POLICY RESEARCH WORKING PAPER 1699

The Maturity Structure of Debt

Determinants and Effects on Firms' Performance

Evidence from the United Kingdom and Italy

Fabio Schiantarelli
Alessandro Sembenelli

Firms tend to match assets with liabilities, and more profitable firms have more long-term debt. Long-term debt has a positive effect on firms' performance, but this is not true when a large fraction of that debt is subsidized.

The World Bank
Policy Research Department
Finance and Private Sector Development Division
January 1997

Summary findings

Schiantarelli and Sembenelli empirically investigate the determinants and consequences of the maturity structure of debt using data from a panel of U.K. and Italian firms.

They find that in choosing a maturity structure for debt, firms tend to match assets and liabilities, as both conventional wisdom and some recent theoretical models suggest. They conclude that more profitable firms (as measured by the ratio of cash flow to capital) tend to have more long-term debt. This finding is consistent with the dominant role played by firms' fear of liquidation and loss of control associated with short-term debt. It may also reflect the willingness of financial markets to provide long-term finance only to quality firms.

The data do not support the hypothesis that short-term debt, through better monitoring and control, boosts efficiency and growth. If anything, the results support the opposite conclusion. In both countries the data suggest a positive relationship between initial debt maturity and the firms' subsequent medium-term performance in terms of profitability and growth in real sales. In both countries total factor productivity depends positively on the length of debt maturity when the maturity variable is entered both contemporaneously and lagged.

But in Italy the positive effect of the length of maturity on productivity is substantially reduced or even reversed the larger is the proportion of subsidized credit.

Schiantarelli and Sembenelli document the relationship between firms' characteristics and their choice of shorter or long-term debt by estimating a maturity equation and interpreting the results in light of insights from theoretical literature, and by analyzing the effects of maturity on firms' later performance in terms of profitability, growth, and productivity. They estimate a Cobb-Douglas production function and assess how total factor productivity depends on the degree of leverage and the proportion of longer- and shorter-term debt. They also analyze the relationship between firms' debt maturity and investment by estimating an accelerator type of investment equation, augmented by financial variables.

This paper — a product of the Finance and Private Sector Development Division, Policy Research Department — is part of a larger effort in the department to study the effects of financial structure on economic performance. The study was funded by the Bank's Research Support Budget under research project "Term Finance: Theory and Evidence" (RPO 679-62). Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Bill Moore, room N9-038, telephone 202-473-8526, fax 202-522-1155, Internet address bmoore@worldbank.org. January 1997. (40 pages)

The Maturity Structure of Debt

Determinants and Effects on Firms' Performance

Evidence from the United Kingdom and Italy

Fabio Schiantarelli
(Boston College and World Bank)

Alessandro Sembenelli
(CERIS-CNR)

Address for correspondence: Fabio Schiantarelli, World Bank, PRDFP, 1818 H Street, NW, Room N9-031, Washington, DC 20433. Tel.: (202) 458-7341. E-mail: fschiantarelli@worldbank.org.

A version of this paper was presented at the conference "Term Finance: Theory and Evidence," Finance and Private Sector Development Division, Policy Research Department, World Bank, Washington, DC, June 14, 1996. We would like to thank C. Calomiris, G. Caprio, Jr., S. Claessens, A. Demirgüç-Kunt, M. Giugale, R. Levine, V. Maksimovic, S. Ospina, and other conference participants for useful comments and discussions.

DETERMINANTS AND CONSEQUENCES OF THE MATURITY STRUCTURE OF FIRMS' DEBT: THE CASE OF THE UK AND ITALY

1. Introduction

While there is a vast theoretical and empirical literature on firms' choice of the overall degree of leverage, much less is known about the maturity structure of firms' debt. Yet short and long term are by no means equivalent ways of financing firms' acquisition of real assets, as they have different incentive characteristics, and, therefore, different effects on firms' real performance. This makes it imperative to document the nature of the maturity structure of debt, and to investigate its determinants and consequences. [1]

Such an analysis has potentially important policy consequences, since governments both in developed and developing countries have often intervened in the credit markets, to foster the provision of long term debt finance. Presumably this intervention was based on the idea that, because of imperfections in capital markets, there was an under-provision of long term finance to at least certain categories of firms that kept them from exploiting favorable investment opportunities. This has led to the development of programs and institutions that dispense long term credit to enterprises, often (but not necessarily) at heavily subsidized rates. Although in this paper we do not

---

[1] See, however, Barclay and Smith (1996) for an empirical investigation of the determinants of the maturity structure of firms' debt for US firms.

intend to provide a detailed analysis of such government interventions, an understanding of the nature and consequences of maturity choices is a step towards evaluating their potential effects and desirability.

