Do Separation Packages Need to Be That Generous?

Simulations for Government Employees in Guinea-Bissau (*)

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Abstract

Separation packages may be needed to overcome resistance to public sector downsizing, and can be justified on fairness grounds. But what is the "right" amount of compensation? This paper offers a practical answer to this question, using the case of Guinea-Bissau as an illustration. Building on previous work by Ariel Fiszbein and Ragui Assaad, the paper assumes that a "just right" package has to offset the loss in earnings and benefits from job separation. Two approaches are used to quantify the loss in benefits. The direct approach explicitly measures the present value of old-age pension, for those workers who end up in the informal sector of the economy. The indirect approach infers the value of benefits from the situation of public sector workers who could apparently earn more out of the public sector than in it, but do not voluntarily leave. The two approaches yield remarkably similar distributions of predicted losses. These distributions are used to compare the performance of four separation packages: three based on usual rules-of-thumb and one "tailored" to individual characteristics such as gender, education and region of residence. If the goal is to satisfy a majority of the workers, the tailored package outperforms all others.

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1. Introduction

Public sector downsizing should not be a final objective of economic policy. Downsizing may however be needed to make the public sector more efficient and to facilitate the development of a more vibrant private sector. It is increasingly accepted that governments should focus their efforts on the core public activities that are crucial to development, such as delivering sound economic policies and providing basic health and education. Conversely, they should not waste scarce resources in activities the private sector can do better, such as producing goods and services, including among the latter the cleaning, maintenance and surveillance of its own facilities. Restructuring the public sector may therefore require expanding some activities, but also shrinking or privatizing others.

Separation packages are a way to overcome labor resistance to downsizing, restructuring, or privatization. If no compensation were provided, many public sector workers would suffer as a result of job separation. They would experience a decline in earnings and benefits, possibly including some or all of their old-age pension. They could also have to work harder, or be exposed to sharper fluctuations in their income. On the other hand, if very generous separation packages were offered, and workers had a choice, they could all feel compelled to leave by their own will. In between these two extremes, the compensation package would be "just right" if the amount of money offered made each public sector worker roughly indifferent between staying in his or her current job and leaving.

Compensation packages for separated public sector workers are not new. They have been used by governments all around the world, often with support from donor countries and multilateral organizations (Kikeri, 1997). However, workers have some times been

compensated better than "just right"; actually, far better than "just right". In a survey of the cross-country experience with public sector retrenchment in developing countries and transition economies, Haltiwanger and Singh (1999) estimated the average spending per job separation at $2,400. But the figure was as high as $13,000 in the civil service of Senegal, $16,000 in the mining sector of Bolivia, and $17,000 in the public enterprises of India, despite the fact that all three countries had a per capita income of less than $1,000 per year. Lacking practical tools to design compensation packages, past mistakes translate into present over-spending, as the excessive figures or formulas of previous downsizing episodes become a reference for new public sector restructuring endeavors.

The reasons for over-spending on separation packages are somewhat understandable. One of them is policy credibility. If the compensation offered was too low, workers would not be compelled to leave, and the political costs of such a failure could be high. Given the fact that the package that elicits indifference on the worker (i.e., the "just right" amount) is not directly observable, policy makers may prefer to err in the direction of over-compensation. Another reason why governments may pay more than the "just right" amount is that they usually face tight constraints regarding their current expenditures, but may all of a sudden have access to abundant resources for public sector restructuring from donor countries and multilateral organizations. This combination of a hard-budget constraint for salaries and a soft-budget constraint for separation packages creates an incentive to compensate better than "just right".[1]

Over-spending in compensation packages is questionable, both on economic and on fairness grounds. From an economic point of view, every transfer entails a cost. Sooner or

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[1] Cases were workers are under-compensated abound as well. Even when the average compensation package is overly generous, some workers may get much less than needed

later, taxes will have to be raised, or other government expenditures will have to be cut, to make up for the compensation of separated public sector workers. The larger this compensation, the heavier the burden on the rest of society. In regard to fairness, it is important to keep in mind that public sector workers are usually not poor, at least compared to their fellow citizens working in the informal sector or living in rural areas. A government committed to poverty alleviation could therefore find better uses for its resources than offering far better than "just right" compensation to public sector workers.

The aim of this paper is to discuss the design of a "just right" compensation package from a practical perspective, using the case of Guinea-Bissau as an illustration. In the preparation for its third structural adjustment program, the government of Guinea-Bissau had considered suppressing all positions in occupational categories "O" to "Z", which correspond to unskilled personnel working on services like cleaning, maintenance and surveillance. The objective was to sub-contract these activities to private firms, to be selected through competitive bidding. The bidding mechanism was to be designed so as to favor those firms that would hire the largest number of separated government employees. It was estimated that roughly one fifth of the separated employees could be hired by the new private contractors. The implementation of this program had to be postponed due to the rebellion of part of the military against the government, in 1998. This rebellion was not prompted by, or related to, the structural adjustment program in preparation. Therefore, as the political situation stabilizes, the retrenchment of government employees in categories "O" to "Z" will probably regain prominence in the economic policy agenda. The paper thus focuses on the appropriate level of compensation for those employees.

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to offset the impact of job separation. Bankrupt state-owned enterprises in Tanzania provide a clear example of under-compensation (Chong and Radwan, 1999).

The choice of Guinea-Bissau as an illustration is deliberate, as this is one of the poorest countries on earth. A credible assessment of the losses in earnings and benefits that government employees can expect as a result of separation has to be based on careful data analysis. Simplifying a bit, it is necessary to evaluate the loss in earnings and benefits of a representative sample of government employees in the event of job separation. For this evaluation to be feasible, detailed databases of government employees and labor force participants at large are needed. If these data requirements can be satisfied in Guinea-Bissau, they can probably bet met in most other developing countries.

2. Methodology

The methodology used in this paper is not entirely novel, although if differs from previous applications in several, important respects. The basic approach was proposed by Fiszbein (1994). It was subsequently refined by Assaad (1999) in the context of a broader research project on public sector downsizing.[2] Fiszbein's contribution was to use a forward-looking formula to assess the "just right" package for each worker. If public sector jobs are seen as an entitlement for life, this package has to compensate for the resulting decline in earnings during all the years of denied service. In an application for Sri Lanka, Fiszbein took into account not only the average earnings separated workers could expect in their new jobs, but also the probability that they would not find any job. The present value of the resulting loss served to estimate the "just right" package for workers of different ages.

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[2] For an overview of the findings of this project, see Rama (1999).

