

**Hardened Budgets and Enterprise Restructuring:  
Theory and an Application to Romania<sup>1</sup>**

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**Abstract**

We identify the presence of soft budgets and analyze their impact on enterprise restructuring in Romania over the initial transition period. A simple analytical framework is developed to show that hardened budget constraints foster rationalization of costs but not new investment. The latter requires availability of external financing. The model emphasizes the importance of the credibility of hardened budgets and the empirical findings are consistent with its predictions. Using a sample of over 4,000 Romanian enterprises from 1992 to 1995, we show that hardened budget constraints induce labor shedding. However, there is no evidence of new investments.

## **1. Introduction**

Since the start of reforms in 1991, Romania has been afflicted with a continued lack of financial discipline, which is evidenced by mounting payment arrears. Attempts to reduce arrears through generalized schemes in the early 1990s raised serious moral hazard problems, as enterprises relied on eventual bail-outs by the government. Subsequently, the focus has been on a limited group of distressed borrowers, due to the fear that the lack of financial discipline could spread through the system as a contagious process initiated by a small number of financially distressed firms (Djankov, 1999).

Romania is just one example of a country experiencing soft budgets that have been pervasive during the early years of transition from plan to market. As summarized in Djankov and Murrell (2000), many studies show that the state has attempted, to varying degrees, to keep afloat distressed enterprises through direct subsidies, government contracts, bank loans, and by allowing the accumulation of arrears to the tax office and the social security fund in all transition economies. Even among the leading reformers, bail-outs in the form of soft bank loans (the Czech Republic), bank loan write-offs (Hungary), tax write-offs and the use of government contracts (Slovakia), and directed subsidies (Poland) existed. In the countries of the former Soviet Union, where governments had little money to spend on enterprises, the prevalent form of budget softness was accumulated tax, social security, and wage arrears. Hence, any new evidence on the effects of hardened budget constraints is of general importance in the transition process and not relevant only for scholars of the Romanian economy.

In this paper, we identify the presence of soft budgets and analyze their impact on enterprise performance in Romania during the initial transition period. We define soft budgets as the expectation of bail-outs or continued financing by managers of non-viable enterprises. Our

model illustrates how passive restructuring, defined as the reduction in excess labor, is enhanced by a hardening of budget constraints. The model also shows that hardened budgets do not induce active restructuring, defined as new fixed investments. Such restructuring requires external financing. Using data on 4,429 enterprises from 1992 to 1995, we find evidence consistent with the predictions of the model.

Our study provides both a theoretical framework for, and empirical analysis of, the effects of hardened budget constraints on enterprise behavior in transition economies. Much of the literature on enterprise performance has concentrated on the effects of ownership changes and type of ownership, e.g., Frydman et al. (1999) and Anderson et al. (2000), and on manager incentives to restructure, e.g., Claessens and Djankov (1999), and Groves et al. (1995). On the other hand, a large theoretical and empirical literature exists on identifying the causes and channels of soft budgets.<sup>2</sup> As a number of governments in transition economies harden their budgets in anticipation of European Union membership, or as a result of poor tax revenues, a study of these effects is timely.

## **2. Analytical Framework**

The effect of hardening budget constraints on enterprise restructuring is illustrated in a simple two-period model. Firms are assumed to be controlled by employees who maximize expected utility. Soft budget constraints are characterized by a subsidy that firms may receive in the second period. We assume that firms are rational and respond to incentives based on the returns to their actions. The model also assumes that the firm needs liquidity to operate. We limit the possibilities of borrowing by firms assuming that they face cash-in-advance constraints in their operations. Such constraints may be eliminated over time as firms can accumulate cash

from undistributed profits. The model introduces government subsidies as a source of soft budget constraints and considers an initial condition in which firms have excess labor. The model serves as a useful benchmark for discussing enterprise responses to government subsidies, as it is based on intertemporal maximization.