The main objective of this paper is to provide a thorough investigation of various issues related to the maturity structure of firms' debt using panel data at the company level for the UK and Italy. We first review the insights on the determinants of the maturity composition of debt that can be obtained from the theoretical literature. We then document how different firms' characteristics are related to their maturity choices by estimating a maturity equation and interpret them in the light of the theoretical predictions. The next step is to analyze what are the effects of maturity on firms' subsequent performance, in terms of profitability, growth, and productivity. To this end we present descriptive evidence on the average profit rate, the rate of growth in real sales, and the investment rate calculated over four year periods, when the firm-year observations are sorted by initial maturity. We also estimate a Cobb-Douglas production function and assess how total factor productivity depends upon the degree of leverage and the maturity composition of debt. Finally, we present empirical evidence on the effect of financial factors, including the maturity structure of debt, on firms' investment policies by estimating a simple accelerator model.

The advantage of investigating these issues both for the UK and Italy is related to the differences in the two countries financial structure. In the UK (as in the US)

publicly issued financial instruments are an important source of external finance.[2] Italy, instead, is characterized by much less developed financial markets and by a greater reliance on banks or on related financial intermediaries that provide most of the external funds.[3] Moreover Italy has made a greater use of subsidized credit as a policy tool to affect the geographical and sectoral allocation of investment and to promote exports. It has also been used to facilitate the adjustment of particular sectors and to promote the development of small enterprises. The importance of subsidized credit has been decreasing over time, but its role was still important over the period covered by our panel. A comparison of the empirical results for the two countries allow us to understand whether these institutional differences matter in explaining both the choice and consequences of the maturity structure of debt.

2. Determinants of Maturity and the Maturity-Performance Relationship

At present, there is not a unified treatment of debt maturity decisions by firms that allows for a different structure of returns from firms' existing and new assets, for the choice between market and intermediated debt, and between debt and equity.[4] What

---

[2] Although the differences between Italy and the UK are incontrovertible, one must be careful in not overemphasizing the importance of securities markets (relative to retentions and banks) in the UK. See Section 3 for further discussion.

[3] See Section 3 for more details.

[4] In certain cases the maturity choice is intertwined with the choice of intermediated versus non intermediated debt, with banks providing most of short term debt and the market most of long term debt.

does exist is a limited number of contributions that, using drastic simplifying assumptions, highlight some particular aspect of the maturity choice. Although less general than one would wish, these contributions are useful in providing some guidance for empirical work and we will review them briefly.

Most of the papers underline the advantages of short term debt in reducing agency problems under asymmetric information and imperfect or costly contract enforcement. One important advantage of shorter term debt has been described by Myers (1977). When investment is financed through debt, this creates an incentive problem because the return of the project has to be split between shareholders and bondholders. Stockholders may not capture enough of the return, so that they may pass over positive net present value projects. The greater the investment opportunities are, the greater the conflict between shareholders and bondholder is, as well as the agency cost associated with the under-investment problem. This agency cost can be reduced by decreasing the overall degree of leverage, but also by restrictive covenants or by reducing the maturity of debt. If the debt matures before the investment option has to be exercised, the under-investment problem can be shown to disappear. Therefore, everything else equal, one would expect to see a shorter maturity associated with the existence of more investment opportunities.

As we have already explained, in Italy also long term debt is provided mostly by specialized financial intermediaries. On the general issue of the role and differences of intermediated debt and arm's-length debt see Diamond (1984), Calomiris and Kahan (1991) and Rajan (1992).

In a model with asymmetric information about borrower's type, Diamond (1991) shows that firms of higher quality (with higher credit rating) should choose short term debt because they will be able to take advantage from the revelation of future good news. This positive information effect outweighs the risk of not being able to refinance oneself and running the risk of being liquidated by the lender (liquidity risk). The opposite is true for firms with lower credit rating. However, still lower rated borrowers can issue only short term debt, so that the relationship between length of maturity and credit rating is non-monotonic.[5] Note that, by ruling out equity, the Diamond model cannot shed light on the effect of the degree of leverage on the maturity choice. However, it is likely that firms with little debt are less exposed to the liquidity risk. This implies that highly leveraged firms would tend to choose longer term debt.