Fiszbein did not take into account the potential loss in benefits, both tangible and intangible, from separation. This omission is problematic in countries where the earnings alternatives of separated public sector workers are mainly in the informal sector of the economy. In Ghana, for instance, a large number of separated public sector workers went back to their villages, to work in agriculture (Alderman *et al*., 1996). Even in a richer country, like Ecuador, half of the separated government employees ended up in the informal sector of the economy (Rama and MacIsaac, 1999). Public sector jobs are characterized by better working conditions, lower effort levels, and better old-age benefits than informal sector jobs. If these tangible and intangible benefits are not taken into account, the loss resulting from job separation may be seriously under-estimated.

Assaad refined the forward-looking approach by combining it with detailed labor market data analysis, using Egypt as an example. Individual records from household surveys can indeed be used to predict the alternative earnings of public sector employees. When this is done, it appears that many among them could earn more if they left the public sector. The fact that they do not do it suggests that they value the other benefits associated with their jobs at least as much as the earnings they forego. Assaad's main contribution was to use this information to infer the loss in benefits that public sector workers would experience in the event of separation. In Egypt, the group whose earnings would increase by more in the event of separation is made of female employees of state-owned enterprises who have university education. Over their working life, the members of this group could earn more than double out of the public sector. Based on this result, Assaad concluded that the value of total compensation in the Egyptian public sector, including tangible and intangible benefits, was

twice the value of monetary earnings. This kind of upward adjustment to monetary earnings leads to a higher present value of the loss from job separation.

This paper builds upon the work of Fiszbein and Assaad by computing the loss in benefits in two different ways. One of them (called "direct" in what follows) extends the time horizon of the present value calculation proposed by Fiszbein. Now, the loss in earnings is computed not only over the years until retirement, but also over the years from retirement to death. The direct approach thus takes into consideration the possible loss of old-age pension resulting from separation. Old-age security is arguably the most important benefit associated with public sector jobs. In the case of Guinea-Bissau, it had been decided that separated employees would lose their entitlement to old-age pension. But Guinea-Bissau is no exception, as old-age pensions are usually not portable and separated public sector workers can expect at best a lump-sum "refund" for their past contributions. The direct approach calculates the level of the old-age pension for each employee if he or she was to remain in the public sector until reaching retirement age. The present value of this pension (over all the years from retirement to death) is then added to the present value of the loss in earnings (over all the years from present to retirement). The result of this calculation depends of course on the assumed life expectancy of government employees, but the sensitivity to the death age is small for plausible values of the discount rate.

The second approach (called "indirect") uses a variant of the methodology proposed by Assaad to compute the loss in benefits. Instead of focusing on the group of public sector workers whose earnings would increase most in the event of separation, as Assaad did, the indirect approach considers the entire distribution of the predicted change in earnings. For a majority of public sector workers, this predicted change is negative. But the right "tail" of this

distribution is long, as some workers could apparently earn much more out of the public sector than in it. Such a long tail could reflect the fact that some workers attach a remarkably high value to the benefits associated with their jobs. But they could also be due to measurement error. Databases are incomplete and inaccurate. Some figures can be truncated, or mistyped, whereas information on individual characteristics that are key to predict alternative earnings may just be missing. The indirect approach gets rid of the upper tail of the distribution of predicted change in earnings, as it assumes that its highest values simply reflect measurement error. The highest predicted change in earnings, once the tail has been removed, is then used as an indicator of the value of the benefits associated with public sector jobs. The result depends of course on the "size" of the tail that is removed from the distribution. But sensitivity analysis shows that the variation is not substantial for plausible sizes of the tail.

Using both direct and indirect approach to estimate the losses from separation is a simple way to assess the robustness of the results, as the two approaches are based on different assumptions. The estimation is carried out using the Downsizing Options Simulation Exercise (or DOSE), an Excel-based application that incorporates the lessons from the broader research project on public sector downsizing. The DOSE also generates summary statistics on the characteristics of the public sector workers who would be satisfied by the compensation received, and estimates the financial and economic returns to downsizing. The results on summary statistics and returns to downsizing are not reported here, because the focus of this paper is on the design of a "just right" compensation package, not on the merits or demerits of the public sector downsizing operation considered by the government of Guinea-Bissau.

3. Data

Two main data sets are needed to predict the losses from separation. First, a national household survey is required to get information on the earnings and individual characteristics of labor force participants. This information allows to estimate how earnings vary with age, education, gender, region of residence and other observable individual characteristics. The resulting relationship between earnings and individual characteristics is known as an earnings function, or a Mincerian equation. Second, a public sector database is needed to get information on the individual characteristics of the workers who might be separated from their jobs. Combining this information with the earnings function, it is possible to predict the earnings of each worker in the public sector database in the event of separation.

In the case of Guinea-Bissau, information on the earnings and individual characteristics of labor force participants was collected by the 1991 national household survey. This survey is somewhat dated, and there actually is a more recent one that has not been processed yet. But in spite of its age, the 1991 survey serves well the purposes of this paper, to the extent that the structure of earnings did not change much during the 1990s. The list of individual characteristics reported by the survey is quite large. Most of these characteristics have a relatively straightforward interpretation. But some variables need to be constructed out of the responses to the survey. One of them is the dummy variable for the private formal sector. Labor earnings may differ substantially between the formal and the informal sector, so that the loss from separation crucially depends on the nature of the job taken subsequently. In this paper, the formal private sector variable is set equal to one for individuals who are either affiliated with social security or entitled to annual leave. It is set equal to zero otherwise.

Another variable that needs to be constructed out of the responses to the survey is the one measuring individual earnings. For the purpose of this paper, earnings were evaluated taking into account both the primary and the secondary occupations of the workers (when applicable) over a one-year period. The resulting figures were adjusted by the consumer price index to express them in 1997 prices. Focusing on annual earnings rather than, say, daily or weekly earnings, is important in developing countries, as many jobs out of the public sector are casual or seasonal. Annual earnings can be low despite occasionally high daily or weekly earnings. The chosen earnings variable thus captures the fact that workers separated from the public sector may spend long periods out of a job. Unfortunately, data on the labor earnings of many farmers and self-employed workers is missing in the national household survey. Discarding the corresponding observations leads to an over-representation of the public sector and the private formal sector in the sample.

Data on public sector workers are from two different sources. A public sector census provided information on the individual characteristics of those workers as of 1996, whereas the database of the Ministry of Finance provided information on public sector wages as of 1997. The individual records from these two sources were matched after adding one year of age and one year of service to the public sector census, to have all the data reflect the situation as of 1997. Only workers in the occupational categories “O” to “Z”, which are the ones targeted by the downsizing program, were retained in the matching process. The earnings data include bonuses and other allowances.

