G$  and  $E_i^P$  are likely to depend on individual characteristics such as gender, education, and experience. Denoting the observable characteristic  $h$  of individual  $i$  as  $X_{hi}$ , we assume the following Mincerian specifications:

$$(2) \quad \log E_i^G = \alpha_0^G + \alpha_1^G X_{1i} + \dots + \alpha_k^G X_{ki} + u_i^G$$

$$(3) \quad \log E_i^P = \alpha_0^P + \alpha_1^P X_{1i} + \dots + \alpha_k^P X_{ki} + u_i^P$$

where the  $u$  terms capture the effect of unobservable characteristics on earnings.

Some relevant individual characteristics, such as talent or aversion to effort, are unfortunately unobservable. We assume that the effects of these characteristics on earnings before and after separation are correlated and write this hypothesis as:

$$(4) \quad u_i^P = \rho u_i^G + \varepsilon_i$$

where  $\varepsilon_i$  is a stochastic disturbance. Replacing above yields:

$$(5) \quad AEL_i = \beta_0 + \beta_G \log E_i^G + \beta_1 X_{1i} + \dots + \beta_k X_{ki} - \varepsilon_i$$

$$\text{with } \beta_j = \rho \alpha_j^G - \alpha_j^P \text{ if } j \neq G \text{ and } \beta_G = 1 - \rho.$$

The actual earnings loss is therefore a function of the set of individual characteristics usually included in Mincerian equations, augmented to include annual earnings before separation.

Estimating equation 5 for displaced BCE employees would provide valuable information on the individual characteristics most likely to be associated with a significant earnings loss. However, this estimation raises an econometric problem: almost half of the displaced employees had no labor earnings at the time of the survey. From a mathematical point of view, the earnings loss  $AEL_i$  is not defined in their case because it would involve the log of zero. We address this

difficulty by using the percentage change in earnings  $(E_i^G - E_i^P) / E_i^G$  as a proxy for  $AEL_i$ . A more fundamental concern is that the lack of earnings does not just represent another level of  $E_i^P$  but rather reflects either unemployment or withdrawal from the labor force. It can therefore be argued that the change in earnings experienced by those who are out of a job does not belong to the linear equation above. To address this concern, we correct for self-selection by estimating the earnings loss conditional on having a job.

Table 4 reports the results obtained when estimating equation 5 with and without a correction for self-selection.<sup>2</sup> The correction is based on the Heckman selection model. Due to the limited number of observations available, we apply this correction to the full sample only. The coefficients of the underlying selection model (not reported in the table) indicate that women, married employees, and those with more seniority in BCE are less likely to hold a job after separation than their otherwise identical fellows. However, the data reject the existence of a self-selection bias, as shown by the similarity of the coefficients in the first two columns in table 4 and by the lack of significance of the  $\lambda$  value in the second column. This outcome is not surprising in a small sample like ours, but it leads us to focus on the results obtained without a correction for self-selection.<sup>3</sup>

Education is an individual characteristic that reduces the earnings loss significantly, according to table 4. Everything else being equal, the loss falls by roughly 3 percent for each additional year of schooling. But after controlling for education, the loss is not significantly affected by the level of salaries at BCE. The implicit value of parameter  $\rho$  is thus close to 1. By contrast, the earnings loss increases with work experience at BCE. In the Mincerian framework, work experience could of course be seen as an indicator of age. However, experience out of BCE does not increase the earnings loss, which suggests that more than a mere age effect is involved. One possible interpretation of the gap between the two experience coefficients is that longer careers at BCE are associated with heavier investments in specific skills that have low returns in the private sector. Another possibility is that working for an overstuffed public sector agency entails a depreciation of human capital. Finally, the earnings loss is larger for female and married employees, and it could be larger for those with more dependents as well.

The effects of individual characteristics on the actual earnings loss have roughly the same signs for all displaced employees regardless of whether they had the

2. The statistical significance of the coefficients in table 4 is probably underestimated. This is because  $\log E_i^G$  is by assumption correlated with the other explanatory variables. In practice, the adjusted  $R^2$  coefficient of a regression of  $\log E_i^G$  on all the  $X_{bi}$  variables is 0.69. However, the discussion in the text implies that omitting  $\log E_i^G$  from the regression would yield biased coefficients on the  $X_{bi}$  variables.

3. The lack of adequate identifying variables further diminishes the relevance of the results obtained with a correction for self-selection. It is indeed difficult to claim that any of the variables in our survey are highly correlated with participation in the labor force but not with the extent of the earnings loss of those who do participate. For instance, the number of dependents is typically assumed to be an identifying variable in other studies dealing with labor force participation and earnings. But the results in tables 4 and 5 suggest that the number of dependents has a direct effect on earnings.