Firms maximize the utility of a representative worker in two possible states, namely remaining employed or becoming unemployed. Unemployment benefits are exogenous and paid by the government. Output is produced with labor and non-labor inputs. The latter are subject to a cash-in-advance constraint, while workers are paid at the end of the period. Initially, firms are characterized by excess employment so that shedding labor in the first period raises efficiency and output in the second period by a factor of  $a$ , where  $a > 1$ . We assume that these are efficiency gains in addition to the savings in wage costs, for example, pressure is put on the remaining employees to work harder. Thus, reducing excess employment can be interpreted as a positive externality. Moreover, re-hiring workers who were laid off in the first period is prohibitively costly. Therefore, labor becomes a fixed factor at its efficient level.

Wages in the first period are set at a level that permits an accumulation of monetary balances sufficient to purchase the optimal level of non-labor inputs in the second period. Therefore, liquidity constraints cannot be binding in the second period. If the liquidity shortage in the first period is very large, the optimal solution for money accumulation may imply negative wages. This can be interpreted as firms borrowing from their workers. However, credit market imperfections are introduced by imposing a lower bound on wages. In such a case, the optimal level of monetary accumulation and, hence, the optimal output in the second period cannot be attained. In other words, the presence of credit market imperfections may make hardening budget constraints ineffective for inducing active restructuring.

## 2.1 The Case of Restructuring

First, we consider the case of restructuring, i.e., the reduction of excess labor. Denote by  $\bar{L} = L_i + L_1$  the total amount of labor, where  $L_1$  denotes productive labor, and  $L_i$  excess employment. Excess employees do not produce any output in period one. Consequently, the valuation function, which is the valuation of production net of non-labor costs, depends on non-labor inputs only, i.e., if  $x_1$  is the amount of non-labor inputs used in period one, the valuation function is  $f(x_1)$ . The productivity of employed workers increases when excess labor is fired. However, the gain in productivity can be exploited only in period two. As a result, the valuation function in period two equals  $af(x_2)$ , where  $x_2$  is the amount of non-labor inputs used in period two. The objective function of the restructuring firm is:

$$W = w_1 L_1 + u L_i + \frac{w_2 L_1}{1 + \delta}, \quad (1)$$

where  $w$  denotes wages,  $u$  the present discounted value of unemployment benefits for the two periods, and  $\delta$  the rate of time discount. Assuming that workers and consumers can borrow freely in the world market at a given rate  $\delta$ ,  $\delta$  becomes the relevant discount rate for workers. Assume that the economy starts from an equilibrium condition in which the initial stock of real monetary balances  $m_0$  enables the firm to purchase an amount of non-labor inputs  $x_1$ . A low level of  $m_0$  denotes a situation of initially tight monetary conditions in the economy (the liquidity squeeze). Firms can accumulate money during the first period by saving the amount:

$$m_1 = f(x_1) - w_1 L_1. \quad (2)$$

In the second period, firms do not accumulate monetary balances because this is the terminal period. Thus:

$$m_2=0=f(x_2)a-w_2L_1. \quad (3)$$

We assume that, for all  $x$  in the range of interest,  $f'(x)>1$ . This implies that, at the optimum, the stock of real balances carried over from period one,  $m_1$ , will be spent entirely on purchasing the new stock of non-labor inputs  $x_2$ . Firms maximize the total expected discounted income of their workers. Using (3), equation (1) can be rewritten as:

$$w_1L_1 + uL_i + \frac{f(x_2)a}{1+\delta}, \quad (1')$$

which, in turn, is equal to:

$$f(x_1) - m_1 + uL_i + \frac{f(m_1)a}{1+\delta}. \quad (1'')$$

The first order condition for the maximization problem is obtained by differentiating (1'') with respect to  $m_1$ . The optimal solution of the maximization problem is:

$$f'(m_1)a = 1 + \delta. \quad (4)$$

It follows from (2) that  $m_1$  is a linear function of  $w_1$ . Without restrictions on  $w_1$ , equality (4) can always be achieved by setting the appropriate level of wages. Denote by  $w_1^*$  the wage rate associated with  $m_1^*$ . The value of the objective function for the adjusting firm, obtained by using the value of  $w_2$  from (3), is:

$$w_1^* L_1 + uL_i + \frac{f(m_1^*)a}{1 + \delta}. \quad (5)$$

To determine whether restructuring occurs, we compare the value of utility in equation (5) with the utility arising when the firm does not restructure.

