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POLICY RESEARCH WORKING PAPER

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# Efficient Public Sector Downsizing

*Martin Rama*

Downsizing operations usually reduce government expenditures significantly, but they increase economic efficiency only when they are thoughtfully designed. Dissociating targeting from compensation is key.



## Summary findings

Most downsizing operations show high financial returns, but their economic returns depend crucially on their design. After comparing public sector employment across countries, Rama analyzes the optimal design of downsizing operations from a microeconomic perspective.

He discusses how to identify redundant workers when individual productivity is observable, as is often the case in state enterprises. Comparisons of productivity and labor costs are misleading because overstaffing is only one among several distortions. He proposes using a shadow cost of labor, much the same as in standard investment projects.

He then discusses how to identify redundancies when individual productivity cannot be observed, as in

government administration. Voluntary separations in exchange for severance pay create an adverse selection problem, whereby the best workers leave the public sector and the worst workers stay. He discusses other self-selection methods more likely to create an incentive for the best workers to stay rather than quit.

Most offers of severance pay tend to overcompensate workers. Rama analyzes how labor data can be used to predict the loss replaced workers will experience and to tailor compensation to their individual characteristics.

Finally, he discusses the appropriate sequence of downsizing and privatization, the consequences of early retirement programs, and the usefulness of training programs and other active labor policies.

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# Efficient Public Sector Downsizing

Martín Rama

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## 1. Introduction

Public sector downsizing is becoming an increasingly important ingredient of economic reform in developing countries. Bloated bureaucracies and over-staffed public enterprises are indeed among the less tackled legacies of a long history of state-led development. Labor redundancies are especially severe in transition economies, where the shift from plan to market requires millions of workers to be relocated out of the public sector. But retrenchment is needed in other regions too. In Latin America and South Asia, decades of protective policies led to the proliferation of white elephants and “sick” industries, most of which cannot be salvaged. All over the world, technological progress is making natural monopolies disappear, thus confronting formerly somnolent public utilities to harsh competition. And the willingness to correct the employment excesses from past patronage and cronyism is becoming stronger as traditional and authoritarian ways are replaced by more modern and democratic ones.

The extent of labor redundancies is so vast that any serious downsizing may actually be politically unfeasible, at least if it is to rely on involuntary dismissals. Hence the increasing popularity, among developing country governments, multilateral agencies and donor countries, of a voluntary approach to reductions in public sector employment. More specifically, the idea is to offer severance pay to encourage the redundant workers to quit, thus overcoming their resistance to downsizing, restructuring and privatization. In many developing countries “buying out” the redundant workers is in fact the only way to bypass the legal obstacles to the dismissal of public sector employees. But in addition, there appears to be some fairness in compensating those who may suffer from a change in the rules of the game. In this respect, severance pay resembles the lump-sum transfers which characterize textbook analyses of economic policy, but are so often missing in real-world reforms. After all, if public sector downsizing and

restructuring increase economic efficiency, it should be possible for those who are out of the public sector to compensate those who are in and still make a net gain. Severance pay can thus be viewed as a tool for Pareto optimality.

Until recently, one of main obstacles to the implementation of the voluntary approach to public sector downsizing was its extremely high cost. Sometimes, hundreds of thousands of workers need to be relocated to the private sector, with the average compensation and training package amounting to several thousand dollars per worker. A single downsizing operation may therefore cost hundreds of millions of dollars. The problem is the countries where public sector downsizing is most needed are usually cash strapped. But recent changes in the attitude of multilateral agencies towards mass retrenchment have significantly softened the budget constraint on downsizing. In February 1996, the World Bank's operational rules were modified so as to allow lending for severance pay, provided that it is aimed at restructuring the public sector.<sup>1</sup> The International Monetary Fund is also favorable to the voluntary approach to downsizing, because it allows to quickly reduce budget deficits, particularly if severance pay packages are not treated as current expenditure but rather as investment. And regional organizations such as the Inter-American Development Bank are also keen to lend for severance pay. As a result, many developing countries have plans for public sector downsizing in preparation, or already in execution.

While the efficiency gains from public sector downsizing are potentially large, the chances to mishandle it are considerable too. It is quite obvious that the public sectors of

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<sup>1</sup> Previously, severance pay was viewed as a pure transfer, and according to the World Bank's statutes lending is allowed insofar it serves a productive purpose. But the case was made that the restructuring of state-owned enterprises was a productive endeavor, which in turn made lending for severance pay legitimate. The same logic may be extended soon to civil service reforms. Lending for severance pay is not allowed when no state-owned enterprise in a specific sector is viable.

developing countries are plagued with workers who contribute little to aggregate output or welfare, if anything at all. The issue is whether the use of severance pay packages will help chase these low productivity workers. The frequently observed “revolving door” syndrome, whereby some of the separated workers are in the end re-hired, suggests that some downsizing operations lead to the departure of the few who make the public sector function. And damaging the ability of the government to get things done would be a serious mistake, given how important the quality of bureaucracy is for economic development (see World Bank, 1997).

There are also other reasons why downsizing may be mishandled. Over-staffing is usually one among several distortions characterizing the public sector. Just to mention another one, wage levels usually differ from private sector wages. They tend to be lower than in the private sector at the top of the hierarchy, and higher at the bottom. But it is well known that when there are several distortions, removing only one of them may not increase economic efficiency. Furthermore, the externalities from mass retrenchment should not be ignored. The most obvious of these externalities arise in the context of one-company towns, which may easily become ghost towns. But public sector downsizing leads to fiscal externalities too, because it reduces the equilibrium level of government expenditures, hence the burden from distortionary taxes. The socially optimal amount of labor shedding may therefore be either higher or lower than it appears at a first glance.

The aim of this paper is to provide a conceptual framework to assess the costs and benefits from public sector downsizing. The underlying assumption is that downsizing projects are not different by nature from more standard investment projects, and should therefore be subject to the same kind of financial and economic evaluation. Standard investment projects are undertaken only when their benefits outweigh their costs. When product and factor markets are competitive, benefits and costs assessed at market prices provide an accurate measure of benefits

and costs to society. Or, equivalently, the financial returns of a standard investment project provide a decent approximation to its economic returns. But the connection between financial and economic returns is much more tenuous in the case of downsizing projects. The rest of the paper analyzes why this is so, and derives a series of practical recommendations aimed at maximizing economic returns.

The paper builds up on the findings of a recently completed research project on Public Sector Retrenchment and Efficient Compensation Schemes, identified as the PSR project hereafter.<sup>2</sup> The motivation underlying this research is the lack of a unified framework to assess the extent of labor redundancies and to derive the appropriate policy implications. There are only a few studies available on which policy makers can rely when faced with over-staffed government agencies and state-owned enterprises.<sup>3</sup> But these studies deal with particular aspects of the redundancy problem only. And even the vast literature on state-owned enterprises and privatization had somewhat downplayed the ensuing labor issues. A broader perspective on public sector downsizing is therefore warranted.

## 2. Public Sector Employment across Countries

The first and most straightforward way to assess the extent of redundancies in a specific country is to compare the public sector share of its labor force to the corresponding shares in similar countries. The problem is of course to decide what a “similar” country would be. This

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<sup>2</sup> For more information see <http://www.worldbank.org/html/prdph/downsize/home.htm>. A complete version of most of the research papers produced for the PSR project can be downloaded from this website.

<sup>3</sup> Among them: Svejnar and Terrell (1991), Fiszbein (1992), Diwan (1993), Banerji and Sabot (1995), Macgregor *et al.* (1997) and Van der Hoeven and Sziraczki (1997).

problem can be addressed by analyzing the relationship between the public sector share of the labor force across countries and the characteristics of those countries. The gap between the share observed in a specific country and the share predicted based on this relationship provides a measure of labor redundancies at the aggregate level. This measure does not tell whether the country's public sector is over-staffed compared to any optimal benchmark. But it flags the countries where the problem is more likely to exist.

The idea that a stable relationship exists between the size of the public sector and other country characteristics is not new. More than a hundred years ago, Adolf Wagner conjectured that this size would increase with economic development. The high income elasticity of the demand for welfare services, and the need to regulate an increasingly complex economy, were among the reasons invoked by Wagner to justify his hypothesis. More recently, Dani Rodrik (1996) has argued that the government's size can be expected to increase with exposure to external risk. The absence of insurance markets to stabilize the income fluctuations associated with outward orientation is at the roots of Rodrik's hypothesis.

These and other hypotheses have been assessed empirically in several opportunities, but the size of the public sector has been generally measured through government expenditures (see Commander *et al.*, 1997, for a survey and updated estimates). The determinants of public sector employment have been discussed in only a few studies, namely those by Heller and Tait (1983), Kraay and Van Rijckeghem (1995), Rodrik (1997) and Schiavo-Campo *et al.* (1997). These studies vary in their country coverage as well as in their methodology. Some are descriptive while others involve econometric analysis. Among the latter, some are based on cross-country regressions whereas others also introduce a time dimension in the analysis. Because of the diversity of approaches, it is useful to first replicate the regularities identified by these papers in the simplest way, for the broadest sample of countries.

The data used for this task are from a cross-country data base of labor market indicators currently in preparation at the Development Research Group of the World Bank. Two employment variables are considered: one for the general government, which comprises both central and local administration, and the other for the public sector, which in addition comprises state-owned enterprises.<sup>4</sup> For each country, there is a maximum of three observations, one each for the 1970s, the 1980s and the 1990s. When several observations are available for a specific country in a specific decade, only the one closest to the middle of that decade is considered. In all cases, employment in the general government or the public sector is divided by the total labor force in the same year, estimated based on ILO data. The result is an unbalanced panel covering 90 countries for the general government and 41 countries for the public sector.

The labor force shares of the general government and the public sector are regressed against a set of country characteristics, including economic development and exposure to external risk. Economic development is measured by output per capita at 1985 PPP prices, according to the Penn World Tables. This variable and its square are entered for the same years for which the labor force shares are available. Exposure to external risk is measured as in Rodrik (1997), based on two variables. The first one is openness to trade, defined as the ratio of combined trade to output. Because of its potential endogeneity, this variable is instrumented by the exogenous component of foreign trade, as predicted by the gravity model of Frankel and Romer (1996). The second variable is the standard deviation of the annual change in the terms of trade over the previous decade. The external risk measure is defined as the product of the former two variables. Other variables considered in the regression analysis are the urban share of population and a set of regional dummies, with OECD countries as default.

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<sup>4</sup> Central government alone was not considered, in spite of the data being available, because its size is likely to be affected by the extent of federalism, and the latter is difficult to measure.

In spite of the limited number of country characteristics considered, the explanatory power of the regressions is quite high. Table 1 shows that the chosen explanatory variables account for as much as 55 percent of the variation in the labor force share of the general government, and 59 percent of the variation in the public sector share. Moreover, the estimated signs are plausible. At low levels of economic development, employment in the general government increases with output per capita, as predicted by Adolf Wagner. However, the relationship is not monotonic but rather quadratic, with maximum size attained at around 14,000 dollars per capita, at 1985 PPP prices. Government size increases significantly with exposure to external risk too, as claimed by Dani Rodrik. And it also increases with urbanization.

The regression analysis also highlights important regional disparities. Employment in the general government tends to be much higher in Latin America than in other countries. Public sector employment also appears to be higher in Latin America and in South Asia, although the corresponding coefficients are not statistically significant. Still, the hypothesis that all the regional dummies are equal to zero is rejected at the 5 percent level of confidence. Regional features may therefore explain a larger portion of the variance in government size across countries than is suggested by the statistical significance of individual coefficients.

To assess the extent of labor redundancies, however, it is the unexplained portion of variation in government size across countries that matters. Consider, for instance, countries whose actual share of the labor force employed in the general government differs from the predicted share by more than one standard error of the regression. Based on this criterion, employment in the general government is higher than predicted in a dozen countries, including Algeria, Angola, Botswana, Egypt, Finland, Sri Lanka, Sweden and Trinidad and Tobago. At the other extreme, the governments of countries like Chile, Germany, Japan, Korea, Singapore and Togo are leaner than predicted.

Table 1

## Determinants of Public Sector Employment

Explanatory variables	Dependent variable	Employment in the general government (in percentage of total labor force)		Employment in the public sector (in percentage of total labor force)	
		(1)	(2)	(3)	(4)
Output per capita (000 dollars at 1985 PPP prices)		1.391 *** (2.993)	2.165 *** (3.406)	0.175 (1.097)	0.107 (0.455)
Output per capita squared (000000 dollars at 1985 PPP prices)		-0.049 (-1.655)	-0.079 ** (-2.384)	0.079 (-0.870)	-0.014 (-0.124)
Exposure to external risk (as defined in the text)		1.003 *** (3.303)	0.838 *** (3.105)	1.751 *** (3.327)	2.201 *** (3.724)
Urban population (percentage of total population)		0.048 * (1.675)	0.002 (0.061)	0.075 (1.019)	0.079 (1.064)
East Asia			-2.309 (-0.904)		-0.200 (0.032)
Latin America and Caribbean			9.235 *** (2.747)		10.512 (1.524)
Middle East and North Africa			2.099 (0.808)		3.749 (0.710)
South Asia			2.570 (0.905)		8.408 (1.209)
Sub-Saharan Africa			1.319 (0.491)		1.041 (0.152)
Independent term		1.198 (1.423)	0.061 (0.020)	1.743 (1.187)	-0.691 (-0.092)
Number of observations		121	121	48	48
Adjusted R <sup>2</sup>		0.482	0.548	0.531	0.587
F statistic		28.94	17.13	14.30	8.43

Note: White heteroskedasticity-consistent estimates, with t-statistics reported in parentheses. Statistically significant coefficients at the 10, 5 and 1 percent level are indicated by one, two and three asterisks respectively.

The pattern is similar when employment in the public sector as a whole is considered. Based on the corresponding residuals, a country like Côte d'Ivoire should be included in the "lean" list. On the other hand, the comparison with employment in the general government suggests that some countries are characterized by over-manned state-owned enterprises. For instance, in the cases of Angola and Sri Lanka the residuals of the regression for employment in the public sector are much larger than the (already large) residuals for employment in the general government. Conversely, the state-owned enterprises of countries like Germany, and Korea and Sénégal appear to be relatively leaner than their general governments.

The regression results in Table 1 indicate how large public sector employment tends to be in countries with specific characteristics, not how large it should be. And there are a couple of reasons to think that it tends to be larger than it should. The first one is the excessive share of government consumption devoted to salaries in developing countries. The recent literature on educational production functions is useful to illustrate this point. If the allocation of government expenditures in education was made so as to maximize educational attainment, inputs such as teacher salaries and books would be combined so that their marginal product per dollar spent would be the same. In practice, however, so little is spent on books and instruction materials that their marginal product per dollar is 10 to 100 times higher than that of teacher salaries (Pritchett and Filmer, 1997). This productivity gap suggests that for any given level of government consumption too much is spent on labor inputs and too little on non-labor inputs.