In the Diamond model the time structure of returns from the investment project is kept fixed. In a recent paper Hart and More (1994) discuss how the maturity of firms debt varies with the timing of project returns.[6] More specifically, in a model in which the entrepreneur cannot be costlesly replaced, they show that the faster the returns (assumed to be perfectly certain) arrive, the shorter will the optimal repayment structure (maturity) of debt be. This provides a rationale for the conventional wisdom

---

[5] The prediction of a positive association between firm quality and the amount of short term debt issued is also found in Kale and Noe (1990). In equilibrium, better firms will issue more short term debt and worse firms more long term debt.

[6] See also Hart and Moore (1995).

that suggests that the maturity of assets and liabilities should be matched. Another important prediction of their model is that, as the durability (liquidation value) of assets increases, debt becomes longer term. A support of the conventional view about matching of assets and liabilities is also provided by Myers (1977). Since assets in place allow the firm to support more debt, one can think of matching as scheduling debt repayments to correspond with the decline in the value of existing assets.

Just as there does not exist a unified treatment of the maturity choice, there is no contribution in the literature that provides a thorough analysis of the relationship between maturity and subsequent firm performance in terms of productivity, profitability and firm growth. This could be achieved, for instance, by endogeneizing the level of effort of the entrepreneur or of managers. Obviously some of the arguments we have reviewed above do have a bearing on this issue. For instance, if the use of short term debt reduces the likelihood that firms will pass up profitable investment opportunities, we would expect more short term debt to be associated with greater future investment and profitability, everything else equal.

More in general, arguments similar to the ones associated with the role of leverage as a discipline device are likely to apply[7]. Because of the more continuous scrutiny of firms' actions and threat of liquidation that is associated with short term debt, one may expect a reduction in wasteful activities by managers and, possibly, a greater search for efficiency in all the firm's operations. This should lead to greater

[7] See, for instance, Jensen (1986), (1989).

productivity and profitability. The prediction concerning investment and sales growth is instead more ambiguous, because the more frequent pressure to disburse free cash flow that comes with short term debt, may decrease the ability to pursue empire building tendencies, leading to lower investment and sales growth.

The favorable effects of a shorter maturity composition of firms' debt we have described so far could be counterbalanced by the fact that fear of liquidation may induce firms not to choose investment projects characterized by greater returns, in a present value sense, but accruing further into the future. Similarly, more productive technologies might not be adopted, unless they provide an immediate payoff. This shortening of the investment horizon may have, therefore, negative consequences on the overall performance of the firm. The idea that long term finance is very important for firms' growth, together with the assessment that in certain circumstances it is not adequately provided by the market, is implicit in the policies adopted in the past both by some national governments and by international financial institutions, like the World Bank. In Italy, for instance this took the form of fostering the development of Istituti di Credito Speciale, that provided long term loans, often at subsidized rates, to firms in order to promote the development of particular geographical regions, to favor the growth of small firms, and to help certain sectors. At the international level, the World Bank contributed to the creation of Development Finance Corporations, and provided financial support to other programs designed to extend long term loans to firms. Because of the widespread nature of these policies, an understanding of the

determinants and of the consequences of the maturity choice by firms is more than an academic exercise.

3. The Structure of Financial Markets, Data and Definitions

According to common wisdom the UK has one of the most developed financial systems in the world, where financial markets are perceived to play a prominent role in channeling funds from savers to industrial firms. Indeed, in the financial literature the UK system is taken as one of the two real world examples, the other being the US, of what is commonly defined as a "market-based system". This characterization is indeed supported by various indices of the importance of the stock market. For instance, the stock market to GDP ratio equals .92 in the period 1986-1993 and this places the UK in sixth place in the world in terms of stock market development (see Demirguc-Kunt and R. Levine (1995)). The corresponding figure for Italy is .16 which puts Italy in twenty-ninth place. The bond market capitalization relative to GDP equals .025 in the UK in 1986, smaller than in the US (.238), but higher than in Italy (.007) (see Rajan and Zingales (1995)). However, as noted by Mayer (1988), the role of the markets in financing the corporate sector in the UK is often overemphasized since in the 1970-85 period retentions accounted for 74% of the financing of total assets, with bank loans covering the majority of external funding.