## 2.2 The Case of No Restructuring

No restructuring implies that the firm retains all workers and obtains a subsidy  $s$  in the second period. In the first period, production is constrained by the amount of real balances the firm holds at the beginning of the period. Thus, output would be the same as for the restructuring firm. In general, subsidies can be measured as a proportion of non-labor inputs because they allow firms to buy non-labor inputs. Thus, subsidies are defined as:

$$s = \beta x_2 = \beta m_1,$$

with  $0 < \beta \leq 1$ . The larger is  $\beta$ , the larger are the benefits for non-restructuring firms. Therefore, we focus first on the case  $\beta=1$ , where subsidies permit the non-restructuring firm to purchase the same amount of non-labor inputs used by the restructuring firm. Hence, we have:

$$s = x_2 = m_1.$$

We assume that non-restructuring firms use revenues from their output to pay the wage bill entirely. Thus, the wage bill exhausts output in both periods, so that:

$$w_1^n \bar{L} = y_1 = f(m_0), \text{ and}$$

$$w_2^n \bar{L} = y_2 = f(m_1),$$

where  $w^n$  is the wage in the non-restructuring firm and total utility is:

$$w_1^n \bar{L} + \frac{f(m_1)}{1+\delta}. \quad (6)$$

### 2.3 Incentives to Restructure

Firms will restructure if the utility of the representative worker is higher in the case of restructuring, i.e., if the value of expression (5) is higher than the value of (6). For  $\beta=1$  the condition for restructuring is:

$$w_1^* L_1 + u L_i + \frac{f(m_1)a}{1+\delta} \geq w_1^n \bar{L} + \frac{f(m_1)}{1+\delta},$$

or

$$\frac{(a-1)}{1+\delta} \geq \frac{(w_1^n - u)L_i + (w_1^n - w_1^*)L_1}{f(m_1)}. \quad (7)$$

For the case in which  $\beta < 1$ , condition (7) becomes

$$w_1^* L_1 + u L_i + \frac{f(m_1)a}{1+\delta} \geq w_1^n \bar{L} + \frac{f(\beta m_1)}{1+\delta}, \quad (7')$$

or

$$\frac{af(m_1) - f(\beta m_1)}{1+\delta} \geq (w_1^n - u)L_i + (w_1^n - w_1^*)L_1. \quad (7'')$$

A reduction in  $\beta$  raises the value of the left-hand-side of (7''), and thus makes the case for restructuring more likely. Therefore, the higher is the value of subsidies, the less likely is the case of restructuring.

We assume that the right-hand side of inequality (7) is positive. Restructuring will occur if the discounted value of the gain in efficiency, i.e.,  $(a-1)/(1+\delta)$ , is larger than the cost of

restructuring in foregone wages, weighted by the reciprocal of output in the no-restructuring case. Moreover, the likelihood of restructuring is higher, the lower the rate of time discount.

The model implies that wage movements help achieve the optimal level of output in the second period, irrespective of the magnitude of the liquidity squeeze in the first period. If the liquidity squeeze is extremely large, optimal wages could become negative. In this case if we impose a non-negativity constraint on wages, optimal money accumulation cannot be attained and  $m_1$  is determined by equation (2) with  $w_1$  set equal to zero so that  $m_1$  equals  $f(m_0)$ , which is less than  $m_1^*$ . Such a lower bound can be interpreted as the presence of credit market imperfections. In such a case, even if firms respond to hardening budget constraints by reducing excess labor, restructuring firms will not achieve a higher level of output through investment in non-labor inputs,  $x_2$ . Consequently, the first-period savings are forced to be less than optimal, which is detrimental to the second-period output. If  $m_1$  is close to its optimal level given by condition (4), the amount of savings, and thus the reduction in wages, necessary to move to the optimal solution in period two is smaller.