A second reason to believe that the public sector share of the labor force is on average too high is the negative impact of government consumption on long-run growth. This is a common finding in the new growth literature, which traces differences in economic performance across countries to differences in their economic policies, controlling for other relevant variables such as their initial income or their political stability. The nature of the government expenditures

taken into account varies from study to study. For instance, Knight *et al.* (1996) focus on military spending, whereas Barro and Sala-i-Martin (1995) consider government consumption excluding defense and education. But the impact on long-run remains negative in all cases. And it is also negative when the government consumption variable is replaced by the share of the public sector in the total labor force (Rama, 1995).

In sum, governments may spend more than they should and, for every dollar spent they may use more labor than they should. Which in turn implies that aggregate labor redundancies could be significant even in countries whose government share of the labor force falls short of the value predicted by the regressions in Table 1. It follows that cross-country comparisons are useful to identify the countries where over-staffing is more likely to be prevalent, not to measure the actual extent of labor redundancies. More importantly, cross-country comparisons cannot identify the government agencies or state-owned enterprises where over-staffing is to be found, not to mention the individual lines of production, departments or jobs that need to be terminated. The macroeconomic perspective provided by cross-country comparisons has therefore to be supplemented by a microeconomic approach.

### 3. Financial and Economic Returns to Downsizing

The failure to correctly identify labor redundancies in specific government agencies and state-owned enterprises explains the disappointing results of some of the downsizing operations carried out with World Bank support. A total of 41 such operations in 37 countries were carefully reviewed by Haltiwanger and Singh (1997), in a paper prepared for the PSR project. These operations took place between early 1991 and late 1993, at a time when the World Bank was not allowed to lend for severance pay yet. Local counterpart resources were therefore used

for that purpose. On average, each of the operations led to the separation of more than 125 thousand workers at a cost of almost 300 million dollars, of which 87 millions were spent in severance pay. Variation across operations was considerable though. For instance, the smallest one affected 247 public sector workers only, compared to more than 1.6 million workers for the largest one. These operations provide a unique opportunity to assess how successful public sector downsizing has been so far.

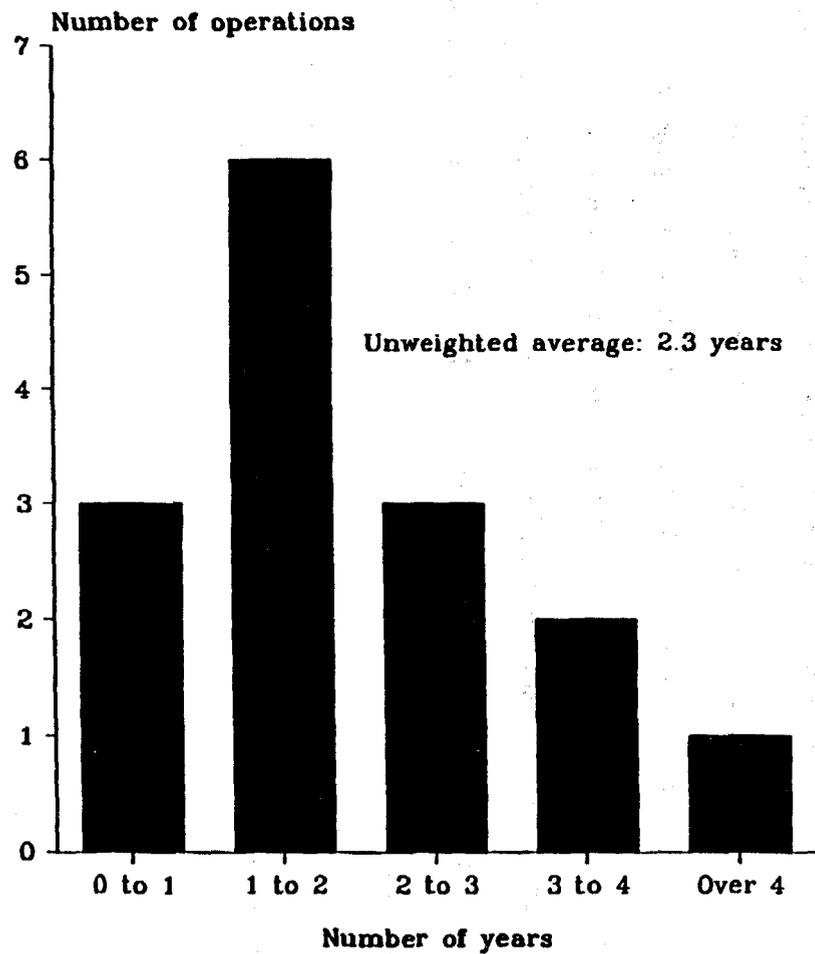
As for any other investment project, it is useful to distinguish between the financial and the economic returns of the downsizing operations carried out with Bank support. Financial returns result from a reduction of public sector expenditures, and particularly of the public sector wage bill. When the present value of this reduction is higher than the up front cost in terms of severance pay, safety nets and the like, downsizing has positive financial returns. Economic returns, in contrast, result from a better allocation of labor across sectors. When the contribution of displaced workers to aggregate welfare is higher out of the public sector than in it, downsizing has positive economic returns. In the simplest case, where labor productivity in the public sector is close to zero, all downsizing projects have non-negative economic returns. In the general case, however, financial returns may be a poor indicator of economic returns.

Haltiwanger and Singh evaluate the financial returns of the surveyed operations based on the number of years it takes to recover their direct financial costs under the form of lower expenditures, using a 10 percent annual discount rate. This indicator is called the break-even period hereafter. Figure 1a shows the results for the 15 downsizing operations for which the required information was available.<sup>5</sup> Based on these results, the performance of downsizing

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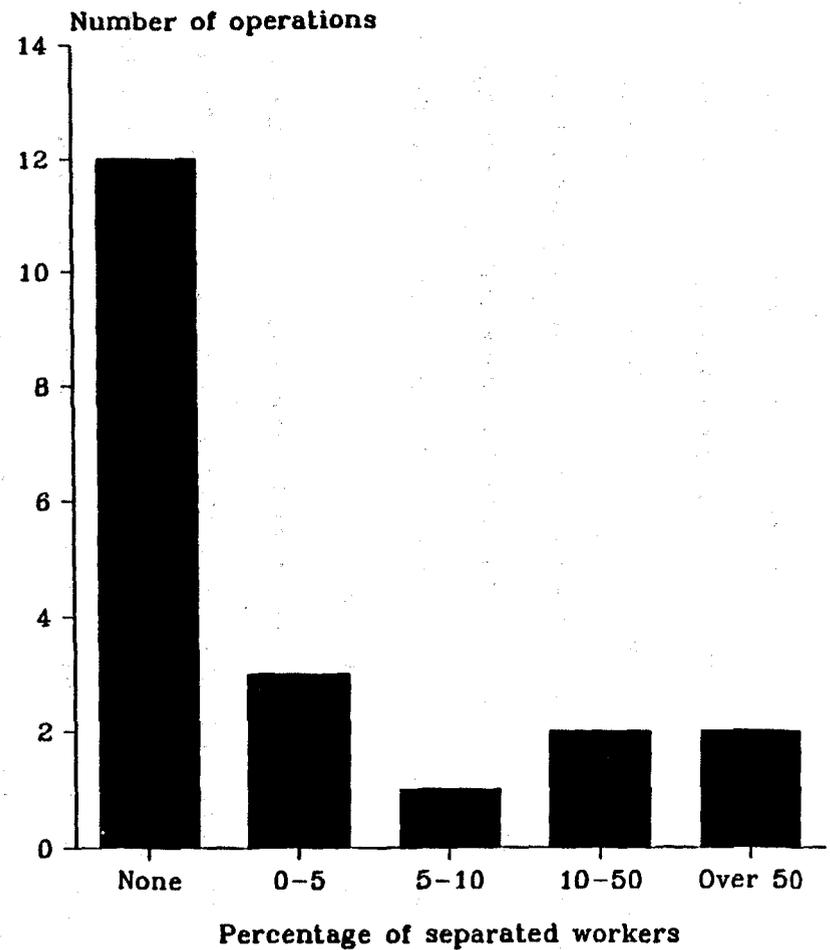
<sup>5</sup> These operations are as follows: Ethiopia (military), Ghana (civil service), Kenya (civil service), Malawi (civil service), Namibia (military), Sierra Leone (civil service), Uganda (military), Argentina (public enterprises and federal administration), Bolivia (mining), Peru (public sector), Bangladesh (jute sector), China (Shengyang region), the Lao People's Democratic Republic (civil service) and Pakistan (public enterprise).

**Figure 1a**  
**Break-even Period**



Note: Calculated as number of years for which present value of savings equals retrenchment cost, with 10% discount rate.

**Figure 1b**  
**Workers Re-hired**



Source: Haltiwanger and Singh (1997)

operations was remarkably good. The average break-even period was 2 years and four months, and it exceeded 4 years in less than 10 percent of the cases. Few investment projects display such high financial returns. However, these results should come as no surprise. If, say, a couple of years of salary are offered to whoever is willing to leave the public sector, as is often the case in practice, the up front spending is recovered under the form of a lower wage bill in a mere 2 years. But this calculation does not tell whether the workers who took this offer and left the public sector were really redundant.

Economic returns to downsizing are much harder to evaluate than financial returns. Haltiwanger and Singh provide an indirect measure of economic returns, which is the percentage of the displaced workers who were subsequently re-hired by the restructuring agencies or state-owned enterprises. Note that re-hires are different from new hires. The latter are not necessarily an indication of failure, because the new recruits may have skills that were missing among the displaced workers. Re-hires, in contrast, indicate a poorly handled downsizing process. In the best case, they imply that workers who were essential to the operation of the restructured agencies or state-owned enterprises were mistakenly considered redundant. In the worst case, they suggest that workers who had no intention to leave the public sector were able to cash in golden handshakes. It is difficult to believe that downsizing projects characterized by incompetence (in the best case) or corruption (in the worst one) may have done a good job at reallocating workers based on their productivity in and out of the public sector. Other things equal, a high percentage of displaced workers re-hired can therefore be seen as an indication of low economic returns to downsizing.

The percentage of displaced workers who were subsequently re-hired in the downsizing operations surveyed by Haltiwanger and Singh is shown in Figure 1b. These percentages refer to

the 20 operations for which the required information was available.<sup>6</sup> According to the figure, re-hiring was observed in 40 percent of the operations, and was substantial in 20 percent of them. If anything, these results under-estimate the extent of labor misallocation. In many cases re-hiring was forbidden, to prevent the displaced workers from abusing the system by getting a golden handshake first and returning to their jobs later. Consequently, the fact that 60 percent of the operations display no re-hiring does not imply that essential workers did not leave. Moreover, re-hiring provides no information on a second type of error, which consists of retaining public sector workers who have low productivity. This second type of error is likely to be present even in programs that display no re-hiring at all. Figure 1b thus suggests that economic returns to downsizing may have been low.

The contrast between remarkably high financial returns and relatively low economic returns should be a warning for policy makers and task managers. The inability to distinguish between these two indicators may give rise to an excessively upbeat assessment of the potential gains from downsizing. The problem is economic returns are much harder to measure in downsizing projects than in standard investment projects. In the latter, the difference between financial and economic returns arises from the different valuation of output prices and input costs in the presence of market distortions (Squire, 1989). For instance, investing in an activity protected by import tariffs may yield high financial returns but low or even negative economic returns. The gap between the two assessments stems from the use of different prices to value the output flow created by the investment project. The tariff-inclusive price is appropriate for the

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<sup>6</sup> These operations are as follows: Burkina Faso (railways), Cape Verde (public enterprises), Ethiopia (military), Namibia (military), Sierra Leone (civil service), Uganda (military), Argentina (public enterprises and federal administration), Bolivia (mining), Brazil (civil service), Chile (public sector), Colombia (public sector), Ecuador (civil service), Mexico (ministry of trade), Peru (public sector and tax administration), Bangladesh (jute sector), China (Shengyang region), India (public enterprises) and the former Yugoslav Republic of Macedonia (public enterprise).

financial appraisal, while the international price needs to be used for the economic appraisal. But apart from this difference in valuation, the items involved in the two appraisals are basically the same in standard investment projects. This is not true in the case of downsizing projects. Hence the need for an appropriate conceptual framework.

#### 4. Assessing the Extent of Redundancies

Even if the individual productivity of all public sector workers was perfectly observable, as will be assumed in this section, identifying the redundant workers would not be an easy task. As it will become evident below, the restructuring agency or enterprise may get rid of some public sector workers who are not redundant from a social perspective, or retain workers who would actually contribute more to society out of the public sector. This section analyzes the reasons for these discrepancies in the assessment of labor redundancies or, equivalently, for the gap between financial and economic returns to downsizing. The goal of this analysis is to identify the information set needed to appraise a downsizing project from the economic point of view, and not just from the financial point of view.<sup>7</sup>

##### *An Example*

Consider a government agency or state-owned enterprise which is suddenly given the opportunity to get rid of some or all of its initial labor force  $L_0$ . The problem faced by this

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<sup>7</sup> The chosen approach goes in the direction of reviving project appraisal in the evaluation of economic policies in developing countries (see Devarajan *et al.*, 1995).

agency or enterprise is to decide who, among the  $L_0$  workers, should go. In what follows this will be called the targeting problem.

In the simplest case, all of the  $L_0$  workers would make the same contribution to aggregate welfare if they were to move to the private sector.<sup>8</sup> Assuming an efficient labor market, that contribution would be equal to the prevailing private sector wage  $E_0$ , because the latter reflects the marginal productivity of labor out of the agency or enterprise. Suppose first that the wage paid by the agency or enterprise verifies  $W_0 = E_0$ . Over-staffing implies that the public sector productivity  $Y$  of some of the  $L_0$  workers is less than  $W_0$ . In Figure 2a, all workers in the agency or enterprise are ranked by decreasing level of public sector productivity. The  $L_1$  best performing workers produce more than they cost to the agency or enterprise ( $Y > W_0$ ). The remaining  $L_0 - L_1$  workers, however, cost more than they contribute to its output.