Summary statistics on earnings and individual characteristics in the two data sets are reported in Table 1. The first two columns in this Table correspond to the national household survey, whereas the third column is from the public sector database.

3. Predicted Losses

A key step to predict the losses from separation is to estimate earnings functions for people who do not work in the public sector. Earnings functions are among the best-established empirical regularities in economics. These functions quantify the relationship between individual characteristics, such as those listed in Table 1, and labor earnings. Let annual earnings be denoted as E_i, and characteristics such as gender, education, age or region or residence as "X_1", "X_2", ..., "X_k". For reasons that will become clear below, the dummy variable that indicates whether the person works in the private formal sector is highlighted by noting it differently, as F_i. An earnings function can be written as follows:

$$Log\, E_i = b_0 + b_1 X_{1i} + b_2 X_{2i} + \ldots + b_k X_{ki} + b_F F_i + e_i \qquad (1)$$

In this expression, e_i is an individual-specific disturbance, on average equal to zero.

Data from the 1991 national household survey are used to estimate equation (1). The results can be found in Table 2. Several regularities emerge from these results. First, it appears that labor earnings increase significantly with the level of education. The premium for an additional year of schooling is roughly 12 percent. Second, earnings are higher for those who are married, and they are marginally higher for those with more dependents as well. Third, there are wide regional disparities. Earnings for individuals with the same characteristics could be about 30 percent higher in Bissau than elsewhere. And fourth,

individuals with the same characteristics earn 30 to 40 percent more in the formal private sector than in the informal sector.[3]

Predicted earnings after separation are given by the following equation:

$$\hat{E}_i = \exp\left(\hat{b}_0 + \hat{b}_1 X_{1i} + \hat{b}_2 X_{2i} + \ldots + \hat{b}_k X_{ki} + \hat{b}_F F_i^*\right) \quad (2)$$

where estimated coefficients are indicated by a hat, and F^*_i is a dummy variable for the sector in which the separated worker is expected to end up. This variable is equal to one if the worker gets a job in the formal private sector, and equal to zero if he or she gets a job in the informal sector. Equation (2) makes use of the all the individual characteristics for which data are available, despite the fact that some of them do not appear to play a substantial role in explaining earnings out of the public sector. For instance, according to the earnings functions in Table 2, men earn 5 to 10 percent more than women, other things equal, but the coefficient multiplying the gender variable is not statistically significant (the corresponding t-statistic is low).[4] However, the aim of the exercise is not to identify the determinants of earnings out of the public sector, but rather to predict them in the most accurate way. Consequently, the regression that yields the highest coefficient of determination is used in the exercise. This is the regression reported in the last column of Table 2.

Equation (2) can be used to estimate the predicted change in earnings from separation, $?_i$, as follows:

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[3] The coefficient multiplying a dummy variable can be interpreted as a percentage only if it is small, in absolute terms. For relatively large coefficients, like $ß_F$, the percentage effect is given by $[\exp(1+ ß_F)-1]x100$.

$$h_i = \frac{\hat{E}_i - W_i}{W_i} \tag{3}$$

Figure 1 displays the distribution of $?_i$ for the 3,048 employees in categories "O" to "Z", using two different assumptions. The solid line is drawn under the hypothesis that no separated worker gets a formal sector job ($F^*_i = 0$ for all "i"). In this case, almost all employees can be expected to experience a loss in earnings. At the other end, the dotted line assumes that all separated workers end up in the formal private sector of the economy ($F^*_i = 1$). In this case, roughly a quarter of the separated employees would earn more after separation than in the public sector. Some could even expect to make roughly 300 percent more.

It would be unrealistic, however, to assume that all separated workers will get formal sector jobs. In the case of Guinea-Bissau, roughly one-fifth the separated workers could be hired by the new private contractors in charge of the cleaning, surveillance and maintenance of government facilities. These contractors will be under close scrutiny to comply with labor market regulations. The rest of the separated workers, on the other hand, will most likely end up in the informal sector, and get no perks or benefits attached to their jobs. The indicator F^*_i is therefore generated randomly, assuming that the probability of getting a formal sector job after separation is one-fifth, for all workers. Several random draws were produced, but the earnings distribution only changed marginally, as the public sector database contains a very large number of employees in the categories "O" to "Z".

The direct approach measures the loss L^D_i that the separated public sector worker "i" would experience based on the following expression:

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[4] Note that the hypothesis that all of the coefficients are statistically insignificant is

$$L_i^D = \sum_{t=1}^{A_i} \frac{W_i - \hat{E}_i}{(1+r)^t} + \sum_{t=A_i+1}^{N_i} \frac{\left(1 - F_i^*\right) P_i}{(1+r)^t} \qquad (4)$$

The first sum of terms in the right-hand-side of equation (4) is the earnings loss the worker would experience in all the years since displacement until retirement, measured in present value. In this sum, W_i represents salaries and tangible benefits in the public sector, A_i is the number of years before the worker reaches the legal retirement age, and r is a subjective discount rate. The second sum of terms is the income loss over all the years between retirement and death. In this sum, P_i is the old-age pension the worker would be entitled to if he or she stayed in the public sector until retirement age, and N_i is the expected number of years before death. Equation (4) assumes no loss in old-age income if the worker gets a formal sector job after separation.

To calculate L^D_i, information on the retirement program for civil servants is needed. In the case of Guinea-Bissau, the legal retirement age is 55 years, for both men and women (A_i = 55 for all i). In fact, 300 employees in the public sector database exceed that age. Losses are not computed for those employees, as a sensible downsizing program would not have to compensate them, but just require them to retire. The pension P_i is calculated applying the regulations in force as of 1998, under the assumption of continued service until retirement age, without any change in real remuneration. It is also assumed that the life expectancy is 70 years for male civil servants, and 75 years for females. Finally, the discount rate is set at 10 percent, which is a commonly used value of the time preference in the social assessment of investment projects.

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rejected by the data (the F-statistic is high).

The indirect approach, in turn, measures the loss L^I_i as follows:

$$L_i^I = \sum_{t=1}^{A_i} \frac{W_i \left(1+h_{\max}\right) - \hat{E}_i}{\left(1+r\right)^t} \qquad (5)$$

In this expression, $?_{max}$ is the highest "credible" value of the predicted change in earnings. To implement this approach, it is assumed that the highest 5 percent of the estimated $?_i$ reflects measurement error, rather than potential gains in earnings from separation. Under this assumption, $?_{max}$ is slightly higher than 20 percent. Put differently, public sector employees would value the benefits associated with their jobs, including old-age income security, at roughly one-fifth of their cash earnings. As for the direct approach, the loss from separation is not estimated for employees who had already reached retirement age.