Investment in non-labor inputs can be seen as an example of active restructuring. For instance, Frydman et al. (1999) define active restructuring as the increase in sales, irrespective of whether it takes place through investment in variable or in fixed capital. The important aspect is that such an investment decision requires accumulation of savings in the previous period. In our model, investment in non-labor inputs is analogous to investment in fixed capital with full depreciation in the same period. This simple characterization captures a key point: hardening budget constraints does not necessarily induce active restructuring. Costs may be reduced but the presence of credit market imperfections may jeopardize the achievement of active restructuring.

## 2.4 Credibility of Hard Budget Constraints

The model outlined above can be analyzed from another angle. We can compare the outcomes of the case in which there is a positive subsidy  $s$  with the case in which the government credibly commits to eliminating subsidies. With no subsidies, the firm produces no output in the second period in the case of no-restructuring by assumption. The condition for restructuring becomes:

$$\frac{a}{1+\delta} \geq \frac{(w_1^n - u)L_i + (w_1^n - w_1^*)L_1}{f(m_1)}, \quad (8)$$

a condition which is satisfied for low values of  $\delta$ . In the relevant equilibrium we assume that  $m_1 > m_0$ , and thus  $f(m_1) > f(m_0) = y_1$ . Using the fact that  $w_1^n \bar{L} = y_1$ , for  $\delta \rightarrow 0$ , equation (8) can be rewritten as:

$$a \geq \frac{y_1}{f(m_1)} - \frac{uL_i + w_1^*L_1}{f(m_1)},$$

which is always satisfied as  $a > 1$ . Thus, if  $\delta$  is not too large so that firms are not too myopic, inequality (8) is satisfied. Credible hardening of the budget constraint fosters restructuring. We treat credibility as an exogenous factor related to the reputation of the policy-maker. We abstract from issues related to the endogeneity of the credibility of policies; such endogeneity may arise when policy actions are linked to the state of the economy. Therefore, we also rule out strategic behavior on the part of enterprises that can collude to extract subsidies from the government. Although important, these aspects go beyond the scope of this paper.

If hardened budget constraints are not credible, firms will not restructure. In that context, the optimal policy for the government is to validate the expectations of the firms by providing subsidies. Hardening budget constraints *ex post*, when the hardening is not credible, leads to the

worst outcome. This may explain the vicious circle characterizing countries like Romania, in which policy makers lack credibility.

The analytical framework developed in this section leads to three hypotheses. First, hardened budget constraints induce labor shedding. Second, hardened budget constraints do not result in new investment unless the enterprise has access to external financing. Finally, if the budget constraint is not credible, firms will not restructure. We test the first two hypotheses in Section 3. The third hypothesis is inherently untestable with the data we have because it depends on the perceptions of enterprise managers. Those can be documented only by using enterprise surveys.

### **3. Data and Descriptive Analysis**

The goal of this section is to document whether loss-makers existed in Romania during the sample period, whether they benefited from soft budgets, what were the channels of such budgets, and how the behavior of such firms was affected by the hardening of budget constraints. The empirical investigation is an application of the model developed in the previous section and not an analysis of all aspects of hardening the budget constraints. As a first step, we compute cash accounts for all firms and then link the cash-flow of a firm to the different sources of financing. In particular, we identify the financing of losses through different channels, including bank credit and arrears. Profitability is a crude measure of an enterprise's cash position. To translate profits into cash positions, we add to net profits the depreciation of assets, as stated in the income statement, and subtract the change in net trade credit. Cash flows also depend on the amount of sales paid in cash and the amount of costs cleared through cash payments. Thus, an increase in receivables reduces the cash-flow, while an increase in payables increases it. As a

significant share of trade credit is involuntary, in the form of arrears, it is essential to examine the role of arrears in determining cash-flows.<sup>3</sup> The difference between net profits plus depreciation and cash-flow, including arrears, measures the degree of redistribution of liquidity across firms.

We have individual enterprise balance sheet and profit and loss statement data for 1992 to 1995 obtained from the Romanian Statistical Office. The data are end-year observations and cover all firms that were registered as state-owned enterprises in 1992. If some plants are owned by the same parent company, this relationship is accounted for in the data. Overall, 5,596 enterprises are included, although the coverage varies slightly across regressions due to missing observations. We do not eliminate outliers, fearing that some information can be lost in the process. Instead, we use a logit specification as a robustness check for our findings.