Before analyzing whether the  $L_0 - L_1$  least productive workers are redundant from the social point of view, it may be useful to discuss Figure 2a in more detail. The public sector productivity schedule represented in this figure admits two different interpretations. The most straightforward one is as a labor demand curve. If an increasing number of identical workers are combined with a given amount of capital, the value added by each additional worker gradually decreases. Another interpretation is in terms of heterogeneous individual productivity. If the government agency or state-owned enterprise is not good at monitoring effort, the value added by the laziest workers can be expected to be lower than that of the hardest-working ones, even when all of them are combined with the same amount of capital (say, a desk and a chair each).

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<sup>8</sup> The analysis remains valid in the case of agencies or enterprises characterized by heterogeneous personnel provided that their labor force is first disaggregated into smaller clusters of relatively similar workers.

Figure 2a  
Labor Productivity

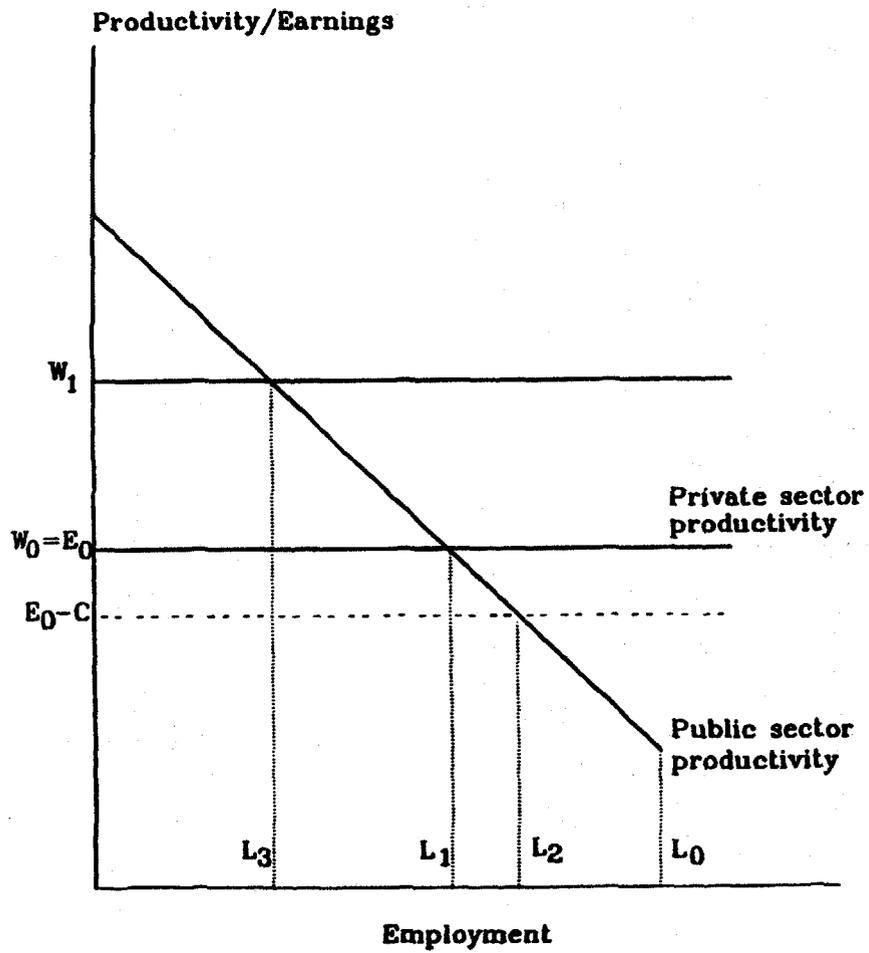
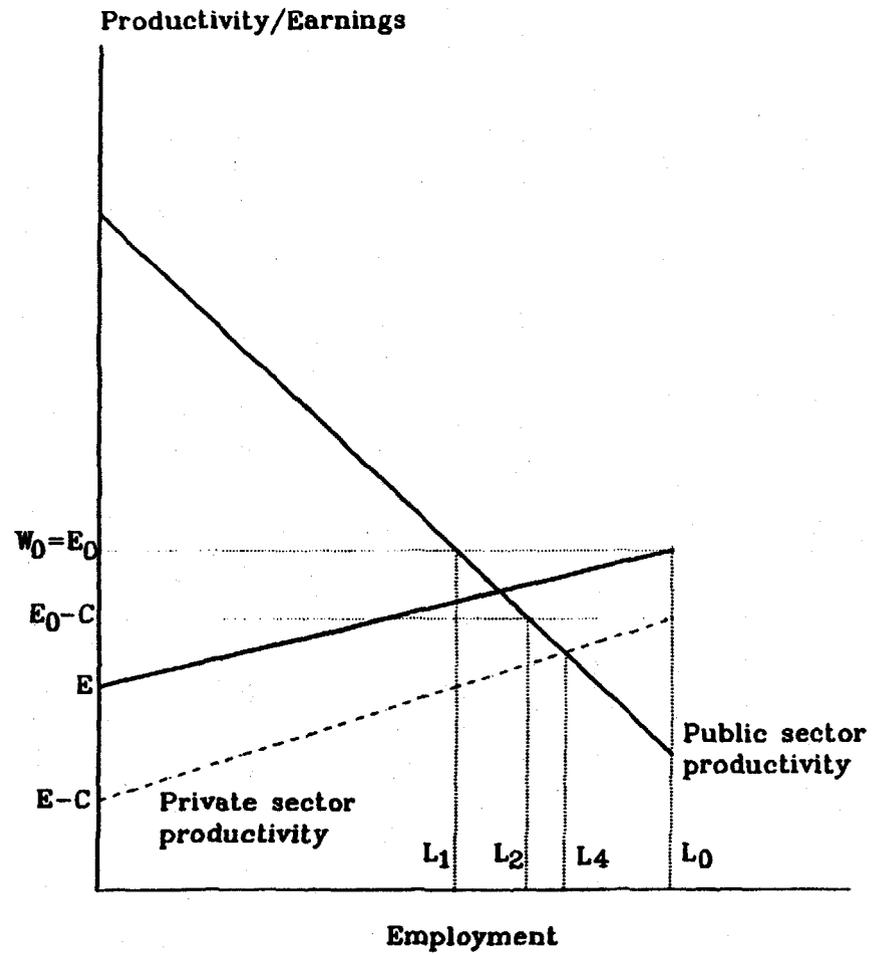


Figure 2b  
Productive Externalities



This second interpretation will be more useful when dealing with the adverse selection problem, in the next section, while the first one is more appropriate in the present context.<sup>9</sup>

Another important aspect of Figure 2a has to do with measurement units. Production and earnings per worker are flows that can be measured over various periods of time, such as a month or a year. Displacement, by contrast, is a once-and-for-all event. But for the assessment of economic returns to be feasible, it is necessary to measure all costs and benefits in a consistent way. More specifically, when an agency or enterprise decides to separate a worker, it weighs the up front cost in terms of severance pay, training and the like against the net burden the worker would represent if he or she was to stay. The appropriate period to measure this burden is the expected life of the labor contract, i.e. the number of years until the worker quits, retires or dies. Therefore, this is the period the production and earnings variables in Figure 2a should refer to. For example,  $Y$  and  $W_0$  should be interpreted as the present value of all of the future worker's output and labor earnings, respectively, if he or she was to stay in the public sector. Similarly,  $E_0$  would represent the present value of the earnings the worker would generate over the same period of time if he or she was to leave the public sector.

Not all of the  $L_0 - L_1$  workers whose productivity  $Y$  is lower than their wage  $W_0$  are necessarily redundant from the economic point of view. An important reason why they may not be is the existence of transition costs. It usually takes some time for a displaced worker to land a new job. Therefore, public sector output  $Y$  should not be compared to private sector output  $E_0$ , but rather to  $E_0 - C$ , where  $C$  is the foregone output during the transition to a new job. For instance, if the displaced worker is ten years younger than the legal retirement age, and he or she may spend one year unemployed before getting a new job, the transition cost is roughly  $C =$

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<sup>9</sup> In some agencies or enterprises, labor productivity may verify  $Y < E_0$  for all  $L$ . While the discussion ignores this extreme possibility, its analysis is relatively straightforward within the proposed framework.

$E_0/10$ . In terms of Figure 2a, a strictly positive transition cost  $C$  implies that there are  $L_0 - L_2$  redundant workers from the social point of view, instead of  $L_0 - L_1$ .

The socially optimal extent of downsizing is also affected by the potential earnings gap between public and private sector jobs. So far, the analysis was carried out under the assumption that  $W_0 = E_0$ . However, the largest redundancies are usually found at low skill levels, and because of its more egalitarian nature the public sector tends to reward low-skill workers more than the private sector (more on this issue in section 6). The implications of this earnings gap between public and private sector jobs are illustrated in Figure 2a. Assume that the wage in the public sector is  $W_1 > E_0$ . If the restructuring agency or enterprise could reduce its employment, but could not change its pay scale, its optimal decision would be to get rid of the  $L_0 - L_3$  least productive workers. The extent of downsizing would be larger the wider the gap between public and private sector wages. But some of the displaced public sector workers (those in the  $L_2 - L_3$  range in the figure) cannot be considered redundant, given that their productivity  $Y$  in the public sector is higher than their net output  $E_0 - C$  out of it. The premium earned by public sector workers thus leads to excess downsizing.

In the simple case considered so far, the right extent of downsizing could be attained if the cost of separating a worker, from the perspective of the agency or enterprise, was equal to the loss the worker would experience as a result of separation. From the worker's perspective, this loss is made of two components: the earnings foregone in the transition to a new job  $C$ , and the permanent earnings loss,  $W - E$ . From the point of view of the agency or enterprise, in turn, the cost of separating a worker includes severance pay, training expenditures, allowances for relocation and the like. For simplicity, in what follows this cost will be identified as severance pay, or  $S$  for short. In making its retrenchment decision, the agency or enterprise weighs the cost  $W - Y$  of retaining a redundant worker against the cost  $S$  of getting rid of him or her. But if the

cost of displacement was such that  $S = C + W - E$ , this comparison would lead to the displacement of all workers for whom  $Y < E - C$ , which is the socially optimal decision.

Severance pay may be a very imperfect way to make the agency or enterprise internalize the effects of downsizing though. This is because the severance pay burden tends to be quite different from the loss experienced by displaced workers. For example, over-compensation tends to be common in programs relying on voluntary separations (more on this issue in section 6). More importantly, whatever the amount of compensation actually received by the workers, the burden may be borne by other government bodies. For instance, from the point of view of the restructuring agency or enterprise the separation cost is equal to zero when compensation is paid out of the general budget, or when early retirement mechanisms are used (more on this in section 7). It is therefore important to develop the appropriate tools to evaluate the economic returns to downsizing in each case, regardless of the amount and source of the compensation received by the workers.

#### *A Shadow Price Approach*

The possibility of a wrong extent of downsizing is an illustration of the second-best principle. The initial situation of the restructuring agency or enterprise is one where several distortions and imperfections prevail. Over-staffing is one among them. The discussion in the previous section highlighted two other distortions and imperfections: a “wrong” pay scale in the public sector and transition costs when moving out of it. Product markets may be distorted too, as when trade barriers or legal monopolies protect state-owned enterprises. Last but not least, public sector downsizing often creates fiscal externalities, and sometimes leads to productive

externalities. Downsizing operations often tackle one of these distortions and imperfections only, namely over-staffing. But this may not result in improved economic efficiency.

The first-best solution would of course be to remove all distortions simultaneously. There is clearly no point in keeping product market barriers, or in paying relatively unskilled government employees more than they would earn in the private sector. Deregulation and privatization would actually go a long way towards removing these distortions, so that downsizing should be better let to the new private managers whenever possible, as will be argued in section 7. The first-best solution may, however, be unattainable. Privatization may not be advisable on economic grounds, or may be unfeasible on political grounds. Modifying the pay scales of the public sector may be out of reach for specific agencies or enterprises. And there are some imperfections that cannot be easily removed, as is the case for the cost of changing jobs, or for the fiscal and productive externalities from downsizing.

The second-best solution is to assess labor redundancies based on shadow, rather than actual prices.<sup>10</sup> In the simple example considered in the previous section, the shadow price of labor  $W^*$  is equal to the wage level that would lead to the socially optimal extent of downsizing. This shadow price verifies:

$$W^* = (1 - u_0)E_0 \quad (1)$$

where  $u_0E_0 = C$  is the transition cost. Note that  $u_0$  can be interpreted as an unemployment rate, to the extent that it measures the fraction of his or her time a displaced worker may spend out of

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<sup>10</sup> It could be objected that no one actually uses shadow prices when appraising investment projects, and the same should be expected in the case of downsizing projects. However, the main merit of the shadow pricing approach lies on the conceptual structure it provides to identify and roughly quantify the side-effects of projects, which are not always apparent.

a job. All of the public sector workers whose productivity  $Y$  is higher than  $W^*$  should be retained, even if this productivity is such that  $Y < W$ . The remaining public sector workers are redundant from the social point of view, even if  $Y > W$ .

The expression above cannot be used as such when product markets are not competitive though. If the restructuring enterprise is protected by significant trade barriers or by a legal monopoly, labor productivity  $Y$  may appear to be high when evaluated at domestic prices but actually be quite low if measured at comparable international prices. Since there is no point in using scarce resources to produce goods that could be obtained at a lower cost elsewhere, the shadow price of labor in equation (1) should be compared to labor productivity measured at international prices,  $Y^*$ , defined as:

$$Y^* = \frac{Y}{1 + g} \quad (2)$$

where  $g$  measures the gap between domestic and international prices (in the simplest case,  $g$  would be equal to the tariff rate applicable to the enterprise's output).

An adjustment to the basic formula in equation (1) is also needed when some of the displaced workers may withdraw from the labor force after separation. This is what happens when the reduction in public sector employment is achieved through early retirement programs. Labor force withdrawal may also result from the difficulty to find new jobs, or from the unappealing nature of the available jobs. Consider the case of female employees. Because gender disparities tend to be smaller in the public sector than out of it, these employees may face a significant earnings loss when moving to private sector jobs. And they may also have to adjust to less flexible working hours, as well as to lower family-related benefits (e.g. shorter maternity

and parental leave). For many of these female employees, becoming housewives may therefore seem a more rewarding alternative than working in the private sector.

Does the possibility of a labor force withdrawal affect the assessment of redundancies? The productivity of the workers who retire or become housewives after separation is of course equal to zero, and not to  $(1 - u_0)E_0$  as was assumed before. On the other hand, their productivity before separation was probably small, but nevertheless positive. So, these workers contribute more to total output in the public sector than out of it, which in turn may suggest that they are not redundant. But this conclusion is not warranted, because the welfare of the displaced workers who withdraw from the labor force is not equal to zero. In fact, it is higher than the alternative earnings  $(1 - u_0)E_0$ . It is precisely because it is higher that these workers withdraw from the labor force after separation. As long as their welfare when they are out of the labor force is higher than their contribution to total output when they are in the public sector, these workers can be considered redundant.