As in the UK, retentions account for most of corporate sector's total funding in

Italy as well (61.8% for a closed sample of 972 large private firms over the 1982-90 period). Nevertheless, the differences between the two financial systems are profound. In particular, both the stock and the bond market play a very limited role in Italy, as the aggregate data on market capitalization we have reported suggest. Very few companies are quoted and, furthermore, public companies in the conventional Anglo-Saxon sense do not exist. On the contrary, family groups hold controlling interests through a pyramidal hierarchy of financial and operational firms and cross-shareholding abounds. Firms get a substantial proportion of external financial sources (both long and short term) from banks or from other financial institutions (for the same sample of Italian firms bank debt represented in 1990 about 75% of total financial debt with intra-group financial debt covering much of the rest).[8] In spite of recent privatizations, the influence of the Government on banks' behavior is still large, and it was even larger in the period covered by our panel (1977-90) when the largest banks were directly owned by the State. According to Italian banking law, until the early nineties financial intermediaries were segmented in two separate categories: "Banche Ordinarie" (Commercial Banks) and "Istituti di Credito Speciale - ICS" (Investment Banks), specialized in supplying short-term and long term loans respectively. One of the reasons why firms did not rely more on direct bond issues is that ICS could issue

[8] Notice that the ratio of domestic bank credit to the private sector relative to GDP is higher for the UK than for Italy, but this indicator is misleading to judge the importance of banks for firms' financing. In fact, domestic bank credit includes also credit to consumers and Italy is notorious for the narrowness of its mortgage and consumer credit markets.

tax free bonds to finance their operations. Moreover, some of the ICS's loans were at subsidized rates, although the fraction has decreased steadily over time. In 1977, for instance, 35% of total funds intermediated by ICS was at subsidized rate. In 1990 the figure has decreased to 26.2%.

This is the background against which one has to assess our empirical results. The empirical work in this paper is based on two rich unbalanced panels of UK and Italian companies with at least five years of consecutive observations. The UK panel is constructed from the balance sheet data collected by Datastream. It includes 604 quoted companies over the period 1976-1991 and contains 5244 observations. The panel for Italy is constructed using the balance sheet data collected by Mediobanca. It includes 750 private companies, mostly unquoted, over the period 1977-1990 and it contains 6327 observations. (see Table 1 for a detailed description of the unbalanced structure of the two panels).

Throughout our empirical work we will rely on a definition of maturity, calculated as long term debt divided by the sum of long term and short term financial debt. Account payables (trade debt) is excluded from the definition of short term debt.[9] Short term debt is defined differently for Italy and for the UK. For the UK, it is

---

[9] This decision is mainly due to data limitations. In fact, trade debt is available as a separate item for the UK only for the more recent years. Account payables are, instead, available for Italy. When we include them in the definition of short term debt, the econometric results we describe below remain, on the whole, unalterd.

defined as loans that are due to be repaid in less than one year, including therefore long term loans with less than a year to maturity. This portion of long term debt is not included in short term debt in Italy. However, the latter contains also, intra-group financial debt, which in principle one would want to keep separate. Aggregate information from a smaller sample of 972 private large firms, suggests that financial intra-group debt represents over the period an average of 13.2% of total financial debt.

In Table 2 we present the evolution over time of the mean, median and standard deviation of the ratio between long term and total debt for both the UK and Italy. Although cross countries comparisons must be treated with some caution because the definition of maturity is not exactly identical for the two countries, it appears that the maturity composition of debt is not dramatically different in the UK and in Italy. Also, the UK data suggest that, whatever measure of centrality is used, the maturity composition of debt becomes shorter during the recession years at the beginning of the 80's, while it lengthens during the prolonged expansion that follows. This trend continues also at the onset of the recessionary period at the end of the 80's, beginning of the 90's. The movements for Italy are less pronounced and are sensitive to the measure of centrality adopted. The only clear trend is the increase in the average value of maturity from 1984 to at least 1988, which is also a period of fast economic growth.

4. Empirical Evidence

In this section we present descriptive and econometric evidence

on firms' maturity choice and on the relationship between the maturity structure of debt and firms' subsequent performance.

4.1 Maturity Choices: Descriptive Statistics and Econometric Analysis

Before estimating a maturity equation, it is useful to start from some summary statistics about maturity and firms characteristics. In Table 3 for the UK and in Table 4 for Italy we report, in addition to the maturity composition of debt, MAT, the maturity structure of assets, ASS, measured as the ratio between fixed assets at replacement cost and total assets. Total assets are defined as the sum of fixed assets and gross working capital. The latter includes inventories and accounts receivable and other short term credits due to the firm. We also report information on leverage (excluding trade debt), LEV, on the cash flow to asset ratio, CFK, on the log of real sales, LY, on the growth rate of real sales, DLY, and on the liquid financial assets to total assets ratio, LIQK (only for the UK, due to data limitations). The means of all the variables are reported for both the total samples and for the sub-samples of observations below and above the median value of maturity length.