International accounting standards were not introduced in Romania during the sample period. This is not a big problem in the analysis because we compare relative performance across groups of firms in the same year. However, we made several adjustments. Under the Romanian accounting system, subsidies and production for inventories are recorded as sales. Since data on sales, subsidies, and inventory changes are reported in all cases, we recalculate the revenue numbers to account for sold, rather than produced, output. Firm-specific output prices are not available. One option is to use output price indices at the industry level. This would limit the comparisons between firms within the same sector, given the likely variation in their pricing strategies. Hence, we develop the analysis on the basis of ratios of revenues and financing and avoid the need for inflation-accounting, i.e., we use nominal data in both the numerator and denominator. However, different price indices are relevant for sales revenues and financing. Due to the lack of suitable price series, we cannot address this problem adequately.

We distinguish between two groups of loss-making firms. One, defined as chronic loss-makers and comprising 1,087 enterprises, displays negative net profits throughout the period 1993 to 1995; the other is composed of 3,342 firms that were loss-making in 1993 but became profitable in 1994 and remained profitable in 1995. Those are defined as loss-making firms that adjusted. A third group of 1,167 enterprises earned profits in 1993 but made losses in 1994 and 1995 or in one of these two years. Those were excluded from the data set. We differentiate between chronic loss-makers and adjusted firms in order to sharpen the empirical tests of the model because we expect chronic loss-makers to have easier access to soft financing than do adjusted firms. For firms to adjust, all else equal, they must have felt the hardening of budget constraints and we look for this regularity in the data.

The descriptive statistics comparing chronic loss-makers and adjusted firms are reported in Table 1. The reported values are the medians for each year. Net profits are defined as the ratio of sales revenues minus cost of goods sold, minus interest, depreciation, and taxes, divided by sales revenues. New bank financing is the flow of net bank financing over total sales revenue in the same year. Labor shedding is defined as the percentage reduction in employment from one year to the next. New investments are defined as the flow of new investments over total sales revenues in a given year. Arrears are defined as a share of sales revenue in the same year. Those represent stock figures.

The aggregate magnitude of losses declined sharply over the period. The reduction was especially pronounced if one looks at net profits, which improved from  $-27$  ( $-34$ ) percent of sales in 1993 to  $11$  ( $-13$ ) percent in 1995 for adjusted (chronic loss-making) firms. Chronic loss-makers were able to obtain fresh bank loans throughout the period.<sup>4</sup> The share of new bank financing in total sales for these firms increased from 7 percent in 1993 to 14 percent in 1994 and

in 1995. In contrast, the share of new bank financing in total sales of adjusted firms increased to 11 percent in 1994 but fell to 7 percent in 1995. Chronic loss-makers received a larger share of financing than did firms that showed signs of restructuring. This result is easily rationalizable ex post because chronic loss-makers needed more external financing to cover their losses. However, it is not clear why banks would decide to lend to chronic loss-makers ex ante, given their poor operational performance.

[Table 1 here]

Arrears with respect to other enterprises, to suppliers and workers did not play a large role in financing the losses of either chronic loss-makers or adjusted firms. The stock of all three indicators remained largely constant from 1993 to 1995. In contrast, arrears to the tax authority increased over time for chronic loss-makers, reaching 8 percent of the value of total sales in 1995. Adjusted firms displayed smaller stocks of arrears to the tax authority, amounting to 2 percent of total sales in 1994 and 4 percent of total sales in 1995.

The numbers suggest that bank loans and arrears to the tax authority were the main conduits of soft budgets for ailing enterprises in Romania. As proxies for soft budgets, these two variables are highly correlated with a simple Pearson correlation coefficient of 0.894. Since far fewer firms, 2,274, report arrears to the tax office than use bank financing, 4,321, we choose the bank financing variable for the regression analysis. This decision is dictated by our desire to retain as many firms as possible for the empirical analysis.