A more general expression for the shadow price of labor, taking into account the fact that some of the displaced workers may withdraw from the labor force after separation, is given by:

$$W^* = p(1 - u_0)E_0 + (1 - p)R \quad (3)$$

where  $p$  is the labor force participation rate of displaced workers after separation and  $R$  is their reservation wage or, equivalently, their welfare while inactive. Labor force withdrawal implies that  $R > (1 - u_0)E_0$ . It is straightforward to verify that this formula is identical to the previous one if  $p = 1$ . But if  $p < 1$  the shadow price of labor is higher than in equation (1), and the socially optimal extent of downsizing is smaller.

When workers in the restructuring agency or enterprise have different characteristics, the shadow price of labor should be estimated for smaller clusters of homogeneous workers. Private

sector earnings, reservation wages, and unemployment and participation rates tend to vary with education, experience, gender, age and the like, as shown by uncountable labor market studies. These are in fact the studies that need to be used to replace the variables in equation (3) by real numbers, thus allowing to estimate the appropriate shadow prices of labor for workers with given characteristics. Note however that the use of information on some of those characteristics, such as gender and age, could be ruled out in specific countries where it would be seen as a discriminatory practice.

### *Externalities from Downsizing*

The analysis of redundancies has focused so far on the displaced workers, gauging whether they may contribute more to aggregate welfare out of the public sector than in it. But the downsizing process may also affect the rest of the economy. One way it may do it is through its fiscal implications. The restructuring agency or enterprise usually gets some or all of its resources from the budget. For instance, in most government services cost recovery tends to be limited, or directly non-existent. Similarly, state-owned enterprises are often supported by explicit subsidies or soft budget constraints. Conversely some state-owned enterprises actually transfer resources to the budget. Whatever their sign, these transfers imply that downsizing modifies the equilibrium level of taxes.

Let  $T$  be the net transfer per worker from the general budget to the restructuring agency or enterprise, with  $T < 0$  if the latter runs a surplus. Much the same as the public sector wage  $W$ , the transfer  $T$  is defined over the expected life of the labor contract. However,  $T$  is not necessarily equal to  $W$ . It may be lower than  $W$  when the agency or enterprise sells the goods or services it produces to the public, or higher than  $W$  when significant overheads exist. An

example of those overheads are the social services usually provided by state-owned enterprises to their workers in transition economies. Moreover, the transfer  $T$  is not necessarily the same for all of the workers in the restructuring agency or enterprise. For instance,  $T$  may be positive as long as there are large redundancies, but negative at low employment levels.

A clear distinction should be made between the amount of resources received (contributed) by the restructuring agency or enterprise and the cost (value) of these resources for the rest of society. There is indeed no such a thing as a costless transfer of resources. For every dollar of revenue raised by the government through taxation there is a loss of  $b$  dollars in administrative costs and in inefficiencies resulting from distortionary taxation. And in developing countries,  $b$  can be quite large. In India, for example, it was estimated at around 0.8, which means that 80 cents of output are lost per dollar of revenue raised (Ahmad and Stern, 1987). Moreover, some state-owned enterprises do not need large subsidies because they are in a monopoly situation, and can extract rent from their customers. In their case, the inefficiencies resulting from monopoly power should be counted as part of the loss  $b$ .

Fiscal externalities represent one additional reason why the restructuring agency or enterprise may make a wrong retrenchment decision. Assume for simplicity that displaced workers do not withdraw from the labor force after separation, so that  $p = 1$ . Under this assumption, public sector productivity  $Y^*$  should be compared to the shadow price of labor  $W^*$ , now defined as follows:

$$W^* = (1 - u_0)E_0 + b(T - S) \quad (4)$$

where  $T - S$  represents the net fiscal savings from downsizing. Note that when taxes resemble the lump-sum transfers of textbook analyses,  $b$  is equal to zero and the shadow price of labor is the same as in equation (1).

This new expression of the shadow price of labor is helpful to clarify the link between financial and economic returns to downsizing. Financial returns are positive when the reduction in government transfers is larger than the up front cost of downsizing, i.e. when  $T > S$ . Economic returns are positive when productivity out of the public sector is higher than in it, i.e. when  $W^* > Y^*$ . From equation (4), it follows that the two indicators increase with  $T$  and decrease with  $S$ . However, in spite of their joint variation these two indicators may have opposite signs. In terms of equation (4),  $T - S$  may be positive and  $W^* - Y^*$  negative.

The possibility of a downsizing project being assessed differently on financial and economic grounds is illustrated by the study prepared by Ruppert (1997) for the PSR project. This study refers to the unemployment insurance mechanism set up by Algeria in 1994 to deal with labor redundancies in state-owned enterprises. The mechanism accomplishes significant savings  $T$  at a relatively low cost  $S$ , so that its financial returns are high. However, the fact that the Algerian unemployment rate is in the order of 28 percent suggests that there is a substantial earnings gap between “good” public sector jobs and “bad” informal sector jobs. In terms of equation (4),  $E_0$  is much smaller than  $W_0$  and, as a result,  $W^*$  is smaller than  $W_0$  too. State-owned enterprises could then shed more labor than is socially optimal. As a result, the economic returns of the unemployment insurance mechanism could be low, or even negative.

Public sector downsizing may affect the rest of the economy not only through its fiscal impact, but also because of its direct impact on private sector output. An obvious illustration of this productive externality is provided by the one-company town setting. The main feature of this setting is the large share of jobs in a particular region (the town, for short) provided by the restructuring agency or enterprise (the company). As a result, many of the other jobs in the town also depend on employment and wage levels in the company. For instance, the company’s employees are probably the most important customers of the town’s private shops. A drastic

employment reduction in the company is therefore likely to depress private sector activity in the town in a very Keynesian way. It follows that the level of earnings and productivity  $E$  out of the public sector cannot be taken as given.

Productive externalities from downsizing may also arise at the nation-wide level. Mass retrenchment programs, affecting a substantial fraction of the urban labor force, can increase unemployment rates over long periods of time. For instance, in some sub-Saharan African countries, where the public sector represents a large share of the modern economy, downsizing may depress economic activity in the short run. But productive externalities of this sort may also arise in more developed economies, as suggested by the significant increase in unemployment rates associated with public sector downsizing in Argentina. Which means that in cases of mass retrenchment the transition cost  $C$  cannot be taken as given either.

The implications of productive externalities for public sector downsizing can be illustrated by means of a diagram. In Figure 2b, the levels of both  $E$  and  $E - C$  decrease as the number of public sector workers contracts. The reduction is larger the higher the share of the relevant labor force directly affected by the downsizing. Let  $e$  be the reduction in  $E - C$ , in percentage, for every one percent of the labor force  $N$  reallocated out of the public sector. Parameter  $e$  summarizes the combined effects of downsizing on the private sector earnings of those who hold a job, and on the unemployment spells of those who do not. If this reduction in  $E - C$  affected only the displaced workers, but not those who were already out of the public sector, the optimal decision would be to get rid of the least productive  $L_0 - L_4$  workers.

The optimal extent of downsizing would be smaller than that if the reduction in private sector earnings and productivity affected in the same way the workers who are displaced from the public sector and those who were out of it to begin with. In this case, the shadow price of labor  $W^*$  would become:

$$W^* = \left(1 - u_0 - e \cdot \frac{N - L_0}{N}\right) E_0 + b(T - S) \quad (5)$$

(see Appendix A for the derivation of this expression). When  $e = 0$ , the shadow price of labor is the same as in equation (4). But in the presence of significant productive externalities  $W^*$  is lower, and the socially optimal extent of downsizing smaller, than before.

It may of course be difficult to gauge how large parameter  $e$  is in practice. Clearly, its lower bound is zero. In most downsizing operations, productive externalities are probably too small to affect in any way the optimal extent of labor shedding. At the other end, the upper bound of parameter  $e$  is almost certainly associated with the one-company town setting. A study for the PSR project, by Rama and Scott (1997), focuses on this upper bound. Using individual data from a recently completed household survey for Kazakstan, this study evaluates how individual earnings in a district are affected by the share of the district's population employed by its main company. If that share was to shrink by 10 percent, the study finds, individual earnings in the district would decline by about 5 percent.

A third potential externality from public sector retrenchment is associated with private transfers between households. It is sometimes claimed that because of these transfers, the earnings of several households depend on one single public sector wage. This is the case in many Sub-Saharan African countries, where extended families are common. At a first glance, these transfers create a situation that resembles the one-company town setting: as employment falls in the restructuring agency or enterprise, the earnings of those who are out of it fall too. So, should the extent of downsizing be smaller the larger the fraction of the initial wage bill  $L_0 W_0$  that is transferred to other households? The short answer is no. Private transfers may affect the earnings of those who are out of the public sector, but not their productivity. In the one-company town setting, local shops go out of business as public sector employees lose their jobs.

In the extended family setting, by contrast, the peasant relatives of these employees keep farming their land as before.<sup>11</sup> To the extent that labor productivity out of the public sector remains unaffected, the shadow price of labor  $W^*$  should be the one in equation (4). Private transfers may provide a legitimate case to fully compensate displaced public sector workers though, as will be discussed in section 6.

## 5. The Adverse Selection Problem

In the public sector, and more specifically in government administration, individual productivity may be difficult to measure. Labor redundancies stem in part from this difficulty. Troubles start at the recruitment stage, where the weaknesses of screening mechanisms, coupled with widespread political patronage and cronyism, allow large numbers of hardly competent or devoted individuals to land a public sector job. But they get much worse at the monitoring stage, where seniority-based promotions and an almost complete job security usually suppress any incentive for good performance. Lazy public sector workers face virtually no risk of being caught shirking, and even if this was to happen, they would face virtually no risk of being fired. Under these circumstances, only those public sector workers who have a high work ethic are likely to be productive (see Shapiro and Stiglitz, 1984).

When individual productivity is difficult to measure, the approach in the previous two sections cannot be applied. Evaluating the shadow price of labor  $W^*$  is clearly not enough to

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<sup>11</sup> For the sake of simplicity, the impact of lower transfers on labor supply is ignored here. Strictly speaking, the employees' relatives are likely to work harder, and therefore to produce more, to partially compensate for the decline in their earnings. But this should be a second-order effect, while the Keynesian impact on economic activity in the one-company town setting is a first-order effect.

decide who is redundant and who is not if, on the other hand, information on Y is missing. In practice, other approaches are used to carry out the downsizing. Typically, an estimate of the percentage of redundant workers is first produced by comparing the employment level in the agency or enterprise to some best-practice benchmark. Then, severance pay is offered to those willing to resign their public sector job voluntarily. An obvious problem with this approach is that the percentage of workers accepting the offer may differ from the estimated percentage of redundant workers. But a far more serious problem is the potentially “wrong” composition of stayers and leavers.

### *An Example*

Assume all public sector employees are identical, except in their aversion to effort.<sup>12</sup> For simplicity, suppose that there are only two levels of effort aversion, so that some individuals are lazy while others are hard workers. As will be shown below, the results would be similar if there was a continuum of effort aversion levels instead. Assume also that private sector firms are effective at monitoring effort, so that they can extract the same output level from both types of employees. The public sector, in contrast, is much less effective at monitoring, so that lazy employees shirk. Ideally, these employees should be separated from their jobs. Public sector output would not suffer much, because they do not do much in it. But private sector output

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<sup>12</sup> This section draws from the simple model in Rama (1989). Other models of the public sector assume that workers differ in their tolerance to corrupt behavior (see Van Rijckeghem and Weder, 1997). But focusing on effort aversion only simplifies the analysis. As in the case with complete information, if workers differ in their observable dimensions, the labor force should first be disaggregated into smaller clusters for the analysis to apply.

would increase, because private sector firms know how to make them work. The problem is of course how to identify the lazy employees.

If severance pay was used in this context to induce voluntary separations, hard working employees would be the first ones to go, while lazy employees would be the last ones. To understand why, it is first necessary to compare the welfare loss of both types of employees in case of separation. In the simple example considered, both types of employees would have the same earnings in the public sector. Output being difficult to measure, public sector pay tends to be based on observable characteristics, such as education and seniority, and both types of workers are supposed to be identical in this respect. Moreover, both types of employees would have the same earnings out of the public sector too. Private sector pay depends on productivity, and private sector monitoring is assumed to be effective enough to achieve a consistent productivity across workers. The change in earnings is therefore the same for both types of employees. But the change in effort is not. The effort level remains unchanged for hard working employees, while it increases substantially for lazy ones. The total welfare loss is therefore larger for the latter.

The extent and composition of downsizing depends on the amount of severance offered to induce voluntary departures. In the simple example considered, there are three possible outcomes. First, the package offered could be less than the earnings loss of the hard working employees. None of them would then leave. But in addition, none of the lazy ones would leave either, because their welfare loss is even larger. At the other end, the package could be generous enough to offset the welfare loss of lazy public employees. Since the loss of the hard working employees is smaller, all employees would then accept the offer and leave. In between these two extremes, the package could be higher than the welfare loss of hard working employees, but lower than that of lazy employees. In this case, only the latter would stay.

Economic returns to downsizing differ in each of these three alternatives, but no ranking is valid under all circumstances, as shown in the study prepared by Levy and McLean (1997) for the PSR project. In the second and third cases, private sector output increases while public sector output decreases. Both the increase in private sector output and the decline in public sector output are larger in the second case, because more people are reallocated across sectors. The decline in public sector output could be similar in the second and third cases if the public sector productivity of lazy workers was very low. Which in turn implies that economic returns in the second case could be higher than in the third one. But they could be negative in both cases, which implies that offering severance across the board may reduce economic efficiency.

The problem is similar under more general assumptions. For instance, there could be a continuum of effort aversion levels, instead of only two. In this case, much the same as in Figures 2a and 2b, all public sector workers could be ranked according to their productivity, except that this productivity would not be observable to an outsider. Under the assumptions adopted, public sector productivity would decrease with effort aversion, while the loss from displacement would increase. As before, a severance pay offer made across the board could be rejected by all of the workers (including the hardest working one) if it was too low, or accepted by all of them (including the laziest one) if it was too high. The only difference with the previous example concerns the third case, where some workers leave and others stay. Now, the fraction of workers leaving would vary with the amount of severance offered. But that fraction would always include the hardest working individuals.