Figure 2 summarizes the predicted losses from separation. The solid line corresponds to the direct approach, and the dotted line to the indirect approach. It is quite remarkable how close the two estimates are. The average loss is 672 thousand CFA francs per worker based on the direct approach, and 745 thousand CFA francs based on the indirect approach. These figures amount to roughly 1,300 US dollars per worker.[5] The two approaches also yield consistent results at the individual level, as the correlation between L^D_i and L^I_i is 0.765. This similarity of the results suggests that the estimated loss provide a reliable benchmark to assess alternative compensation offers.

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[5] The main difference is at the low end of the distribution. The direct approach suggests that some government employees would experience a very small loss in the event of

5. Separation Packages

The compensation offered to redundant workers can be a lump sum, or it can be based on a formula involving several observable characteristics of those workers. A frequently used formula makes compensation a multiple of the salary in government. For instance, workers can be offered two years of salary. Another popular formula also takes seniority into account, as compensation is set at a specific number of months of salary per year of service in government. This is the formula that the government of Guinea-Bissau was planning to use for its public sector downsizing operation, as a December 1999 *Despacho* from the Ministry of Civil Service and Labor had set up severance pay for workers in the occupational categories "O" to "Z" at 10 months of salary per year of service.

The choice of the arguments considered in these formulas is to some extent arbitrary. There are other potentially observable individual characteristics of the worker, in addition to salary and seniority. Some of them could help predict the loss in earnings and benefits separated workers would experience. For instance, the analysis in the previous section made it clear that alternative earnings out of the public sector increase with educational attainment. The "just right" compensation may thus need to be higher for a public sector worker with primary education only than for an otherwise identical worker, with an identical public sector salary, who completed a few years of secondary or technical education. Similarly, potential earnings are higher in Bissau than out of it. The "just right" compensation could then be higher in remote areas, where job alternatives might be limited, than in the capital city.

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separation. But according to the indirect approach, roughly 85 percent of the employees would face a total loss in excess of 400 thousand CFA Francs.

A second problem with the usual rules-of-thumb is that they implicitly assume a relationship between losses from separation and the few individual characteristics they consider which may be wrong. For instance, offering two years of salary as compensation may sound reasonable, but one or three years of salary could be reasonable as well. Similarly, putting a premium on seniority leads to higher compensation for workers who are close to retirement age than for workers at the beginning of their public sector careers. However, it is not clear that the former lose more from displacement than the latter. If the earnings gap between jobs in and out of the public sector is large, young public sector workers may actually experience a larger loss, in present value, because they are denied decades of relatively high earnings. Thus, the relationship between tenure and losses from displacement could well be negative, or change signs, whereas usual rules-of-thumb assume that it is always positive.

Three of the four packages considered in this paper, identified with the letters A, B, and C, are based on the usual rules-of-thumb. Package A is a lump sum. The amount of compensation S^A_i received by employee "i" is given by:

$$S_i^A = q^A \tag{6}$$

Parameter $?^A$ is allowed to vary so as to make compensation more attractive. Package B, in turn, is a multiple of the employee's salary in government. The amount of compensation S^B_i thus verifies:

$$S_i^B = q^B W_i \tag{7}$$

As before, parameter $?^{B}$ can be adjusted so as to make the package more attractive. In package C, the amount of compensation S^{C}_{i} is set in months of salary per year of service, Y_i, as follows:

$$S_i^C = q^C W_i Y_i \tag{8}$$

Variable Y_i could be one of the individual characteristics X_i considered when estimating potential earnings out of the public sector, in equation (1).

Package D, on the other hand, is based on an analysis of the distribution of predicted losses in benefits in earnings from separation. These losses, as defined by equations (4) and (5), are non-linear relationships involving the individual characteristics of the employees, as well as the characteristics of their government jobs. The meaning of these equations might be too difficult to explain to public sector employees with limited education. Lack of transparency, in turn, may jeopardize the whole downsizing process. It is therefore important to device a simple, linear formula that yields a good approximation to the present value of the earnings. For instance, the following formula could be considered:

$$S_i^D = q^D + l_0 W_i Y_i + l_1 X_{1i} + l_2 X_{2i} + \ldots + l_h X_{hi} \tag{9}$$

The number of variables "h" in equation (9) is smaller than their number "k" in equation (1), as only those individual characteristics that account for a large proportion of the variation in the predicted loss should be retained. Variables that could be subject to fraud or manipulation by the displaced workers would need to be excluded as well.[6] For instance, information on

marital status and the number of dependents is not reliable in countries where out-of-wedlock births and extended families are common. In the case of Guinea-Bissau equation (9) could also include the formal sector dummy F^*_i, because workers who are hired by the new private sector contractors are likely to experience a smaller loss, hence need less compensation. However, to keep the discussion general, package D is designed as if the government had no information on the sector displaced workers will end up working in.

A simple statistical analysis can be used to assign values to parameters $?_0$ to $?_h$. In Tables 3 and 4, the present value of the losses from separation (L^D_i and L^I_i respectively) is regressed on W_iY_i and a series of individual characteristics. When using the direct approach to measure losses from separation, the regressions are carried out for all government employees who have not reached retirement age. When using the indirect approach, employees who could apparently earn much more out of the public sector than they earn in it are also dropped from the sample. In more technical terms, only those government employees for whom $?_i < ?_{max}$ are considered. Also, all regressions are carried out for three groups of workers: the entire sample, the third with the smallest losses, and the two-thirds with the smallest losses. Splitting the sample in this way allows to identify the variables for which the linear approximation assumed in equation (9) is valid.

The regressions in Tables 3 and 4 do not aim to "explain" the losses from separation. The "right" model is not the linear expression in equation (9), but rather the non-linear expressions in equations (4) and (5). The purpose of these regressions is only to find a linear relationship that can "mimic" a substantial portion of the variance in the predicted losses from separation. Moreover, the left-hand-side variables in the regressions in Tables 3 and 4 are

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[6] In some countries, legal considerations matter as well. For instance, a different level of compensation for men and women could be seen as a form of discrimination.

constructed using the right-hand-side variables in those same regressions, which accounts for the apparently high statistical significance (t-statistic) of some of the estimated coefficients. Not all coefficients are highly significant for all sub-samples, however, thus suggesting that the linear approximation only holds for selected individual characteristics.