We next look at the evidence on labor shedding and new investment to test the predictions of the theoretical model. While both chronic loss-makers and adjusted firms reduce employment significantly from 1993 to 1995, enterprises that had their budget constraint hardened exhibited higher levels of labor shedding. In contrast, net investments were roughly

equal in the two groups, averaging 5 percent of total sales during the sample period. Although these findings are consistent with the predictions of the model, they do not constitute a rigorous test. Hence, we employ regression analysis to shed more light on the effect of hardened budget constraints on enterprise restructuring.

Implementing the empirical analysis on the effects of hardening budget constraints on enterprise performance raises both endogeneity and reverse causality issues. Changes in financing flows to firms may be caused by changes in enterprise performance, which in turn determines the demand for financing. The flow of new bank financing and accumulating arrears to the tax authority are the main channels of soft budgets in Romania. Consistent with the theoretical literature on the causes of soft budgets, both seem to arise from the interest of Romanian politicians to keep chronic loss-makers afloat. While we cannot differentiate between loans from privately-owned and state-owned banks in the data, we know that 76% of banking assets were in state hands at the end of 1995, suggesting that the government may have used state-owned banks as a conduit for financial transfers. The main explanatory variable in the regression analysis is the average share of new bank financing in total revenues in the period from 1992 to 1994, lagged one year to correct for endogeneity and reverse causality problems. The data do not offer obvious candidates for instrumental variables that could be used to reduce endogeneity. We also construct an interactive variable between new bank financing and a dummy that equals 1 if the firm has adjusted and 0 otherwise.

We use the average annual percent change in labor shedding from 1993 to 1995 as a proxy for passive restructuring and the average annual flow of new investment as a share of total sales from 1993 to 1995 as a proxy for active restructuring. These measures have been widely-used in the literature, based on Grosfeld and Roland (1996). We use average figures over the

sample period to correct for outliers, especially outliers due to temporary slumps or stoppages in production.

To account for the effect of other factors on enterprise restructuring, we include a set of control variables commonly used in previous literature. The average annual export-to-sales ratio in 1992 to 1994 proxies for the ability of enterprises to use trade financing from abroad. Such firms are less dependent on the decline in domestic demand for their products and the investment of export-oriented Romanian firms' is less dependent on access to domestic bank financing. We include the initial enterprise size, using 1992 employment, to proxy for the political influence of the enterprise. Larger enterprises are more likely to receive soft financing, given their importance in limiting the rise in unemployment. Finally, we include the change in real sales from 1992 to 1994 as a proxy for the demand for an enterprise's products. If product demand is high, the manager would have less need to shed labor and may have more flexibility in financing new investment from retained earnings rather than from external bank financing.<sup>5</sup>

First, we use continuous variables in an ordinary-least-squares (OLS) specification with heteroskedasticity-consistent standard errors to test the model. The benefit of this specification is that it allows us to generate elasticity estimates for the effect of the explanatory variables on our dependent variables. The downside of using the OLS estimation is that the results are sensitive to the presence of outliers. We could have capped all variables at a certain maximum value, e.g., the value of the 95<sup>th</sup> percentile, to eliminate this problem. However, it is difficult to choose cut-off values for enterprises in transition economies given the vastly different ways that those enterprises behaved in the early years of reform. Instead, we use the median of each variable as a cut-off point and construct discrete variables that are used in a logit regression. For each variable, we assign a value of 1 if its value is higher or equal to the respective median value and

0 otherwise. The benefit of the logit specification is that it provides robust estimates without dropping observations arbitrarily.