### *Using Self-Selection Mechanisms*

Several downsizing mechanisms have been proposed for the case where individual productivity is unobservable. Some of these mechanisms may mitigate the adverse selection problem, whereas others are probably ineffective. A first possibility is to make several severance pay offers over time, starting with a low level of compensation and then gradually increasing it until the percentage of workers who accept the offer matches the estimated redundancy. The main merit of this mechanism is to avoid the two extreme cases considered above, where none or all of the workers in the agency or enterprise are willing to resign. Moreover, a sequence of offers would reduce the total cost of the operation, hence increase its financial and economic returns. A single offer implies that the cost per displaced worker is the same for all of them, whereas a sequence of offers allows to pay less to the first workers willing to leave. But the sequencing of severance pay offers has drawbacks too.

The first and most obvious drawback is that sequencing does nothing to remedy the adverse selection problem. The first workers to accept severance pay and leave are still the less effort averse, because they are the ones with less to lose from separation. For any given percentage of workers separated, both a single severance pay offer and a sequence of offers over time would actually lead to the departure of exactly the same workers. The second shortcoming of sequencing is that it is not credible. The first time this mechanism is used workers may ignore that higher offers will be made subsequently. If they knew it, they would probably wait. But if sequencing was used in a systematic manner, or recommended by multilateral organizations like the World Bank, public sector workers would learn about it. And the expected reduction in the cost of downsizing would vanish along with the "surprise" effect.

A second proposed remedy to the adverse selection problem is the randomization of job separations (Diwan, 1993). In this case, leavers are not selected based on their acceptance of a severance pay offer, but rather on random trials, with the probability of losing their jobs being equal to the estimated percentage of redundant workers. The main merit of this alternative is to make the composition of leavers resemble that of employment in the restructuring agency or enterprise. On average, the proportion of lazy workers would be the same among stayers and leavers. This alternative mechanism thus achieves an unambiguous increase in the economic returns to downsizing, compared to the offering of severance pay across the board. However, shutting down the agency or enterprise, or leaving it as is, may still be better alternatives than partial downsizing, even randomized.

As is typically the case when there is private information, the most useful mechanisms are those leading the workers to “reveal” whether they are lazy or not. Two of these mechanisms have been proposed. The first one involves an auction. Assume that all workers in the restructuring agency or enterprise are given the possibility to indicate, in a sealed envelope, the amount of severance they would require to voluntarily quit their public sector jobs. No guarantee is provided that a severance pay package will be offered to every individual worker. But for those who receive an offer, a promise is made that the offer will match whatever amount is indicated in the sealed envelope. To minimize the potential for collusion, individual bids remain confidential, as do the payments made to those whose bids are accepted (see Levy and McLean, 1997, for a more formal discussion).

In the simple example where workers differ in their effort aversion, the highest bids would correspond to the laziest workers, because they are the ones who would suffer the most from separation. But these are also the workers that need to be reallocated to the private sector, so that they should be the ones to get severance pay. Which in turn makes the weaknesses of this

alternative transparent. To begin with, offering severance pay to the workers who post the highest bids could be seen as deeply unfair by those remaining in the public sector. Morale and work effort would suffer accordingly, and the expected efficiency gains would fail to materialize. But a more important problem is the lack of credibility of this alternative. As for sequencing, if auctioning was used in a systematic manner, or recommended by the World Bank, workers would learn about it and overbid in the hope of getting golden handshakes. The information content of the bids would be lost, and public sector downsizing could end up being an outrageously expensive and inefficient endeavor.

The fourth and most interesting possibility involves the use of other self-selection mechanisms, which will be called menus for short. Much the same as severance pay offers, these other mechanisms allow identifying the hard working individuals. The main difference is they are designed in a way that creates an incentive for these individuals to remain in the public sector, rather than to quit. An example, related to the simple case in which public sector workers differ only in their effort aversion, may help illustrate the point. Because lazier workers stand to lose more in case of displacement, they are also more likely to value job security. As a result, an offer to relinquish tenure and switch to a better paid fix-term contract could interest the hard-working public sector employees, but look unattractive to the lazy ones. This kind of offer would thus achieve the goal of revealing the workers type and, in addition, create an incentive for the good ones to stay in the public sector.

The problem is of course what to do of the lazy workers, i.e. of those who do not accept the fix-term offer. In some cases it may be legally impossible to fire them. But even if it was, the prospects of being fired could make them amenable to accept the fix-term offer. The undesirable implication is that the acceptance of this offer would not reveal the true type of the workers anymore. It may therefore be useful to combine the fix-term offer with a standard

severance pay offer. If the amounts of severance pay and wage raise were appropriately chosen, hard working employees would want to switch to fix-term contracts, whereas lazy ones would prefer the severance pay offer. An illustration of this possibility is provided in Appendix B, by means of a simple analytical model.

Depending on the source of heterogeneity among workers, the menu could contain different options.<sup>13</sup> The central element of the menu approach is not the nature of the options offered, but rather the fact that these options create an incentive for the individuals who should quit the public sector to actually leave, and for the others to stay. Self-selection is thus used as a substitute for perfect information about the characteristics of the workers. Note that the use of self-selection mechanisms is a standard practice in many projects supported by multilateral organizations like the World Bank. Poverty alleviation efforts typically use mechanisms of this sort to make sure that only the most needy get transfers from the budget (see Grosh, 1994). But this approach has been neglected in the case of public sector downsizing. If anything, offering severance pay across the board is an example of how a self-selection mechanism can be used to achieve the wrong result.

## 6. The Over-Payment Problem

The rationale to compensate displaced workers stems primarily from the welfare loss they may experience as a result of displacement. The analysis in the previous sections highlighted several dimensions of that loss, including the gaps in earnings, stability and work effort between public and private sector jobs. In cases where public sector workers cannot be

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<sup>13</sup> The menu should in fact be part of a broader design of incentives. Interesting examples of incentive schemes for government administration are provided by Mookherjee (1997).

legally dismissed, any compensation that falls short of this welfare loss will fail to encourage their voluntary departure. But even in cases where dismissals are legally feasible, an insufficient compensation may make the restructuring program derail. Public sector workers are indeed among the most vocal and influential interest groups in any society. Finally, absent these legal and political constraints, compensation could also be justified on fairness grounds. After all, displaced workers stand to lose due to an unexpected change in economic policies.

Compensation may however contradict the broader objectives of economic policy reform in developing countries. Many efforts by multilateral organizations and donor countries are aimed at reorienting public expenditures towards the most needy. The rationale for these efforts is that the poor in general, and the rural poor in particular, have a disproportionately weak voice in the policy making process. Conditional lending and technical assistance seek to offset, to some extent, the influence of organized interest groups, among which public sector workers play a prominent role (see Rama and Tabellini, 1997). Consequently, there is some conflict between the efforts to tilt the budgetary process in favor of the poor, and the willingness to lend generous amounts of money to finance severance pay packages for workers who are less likely to be poor than the general population (see London Economics, 1996). It could even be argued that the past privileges of these workers represent an additional reason to stop transferring resources to them. From this perspective, no severance should be paid unless legal or political constraints make it absolutely necessary.

This conclusion may not be valid, however, when public sector workers share a significant portion of their earnings with their extended families, as is the case in some Sub-Saharan African countries. Private transfers imply that for each public sector job suppressed, several households are bound to experience a welfare loss. And some of those households were probably poor even before downsizing. However, private transfers also suggest that the

displaced public sector workers are likely to share the compensation they receive with their less fortunate relatives. In the extended family setting, compensating the displaced workers may therefore reduce the adverse impact of downsizing on poverty.

While the decision to pay severance should be made on a case-by-case basis, there are clearly no circumstances that would justify the over-compensation of displaced workers. Over-compensation is, however, a potential bias of downsizing operations. To some extent, such a bias is inevitable when downsizing is based on voluntary separations. Workers who are offered a compensation lower than the welfare loss they may experience will prefer to stay in the public sector. Workers who are offered more than they stand to lose, on the other hand, will accept the offer and leave. Therefore, mistakes in the direction of excessively low compensation have no practical implications, whereas mistakes in the direction of excessively high compensation materialize. Ill-designed compensation mechanisms exacerbate this second type of mistake.

### *An Example*

The most typical rule-of-thumb used to compensate displaced public sector workers is actually one of those ill-designed mechanisms. This rule-of-thumb is based on the public sector wage of the displaced workers at the time of separation. Usually, severance pay is set at the equivalent of several months or years of this wage. In some cases, the multiple increases with seniority.<sup>14</sup> Since seniority is one of the main determinants of promotion in the public sector, the result is a severance pay package that increases more than proportionally with the wage prior to displacement. But this is likely to be wrong. If the public sector wage is to be used as the main parameter to set severance pay (and this is a big if, as will be shown below) the amount of

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<sup>14</sup> For surveys of these rules-of-thumb, see Nunberg (1994) and Kikeri (1997).

compensation should probably decrease, rather than increase, with the wage level. A simple example can be used to explain why.

Assume that the public sector is more egalitarian than the private sector. As a result, the earnings of low-skill workers tend to be higher in the public sector than in the private sector, while the opposite holds true for high-skill workers. Typical earnings functions in and out of the public sector are represented by the solid schedules in Figure 3a.<sup>15</sup> An obvious question when looking at these schedules is why workers whose skills are above the cut-off point  $H_1$  stay in the public sector, given that they could earn more out of it. The answer is that public sector jobs reward their holders in more ways than one. Job security, a lower effort level, the possibility of moonlighting or even of taking bribes, and the power and prestige associated with the job are among those other rewards. Their cash equivalent should therefore be added to the visible component of public sector earnings. Which leads to the adjusted public sector earnings schedule in Figure 3a.

The welfare loss experienced by a displaced worker is represented by the vertical distance between the adjusted public sector earnings and the corresponding private sector earnings. This distance is called rent in what follows. As long as the public sector is more egalitarian than the private sector, this rent decreases with the skill level as shown by the downward-sloping schedule in Figure 3b. On the other hand, the rule-of-thumb typically used for compensation purposes implies that severance pay is proportional or more than proportional to the public sector wage. Since the latter increases in line with the skills level, so does severance pay, as shown by the upward-sloping schedule in Figure 3b. The cut-off skill level for

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<sup>15</sup> The relevant earnings include payments in kind as well as non-wage benefits (e.g. health insurance coverage). In terms of the analysis in section 4, public sector earnings would correspond to W and private sector earnings to E - C.

Figure 3a  
Earnings Functions

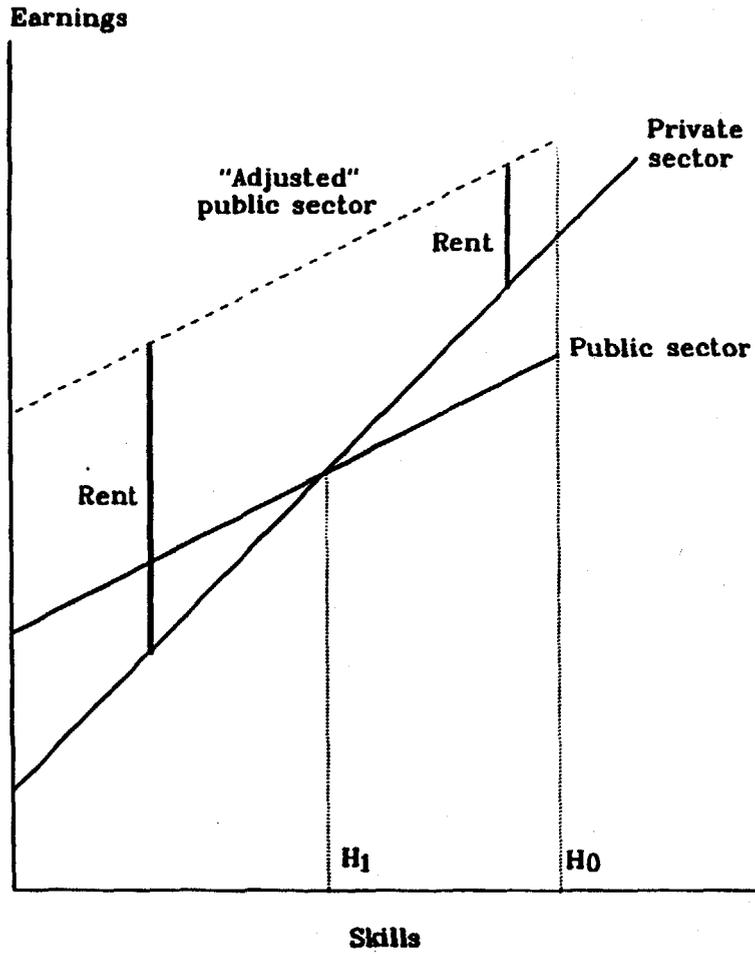
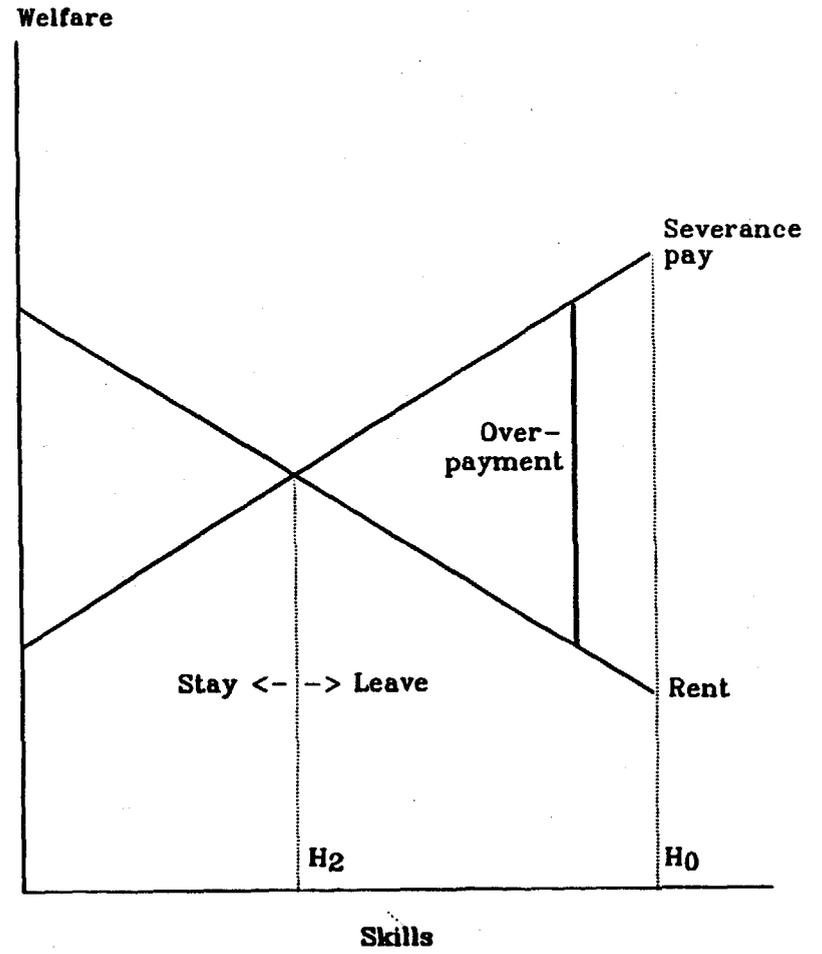


Figure 3b  
Welfare Levels



which compensation exactly offsets the welfare loss, identified as  $H_2$ , can be either higher or lower than  $H_1$ .