Based on the results in Tables 3 and 4, three individual characteristics are good predictors of the loss from separation, regardless of the loss indicator used. These are gender, education and region of residence. The sign of the corresponding coefficients is the same across all specifications. Also, their absolute size is similar across sub-samples, except for the third with the smallest losses. At the other extreme, age appears to be a poor predictor, as the sign of the corresponding coefficient changes with the sub-sample considered. As regards the arguments used in standard separation packages (earnings in government and earnings multiplied by years of service), they fall in between these two extremes. The corresponding coefficients are most of the times positive, as the usual rules-of-thumb assume, but their absolute size varies substantially with the sub-sample considered.

In what follows, the value of parameter $?_0$ is set at 1/24, which corresponds to half a month of salary per year of service. A bonus of 60 thousand CFA Francs is given to female workers, and a bonus of 150 thousand CFA Francs is given to those who live and work out of Bissau. Also, the resulting package is reduced by 50 thousand CFA Franc for each additional year of education. All of the other ? coefficients in equation (9) are set equal to zero, so that the only "free" parameter is $?^D$. It is important to emphasize that this is not a proposed compensation package for Guinea-Bissau, but rather a reference to assess the performance of the usual rules-of-thumb.

6. Cost and Fairness

The performance of the four separation packages can be evaluated on two grounds: cost and fairness. For each government employee, the separation package can be compared to the expected loss in earnings and benefits. It the package exceeds the expected loss, it is assumed that the employee would be satisfied. It follows that each separation package is associated with a satisfaction rate, ranging from 0 to 100 percent. The cost and fairness indicators are calculated for a pre-specified satisfaction rate; for instance, 60 percent. Cost is measured as the average package of those employees who would be satisfied by the amount of compensation received. Fairness is the correlation coefficient between the compensation and the loss in earnings and benefits, for those employees who would be satisfied. Implicitly, both indicators use voluntary separations as a benchmark, as the fraction of employees satisfied should be the same as the fraction of employees who would take the package and leave the public sector, if they had a choice.

In practice, every "reasonable" package will over-compensate some employees, and under-compensate others. Only exceptionally will compensation match exactly the predicted loss in earnings and benefits. Therefore, the employees who are satisfied with the package are most likely over-compensated. It follows that the average cost of a package is higher than the average loss in earnings and benefits of those employees who are satisfied with it. In terms of the voluntary separation benchmark, mistakes in the direction of over-compensation materialize, whereas mistakes in the direction of under-compensation have no practical implication. Over-compensation also implies that the fairness of a separation package can be low. If the package received by all satisfied employees was equal to their predicted loss (or a multiple of it), the

fairness coefficient would be equal to one. But in practice, some employees get a windfall whereas others are compensated "just right", so that the fairness coefficient can be close to zero, or even negative.

Tables 5 and 6 report the cost and fairness of each of the four packages, for nine satisfaction rates ranging from 10 to 90 percent. The zero satisfaction rate is uninteresting, as it would require no compensation. At the other end, the 100 percent satisfaction rate can only be reached at unreasonably high separation costs, as the package has to be generous enough to match the highest loss in earnings and benefits in all the sample, and this is often an outlier. The only difference between Tables 5 and 6 concerns the loss indicator used. In Table 5 the total loss in earnings and benefits is the one obtained using the direct approach, whereas Table 6 is based on the indirect approach. The figures in italics in these two tables indicate the cheapest package, and the fairest package, for each satisfaction rate.

In the case of Guinea-Bissau, packages A and B are quite similar. This is because of the very small variation in earnings across employees in categories “O” to “Z”. If all workers have roughly the same salary in government, a package defined as a multiple of this salary is not too different from a lump-sum payment. Whereas salaries in government are roughly the same for all employees in categories “O” to “Z”, losses from separation are not. As the correlation coefficient between a constant and a variable is zero, packages A and B perform very poorly in terms of fairness. However, they are cost-effective at low satisfaction rates. If downsizing can be carried out without fully compensating more than one third of government employees, “flat” packages of this sort could keep downsizing expenditures under control.

At the other end, “tailored” compensation, as in package D, is the most cost-effective alternative if satisfaction rates need to be high. Packages C and D have a similar performance

at low satisfaction rates. The average cost per separated worker is slightly higher for package C, but the fairness coefficient can be higher as well. However, in order to attain high satisfaction rates, the number of months of salary per year of service required by package C becomes too high. At a 70 percent satisfaction rate, package C costs roughly twice as much as package D, but the latter does much better in terms of fairness. The gap between the two packages becomes dramatic at very high satisfaction rates. In fact, "tailored" compensation dominates all the alternatives, both on cost and on fairness grounds, if a majority of the workers need to be "bought off".

The compensation formula that the government of Guinea-Bissau was planning to use for its public sector downsizing operation, which is a special case of package, turns out to be quite onerous. This formula would lead to a satisfaction rate of 78 percent, based on the direct approach, or 73 percent, based on the indirect approach. The average cost per satisfied worker would be roughly two million CFA Francs, and the fairness coefficient would be around 45 percent. Better outcomes could be attained spending less than half. A lump sum of less than one million CFA Francs would achieve the same satisfaction rate than the formula considered in Guinea-Bissau. A similar result, at a similar cost, would be obtained offering less than seven years of salary as compensation. Package D would be even less expensive, as it would cost roughly 880 thousand CFA Francs per satisfied worker. The fairness coefficient would, in this case, be close to 70 percent.

7. Conclusion

The approach to compensation discussed in this paper follows some basic economic principles, so that its validity should be quite general. However, the simulations presented should be interpreted with caution, as they are clearly specific. This is because countries often differ in their labor market characteristics, and in the criteria underlying pay and benefits in the public sector. As a result, the distribution of the predicted losses in earnings and benefits from job separation may vary substantially from country to country. Moreover, this paper has focused on a narrowly defined group of public sector workers, namely relatively unskilled individuals performing cleaning, surveillance and maintenance tasks. Even in the specific case of Guinea-Bissau, the distribution of predicted losses could be quite different for other groups, such as clerical workers or teachers. Therefore, the "ranking" of packages resulting from the cost and fairness comparisons proposed may not have general validity.

Since the aim of this exercise is to contribute to actual policymaking, the simulations in this paper are deliberately simple and may be subject to criticism on methodological grounds. Important labor market issues, including self-selection into public sector jobs, are not addressed. Earnings out of the public sector are predicted here as if government employees were not systematically different from other labor force participants. But it could well be that only the smartest workers make it to public sector jobs, or only the least ambitious stick to them. The earnings of a worker who is smarter than the average should be higher than those predicted by a standard earnings function, which does not include talent among its arguments. Conversely, the earnings of a worker who is less ambitious than the average could be lower. More rigorous simulations would need to be based on a deeper analysis of the labor market, dealing among others with the self-selection problem.