Table 4. *Determinants of the Actual Earnings Loss of Former Employees of the Central Bank of Ecuador*

| Variable                      | Full sample            |                         |                            |                           |
|-------------------------------|------------------------|-------------------------|----------------------------|---------------------------|
|                               | Ordinary least squares | Heckman selection model | Had no choice <sup>a</sup> | Had a choice <sup>a</sup> |
| Independent term              | 1.3496<br>(0.359)      | -1.3883<br>(-0.261)     | 2.5765<br>(0.709)          | -0.2610<br>(-0.037)       |
| Log of wage at BCE            | -0.0664<br>(-0.283)    | 0.0799<br>(0.242)       | -0.1293<br>(-0.570)        | 0.0072<br>(0.016)         |
| Schooling (years)             | -0.0324**<br>(-2.471)  | -0.0414**<br>(-2.106)   | -0.0251*<br>(-1.954)       | -0.0370<br>(-1.503)       |
| Experience at BCE (years)     | 0.0404**<br>(2.550)    | 0.0420*<br>(1.736)      | 0.0298*<br>(1.943)         | 0.0532*<br>(1.784)        |
| Previous experience (years)   | 0.0155<br>(1.420)      | 0.0253<br>(1.506)       | 0.0146<br>(1.393)          | 0.0182<br>(0.882)         |
| Married (yes = 1)             | 0.1760*<br>(1.789)     | 0.1323<br>(0.875)       | 0.0670<br>(0.685)          | 0.2460<br>(1.413)         |
| Female (yes = 1)              | 0.3294**<br>(4.041)    | 0.2469*<br>(1.733)      | 0.2604**<br>(3.115)        | 0.3782**<br>(2.595)       |
| Number of dependents          | 0.0438<br>(1.571)      | 0.0655*<br>(1.664)      | 0.0275<br>(1.025)          | 0.0614<br>(1.151)         |
| Had a choice (yes = 1)        | -0.1815**<br>(-2.303)  | -0.2951**<br>(-2.529)   |                            |                           |
| $\lambda$ value               |                        | 0.0642<br>(0.224)       |                            |                           |
| Adjusted $R^2$                | 0.1147                 |                         | 0.0851                     | 0.1051                    |
| F value                       |                        |                         |                            |                           |
| ( $\chi^2$ value for Heckman) | 6.80                   | 27.21                   | 3.51                       | 3.82                      |
| Sample size                   | 359                    | 359                     | 190                        | 169                       |

\* Significant at 10 percent.

\*\* Significant at 5 percent.

Note: The table compares 1995 with 1992-93 at June 1995 prices. The dependent variable, actual earnings loss, is the wage at the Central Bank of Ecuador (BCE) minus earnings after separation as a proportion of the wage at BCE.  $t$  values are reported in parentheses.

a. Estimated using ordinary least squares.

Source: Authors' calculations.

choice of staying with BCE (table 4). But when we split the sample between voluntary and involuntary separations, the hypothesis that the  $\beta$  coefficients multiplying observable characteristics are the same for the two groups is rejected. Other things being equal, the loss is larger for those who were forced to leave, as shown by the negative and statistically significant coefficient on the dummy variable for choice. Taken at face value, this coefficient implies that the earnings loss of employees who had a choice is roughly 18 percentage points smaller than that of those who had no choice.

## VI. THE PERCEIVED EARNINGS LOSS

We use subjective assessments of household earnings after separation to construct a second indicator of the loss experienced by displaced BCE employees. As

discussed in section IV, these assessments yield a slightly different (more positive) view of earnings after downsizing, compared with the actual figures. This difference could merely reflect measurement error in either or both of the two earnings indicators. In this case, subjective assessments allow us to evaluate the robustness of the results obtained based on actual earnings figures. But subjective assessments may capture more accurately the employees' sentiments following downsizing. Thus this second indicator of the earnings loss may be as relevant as the first one, in spite of being less precise.

We define the perceived earnings loss of household  $i$  in month  $t$  after separation ( $PEL_{it}$ ) based on the employee's assessment of household earnings in that month ( $PHE_{it}$ ), as follows:

$$(6) \quad PEL_{it} = 3 - PHE_{it}.$$

By definition,  $PHE_{it}$  is equal to 0 in the case of no earnings and equal to 5 when current earnings are much higher than the salary at BCE. The case where  $PHE_{it} = 3$  corresponds to the status quo. As a result,  $PEL_{it}$  is an integer varying from 3 for very large losses to  $-2$  for large gains, with 0 reflecting no change. Note that because of the way it is defined,  $PEL_{it}$  measures the loss relative to household earnings while still working for BCE and therefore bears some similarity to  $AEL_i$ .