The rule-of-thumb typically used to compensate displaced workers therefore has two undesirable implications. First, it encourages the most skilled workers to leave the public sector. In terms of Figure 3b, those workers whose skills are above  $H_2$  accept the severance pay offer and leave, while those with skills below  $H_2$  reject it and stay. Over-staffing tends to be more prevalent at low-skill levels, however. Severance pay packages based on public sector wages thus tend to exacerbate the relative shortage of qualified personnel. The second undesirable implication is over-compensation. In terms of Figure 3b, anyone whose skills are strictly above  $H_2$  receives more in terms of severance pay than he or she loses as a result of displacement. Over-compensation is highest at the top of the hierarchy, but almost all of the workers who accept the severance pay package make a net gain out of the downsizing.

A comparison between the use of standard severance pay packages and previous efforts at cutting government expenditures may be warranted at this point. One of the most common criticisms to those efforts is that they have had an adverse impact on the effectiveness of governments (see van Ginneken, 1991, and Colclough, 1997, among others). By compressing the pay scale, it is claimed, budget cuts have encouraged skilled workers to leave, thus jeopardizing the ability of governments to deliver on basic services. And there is little doubt that better outcomes could have been achieved by getting rid of genuinely redundant public sector workers and offering better wages and working conditions to the others. But standard severance pay packages can lead to the departure of skilled public sector workers too, much the same as budget cuts did in the past, although probably in larger numbers.

### *Predicting Losses from Displacement*

The welfare loss a displaced worker experiences can be disaggregated into several components. One of them is the cost, in terms of foregone earnings, of finding a new job. A second component is the permanent loss in earnings and benefits associated with the switch from a public sector job to a private sector one.<sup>16</sup> And a third one is the permanent loss in more intangible benefits, such as higher employment stability or lower work effort. For workers moving from one private sector job to another, only the first component is likely to be relevant. But for workers moving out of the public sector, the other two may be much more sizable.

Consider the second component of the welfare loss, namely the present value of the change in earnings and benefits resulting from moving out of the public sector. It is widely accepted that earnings in and out of the public sector are functions of individual characteristics such as education, experience or gender. Denoting the observable characteristic  $h$  of individual  $i$  as  $X_h^i$ , the following earnings functions can be assumed:

$$W^i = a_{w0} + a_{w1} X_1^i + \dots + a_{wk} X_k^i + v_W^i \quad (6)$$

$$E^i = a_{E0} + a_{E1} X_1^i + \dots + a_{Ek} X_k^i + v_E^i \quad (7)$$

where the terms  $v_E^i$  and  $v_W^i$  capture the effect of characteristics other than  $X_1^i$  to  $X_k^i$  on private and public sector earnings respectively. While these other characteristics may not be observable, their effects on earnings in and out of the public sector should be correlated. For instance, more

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<sup>16</sup> For simplicity, it is assumed here that displaced workers do not withdraw from the labor force after separation. The logic would be similar in case of withdrawal, except that reservation wages (rather than private sector wages) should be considered.

talented people should make higher earnings, both in the public and in the private sector. This hypothesis can be written as follows:

$$v_E^i = r v_W^i + z^i \quad (8)$$

where  $r$  is a correlation coefficient and  $z^i$  is a stochastic disturbance.

If the amount of severance pay  $S^i$  offered to worker  $i$  was set so as to offset his or her earnings loss  $W^i - E^i$ , it should verify:

$$S^i = (ra_{w_0} - a_{e_0}) + (1-r) W^i + (ra_{w_1} - a_{e_1}) X_1^i + \dots + (ra_{w_k} - a_{e_k}) X_k^i - z^i \quad (9)$$

The earnings loss from displacement can thus be linked to the set of individual characteristics usually considered in earnings functions, enlarged so as to include the public sector wage before separation. The typical rules-of-thumb used to calculate severance pay implicitly assume that all of the  $ra_{w_h} - a_{e_h}$  terms in equation (9), with the possible exception of the one multiplying the seniority variable, are equal to zero. However, this assumption is not verified in practice.

Several empirical strategies have been used to evaluate the sign and order of magnitude of the coefficients in equation (9). The simplest one is based on the comparison of earnings before and after separation from the public sector. This is the strategy followed by Alderman *et al.* (1996) in the case of Ghana.<sup>17</sup> Their study estimated equation (9) for the change in earnings resulting from separation, but it implicitly imposed the restriction  $r = 1$ . This first strategy was also applied by two papers prepared for the PSR project. One of them focused on displaced central bank employees in Ecuador (Rama and MacIsaac, 1997) and the other one on cement and

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<sup>17</sup> For studies dealing with retrenchment in Ghana and other Sub-Saharan African countries see also Younger (1996) and some of the chapters in Lindauer and Nunberg (1994).

petrochemical workers in Turkey (Tansel, 1997). These two papers estimated unrestricted versions of equation (9).

A second empirical strategy is based on the comparison of earnings in and out of the public sector at the same point in time. One important merit of this strategy is that it can be implemented before any downsizing takes place, provided that a reliable data set on earnings and individual characteristics exists. This strategy was applied to the case of Egypt by Assaad (1997), in a paper prepared for the PSR project. In practice, the first step was to estimate equations (6) and (7) for public and private sector workers separately. Public sector earnings were then adjusted for the value of intangibles such as job security, lower effort and the like, much the same as in Figure 3a.<sup>18</sup> Finally, the present value of the difference between the adjusted public and private sector earnings until retirement was calculated for public sector workers with different observable characteristics.

The third strategy is to infer the earnings loss from the amount of severance pay that would make workers indifferent between staying in the public sector and leaving it. In analytical terms, this strategy amounts to estimating an adapted version of equation (9), where the change in well-being of displaced worker  $i$ , identified as  $\Delta B^i$ , verifies:

$$\Delta B^i = d_0 + d_1 X_1^i + \dots + d_k X_k^i + d_w W^i + d_s S^i + z^i \quad (10)$$

Although  $\Delta B^i$  itself may be unobservable, its sign may be revealed in several ways, as the discussion in the next paragraph will show. And as long as the  $d$  coefficients can be estimated,

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<sup>18</sup> In practice, public sector earnings were increased in the same proportion for all workers, up to the point where the expected value of  $W^i - E^i$  became non-negative for all of them.

the welfare loss from displacement can be measured as the value of  $S^i$  for which the expected change in well-being  $\Delta B^i$  is equal to zero.

This third strategy was implemented in three papers prepared for the PSR project. In a case study of downsizing in Argentina, Robbins (1996) used individual data on workers who were offered severance pay to voluntarily leave the public sector. Some of them accepted the offer, while others rejected it. Acceptance (rejection) indicates that  $\Delta B^i$  was expected to be positive (negative). The  $d$  coefficients in equation (10) could therefore be estimated using a latent variable model. The approach was similar in the case studies of Ecuador and Turkey, by Rama and MacIsaac (1997) and Tansel (1997) respectively, except that  $\Delta B^i$  was evaluated after separation. Displaced workers were asked whether, in retrospect, they would have preferred to stay in the public sector. An affirmative (negative) answer to this question indicates that  $\Delta B^i$  was in fact negative (positive). And again, a latent variable model can be used to estimate the  $d$  coefficients in equation (10).

### *Tailoring Compensation Packages*

In a typical downsizing operation, the amount of compensation displaced workers get is a function of a few of their observable characteristics, possibly including wage and seniority in the public sector. The implicit assumption is that their welfare losses from displacement can be accurately predicted based on these characteristics. But the discussion above suggests that a better prediction could be obtained if other observable characteristics were considered as well. As a result, fewer workers would be either under-compensated or over-compensated. Tailored severance pay packages would thus contribute to the fairness of the downsizing process. And

they would also reduce the total cost of downsizing in the context of voluntary separations, where over-compensation is more likely to materialize than under-compensation.

The three empirical strategies described above can be used to link the amount of severance pay to be offered to individual characteristics which are easily observable at the time of downsizing. The results obtained when using data from developing countries are summarized in Table 2.<sup>19</sup> The most striking feature in this table is the wide dispersion of effects across variables and countries. This is hardly surprising, to the extent that earnings in and out of the public sector crucially depend on the interaction between the workings of the labor market, the quality of the education system and the pay policies of the government, and all of these vary substantially from country to country. So, if anything, the results in Table 2 should serve as a warning about the risks of using simple rules-of-thumb to set severance pay packages.

Two of the PSR studies actually evaluated the over-payment resulting from using those rules-of-thumb when downsizing has to rely on voluntary separations. In the case of Egypt, Assaad (1997) found that a well-tailored severance pay package would reduce the total cost of compensation by 25 to 38 percent, compared to the most common rules-of-thumb. In Ecuador, well-tailored severance pay would have reduced the cost of voluntary separations by 19 percent (Rama and MacIsaac, 1997). Given that the downsizing operations surveyed by Haltiwanger and Singh (1997) for the PSR project included, on average, 87 million dollars in severance pay, over-payment could be in the tens of million dollars per operation. Which far exceeds the cost of producing and processing the data needed to apply the second empirical strategy outlined above.

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<sup>19</sup> Other empirical studies on public sector downsizing in developing countries, such as the one by Mills and Sahn (1996) for Guinea, or the one by London Economics (1996) for Zambia, do not estimate the impact of individual characteristics on displacement losses. For a comparison with losses from job displacement in industrial countries, see Hamermesh (1989), Topel (1990), Jacobson *et al.* (1993) and Fallick (1995).

Table 2

## Determinants of Displacement Losses

	Earnings loss				Welfare loss			
	Ecuador	Ghana	Slovenia	Turkey	Argentina	Ecuador	Egypt	Turkey
Workers	Central bank employees	Civil servants	Formal labor force	Cement and oil workers	White collar employees	Central bank employees	Urban labor force	Cement and oil workers
Characteristics								
Public sector wage	0	0	n.a.	+	+ b/	0	n.a.	0
Seniority in the job	+	0	+ a/	0	n.a.	+	?	0
Education level	-	0	0	-	0	-	+	-
Total work experience	0	0	+ a/	-	?	+	-	+
Female	+	+	-	0	n.a.	0	+	0
Married	+	0	n.a.	0	-	0	n.a.	0
Number of dependants	0	0	n.a.	0	?	+	n.a.	+
Source	Rama and MacIsaac (1997)	Alderman <i>et al.</i> (1996)	Orazem <i>et al.</i> (1995)	Tansel (1997)	Robbins (1996)	Rama and MacIsaac (1997)	Assaad (1997)	Tansel (1997)

a/ Almost all work experience was under the self-management system that characterized Yugoslavia until the late 1980s.

b/ The coefficient is positive as a result of an implicit restriction imposed by the chosen specification.

Notes: Statistically significant signs are indicated by + or -, while 0 indicates a non-significant coefficient and ? a change in sign across specifications or groups of workers. When the variable was not included in the analysis, n.a. is reported.

In the absence of specific labor market data, the results in Table 2 can be used to conjecture how observable individual characteristics affect welfare losses (or earnings losses, when no welfare estimate is available). First, it appears that the wage level in the public sector is a poor predictor of welfare losses, at least as long as other observable characteristics of the workers are taken into account. Second, with the exception of Egypt, where government hiring and compensation policies strongly distort the payoffs to schooling, the loss from displacement is smaller the higher the education level of the workers. Third, while higher seniority in a public sector job may lead to larger losses from displacement, there is no clear link between total work experience and losses from displacement. And fourth, female workers and those with larger families are likely to suffer more from displacement.

Legal and social constraints may however limit the scope for tailored compensation. For instance, offering different severance pay packages depending on the gender or the family size of public sector workers could be seen as a form of discrimination. Although obstacles of this sort are more likely to arise in industrial countries than in developing countries, it would certainly be a mistake to ignore them. Fortunately, the biases emerging from Table 2 seem to be socially acceptable. For instance, offering more compensation to a single mother than to her otherwise identical male fellow with no dependents would probably raise less objections than the opposite.

## 7. Other Design Issues

Public sector downsizing is seldom an isolated endeavor. In the case of state-owned enterprises, it is sometimes undertaken as a step towards privatization. As a result, it may have an effect on the sale price of those enterprises. Public sector downsizing also has implications for social security. Early retirement, for instance, is often used to compensate the displaced

workers. But anything that affects old-age pensions modifies the long-term liabilities of the government. Finally, the disruption created by mass retrenchment is sometimes mitigated through training programs and placement services. And these programs usually entail significant costs. None of these side-effects should be ignored when assessing the financial and economic returns to public sector downsizing.

### *Privatization*

The analysis of downsizing issues has referred so far to government agencies or state-owned enterprises which are bound to remain in the public sector, or to be shut down. However, in the case of many over-staffed public sector enterprises downsizing is seen as part of the preparation process for privatization. Discussing whether an agency or enterprise should be run by the government or rather by the private sector is clearly beyond the scope of this paper. The answer involves efficiency considerations and public interest issues that need to be carefully evaluated in each case. But whether downsizing should precede privatization when the latter is advisable is an issue that needs to be addressed here.

The problem is of course to identify the appropriate private sector counterfactual. If downsizing was not carried out by the government prior to privatization, the new management would have to deal with labor redundancies. The amount and composition of labor shedding would probably differ in both cases, and the average compensation per worker would be different too. Moreover, the price the potential buyers would be willing to pay for a state-owned enterprise would vary depending on how over-staffed the enterprise is. Because of the ensuing differences in the extent of labor shedding, in the amount of compensation and in the privatization price of the enterprise, assessing the net gains from downsizing prior to

privatization may be difficult. The analysis in the previous sections suggests, however, that a net loss is likely.