The first interesting aspect is that in both countries the mean maturity of debt for long maturity firms (above the median) is more than four times larger than the mean for short maturity firms (below the median). This seems to suggest that there may be very different (possibly constrained) strategies concerning maturity, one characterized by a large role for long term debt, representing in this case

almost three quarters of total non trade (financial) debt, and the other with long term debt playing decisively a minor role, representing less than a fifth of total debt.

As one would expect, observations with longer debt maturity are also characterized by an asset composition containing a higher proportion of longer lived assets.[10] Moreover longer debt maturity, larger size, and higher growth rates of real sales also tend to go together. One may regard some of these results as somewhat surprising in the light of the theoretical arguments reviewed above. We will defer a more detailed discussion of these issues when we will comment on the regression results. Longer debt maturities are also positively associated with a higher cash-flow rate. The association with total leverage is more confusing, as it is positive for the UK and negative with Italy. In the UK, longer maturity is also positively related to the ratio between liquid financial assets and total assets.

For Italy, firms can also be classified according to the structure of ownership: firms associated with domestic business groups (1165 cases), subsidiaries of foreign multinationals (2022 cases), or independent companies (3140 cases)[11]. Business groups and multinational corporations can be seen as organizational forms that allow a mitigation of the information problems that arise in accessing external financial

---

[10] The differences between the mean values of the various firm characteristics for short and long maturity observations described here are all statistically significant with the exception of the growth rate of real sales.

[11] For further information on the methodology used to split the sample, see Schiantarelli and Sembenelli (1995).

resources, possibly also affecting the maturity structure of debt. In order to assess the consequences for maturity, we have computed the percentage of firms belonging to each category which is above (below) the median maturity. No striking differences emerge. However, it appears that affiliates of domestic business groups have a longer maturity. In fact 53.0% of the firm-year cases linked to domestic business groups are characterized by a longer maturity structure than the median. The figure is 47.3% for affiliates of multinational corporations and 50.5% for independent companies.

Although bivariate correlations are interesting, a fuller picture of the maturity choice is contained in Table 5, where we present the results obtained from estimating various specifications of the maturity equation. The dependent variable is end of period maturity and the regressors are beginning of period maturity, beginning and/or end of period leverage and liquidity (the latter only for the UK), the (end of period) maturity structure of assets, contemporaneous cash flow and real sales, and present and past growth rates of sales. Particularly when end of period values of the stock variables are included as regressors, one should think of this equation as one structural equation that is part of a more general system determining firm's financial (and possibly also real) choices. Since we only focus in this section on the maturity equation, obviously our analysis is a partial one. Moreover in estimation one must take into account of the endogeneity problem resulting from the simultaneity of at least financial choices. For this reason we also present results in which only beginning of period leverage and

liquidity are included.[12] Endogeneity of the regressors results also from probable measurement errors and, in any case, one must allow for time invariant firm specific components of the error term. For all these reasons, all the equations are estimated by the Generalized Method of Moments in first differences to eliminate the firm specific effects. Values of the regressors lagged at least twice are used as instruments (Arellano and Bond (1988) and 1992)). All equations contain also year dummies that capture, among other factors, changes in the relative cost of short term versus long term debt.

In both countries there is an element of persistence, in the sense that lagged maturity has a (positive) and powerful effect on maturity today. The most robust result is that the length of maturity is an increasing function of the percentage of fixed assets out of total assets. This confirms the positive prediction of the models by Myers (1977) and by Hart and Moore (1994) that the maturity of assets and liabilities should be matched, just as prescribed by common wisdom. The positive coefficient on the variable ASS also has a collateral based explanation. If fixed assets are the ones more easily collateralizable, and long term debt is the form of debt that is more likely to be backed by collateral, we would expect a positive association between the maturity composition of assets and liabilities.

We allow for a non linear effect of size (proxied here by the log of real sales) on maturity by entering both the log of real sales and its value squared (these results

---

[12] We have also experimented with including only lagged values of ASS and we have obtained results that are similar to the ones reported in the text.

one is that, since many of the programs were designed to redress regional imbalances and to ease transition problems in sectors experimenting structural problems, it is by design that operating cash flow is less positively associated with long term debt (or even negatively associated with it, when the fraction of subsidized credit is very high). In any case this result must be treated with some caution because we have used only information at the aggregate level, since firm by firm data on the nature of long term debt is not available.

We try to capture the existence of growth options by the growth rate of sales between t and t-1, DLY_t, and between t-1 and t-2, DLY_{t-1}. The suggestion by Myers (1977) is that the existence of growth options should be associated with greater use of short term debt to control for the greater likelihood of conflicts between shareholders and bondholders. There is empirical support for this prediction for Italy but not for the UK. In Italy, the coefficient of lagged growth is negative, as well as the sum of the coefficients when both contemporaneous and lagged growth are entered as regressors. However they are all positive for the UK. How much weight one should put on these results depends on how well one thinks present and past sales growth help in predicting future growth opportunities.