By analogy with the analysis in section V, we assume the following relationship between  $PEL_{it}$  and the observable characteristics of individual  $i$ :

$$(7) \quad PEL_{it} = \gamma_0 + \gamma_G \log E_i^G + \gamma_1 X_{1i} + \dots + \gamma_k X_{ki} + \gamma_{T1} t + \gamma_{T2} t^2 + v_i.$$

The right-hand-side variables in this relationship are the same ones used to account for the actual earnings loss, plus a time trend and its square ( $t$  and  $t^2$ , respectively). Indeed, many monthly observations are now available per employee, so that it becomes possible to analyze how earnings losses evolve over time. However, the coefficients on the common regressors are not strictly comparable across the two relationships because  $PEL_{it}$  is not defined in the same way as  $AEL_i$ . As a result, there is no direct link between the coefficients in the equation above and the  $\alpha$  coefficients in the Mincerian equations for earnings in and out of the public sector (equations 2 and 3). This means, in particular, that  $\gamma_G$  is not equal to  $1 - \rho$  any more.

Table 5 reports the estimation results for the determinants of the perceived earnings loss. Given the rejection of the self-selection model in the previous section, and given also the fact that only 5 percent or less of the employees report no household earnings in any particular month, the estimation was carried out by ordinary least squares. The coefficients in table 5 have a higher significance than those in table 4 due to the panel data aspect of the analysis. Not surprisingly, the signs of most of the coefficients are the same in the two tables. As before, the earnings loss is smaller for employees with more education. It is larger for those with longer careers at BCE, for female and married employees, and for those with more dependents, as well. The loss also appears to be larger for those who had no choice. There is, however, an important difference be-

tween the two tables. In table 5 there is a significantly negative association between the perceived earnings loss and the salary while at BCE. This means that, everything else being equal, employees at the top of the BCE hierarchy lost less, in relative terms, than those at the bottom.

For the sample as a whole, table 5 displays a gradual recovery in household earnings over time. However, trends are different depending on whether the employees had a choice. For those who had a choice, the coefficients on the time trend and its square are statistically insignificant. Their household earnings were thus fairly stable after separation. For those who had no choice, household earnings were lowest at separation and then increased gradually. If the obtained coefficients are taken literally, household earnings stabilized roughly one year

Table 5. *Determinants of the Perceived Earnings Loss of Former Employees of the Central Bank of Ecuador*

| Variable                    | Full sample                 |                          |                       |                        |
|-----------------------------|-----------------------------|--------------------------|-----------------------|------------------------|
|                             | Without dummy<br>for choice | With dummy<br>for choice | Had<br>no choice      | Had a<br>choice        |
| Independent term            | 20.7893**<br>(13.401)       | 20.7380**<br>(13.368)    | 19.0599**<br>(9.016)  | 24.5693**<br>(10.711)  |
| Log of wage at BCE          | -1.1671**<br>(-12.062)      | -1.1625**<br>(-12.012)   | -1.0586**<br>(-8.028) | -1.4025**<br>(-9.812)  |
| Schooling (years)           | -0.0850**<br>(-15.649)      | -0.0848**<br>(-15.605)   | -0.0745**<br>(-9.912) | -0.0920**<br>(-11.486) |
| Experience at BCE (years)   | 0.0391**<br>(5.958)         | 0.0390**<br>(5.940)      | 0.0249**<br>(2.789)   | 0.0629**<br>(6.456)    |
| Previous experience (years) | 0.0071<br>(1.581)           | 0.0073<br>(1.618)        | 0.0068<br>(1.105)     | 0.0114*<br>(1.701)     |
| Married (yes = 1)           | 0.1629**<br>(4.010)         | 0.1562**<br>(3.830)      | -0.0194<br>(-0.326)   | 0.3462**<br>(6.091)    |
| Female (yes = 1)            | 0.5859**<br>(17.379)        | 0.5895**<br>(17.456)     | 0.5259**<br>(10.757)  | 0.6854**<br>(14.451)   |
| Number of dependents        | 0.1106**<br>(9.588)         | 0.1105**<br>(9.577)      | 0.1416**<br>(9.004)   | 0.0564**<br>(3.245)    |
| Time (in months)            | -0.0378**<br>(-2.498)       | -0.0370**<br>(-2.446)    | -0.0469**<br>(-2.282) | -0.0249<br>(-1.114)    |
| Time squared                | 0.0014<br>(1.619)           | 0.0013<br>(1.555)        | 0.0020*<br>(1.693)    | 0.0006<br>(0.434)      |
| Had a choice (yes = 1)      |                             | -0.0570*<br>(-1.741)     |                       |                        |
| Adjusted R <sup>2</sup>     | 0.1675                      | 0.1678                   | 0.1590                | 0.1892                 |
| F value                     | 123.01                      | 111.05                   | 62.59                 | 66.41                  |
| Sample size                 | 5,458                       | 5,458                    | 2,934                 | 2,524                  |

\* Significant at 10 percent.