To begin with, the total number of displaced workers is possibly larger when downsizing is managed by the government prior to privatization than when it is left to the new owners. Kikeri (1996) reports examples from various countries where the new managers kept the labor force more or less intact, and claims that net reductions in employment have been generally small in privatized firms. Based on a more systematic comparison of employment patterns across Polish firms during the transition to a market economy, work in progress at the Development Research Group of the World Bank shows that employment cuts were larger in state-owned enterprises than in otherwise similar privatized firms. It thus seems that the government may get rid of workers the new owners would want to keep.

Furthermore, the cost of separation per worker is probably higher when the government is in charge of the downsizing. After all, one of the main reasons why state-owned enterprises are privatized is the relatively higher efficiency of the private sector, compared to the public sector. This basic principle, usually invoked for efficiency in production, should also apply to efficiency in downsizing. More specifically, a state-owned enterprise can shift part of its downsizing costs to other government bodies, for instance under the form of early retirement programs, while in principle the new owners cannot. The temptation to resort to golden handshakes should therefore be stronger when downsizing takes place prior to privatization. Case studies suggest that this has happened in practice (see Galal *et al.*, 1994).

Unnecessary downsizing costs cannot be recovered through a higher privatization price of the state-owned enterprise. At the theoretical level, the privatization price would of course increase every time a redundant worker is separated from his or her job. But getting rid of workers who are not redundant would not increase that price. And even for the genuinely

redundant workers, the increase would be equal to the amount of resources the new owners would have spent to secure their separation, not to the amount of resources actually spent (directly and indirectly) by the government. Therefore, the net proceeds from downsizing prior to privatization can be expected to be negative.

At the empirical level, there is some evidence that the increase in privatization prices resulting from downsizing prior to privatization may not be worth its cost. In a study of the determinants of auction prices for 361 Mexican enterprises privatized between 1983 and 1992, López-de-Silanes (1996) found that downsizing had a marginal impact on privatization prices. The effect was actually insignificant in one specification, and only weakly significant in another. If the significant estimate is taken literally, a 5 percent reduction in employment prior to privatization increases the price of the enterprise by 6 percent. Given how substantial the cost of prior restructuring policies is, the key lesson López-de-Silanes draws from his study is “do not do too much, simply sell”.

The discussion above implies that financial returns to downsizing prior to privatization are most likely negative, but what about economic returns? If downsizing decisions were let to the new managers of the privatized firms, would aggregate welfare increase more than if they were not? The short answer is yes. The main reason why state-owned enterprises may shed the wrong amount of labor is the presence of several distortions and imperfections, in addition to over-staffing. The analysis in section 4 identified five of them: transition costs from one job to another, a “wrong” pay scale in the public sector, imperfect output markets, productive externalities from public sector employment, and fiscal externalities. Of these five, two or even three are corrected by privatization. First, it is not in the interest of the new management to keep a “wrong” pay scale. Wages in the privatized enterprise should therefore move closer to the alternative earnings of the workers. Second, privatization typically eliminates the soft budget

constraint, so that the fiscal externality disappears too. A third distortion is corrected when the labor regulations applying to private sector workers include a reasonable amount of severance pay in case of job loss. In terms of the analysis in section 4, this would imply  $S \approx C$ , which means that the new managers would internalize the transition cost from one job to another.

The extent of downsizing by the new management remains of course sub-optimal when the enterprise operates in non-competitive product markets, or when its employment level has significant productive externalities, as is the case in the one-company town setting. But these distortions do not provide a rationale to downsize prior to privatization. They only imply that privatization, if advisable, should be accompanied by the set up of the appropriate incentives for the privatized firm, including an employment subsidy when productive externalities are significant. The amount of the subsidy should be such that the privatized enterprise would maximize profits when retaining the socially optimal number of workers.

There is however one reason why downsizing may be needed prior to privatization, and that is the credibility of the reform process (see Vickers and Yarrow, 1991, and World Bank, 1995). The ability to overcome labor resistance and trim employment could indeed be seen as a signal that the government is committed to privatization. This signal, in turn, would reduce the uncertainty faced by potential investors, thus making privatization possible. If no action was taken to overcome the opposition of those who stand to lose from privatization, chances are there would be no bids for the enterprise to be privatized. The irreversibility of investment decisions would thus provide a rationale to "buy out" the workers as part of the preparation for privatization. Although some over-spending may be inevitable in the process, its amount could be small compared to the cost of a failed privatization process.

## *Social Security Benefits*

From a purely financial perspective, the net gain from downsizing is higher the larger the reduction in the payroll of the restructuring agency or enterprise and the smaller the cost of compensating the displaced workers. In terms of the analysis in section 4, financial returns can be measured as  $T - S$ , where  $T$  is the net transfer per worker from the general budget to the restructuring agency or enterprise (in present value), and  $S$  is the cost of compensating each displaced worker. But quite often  $T$  is over-estimated and  $S$  under-estimated. This is because both  $T$  and  $S$  tend to be assessed from the point of view of the restructuring agency or enterprise, and not of the public sector as a whole.

Examples abound where the fiscal burden is simply shifted to another government agency. Consider for instance, the social services provided by state-owned enterprises in many transition economies. The cost of these services is often paid for by the taxpayer under the form of explicit or implicit subsidies. Because downsizing reduces the number of beneficiaries from these services, it also appears to reduce the burden on the taxpayer. But nothing is gained if downsizing leads to a mere transfer of these services to central or local governments. A more extreme example is provided by redeployment policies. In many opportunities, public sector workers are offered the choice between taking severance pay and leaving, or moving to another public sector job out of the restructuring agency or enterprise. But unless these workers become more productive in their new jobs, this second alternative entails no gains. The payroll is cut in the restructuring agency or enterprise, only to be inflated elsewhere in the public sector.

The fiscal illusion may be particularly severe when downsizing affects entitlements to old-age pension and other social security benefits. An interesting example is provided by the downsizing program currently underway in several Brazilian states. In a preliminary assessment

of that program, Carneiro and Gill (1997) show that consolidated government savings from downsizing are significantly smaller for the consolidated government than for the individual states. This is because of the pension benefits granted to the displaced workers, which increase the long-term liabilities of the federal government. As a result of the implicit transfer of obligations, savings are 15 to 25 percent lower than it appears at a first glance.

The use of social security benefits as part of the downsizing program has implications for the calculation of the shadow price of labor, hence for the assessment of the optimal extent of labor shedding. The discussion above makes it clear that the values of T and S in the analytical expressions of this price must include any resulting changes in government expenditures elsewhere. For instance, transferring social services from state-owned enterprises to local governments may not entail a reduction in T. Similarly, the values of T and S must include any resulting changes in the present value of the long-term liabilities of the government. For example, the recognition of years of service in the public sector towards an old-age pension in the private sector may significantly affect S, if social security contributions and benefits differ in the public and the private sector.

#### *Active Labor Market Policies*

Public sector downsizing operations are often supported by active labor market policies, including the set up of counseling and placement services and, more importantly, the training of displaced workers. Active labor market policies are common in transition economies, but they can also be found elsewhere. The cross-country survey of downsizing operations prepared by Haltiwanger and Singh (1997) for the PSR project revealed that 63 percent of them included some enhancement of the safety net. And training assistance was a feature of almost 54 percent

of the operations. Moreover, the cost of enhancing the safety net amounted to 205 million dollars per operation on average, which represents more than twice the average cost in severance pay.

Are these active labor market policies really worth they cost? If previous assessments of the effectiveness of vocational education programs in developing countries are to serve as a guide, the answer is probably not (see Middleton *et al.*,1993). Usually, the same government agencies that get low grades in those assessments of vocational education programs end up in charge of the training component of downsizing operations. Seizing a share of the downsizing budget could actually represent a second chance in life for them. But given how large that share has been so far, it would be crucial to ensure that the training component of downsizing programs is not a mere waste of resources.

Two of the studies prepared for the PSR project suggest that resource waste has been considerable. An evaluation of the public sector retrenchment program implemented by Spain in the 1980s showed its limited ability to reallocate workers in alternative industries, in spite of its large training component (Campa, 1997). This failure was partly due to training being focused on the update of previous skills, rather than the acquisition of new ones. A case study of downsizing in the Central Bank of Ecuador, in turn, found that only 12 percent of the displaced workers took the training courses they were offered, in spite of these courses being free of charge (Rama and MacIsaac, 1997). In both cases, the value of the training seems quite limited.

On the other hand, the cross-country survey by Haltiwanger and Singh (1997) found significantly higher re-hiring of displaced workers in downsizing operations that did not include a training component. To the extent that significant re-hiring rates are an indication of poor economic returns to downsizing, it would seem that training increases economic returns. However, the result obtained by Haltiwanger and Singh could also reflect a transition economy

effect. Indeed, the probability that for a displaced worker to be re-hired is lower in transition economies, where a large portion of the labor force has to be relocated out of the public sector, than in other developing countries, where downsizing only affects public sector employment at the margin. Since training programs are more common in transition economies than elsewhere, the observed correlation between training and low re-hiring could involve no causality.

In light of this mixed evidence, the effectiveness of training and other active labor market policies should not be taken for granted. If these policies are to be part of the downsizing operation, a few safeguards should be introduced to minimize the potential waste of resources. A voucher system, whereby workers can choose their training providers among several certified competitors could be one of those safeguards. Allowing displaced workers to cash in part or all of their vouchers would also reduce the scope for useless training programs. And a similar voucher system could be used for counseling and placement services. This demand-driven approach would make it more difficult for other ailing government agencies to divert resources from the downsizing operation.

## 8. A Practical Guide to Downsizing

The previous sections of the paper have dealt with a variety of issues, from the theoretical assessment of labor redundancies, to the empirical evaluation of losses from displacement, to the policy debate on the role of downsizing in privatization. In finishing this overview of public sector downsizing issues, it may be useful to integrate the main lessons from these different sections in a unified framework. Such lessons are organized under the form of a decision tree, intended to assist policy makers in developing countries and task managers in multilateral organizations and donor countries.

Although the discussion above included many warnings on what can go wrong in downsizing operations, these warnings should not be seen as an encouragement for inaction. One of the studies prepared for the PSR project, by Basu, Fields and Debgupta (1997), actually dealt with the consequences of not addressing the over-staffing problem. In India, firms employing more than 100 workers may seek government permission for any retrenchments they wish to make. But these applications seldom succeed and in the end the firms are often declared “sick” and required to continue functioning on the basis of government subsidies. Basu *et al.* (1996) showed that this seemingly protective legislation not only reduces economic efficiency, but may also harm the workers it aims to protect. This is because it reduces labor demand, thus lowering the equilibrium wage level.<sup>20</sup> Mandated job security, it follows, may not be the right response to labor redundancy, not even from the point of view of the workers.

A second policy recommendation is related to the appropriate sequence of downsizing and privatization, when the latter is advisable. As discussed in the previous section, the rationale to downsize state-owned enterprises prior to privatization is weak. Chances are that the “wrong” workers will be separated from their jobs at an excessive cost. And the resulting over-spending will not be recovered through higher privatization prices. The only case where downsizing may be justified prior to privatization is when the government’s ability to overcome labor resistance provides a signal of its commitment to economic reform. The top portion of the decision tree in Table 3 highlights this dilemma.

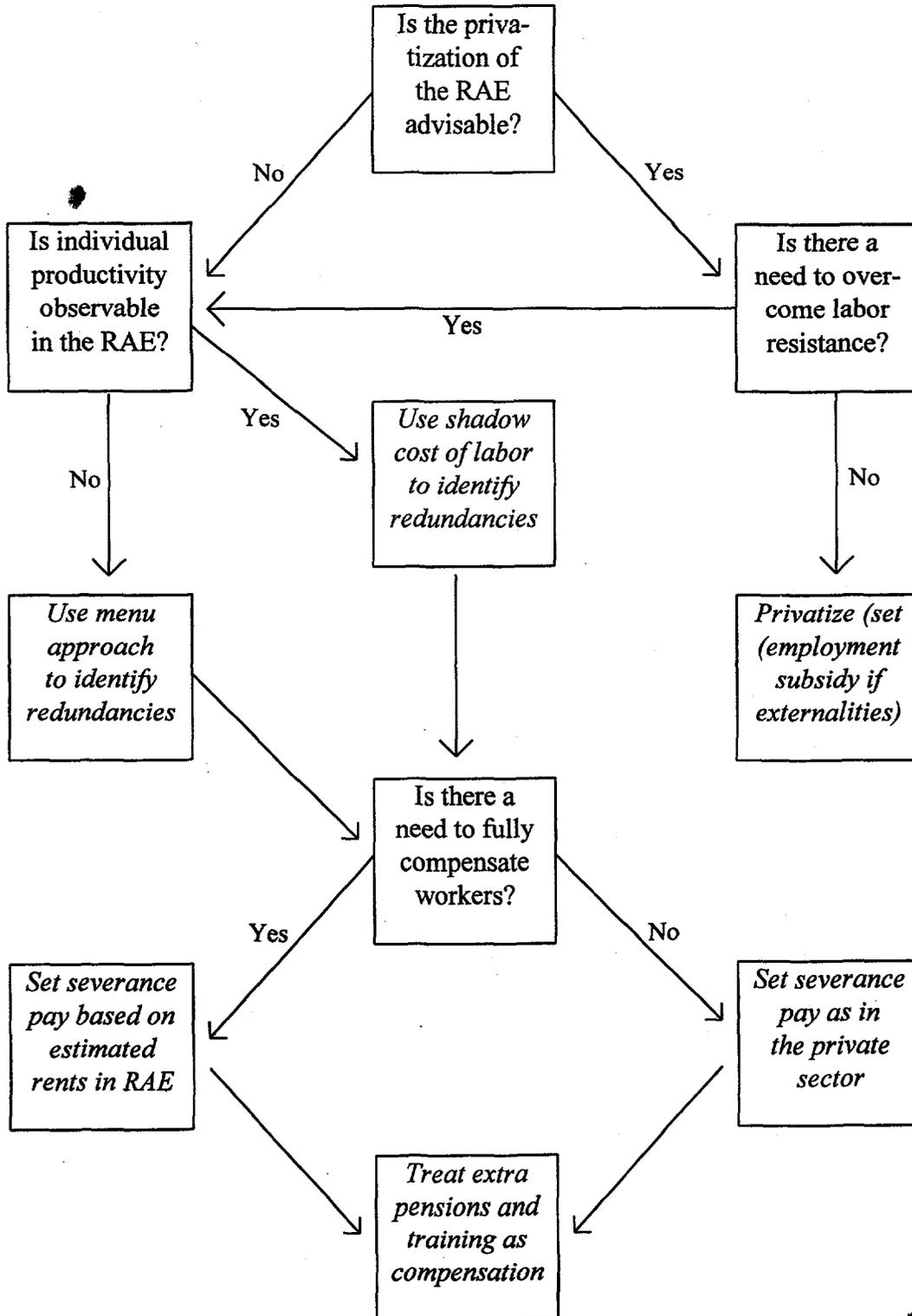
The third and maybe the most important recommendation is to dissociate targeting from compensation. The willingness of multilateral organizations and donor countries to lend substantial amounts of money for severance pay may create a bias in favor of voluntary

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<sup>20</sup> Empirical evidence on the importance of this effect in India and Zimbabwe is provided by Fallon and Lucas (1993).