The effect of leverage on maturity is mostly positive. This is what one would expect since higher leverage increases the threat of liquidation and this would induce firms to shy away from short term debt. Another explanation is that firms with few growth options are less likely to underinvest when it would be profitable. In this case conflicts between shareholders and bondholders are less severe and more

debt and of a longer maturity can be supported. In this sense high leverage works as a proxy for lack of growth opportunities. Also the free cash flow hypothesis would imply that high leverage and reduced availability of investment opportunities are positively correlated, although the reasons are different. In this case debt is a mechanism to reduce the agency costs of the conflict between inside managers and outside providers of finance, and to put a check on the over-investment and empire building tendencies of management by forcing them to pay-out the accumulated cash. A final explanation, is that a high level of debt, conditional on having survived and, therefore, on being in the sample, summarizes all those positive characteristics that have allowed firms to obtain credit in the past. Then the positive leverage coefficient suggests that it is credit worthy for firms that have access or find optimal to use long term debt (just as implied by the positive cash flow coefficient).

The effect of the beginning of period stock of liquid balances on the length of maturity for the UK is negative, while the association with end of period liquid balances is positive and larger in absolute value. One possible explanation for a negative association is that firms may be asked by banks to maintain compensating liquid balances as a condition to obtain short term credit. It is also possible that firms may desire to hold liquid assets as a buffer to absorb the liquidity risk associated with short term debt. Alternatively, a greater liquidity ratio may be a sign, just like cash flow, of the overall health of the firm and will therefore be associated with a longer debt maturity, as in the case of cash flow.

4.2 Maturity and Performance

What is the correlation between the maturity structure of debt and subsequent performance? This is a very important question that we address first by discussing some simple descriptive statistics and then by estimating both a productivity and an investment equation with maturity as an additional explanatory variable. In Tables 6 and 7 we divide all firm-year observations according to whether maturity falls below the first quartile, between the first and the third, or above the third quartile. We then calculate for each sub-sample the average growth rate of real sales, the average investment rate and the average cash flow rate. For Italy the growth rate of sales and the cash flow rate are monotonically increasing in the length of maturity. The same is basically true also for the UK, although in this case the rate of growth in real sales increases with maturity only for the group above the third quartile. For both countries the largest change occurs when the observations with maturity above the third quartile are compared to the rest, although they tend not to be statistically significant. The investment rate increases with maturity in both countries as well, but the change is rather small. The prima facie evidence is not supportive therefore of the idea that short term debt provides a better disciplining device that improves firms' performance.

However, it may be misleading to rely only on bivariate correlations. Additional evidence on this issue is provided in Table 8. In this Table we report the results of estimating a simple Cobb-Douglas gross production function that includes maturity and leverage (at the beginning of period or both at the

beginning and end of period) as explanatory variables in addition to capital, labor and materials. We include leverage as a regressor to control for the impact of general financial pressure on productivity. The dependent variable is the logarithm of the ratio between sales and the capital stock, LYK. The regressors are the log of the ratio of employment to the capital stock, LNK, the log of the ratio between material and the capital stock, LMK, and the log of the capital stock itself, LK. This equation is also estimated in first differences by GMM. Removal of the firm specific component of the error term and instrumenting is important to minimize the risk that the coefficient on maturity may simply reflect the fact that better firms or firms that enjoy a positive idiosyncratic shock receive more long term debt. The capital stock coefficient suggests a mild (especially for Italy) but significant degree of decreasing returns to scale. The elasticity of output with respect to materials is somewhat high (.7) for both countries, while the one for capital is unrealistically large for the UK. The conclusions on the effect of maturity depend upon the timing of the maturity variable. The lagged length of the maturity composition has an economically (although not statistically) insignificant effect in the UK and a positive and significant (economically and statistically) effect in Italy. When both contemporaneous and lagged maturity are entered as regressors, the sum of the coefficients is positive and significant for both countries. On balance, the results are more supportive of the idea that long term debt allows access to better technologies and that it allows firms to be more productive, while there is little or no support for the idea that short term debt increases firms' efficiency.