\*\* Significant at 5 percent.

Note: The table compares 1995 with 1992-93 at June 1995 prices. The dependent variable is the perceived monthly loss in household earnings; it is an integer that can take a value between 3 (very large losses) and -2 (large gains). The estimates were obtained by ordinary least squares. *t* values are reported in parentheses.

Source: Authors' calculations.

after separation. These different trends suggest that those who left voluntarily already had an alternative out of the public sector at the time of separation, whereas the rest of the employees were relatively unprepared to cope with their new situation.

The time trends remain roughly unchanged if fixed-effect estimates are used (results are not reported here). However, most of the coefficients on the  $X_t$  variables become statistically insignificant. Fixed-effects estimates are obtained by replacing the perceived earnings loss variable  $PEL_{it}$  with its deviation with respect to the individual mean ( $PEL_{it} - PEL_i$ ). It follows that individual characteristics have an impact on the magnitude of the perceived earnings loss but not on its variation over time.

## VII. THE IMPLICIT WELFARE LOSS

The change in well-being experienced by displaced employees has dimensions that are not necessarily captured by changes in earnings, either actual or perceived. The total loss can be higher than suggested by the corresponding earnings loss, if more effort is needed to achieve the same living standard as before. It can also be higher if the variability of earnings increases as a result of displacement, or if the prospects for earnings growth over time are worse out of BCE than in it. The total loss can be lower, however, if the observed earnings loss reflects a deliberate withdrawal from the labor force. Last but not least, the impact of the earnings loss on well-being is mitigated by the compensation received. For all of these reasons, an evaluation of the consequences of displacement would be partial if it focused on earnings only.

Rather than try to correct the earnings losses for these other dimensions of the change in well-being, in this article we generate a direct measure of the welfare loss ensuing from displacement. This measure is constructed from a subjective assessment of well-being after separation. Of course, subjective assessments of this kind raise perennially thorny questions about the comparability of utility levels across individuals. But in spite of their limitations, they have been used fruitfully before. For instance, there is a growing literature on the links between happiness and employment status relying on indicators of psychological distress as a measure of disutility (see, for instance, Clark and Oswald 1994; Korpi 1997). In the present context, subjective evaluations of well-being can be used to identify the individual characteristics that are more strongly associated with distress after job separation.

Specifically, the surveyed employees were requested to evaluate their well-being relative to the time when they worked for BCE. The questionnaire explicitly listed a series of elements that needed to be taken into account when answering this question. The list included labor earnings and satisfaction at work if applicable, leisure time available, the possible implications of displacement for labor force participation and migration of any members of the household, and the amount of compensation received. The answer, hereafter identified as the

perceived well-being of the household ( $PHW_i$ ), is an integer ranging from 1 (when well-being is much lower than before separation) to 5 (when it is much higher). The case where  $PHW_i = 3$  corresponds to the status quo.

By analogy with the perceived earnings loss, the perceived welfare loss of household  $i$  ( $PWL_i$ ) is defined as:

$$(8) \quad PWL_i = 3 - PHW_i.$$

By construction,  $PWL_i$  is an integer varying from 2 (for a large loss) to  $-2$  (for a large gain), with 0 reflecting no change. This variable can be linked to individual characteristics like those considered in the analysis of the determinants of the actual earnings loss. But the perceived loss of well-being is also affected by the amount of compensation received ( $C_i$ ). The following specification can therefore be used:

$$(9) \quad PWL_i = \delta_0 + \delta_G \log E_i^G + \delta_C \log C_i + \delta_1 X_{1i} + \dots + \delta_k X_{ki} + \eta_i$$

where coefficient  $\delta_C$  is expected to be negative.

Unlike the actual or perceived earnings, which are calculated or reported based on monetary figures, the level of well-being cannot be measured objectively. Consequently, the distance between adjacent values of  $PHW_i$  is not necessarily constant. For instance, the gap in household well-being between 1 and 2 could be much larger, or much smaller, than the gap between 4 and 5. The problem is the same with  $PWL_i$ . An ordered logit regression is therefore warranted to estimate the coefficients in equation 9. In practice, however, this estimate yields almost identical values for all of the distances between adjacent levels of  $PWL_i$ , while reducing the significance of the estimated coefficients compared with an ordinary least squares estimate.