It is also worth emphasizing that this paper is deliberately narrow in its approach. A separation package could be cheaper and fairer than others, but still be unadvisable. When separations are voluntary, low cost is achieved by implicitly targeting those workers who have the least to lose in the event of separation, either because they earn very little in the public sector, or because they have a relatively high earnings potential out of it. Typically, the most educated workers are those who have the least to lose. But from a public sector reform perspective, it is not clear that separating these workers represents an improvement. The acceptability of a package is clearly not an issue when separations are involuntary, in which case the targeting of redundant workers and their compensation can be dissociated. And it is not an issue in Guinea-Bissau, where all workers in categories "O" to "Z" are redundant, as cleaning, surveillance and maintenance functions should be performed by the private sector. But in general, the implications of different separation packages on the characteristics of those who would be satisfied by them should not be ignored.

Even in the absence of adverse selection, a cheap and fair separation package would not be advisable if its economic returns were negative. Most compensation alternatives seem financially sound, as they trade the equivalent of a few years in salary for a lifetime of payments, under the form of salaries, benefits and old-age pension. However, a comprehensive economic analysis should also take into account the effects of downsizing on the allocation of labor across sectors. Many government employees have a very low productivity, but it is not at all obvious that they would be more productive out of the public sector. Moving from government employment to unemployment, or to the informal sector, could actually reduce total output. While there is clearly no reason to over-spend in compensation, even a "just right" package could be a bad idea.

Finally, there is an important political caveat. If appropriate compensation is needed to make the workers accept the prospect of downsizing, it is very likely that the package will have to be negotiated with public sector trade unions. In that case, the final compensation formula may not be the cheapest one, or the fairest one, but rather a compromise shaped by the bargaining power of all the players involved. From this perspective, the simulation approach proposed in this paper should not be seen as an example of "mindless social engineering", but rather as a tool to introduce some economic rationality in delicate political negotiations. While the approach could certainly be refined, it represents an improvement compared to the ad hoc way in which these negotiations are usually carried out.

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Table 1

Summary Statistics

Individual Characteristics	Household survey		Public sector database
	All workers	Private sector	
Male (yes = 1)	0.73	0.71	0.61
Schooling (years)	6.57	6.38	5.89
Age (years)	31.95	32.27	38.94
Seniority in the job (years)	n.a.	n.a.	11.67
Married (yes = 1)	0.92	0.91	0.76
Number of dependents	5.78	5.65	3.59
Bissau (yes = 1)	0.71	0.68	0.65
Public sector (yes = 1)	0.22	0.00	1.00
Formal private sector (yes = 1)	0.11	0.12	0.00
Earnings (000 CFA per year)	372.0	354.5	169.9
Number of observations	488	344	3048

Note: Earnings figures are measured as of 1997. In the household survey data they include earnings in main and secondary occupation. In the public sector data they include bonuses and allowances. The public sector database includes employees in categories “O” to “Z” only.