We use the average annual percent change of labor shedding during from 1993 to 1995 as the dependent variable. It has a mean of 0.097 for chronic loss-makers, 0.112 for adjusted firms, and 0.108 in the full sample (Table 1 reports the median values by year). Two-digit SIC sector code dummies are included in both specifications. Labor shedding is negatively associated with new bank financing in both specifications. In the OLS specification, the new bank financing variable has coefficient of  $-0.2336$  (Table 2). The mean new bank financing value for the period 1993 to 1995 is 0.126 for chronic loss-makers, 0.098 for adjusted firms, and 0.105 in the full sample. The standard deviation of the variable in the full sample is 0.112. Hence, a one-standard-deviation increase in new bank financing translates into 2.61 percentage points of shed labor for each year during 1993 to 1995. For adjusted firms, this effect is even stronger, as shown by the coefficient on the interactive term, which takes the value  $-0.1853$ . Specifically, an adjusted firm that received one standard deviation less financing shed, on average for each year in 1993 to 1995, 4.8 percent of its labor force more than a chronically loss-making firm with average financing. This is because adjusted firms have higher labor shedding than chronic loss-makers to begin with, and the difference was especially striking in 1995 when employment shrank by 9 percent and 6 percent, respectively. Both results are statistically significant at conventional levels. The logit specification provides similar results. Enterprises in which the flow of new bank financing is higher than or equal to the sample's median are almost 30 percent less likely to have a high incidence of labor shedding, as seen by the size of the coefficient on new bank financing at  $-0.2857$ . This result becomes more robust and economically significant for adjusted firms, as indicated by the coefficient on the interactive term, which takes the value  $-0.1465$ .

The growth in real sales has a negative effect on labor shedding. The intuition is that the pressure to reduce costs decreases when demand is high and the manager can focus instead on increasing revenues. Export orientation also has a significant negative effect on labor shedding. The explanation is that export markets did not collapse as much as domestic demand in the initial transition period; hence, exporters were in a better position to retain output levels and labor. The results of the logit specification confirm the significance of product demand and export orientation. Enterprise size is not related significantly to labor shedding in either specification. Across sectors, labor shedding is more pronounced in heavy machinery, metals, chemicals, and electric machinery, whose coefficients are not reported.

[Table 2 here]

The dependent variable in the first column of Table 3 is the average annual share of new investment over sales revenue between 1993 and 1995. It has a mean of 0.055 for chronic loss-makers, 0.057 for adjusted firms, and 0.056 in the full sample. The explanatory variables are the same as before. The specification is OLS with heteroskedasticity-corrected standard errors. The dependent variable in the second column is discrete and takes the value of 1 if the average share of new investment over total revenues between 1993 and 1995 was higher than the median percentage change and 0 otherwise. The explanatory variables are identical to the variables in the OLS specification, except that they are all discrete variables taking the value of 1 if the magnitude is higher than the median for the sample and 0 otherwise. Two-digit SIC sector code dummies are included in both specifications, but the resulting coefficients are not reported.

Active restructuring is positively related to bank financing, but that association is statistically insignificant in the whole sample both in the OLS and in the logit specification, with t-statistics of 0.5214 and 1.6327, respectively. However, when we interact the financing variable

with a dummy for adjusted firms in the OLS specification, the coefficient is statistically significant and equal to 0.3423. In particular, a one-standard-deviation increase in bank financing for adjusted firms is associated with 2.7 percentage points increase in the ratio of net investment to sales revenues, or more than a 45 percent increase. The logit specification gives a similar estimate of the economic importance of access to credit with adjusted enterprises that have higher-than-the median financing displaying an almost 30 percent higher probability of large investment flows. The exporting status of firms is again associated with more restructuring. Exporting is associated with a 36.6 percent higher probability of investment from the logit specification. Enterprise size is highly significant in the logit specification, suggesting that smaller enterprises are more prone to active restructuring. In contrast, product demand does not seem to be important in explaining active restructuring.

[Table 3 here]

The results suggest a key role for hardening budget constraints as a means of enhancing passive restructuring. As predicted by the model, passive restructuring, i.e., labor shedding, is enhanced, but not active restructuring. For the latter, one needs access to new financing, either through bank credit or through export revenues. This is demonstrated by the significance of the interactive coefficient and the insignificance of the new bank financing variable by itself.

#### **4. Conclusions**

We develop a simple model to test the effects of hardened budget constraints on the restructuring of enterprises in Romania. Consistent with the theory, we show that hard budget constraints induce passive restructuring in the form of labor shedding by firms but not active

restructuring in the form of fixed investment. The model emphasizes, but the empirical analysis does not test, the need for credibility of hard budgets in ensuring any type of restructuring.