Table 6 reports the results obtained using ordinary least squares. The statistical significance of the coefficients may be more seriously underestimated than in the previous two sections, due to the inclusion of  $\log C_i$  among the regressors. Severance pay was based on salary and seniority in BCE, so that the correlation among right-hand-side variables is potentially very high. Fortunately, there were upper and lower bounds on the amount of severance, and the latter was only one of the components of the compensation package. Still, the adjusted  $R^2$  of a regression between  $\log C_i$  and the other regressors is 0.82.

The main difficulty in interpreting the coefficients in table 6 stems from the link between perceived well-being and the amount of compensation received. Because separated employees were compensated, their net welfare loss underestimates the impact that displacement, on its own, had on their well-being. This impact is called the implicit welfare loss in what follows. Note that from a policy perspective, it is relevant to know how the implicit welfare loss varies with the individual characteristics of the employees. This information could help in the design of assistance strategies for displaced employees elsewhere. Knowing how the net welfare loss varies with individual characteristics is less relevant because their observed effects depend on the rules used to set up the compensation pack-

Table 6. *Determinants of the Perceived Loss of Well-Being of Former Employees of the Central Bank of Ecuador*

| Variable                     | Full sample                 |                          |                       |                       |
|------------------------------|-----------------------------|--------------------------|-----------------------|-----------------------|
|                              | Without dummy<br>for choice | With dummy<br>for choice | Had<br>no choice      | Had a<br>choice       |
| Independent term             | 18.5153**<br>(3.642)        | 18.1507**<br>(3.593)     | 14.8293**<br>(2.180)  | 20.7632**<br>(2.665)  |
| Log of wage at BCE           | -0.4945<br>(-1.415)         | -0.4910<br>(-1.414)      | -0.2872<br>(-0.646)   | -0.7764<br>(-1.384)   |
| Schooling (years)            | -0.0841**<br>(-5.139)       | -0.0833**<br>(-5.126)    | -0.0824**<br>(-3.784) | -0.0798**<br>(-3.156) |
| Experience at BCE (years)    | 0.0711**<br>(2.895)         | 0.0694**<br>(2.841)      | 0.0621**<br>(1.927)   | 0.0726*<br>(1.863)    |
| Previous experience (years)  | 0.0249*<br>(1.689)          | 0.0251*<br>(1.716)       | 0.0128<br>(0.665)     | 0.0377<br>(1.635)     |
| Married (yes = 1)            | 0.0100<br>(0.082)           | -0.0178<br>(-0.146)      | -0.1786<br>(-1.031)   | 0.1141<br>(0.638)     |
| Female (yes = 1)             | -0.0757<br>(-0.746)         | -0.0613<br>(-0.607)      | -0.0140<br>(-0.099)   | -0.1370<br>(-0.898)   |
| Number of dependents         | 0.0800**<br>(2.301)         | 0.0794**<br>(2.299)      | 0.0641<br>(1.405)     | 0.1022*<br>(1.851)    |
| Log of compensation received | -0.5723*<br>(-1.896)        | -0.5477*<br>(-1.825)     | -0.5411<br>(-1.401)   | -0.4492<br>(-0.912)   |
| Had a choice (yes = 1)       |                             | -0.2328**<br>(-2.385)    |                       |                       |
| Adjusted R <sup>2</sup>      | 0.1521                      | 0.1633                   | 0.1225                | 0.1524                |
| F value                      | 9.029                       | 8.765                    | 4.298                 | 4.777                 |
| Sample size                  | 359                         | 359                      | 190                   | 169                   |

\* Significant at 10 percent.

\*\* Significant at 5 percent.

Note: The table compares 1995 with 1992-93 at June 1995 prices. The dependent variable is perceived loss of well-being; it is an integer that can take a value between 2 (large losses) and -2 (large gains). The estimates were obtained by ordinary least squares. *t* values are reported in parentheses.

Source: Authors' calculations.

ages, and the specifics of those rules are likely to vary from one downsizing operation to another.

Fortunately, the implicit welfare loss of separated employees can be inferred from their perceived welfare loss. A conceptual experiment may be useful here. Imagine that there is an individual whose compensation package  $C_i$  exactly offsets the impact of displacement on well-being, so that there is no perceived welfare loss (that is,  $PWL_i = 0$ ). For this particular individual, the amount of compensation received provides a monetary measure of the implicit welfare loss. Of course, there may not be many individuals in the sample for whom  $PWL_i = 0$ , so that this measure is generally not available. But the estimated values of the  $\delta$  coefficients allow us to predict the amount of compensation that would have been needed to keep the level of well-being of the separated employees unchanged, given their observable characteristics.