Table 2

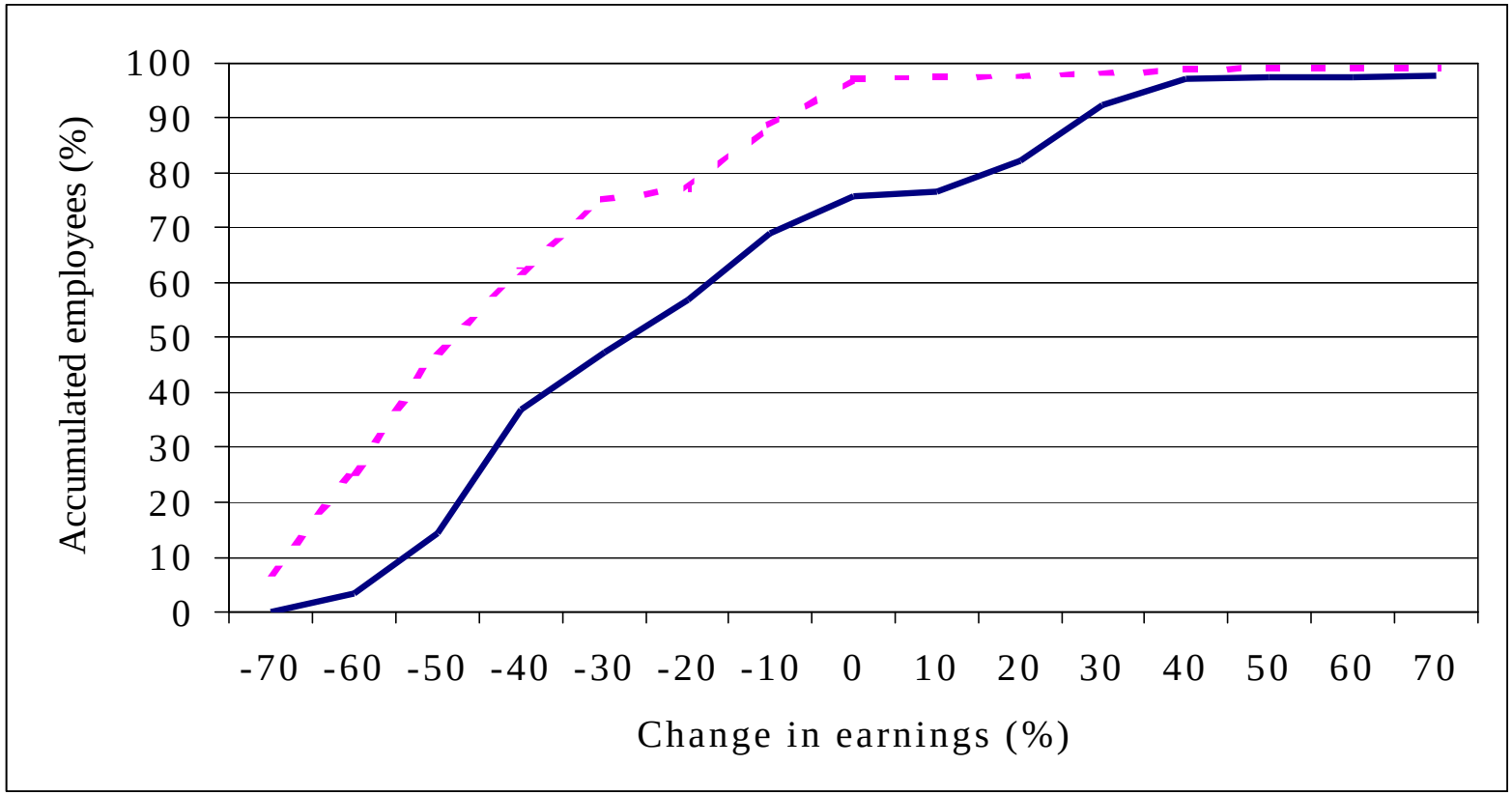
Earnings Out of the Public Sector

Individual characteristics	Dependent variable : log of annual earnings in main and secondary occupations in CFA francs at 1997 prices		
Male (yes = 1)	0.0963 (0.813)	0.0551 (0.464)	0.0897 (0.759)
Schooling (years)	0.1198 *** (7.832)	0.1204 *** (7.929)	0.1224 *** (8.130)
Experience (years)	-0.0046 (-0.705)	-0.0061 (-0.939)	-0.0065 (-1.008)
Married (yes = 1)	0.4987 *** (2.777)	0.4501 ** (2.510)	0.4068 (0.023)
Number of Dependents	0.0224 ** (1.677)	0.0244 * (1.836)	0.0191 (1.438)
Bissau (yes = 1)			0.3115 *** (2.774)
Formal sector (yes = 1)		0.3854 ** (2.448)	0.3387 ** (2.160)
Constant	10.633 *** (32.636)	10.692 *** (32.967)	10.529 *** (32.253)
F-Statistic	16.90	15.29	14.46
Adjusted R^2	0.200	0.200	0.216
Observations	344	344	344

Note: All regressions were estimated by ordinary least squares. t-statistics are reported in parentheses. Significant coefficients at the 10, 5 and 1 percent levels are indicated by one, two and three asterisks respectively.

Figure 1

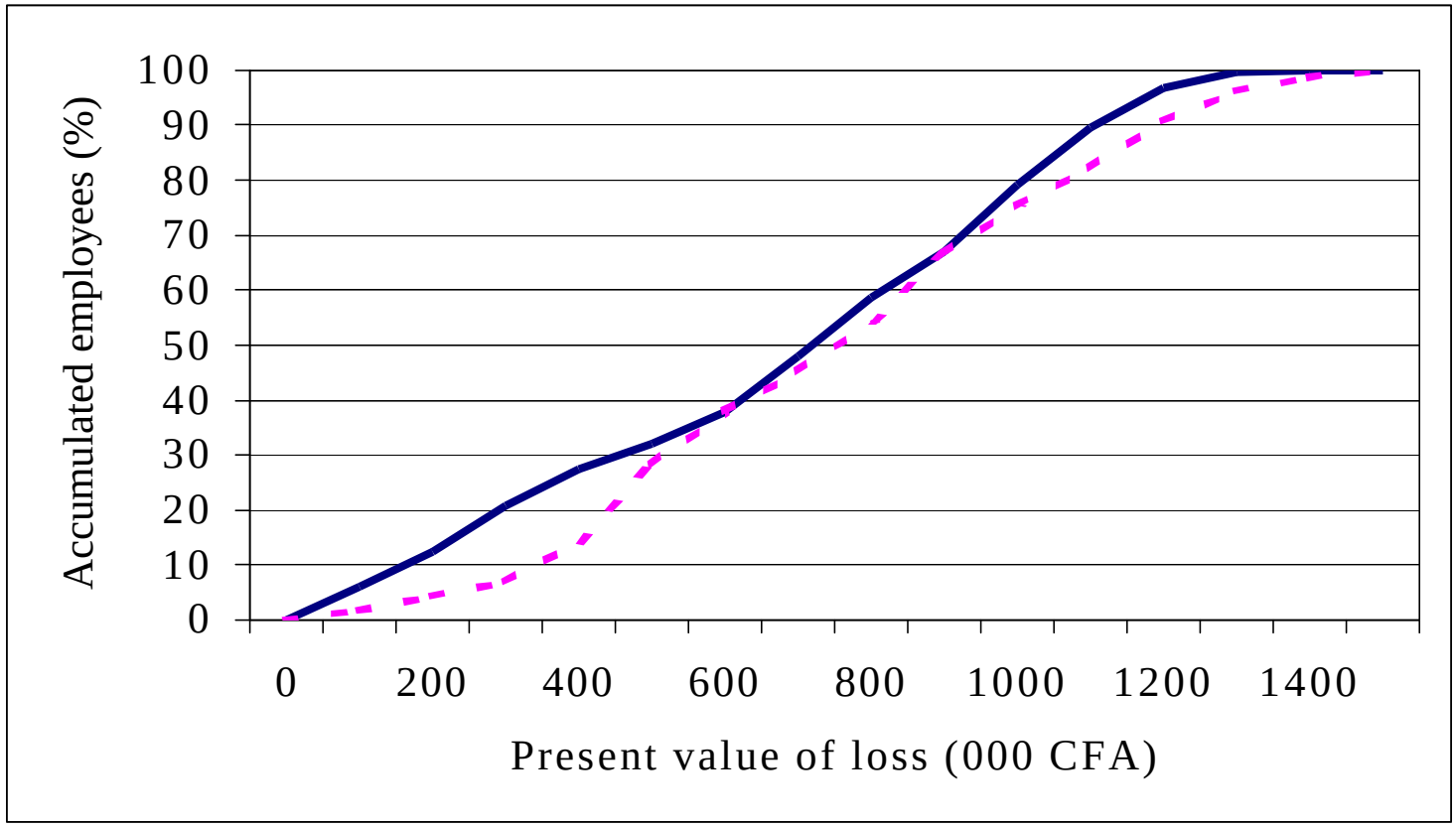
Annual Loss in Earnings from Separation



Note: The solid line is constructed under the assumption that all separated workers get jobs in the private formal sector of the economy, whereas the dotted line assumes that they all end up working in the informal sector.

Figure 2

Total Loss in Earnings and Benefits from Separation



Note: The solid line is constructed using the direct approach to estimate the value of benefits, whereas the dotted line is based on the indirect approach.