Table 3

A Downsizing Decision Tree



Note: RAE stands for restructuring government agency or state-owned enterprise

separation schemes. Moreover, “buying out” the workers is a simple and convenient way to defuse any opposition to public sector restructuring. But severance pay is a potentially perverse selection mechanism. As long as workers differ in unobservable ways (as they often do), offering severance pay across the board creates an incentive for the best workers to leave the public sector and for the worst ones to stay. Severance pay may of course be warranted to compensate the displaced workers for the losses they may experience. But it should be offered only to those workers who are targeted to leave.

The cross-country survey of downsizing operations prepared by Haltiwanger and Singh (1997) for the PSR project confirms that targeting increases the economic returns to downsizing. The re-hiring of displaced workers is significantly less frequent in operations that make an explicit attempt to identify redundancies. For example, one of the most successful downsizing operations reviewed by Haltiwanger and Singh was undertaken in the Peruvian tax administration, where all workers had to pass written examinations. In another success story, the Ecuadorian Central Bank first classified all of its personnel in three groups: those who had to leave, those who had to stay, and those who could be given a choice (Rama and MacIsaac, 1997). Other useful targeting mechanisms include the enforcement of working hours and the removal of “ghost” workers from the payroll prior to any explicit downsizing.

A fourth recommendation is to adapt the targeting mechanism to the nature of the restructuring agency or enterprise, as highlighted by the middle portion of Table 3. When individual productivity is observable, identifying the redundant workers may be relatively straightforward. Engineers and technicians can rank departments and lines of production based on their contribution to total output. But when individual productivity is unobservable, identifying the redundant workers may be more difficult. Game theorists and personnel

managers may be more useful in this case to design the “menu” of options needed to achieve the desired self-selection of public sector workers.

Assessing individual the productivity in the restructuring agency or enterprise is only half of the problem though. The other half is predicting what would happen to aggregate output, or to aggregate welfare, as workers are reallocated out of the public sector. The answer is not obvious, because over-staffing is only one among several distortions characterizing the public sector. The fifth recommendation is not to forget about these other distortions or, equivalently, not to interpret high financial returns to downsizing as an indication of high economic returns. Particularly, downsizing may seem a high-yield operation only because someone else is picking up the bill. But a soft budget constraint on the downsizing bill could be as damaging to economic efficiency as the soft budget constraint on the wage bill was in the past.

The sixth recommendation is to avoid the over-compensation of displaced workers, as highlighted by the bottom part of Table 3. In some circumstances, it may be legitimate to offset the welfare losses these workers may experience by offering them more severance pay than their private sector fellows get when they lose their jobs. But the standard rules-of-thumb used to set severance pay in the public sector tend to reward those at the top of the hierarchy, and to penalize those at the bottom. Labor market data can be used to tailor compensation packages based on observable characteristics of the workers, such as education, seniority or family status. And the costs of producing and processing these data are much smaller than the potential savings from well-tailored compensation.

Finally, other forms of support to the displaced workers, such as counseling and placement services or training courses, should be treated as part of their compensation package. If these services are really useful, the displaced workers may be willing to spend some of their compensation on them. Whether they would use part of their severance pay for this purpose, or

rather a voucher, should not make a difference. But deliberately limiting their choices is equivalent to reducing the value of the compensation they receive, without reducing its cost by the same amount. In any event, active labor market policies should not serve as an excuse to boost ailing training agencies which should rather be themselves restructured.

## 9. Conclusion

Public sector downsizing may become a major reform endeavor in developing countries in the coming years, much the same as trade liberalization and financial liberalization were in the past two decades. As for these two other reform efforts, the potential gains in terms of improved economic efficiency are extremely significant. But the risks are considerable too. The lessons from experience with trade and financial liberalization should not be ignored in this respect. Trade liberalization was, by all accounts, a success. Some could argue that the East Asian miracle was partly fueled by interventionist trade policies, but few would claim that this was a real option for developing countries elsewhere. Financial liberalization, by contrast, led to more mixed results. In its initial phases, it did not always include the appropriate prudential supervision and, as a result, crashes and bail outs were not uncommon.

One of the reasons for the success of trade liberalization, compared to financial liberalization, was the existence of an almost explicit protocol to be followed. Task managers and policy makers knew what they had to do. Typically, the first step was to assess nominal and effective protection rates by sectors. Then, non-tariff barriers had to be converted into explicit tariffs. Subsequent steps involved reducing the dispersion of these tariffs and cutting over time, with the speed of the cuts depending on political considerations. And devaluation could be used to preserve competitiveness along this process. But there was no equivalent protocol in the

initial phases of financial liberalization. As a result, tasks managers and policy makers could not fully reap the benefits of experience and research.

This paper, and more generally the research project it is based on, represent an attempt to sketch a protocol for public sector downsizing. This attempt should be interpreted with great caution. Some of the findings and policy recommendations in the paper may need to be adjusted, and some are possibly wrong. More research and experimentation is certainly needed to move in the direction of a comprehensive and reliable protocol. Forthcoming downsizing operations provide an ideal opportunity to test and evaluate some of the hypotheses and recommendations formulated above. A strong interaction of policy and research in the immediate future could thus contribute to the success of public sector downsizing endeavors over the longer run.

But even a carefully designed protocol could prove ineffective if the mechanisms that led to over-staffing in the first place remain unchallenged. The equilibrium level of public sector employment is probably determined by political forces operating in the context of a particular institutional setting. Temporary incentives to downsize, such as financing for severance pay packages, will probably fail to modify that equilibrium. It is therefore important that the institutional setting itself evolves in the direction of a more professional and efficient public sector. Put differently, downsizing operations should be part of broader efforts to reform and modernize the public sector.

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## Appendix A

### Externalities and the Shadow Price of Labor

The optimal extent of downsizing, from the social point of view, is obtained by solving the following problem:

$$\text{Max}_L F(L) + (N - L)(1 - u)E - b[TL + S(L_0 - L)]$$

where  $L$  represents employment in the restructuring agency or enterprise after downsizing, and  $F(L)$  is the corresponding output level. The second term in this expression measures private sector output after downsizing, under the assumption that none of the displaced workers withdraws from the labor force. The third term represents the fiscal burden the agency or enterprise puts on the rest of the society, through compensation for the workers who are displaced and subsidies for those who are not.

Because of the productive externalities created by downsizing, earnings out of the public sector cannot be considered as given. More specifically, it is assumed that:

$$(1 - u)E = \left(1 - u_0 - e \frac{L_0 - L}{N}\right) E_0$$

The first-order condition of the downsizing problem is therefore:

$$Y = \left(1 - u_0 - \frac{N - L_0}{N}\right) E_0 + b(T - S)$$

where  $Y$  is the derivative of  $F(L)$  with respect to  $L$ . The right-hand side of this equation is the shadow price of labor  $W^*$ .

## Appendix B

### The Menu Approach to Downsizing

Assume the utility  $U$  of all workers in the restructuring agency or enterprise is given by the following expression:

$$U = U(Y - mH)$$

where  $U(.)$  is a concave function,  $Y$  is monetary income,  $H$  is on-the-job effort and parameter  $m$  measures aversion to effort. The argument in function  $U(.)$  is identified as the income equivalent in what follows. Parameter  $m$  is equal to zero for hard working individuals, but positive for lazy ones. The effort variable verifies  $H = 1$  when individuals do actually work, and  $H = 0$  when they shirk. It is assumed that hard working individuals supply the effort level  $H = 1$ , regardless of the quality of monitoring by their employers. Lazy individuals, in contrast, supply  $H = 0$  in the public sector but  $H = 1$  in the private sector.

The menu approach to downsizing confronts public sector workers to three alternatives. The first one is to remain where they are as they are, i.e. to earn a wage  $W$  and have total job security. The second alternative is to switch to a fix term contract and earn a wage  $F > W$ . But now there is a probability  $q > 0$  that the contract will not be renewed when it expires. Because of the low quality of monitoring in the public sector, the probability  $q$  is assumed to be the same for both hard working and lazy individuals. If the contract is not renewed, the worker has to move to the private sector, where the wage is  $E < W$ . Finally, the third alternative is to get  $S$  in severance pay and voluntarily move to the private sector.

The utility level in each of these three scenarios can be identified as  $U_i^j$ , where the sub-index  $i$  indicates aversion to effort (with  $i = H$  for hard working individuals and  $i = L$  for lazy ones) and the supra-index  $j$  corresponds to the type of contract (with  $j = P$  for the standard public sector contract,  $j = F$  for the fix-term contract and  $j = S$  for the severance pay offer). Based on the discussion in the previous paragraph, and neglecting discounting issues, the utility levels attained by hard working individuals are given by:

$$U_H^P = U(W)$$

$$U_H^F = (1 - q)U(F) + q U(E)$$

$$U_H^S = U(E + S)$$

The corresponding expressions for lazy workers are:

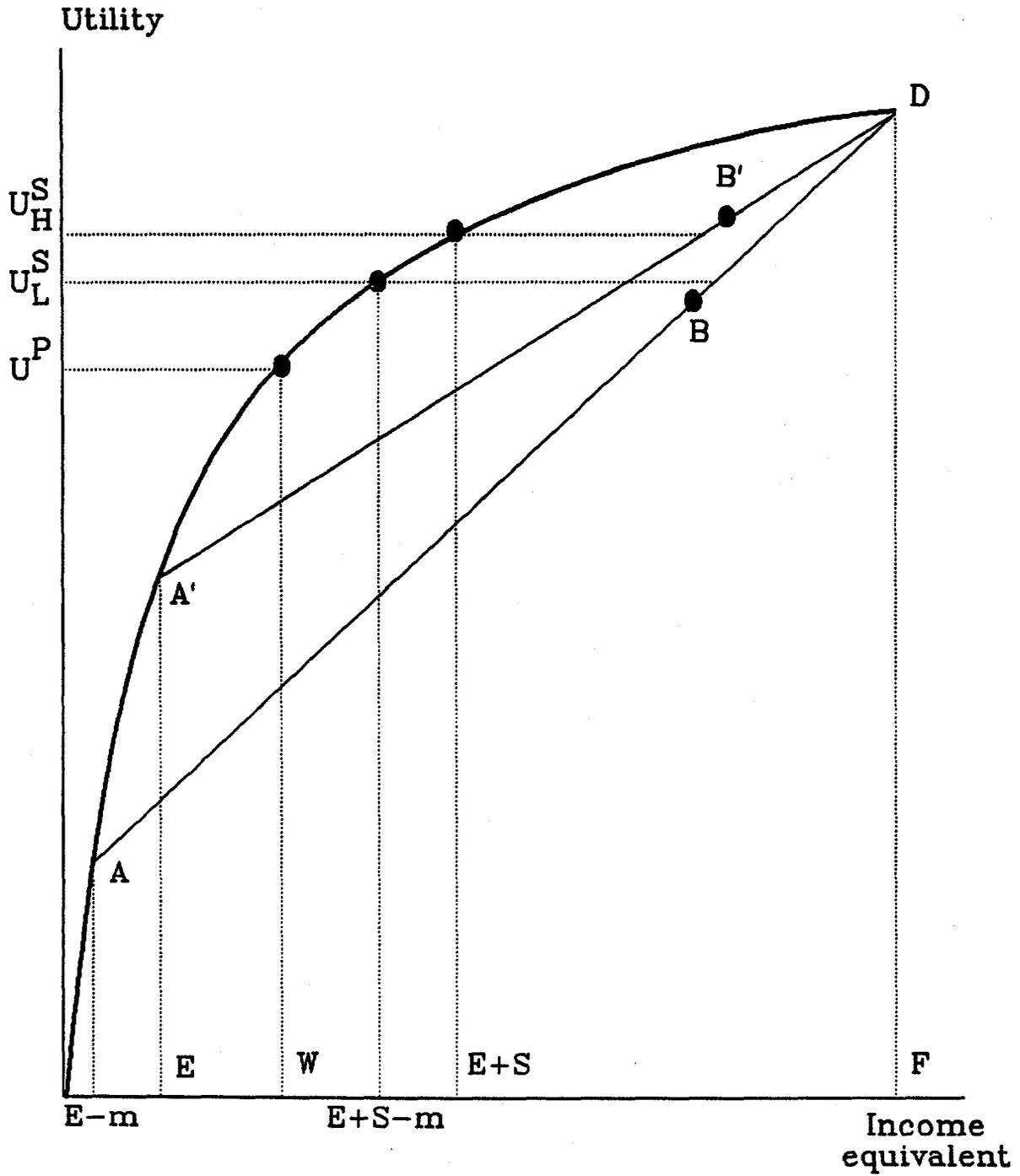
$$U_L^P = U(W)$$

$$U_L^F = (1 - q)U(F) + q U(E - m)$$

$$U_L^S = g(E + S - m)$$

These utility levels are represented in Figure A-1, by means of dark dots. Three of these dots lay right on the utility function (the curved line), because the corresponding options in the menu do not entail any uncertainty. For instance, option P leads to the utility level  $U_L^P = U_H^P = U^P$ , regardless of the worker's effort aversion. The figure also assumes that severance pay is high enough to be attractive to both types of workers ( $U_H^S > U_L^S > U^P$ ). Therefore, if no other option was offered, all workers would accept the severance pay package and leave. There is however a third option, represented by the dark dots laying below the utility function. Utility in

Figure A-1  
 Utility Levels and Menu Options



this case is a weighted average of  $U(F)$  on the one hand, and either  $U(E-m)$  or  $U(E)$  on the other hand, with weights  $(1-q)$  and  $q$  respectively. In the figure, the dots are drawn so as to verify  $AB/BD = A'B'/B'D = q/(1-q)$ . It then appears that a hard working individual would prefer a fix term contract to the severance pay offer, while the opposite would be true for a lazy worker.

The menu approach thus allows to allocate the workers in a socially optimal way, in spite of the lack of information regarding their individual characteristics. The case in Figure A-1 only illustrates a possibility though. Had the workers been risk neutral, for instance, and the menu approach would have failed to achieve the desired self-selection. More generally, the effectiveness of this approach cannot be taken for granted, so that a careful assessment of its relevance is needed in each particular downsizing operation.

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