In Table 8, we also report an interesting result concerning the productivity effects of subsidized credit. In the last column we have allowed the coefficient on the maturity variables to depend upon the aggregate proportion of the stock of long term debt from ICS that is subsidized, AG (we do not have information on the availability of subsidized credit at the firm level). The coefficients on both interaction variables between maturity and the proportion of subsidized credit are negative and the one on the contemporaneous interaction is highly significant. Since the coefficients on the interaction variables are approximately twice as large in absolute value as the coefficients on maturity and since the proportion of subsidized credit fluctuates between a quarter and a third of the total, this implies that the positive effect of the availability of long term credit is very much reduced, and it can even be reversed when the fraction of subsidized credit is high.[13] The caveats on the use of only aggregate information on subsidized credit applies here as well.

The effect of leverage is negative and significant for both Italy and the UK which means that being under financial pressure does not lead to greater productivity. Actually the opposite seams to be the case.[14] This result, therefore, does not lend support to those theories that emphasize the role of financial pressure in inducing

---

[13] On the effect of subsidized credit in Japan see Calomiris and Himmelberg (1995).

[14] Nickell and Nicolitsas (1995) obtained the opposite result for the UK, when using the coverage ratio (interest payments divided by cash flow) as measure of leverage. However, when we add the coverage ratio to our original specification the results are virtually unchanged with the stock measure dominating the flow measure. On the effect of financial distress on corporate performance, see also Opler and Titman (1994).

managers to make choices that improve the firm's performance (Jensen (1986), (1989) and Wruck (1990)). However, a high leverage may also weaken the incentive to pursue efficiency, since borrowers' relative stake in the firm is smaller.[15]

Finally, to test whether the maturity structure of debt has an impact on firms' investment policies, we estimate a simple augmented accelerator model, with the investment rate as dependent variable and the rate of growth in sales, the ratio of cash flow to total assets, leverage, and the maturity structure of debt as regressors. We allow the maturity variable to enter both contemporaneusly and lagged once. A significant cash flow variable is likely to capture the importance of financing constraints and may also reflect the fact that contemporary cash flow acts as a proxy for expected profitability.[16] Also, higher leverage should lead to a greater premium on debt and then have a negative impact on investment, if the rate of interest is an increasing function of firm's leverage because of the existence of agency and/or financial distress costs.[17] As mentioned in Section 2, the prediction on the relation between investment and debt maturity is instead ambiguous. However, the common wisdom is that the availability of long term finance should stimulate investment in fixed capital by reducing the fear of liquidation and by allowing firms to make long term plans. Moreover, if the interest

---

[15] The adverse consequences of the conflict between borrowers and lenders is emphasized in Jensen and Meckling (1976), Myers (1977), Stulz (1990).

[16] See Fazzari, Hubbard and Petersen (1988) for an empirical investigation of cash flow and financing constraints.

[17] See Lang, Ofek and Stulz (1995) for an empirical analysis using US firms panel data.

rate on loans is subsidized, as it was the case in Italy for some firms, the cost of borrowing would also be lower.

The results for our investment equations estimated by GMM in first differences are presented in Table 9. As expected, the coefficients on the rate of growth in real sales are positive and significant both for the UK and for Italy. Analogously, the coefficients on contemporary cash flow are positive and significant for both countries. However, the size of the coefficient for Italy is almost twice as large as that for the UK, possibly suggesting that capital market imperfections faced by firms are more important in Italy than in the UK. The coefficients on beginning of period leverage are negative and significant for both countries, as suggested by the financial distress hypothesis.

Finally, the coefficient on the contemporary maturity variable is positive and significant for UK firms, while the one on the lagged maturity variable is opposite in sign, significant, and almost identical in absolute value. This suggests that it is the change in maturity that affects investment positively in the UK, although the effect is not very large (the results when this restrictions is imposed are reported in the second column). The maturity coefficients are never significant for Italian firms. The results do not change when maturity is interacted with the proportion of subsidized credit. The sign of the interaction terms are, however, positive as one would expect. Since the panel for Italy includes mostly unquoted companies, some of which may be at an informational disadvantage, we have also re-estimated the investment equation allowing (all) the coefficients to differ according to whether firms are

associated with domestic business groups, are subsidiaries of multinational corporations, or are independent firms.[18] For reasons of space we do not report the detailed results. However, it is interesting to note that the cash flow coefficient is significant only for independent firms (.41 with a t statistic of 3.3), and, more importantly from our point of view, the coefficient of the change in maturity variable is significant and positive only for members of domestic groups (.11 with a t statistic of 3.08). It is insignificant and minuscule for the other firms. This result is somewhat surprising because one would have expected that an increased access to long term (possibly subsidized) debt would be associated with greater investment, especially for financially constrained independent firms.