In analytical terms, we define the implicit welfare loss of individual  $i$  ( $IWL_i$ )

as the value of  $\log C_i$  for which the predicted value of the perceived welfare loss  $PWL_i$  is equal to 0, which implies:

$$(10) \quad IWL_i = \theta_0 + \theta_G \log E_i^G + \theta_1 X_{1i} + \dots + \theta_k X_{ki}$$

$$\text{with } \theta_j = -\hat{\delta}_j / \hat{\delta}_c.$$

In this equation  $\hat{\delta}_j$  stands for the estimated value of  $\delta_j$ . Table 7 reports the resulting  $\theta$  coefficients. Note that their interpretation is similar to that of the  $\beta$  and  $\gamma$  coefficients in the expressions of the actual and perceived changes in earnings, respectively. But their absolute values are not strictly comparable because the left-hand-side variables are different.

As before, more-educated employees fare better than their otherwise identical fellows. If interpreted literally, the coefficients in table 7 mean that the implicit welfare loss decreases by roughly 15 percent for each additional year of schooling. The loss is larger for those employees with more experience, particularly at BCE. It is also larger for those with more dependents. And it could be about 40 percentage points larger for those who had no choice. But the implicit welfare loss does not appear to be influenced by the employee's salary or gender. The lack of significance of the gender variable is worth stressing. The analysis of the determinants of earnings losses, in tables 4 and 5, suggests that women were more severely affected by downsizing than men. But the results in table 7 implicitly confirm that the fall in female earnings was due to a deliberate decision to withdraw from the labor force.

Table 7. *Determinants of the Implicit Welfare Loss of Former Employees of the Central Bank of Ecuador*

| Variable                    | Full sample                 |                          |                  |                 |
|-----------------------------|-----------------------------|--------------------------|------------------|-----------------|
|                             | Without dummy<br>for choice | With dummy<br>for choice | Had<br>no choice | Had a<br>choice |
| Independent term            | 32.3498**                   | 33.1403**                | 27.4056**        | 46.2278**       |
| Log of wage at BCE          | -0.8650                     | -0.8965                  | -0.5308          | -1.7287         |
| Schooling (years)           | -0.1469**                   | -0.1521**                | -0.1523**        | -0.1776**       |
| Experience at BCE (years)   | 0.1242**                    | 0.1266**                 | 0.1147**         | 0.1616*         |
| Previous experience (years) | 0.0435*                     | 0.0459*                  | 0.0237           | 0.0840          |
| Married (yes = 1)           | 0.0175                      | -0.0325                  | -0.3301          | 0.2541          |
| Female (yes = 1)            | -0.1326                     | -0.1119                  | -0.0259          | -0.3051         |
| Number of dependents        | 0.1398**                    | 0.1450**                 | 0.1184           | 0.2274*         |
| Had a choice (yes = 1)      |                             | -0.4251**                |                  |                 |

\* Significant at 10 percent.

\*\* Significant at 5 percent.

Note: The table compares 1995 with 1992-93 at June 1995 prices. The explained variable is the log of compensation required for no perceived loss of well-being. The calculations are based on the coefficients in table 6. The implicit welfare loss is defined as the log of compensation for which the predicted value of the perceived loss of well-being is equal to zero. The significance of the corresponding coefficients in table 6 is reproduced here.

Source: Authors' calculations.

Ex post regret at having left BCE provides yet another way of assessing the welfare loss from displacement, at least in principle. All of the surveyed employees were asked whether, in retrospect, they would have preferred to stay with BCE. Their answer to this question can be assumed to be a function of the same observable characteristics considered before. It can also be expected to depend on the amount of compensation received. If such a function could be estimated, it would be possible to predict, for each individual in the sample, the amount of compensation that would have achieved ex post indifference. Such an amount, in turn, would provide another measure of the implicit welfare loss. A binary dependent variable model was thus estimated for the ex post regret variable, with the right-hand-side variables being the same as for the perceived loss of well-being. Unfortunately, the overall fit of the regression is poor, except in the case of the employees who had a choice. The estimated coefficients are therefore not reliable enough to make inferences about the amount of compensation that would have left displaced BCE employees indifferent between staying and leaving.