The evidence also suggests that active restructuring depends crucially on access to external financing. Tightening of bank credit may raise enterprise efficiency in the short run but at the cost of curtailing investments. This impasse can be solved only with the development of an efficient financial sector that is capable of ensuring financial discipline and channeling resources toward good investment opportunities. Financial market development depends, in turn, on the legal and regulatory structures of financial contracting and their enforcement. Thus, our paper relates the recent literature on enterprise restructuring in transition to the broader literature on the determinants of financial sector development. Finally, the findings suggest that, in the initial transition period of hardening budget constraints, a top priority for governments is the development of a social safety net that would accommodate the rising flow of unemployed.

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**Table 1: Enterprise Indicators of Financing and Performance, 1993 to 1995**

Variable (Median Values)	Chronic Loss-Makers			Adjusted Firms		
	1993	1994	1995	1993	1994	1995
<b>Performance</b>						
Net Profits (Share of Sales)	-0.34	-0.19	-0.13	-0.27	0.09	0.11
New Bank Financing (Share of Sales)	0.07	0.14	0.14	0.08	0.11	0.07
Labor Shedding (Annual Change )	0.10	0.11	0.06	0.12	0.12	0.09
Net Investments (Share of Sales)	0.02	0.06	0.08	0.03	0.06	0.06
<b>Arrears (Stocks, Share of Sales)</b>						
To Wages	0.02	0.02	0.05	0.04	0.01	0.03
To the Tax Authority	0.06	0.07	0.08	0.06	0.02	0.04
To Suppliers	0.06	0.05	0.06	0.07	0.06	0.07
To All Enterprises	0.10	0.13	0.14	0.10	0.11	0.12
Sample of Firms	1,087			3,342		

**Table 2: Determinants of Passive Restructuring**

Explanatory Variable	Ordinary Least Squares		Logit	
	Coefficient	T-statistics	Coefficient	T-statistics
New Bank Financing	-0.2336***	2.8574	-0.2857***	3.1857
New Bank Financing * Adjusted	-0.1853**	2.0247	-0.1465***	2.3547
Exporter	-0.0665*	1.8652	-0.3258***	2.6485
Product Demand	-0.2614***	12.3658	-0.3784***	13.8541
Enterprise Size	0.0009	0.8247	0.0015	1.5066
Number of Observations	4,166		4,166	
Adjusted R <sup>2</sup>	0.3241			
% Concordant			0.834	

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level.

**Table 3: Determinants of Active Restructuring**

Explanatory Variable	Ordinary Least Squares		Logit	
	Coefficient	T-statistics	Coefficient	T-statistics
New Bank Financing	0.0074	0.5214	0.1152	1.6327
New Bank Financing * Adjusted	0.3423*	1.8945	0.2968***	3.1844
Exporter	0.0321***	4.1159	0.3657**	2.0413
Product Demand	0.1654	1.6254	0.1339	1.7364
Enterprise Size	-0.0003	0.6258	-0.0007***	6.5211
Number of Observations	4,132		4,132	
Adjusted R <sup>2</sup>	0.012			
% Concordant			0.839	

\*\*\* Significant at the 1% level; \*\* Significant at the 5% level; \* Significant at the 10% level.

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<sup>2</sup> The theoretical literature is summarized in Kornai (1998) and Maskin (1999). Empirical studies include Bonin and Schaffer (1995) on Hungary, Claessens and Djankov (2001) on the seven Central and Eastern European countries, Perotti and Carare (1996) on Romania, Li and Liang (1998) on China, and Schaffer (1998) on the Czech Republic, Hungary, Kazakhstan, Poland, Romania, and Russia.

<sup>3</sup> Schaffer (1998) shows that inter-enterprise arrears tend to cancel out among enterprises and arrears to energy suppliers were the only source of soft financing in Romania in 1994 to 1995.

<sup>4</sup> It is unclear whether their debts were rolled-over without being considered non-performing or whether firms did service their obligations with banks.

<sup>5</sup> In alternative specifications, we also account separately for bank credit to private and state-owned firms, following the theoretical model in Shleifer and Vishny (1994). The model suggests that bank credit to state-owned firms should be associated with less strategic restructuring, since credits are given for reasons other than investments.