Table 3

Predictors of Total Loss (Direct Approach)

Individual characteristics	Dependent variable: Total loss in earnings and benefits from separation (in 000 CFA)					
	Lowest 1/3	Lowest 2/3	All	Lowest 1/3	Lowest 2/3	All
Earnings (000 CFA)	3.054 ** (2.507)	1.053 (0.781)	4.625 *** (3.951)			
Earnings (000 CFA) x Years of service				0.0194 *** (4.119)	0.0091 * (1.874)	0.0535 *** (13.858)
Male (yes = 1)	-54.16 *** (-5.520)	-81.45 *** (-7.902)	-46.25 *** (-5.146)	-60.47 *** (-6.110)	-85.21 *** (-8.096)	-76.74 *** (-8.516)
Schooling (years)	-9.01 *** (-3.977)	-45.50 *** (-20.159)	-88.58 *** (-52.699)	-9.00 *** (-3.995)	-45.68 *** (-20.249)	-87.61 *** (-53.847)
Age (years)	3.03 *** (4.579)	4.76 *** (7.210)	0.50 (0.906)	1.62 ** (2.206)	4.23 *** (5.926)	-3.39 *** (-5.605)
Bissau (yes = 1)	11.53 (0.818)	-167.86 *** (-14.753)	-217.74 *** (-23.567)	18.27 (1.304)	-167.48 *** (-14.754)	-212.37 *** (-23.743)
Independent term	-283.07 (-1.342)	614.48 *** (2.654)	564.36 *** (2.825)	252.06 *** (6.362)	801.06 *** (21.308)	544.50 *** (46.694)
F-Statistic	20.02	199.44	738.63	22.37	200.33	821.04
Adjusted R^2	0.094	0.352	0.574	0.105	0.353	0.599
Observations	916	1830	2744	916	1830	2744

Note: All regressions were estimated by ordinary least squares. t-statistics are reported in parentheses. Significant coefficients at the 10, 5 and 1 percent levels are indicated by one, two and three asterisks respectively.

Table 4

Predictors of Total Loss (Indirect Approach)

Individual characteristics	Dependent variable: Total loss in earnings and benefits from separation (in 000 CFA)					
	Lowest 1/3	Lowest 2/3	All	Lowest 1/3	Lowest 2/3	All
Earnings (000 CFA)	-0.2655 (-0.235)	1.650 (1.447)	5.815 *** (6.376)			
Earnings (000 CFA) x Years of service				0.0056 (1.551)	0.0130 *** (3.567)	0.0123 *** (3.968)
Male (yes = 1)	-2.70 (-0.305)	-50.68 *** (-5.814)	-56.82 *** (-8.129)	-5.81 (-0.649)	-57.56 *** (-6.438)	-60.99 *** (-8.402)
Schooling (years)	-11.83 *** (-4.232)	-57.35 *** (-23.637)	-95.04 *** (-66.406)	-12.36 *** (-4.399)	-57.01 *** (-23.642)	-94.21 *** (-65.322)
Age (years)	-6.89 *** (-11.273)	-14.97 *** (-23.023)	-22.39 *** (-51.848)	-7.29 ** (-10.989)	-15.83 *** (-22.877)	-23.30 *** (-47.962)
Bissau (yes = 1)	-10.95 (-0.943)	-183.93 *** (-19.570)	-220.99 *** (-30.994)	-9.48 (-0.815)	-181.77 *** (-19.433)	-217.61 *** (-30.407)
Independent term	794.66 *** (4.306)	1415.06 *** (7.231)	1322.78 *** (8.506)	759.24 *** (16.777)	1703.49 *** (41.711)	2317.16 *** (106.063)
F-Statistic Adjusted R^2 Observations	32.83 0.156 864	180.2 0.341 1730	1305.3 0.715 2595	33.39 0.158 864	183.5 0.347 1730	1288.0 0.713 2595

Note: All regressions were estimated by ordinary least squares. t-statistics are reported in parentheses. Significant coefficients at the 10, 5 and 1 percent levels are indicated by one, two and three asterisks respectively.

Table 5

Performance of Alternative Packages (Direct Approach)

Percent of employees satisfied	Average compensation per separated employee (000 CFA)				Correlation coefficient between compensation and loss			
	A	B	C	D	A	B	C	D
10	176.0	*138.8*	227.1	232.7	0.000	-0.193	0.650	*0.854*
20	300.5	*300.4*	451.5	397.8	0.000	0.015	0.656	*0.743*
30	468.8	*464.3*	660.6	465.2	0.000	0.072	*0.765*	0.658
40	632.5	633.9	818.8	*567.2*	0.000	-0.013	*0.735*	0.649
50	722.0	724.3	964.3	*667.0*	0.000	-0.040	*0.686*	0.644
60	818.0	816.2	1157.3	*736.7*	0.000	-0.035	0.621	*0.643*
70	939.5	944.2	1464.0	*809.1*	0.000	-0.035	0.528	*0.668*
80	1007.4	1014.4	2143.6	*871.8*	0.000	-0.064	0.442	*0.713*
90	1106.3	1107.2	3642.0	927.3	0.000	-0.038	0.351	*0.749*

Note: Package A is a variable lump-sum; package B is a variable multiple of the salary in government; package C is a variable multiple of the salary multiplied by the number of years of service; package D is a variable lump-sum, plus half a month of salary per year of service, minus 50,000 CFA per year of completed education, plus 60,000 CFA for female employees, plus 150,000 for employees who work out of Bissau. The variable component of each package is increased until the percentage of satisfied employees indicated in the first column of the table is reached.

Table 6

Performance of Alternative Packages (Indirect Approach)

Percent of employees satisfied	Average compensation per separated employee (000 CFA)				Correlation coefficient between compensation and loss			
	A	B	C	D	A	B	C	D
10	*358.0*	361.0	441.0	412.7	0.000	-0.191	*0.596*	0.553
20	437.6	*437.6*	636.0	556.7	0.000	-0.059	*0.629*	0.524
30	*513.0*	514.0	813.5	620.6	0.000	-0.053	*0.615*	0.562
40	624.2	*618.7*	989.7	650.4	0.000	-0.029	0.591	*0.594*
50	760.0	762.4	1188.3	*705.5*	0.000	-0.036	0.553	*0.617*
60	843.0	841.6	1446.7	*783.0*	0.000	-0.027	0.496	*0.633*
70	932.0	930.6	1862.8	*861.0*	0.000	-0.013	0.455	*0.651*
80	1065.5	1064.9	2759.8	*940.1*	0.000	-0.010	0.391	*0.671*
90	1193.0	1194.8	4806.3	*1052.8*	0.000	-0.020	0.326	*0.704*

Note: Package A is a variable lump-sum; package B is a variable multiple of the salary in government; package C is a variable multiple of the salary multiplied by the number of years of service; package D is a variable lump-sum, plus half a month of salary per year of service, minus 50,000 CFA per year of completed education, plus 60,000 CFA for female employees, plus 150,000 for employees who work out of Bissau. The variable component of each package is increased until the percentage of satisfied employees indicated in the first column of the table is reached.