#### VIII. POLICY IMPLICATIONS

In spite of the small sample size, our analysis of the changes in earnings and welfare experienced by displaced BCE employees has potential implications for downsizing operations elsewhere. These implications refer to the design of cost-effective ways to support displaced workers. To some extent, our analysis could also be interpreted as an ex post evaluation of downsizing at BCE. But such an evaluation would be intrinsically partial, for two reasons. First, when the downsizing operation was decided on, the management of BCE did not have the kind of hindsight that our survey gives us. It would certainly be unfair to judge the decisions it made using information that was not available at that time. And second, our analysis can only tell us how the displaced employees fared after separation. It cannot tell us which among all BCE employees should have been separated in the first place.

A warning from our analysis concerns the potential of training programs to facilitate the redeployment process. In the case of BCE, only 12 percent of the displaced employees took any of the courses offered, although these were provided free of charge. This finding is similar to those from other studies (see Lindauer and Nunberg 1994) and runs against the belief that training programs must be an important component of downsizing operations. These programs tend to be costly and may become easy prey for ailing training agencies. If separated workers shun them, resources could be better spent on things they value, namely, direct compensation.

Other policy implications from our analysis are related to the appropriate design of compensation packages. Our analysis highlights the links between the observable characteristics of public sector workers and the extent of the losses they experience as a result of displacement. The ability to predict those losses

may be particularly important in cases where involuntary separations are precluded by law. It may also be important when compensation is required due to fairness considerations or as a matter of political feasibility. No valid reasons exist, however, for overcompensating displaced workers. The results in this article could therefore be useful in mitigating some of the overcompensation bias that characterizes downsizing programs based on voluntary job separations.

A result obtained consistently across the study is the negative association between schooling and losses from displacement. Employees with higher levels of education experience smaller earnings and welfare losses than their otherwise identical fellows. Severance pay packages that fail to take schooling into account may therefore lead to a public sector brain drain. This possibility can only be exacerbated when the amount of compensation offered is a multiple of the public sector salary.<sup>4</sup> Our results indicate that after controlling for other individual characteristics, the losses from displacement (in relative terms) are at best independent of the level of salaries in the public sector. If anything, there is a negative association between salaries and relative losses. A compensation package that increases proportionally with the salary is more attractive for employees who are at the top of the public sector ladder than for those at the bottom, whereas redundancies tend to be more prevalent at the bottom. However, the results show that the losses from displacement do increase with seniority in the public sector, as is assumed by the standard rules of thumb for compensation.

Another result that deserves attention concerns gender. At first glance, women lose more than men from displacement. As a percentage of public sector salaries, their earnings losses appear to exceed those of men by about 30 points. But the gap is partly explained by the withdrawal of many female employees from the labor force after separation. Employees who withdraw from the labor force experience a drop in earnings, but not necessarily a large reduction in welfare. Table 8 reports a low correlation between actual earnings loss and implicit welfare loss, particularly for employees who had a choice. The implicit welfare loss, in fact, does not vary significantly with gender. Because compensation packages aim at offsetting welfare losses rather than earnings losses, our results suggest that the packages should be similar for men and women.

A final policy implication of our analysis is that a poor tailoring of compensation to individual characteristics can be both unfair and expensive. As shown in table 8, the correlation coefficient between the compensation received and the actual earnings loss is low, particularly in the case of displaced employees who had a choice. The correlation coefficient between the compensation received and the implicit welfare loss is even lower. In the context of involuntary separations, these low correlation coefficients imply that some employees are penalized (or rewarded) much more than others by the downsizing process. The perceived unfairness of this process can, in turn, create resistance to further public sector restructuring. In a context of voluntary separations, moreover, the low

4. Whether education and other individual characteristics can actually be used to tailor compensation packages depends, of course, on legal, political, and social considerations specific to each country.

Table 8. *Correlation between Loss Indicators for Former Employees of the Central Bank of Ecuador*

| <i>Indicator</i>             | <i>Actual earnings loss</i> | <i>Perceived earnings loss</i> | <i>Implicit welfare loss</i> |
|------------------------------|-----------------------------|--------------------------------|------------------------------|
| <i>Had no choice</i>         |                             |                                |                              |
| Actual compensation received | 0.4448                      | -0.0161                        | 0.3134                       |
| Actual earnings loss         | 1.0000                      | 0.3822                         | 0.2540                       |
| Perceived earnings loss      | 0.3822                      | 1.0000                         | 0.1937                       |
| <i>Had a choice</i>          |                             |                                |                              |
| Actual compensation received | 0.3627                      | 0.0005                         | 0.2229                       |
| Actual earnings loss         | 1.0000                      | 0.3186                         | 0.1506                       |
| Perceived welfare loss       | 0.3186                      | 1.0000                         | 0.1697                       |

*Note:* The table compares 1995 with 1992-93 at June 1995 prices. Actual compensation received includes returned contributions to old-age pensions and to unemployment insurance, in addition to severance pay. The perceived earnings loss is the individual average over the months following separation. The implicit welfare loss is calculated based on the coefficients in table 7.

*Source:* Authors' calculations.

correlation between compensation and losses may substantially increase the cost of downsizing operations. Assume for a moment that employees have accurate expectations about their prospects out of the public sector. If this is so, those for whom compensation exceeds the expected welfare loss will leave the public sector, while the others will stay. The former mistake will thus lead to overspending, while the latter will not achieve any savings because the separation offer will be rejected.

Table 9 compares the actual cost of BCE downsizing with the cost of paying each displaced employee the equivalent of his or her implicit welfare loss. The two costs turn out to be similar for the employees who had no choice. But the cost of downsizing could have been smaller in the case of those who had a choice, had the compensation packages been better tailored. On average, the actual compensation received by these employees, including refunds of past contributions to social se-

Table 9. *The Cost of Alternative Compensation Rules*  
(average per employee)

| <i>Indicator</i>             | <i>In millions of sucres at June 1995 prices</i> | <i>As a multiple of the wage at the BCE</i> | <i>As a percentage of actual compensation paid</i> |
|------------------------------|--|---|--|
| <i>Had no choice</i>         |  |   |  |
| Actual compensation received | 50.89  | 2.26  | 100.0  |
| Implicit welfare loss        | 55.63  | 2.47  | 109.3  |
| <i>Had a choice</i>          |  |   |  |
| Actual compensation received | 51.58  | 2.29  | 100.0  |
| Implicit welfare loss        | 41.78  | 1.86  | 81.0   |

*Note:* The implicit welfare loss was calculated based on the coefficients in table 7. Actual compensation received includes returned contributions to old-age pensions and to unemployment insurance, in addition to severance pay.

*Source:* Authors' calculations.

curity, amounted to 2.3 years of salary. Note that 2.3 years is the average payback period of downsizing operations across the episodes surveyed by Haltiwanger and Singh (this issue). Our estimates suggest that an average of 1.9 years would have been enough to compensate appropriately for the ensuing welfare losses. The total cost of the voluntary component of the downsizing operation would then have been about 20 percent lower than it actually was.

## IX. CONCLUSIONS

Public sector downsizing will almost certainly become a major policy endeavor in the coming years. In the case of developing countries, efforts at trimming the payroll will affect highly organized and vocal groups of public sector workers, thus giving a prominent role to compensation issues. Yet, relatively little is known about the nature and extent of the losses these workers may experience. Given the paucity of information, and given also the need to defuse the potential resistance to restructuring, governments around the world may be tempted by the "golden handshake" approach. A problem with this approach is that it may exacerbate the adverse selection problem that plagues most downsizing programs, whereby competent and hard-working employees leave the public sector, while those who are a real drag on efficiency stay. But even if the only separated workers are those who are genuinely redundant, golden handshakes could still significantly increase the cost of public sector restructuring. Typically, a major downsizing program has a price tag in the hundreds of millions of dollars. If ignorance about the losses that displaced workers may experience leads to a "mere" 10 percent premium on the compensation offered, the total cost may increase by several tens of millions of dollars. All of this suggests that a careful assessment of the losses that displaced workers may experience is warranted.

In this article we analyzed one particular episode of downsizing, but the findings may have implications for other cases as well. First, we showed that in spite of their popularity, training programs may be ineffective in assisting displaced employees. Second, we showed that both earnings and welfare losses are correlated with a variety of observable individual characteristics, such as education or the number of dependents, and not just with salary and seniority in the public sector, which are the two variables considered by the standard rules of thumb used for compensation. These rules implicitly assume that the loss from displacement increases with seniority, which is supported by our analysis. But they also assume that the loss decreases with salary, which is rejected. Finally, we showed that the savings from better-tailored compensation can be substantial, particularly in the case of public sector workers who are offered the option of staying in the public sector.

The particular episode we analyzed was quite remarkable, in the sense that overspending was moderate in the case of the employees who had a choice and slightly negative in the case of those who had no choice. It is probable that the management of BCE, rather than luck, deserves the credit for this relatively good

performance. Unlike the first phase of the downsizing process, the second phase was indeed characterized by attention to details. And it would appear that the selection process to distinguish the employees who were dispensable from those who were essential might have been successful as well. But it would be a mistake to assume that the second phase of BCE downsizing can be easily replicated elsewhere. In the absence of careful preparation, the standard downsizing operation is more likely to resemble the first phase.

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