5. Conclusions

What are the main conclusions we can derive from the empirical investigation of the determinants and consequences of the maturity structure of debt for our panel of UK and Italian firms? One of the most robust results for both countries is that, in choosing the maturity structure of debt, firms tend to match assets and liabilities as suggested both by the conventional wisdom and by some recent theoretical models (Hart and Moore (1995)). A second general conclusion is that more profitable firms

[18] All the firms in the UK panel are quoted and represent a relatively more homogeneous set relative to the Italian firms in our panel.

(as measured by the cash flow to capital ratio, are characterized by a longer maturity structure of debt. This finding is consistent, on the demand side, with a dominant role played by the fear of liquidation and loss of control in the choice of maturity by firms. Short of liquidation, a more frequent renegotiation of the debt contract may give an advantage to the supplier of finance in appropriating at least part of the firm surplus, particularly if informational asymmetries weaken the competitive nature of the market for loans. For some of the Italian firms, the incentive to choose long term debt may also be associated with the existence of subsidized credit, in which case the positive association between length of debt maturity and cash flow is reduced and possibly reversed, when the fraction of subsidized credit is high. On the supply side, financial markets seem willing to provide long term finance only to quality firms and prefer instead to subject lower quality firms to the more continuous monitoring which is associated with short-term finance.

From a policy point of view, one of the most interesting results that emerges from our analysis is that there is no support in the data for the hypothesis that short term debt has better monitoring and control properties, and may, therefore, boost efficiency and growth. If anything, the empirical results we present in this paper suggest that the opposite may be true. In particular, the descriptive statistics point out to the existence of a positive relation in both countries between initial maturity and the subsequent medium-run performance of the firm in terms of profitability and growth in real sales. Moreover, for Italy and the UK, total factor productivity depends positively

upon the length of debt maturity when the maturity variable is entered both contemporaneously and lagged.

However, and this is equally important for policy, in Italy the positive effect of the length of maturity on productivity is substantially reduced or even reversed the larger is the proportion of subsidized credit, which points to the disincentive effects of financial subsidies. This issue is very important and it deserves a closer investigation. Optimally one would want to be able to rely upon firm level information on the sources and conditions attached to all loans, which, however, is not available for the firms in our panel. Finally the results from the investment equations suggest a positive, but not very large, effect of an increase in the length of maturity on the quantity of investment for UK firms and for some of the Italian firms.

References

Arellano, M. and S. Bond (1988), "Dynamic Panel Data Estimation Using DPD - A Guide for Users", Institute for Fiscal Studies, Working Paper, 88/15, London.

Arellano, M. and S. Bond (1992), "Some Tests of Specification for Panel Data: Montecarlo Evidence and an Application to Employment Equations", The Review of Economic Studies, 58, 277-297.

Barclay, M.J. and C. W. Smith, Jr. (1995), "The Maturity Structure of Corporate Debt", The Journal of Finance, July, pp. 609-631.

Calomiris, C.W. and C. M. Kahn (1991), "The Role of Demandable Debt in Structuring Optimal Banking Arrangements", American Economic Review, 81, June, 497-513.

Calomiris, C. and C. Himmelberg (1995), "Government Credit Policy and Industrial Performance: Japanese Machine Tool Producers 1963-1991", Policy Research Working Papers No. 1434, The World Bank.

Demirguc-Kunt, A. and R. Levine (1995), "Stock Market Development and Financial Intermediaries: Stylized Facts", Policy Research Working Papers 1462, The World Bank, May.

Diamond, D.W. (1984), "Financial Intermediation and Delegated Monitoring", Review of Economic Studies, 51, July, 393-414.

Diamond, D.W. (1991), "Debt Maturity Structure and Liquidity Risk", Quarterly Journal of economics, 106, 710-737.

Diamond, D.W. (1993), "Seniority and Maturity of Debt Contracts", Journal of Financial Economics, 33, 341-368.

Fazzari, S.M., Hubbard, R.G. and B.C. Petersen (1988), "Financing Constraints and Corporate Investment", Brooking Papers on Economic Activity, 141-95.

Hart, O. and J. Moore (1994), "A Theory of Debt Based on the Inalienability of Human Capital", Quarterly Journal of Economics, November, 841-979.

Hart, O. and J. Moore (1995), "Debt and Seniority: An Analysis of the Role of hard Claims in Constraining Management", American Economic Review, June, 567-585, see also NBER WP No. 3431.

Jensen, M.C. (1986), "Agency Costs of Free Cash Flow, Corporate Finance and Takeovers", American Economic Review, Papers and Proceedings, 76, 323-9.

Jensen, M.C. (1989) "The Eclipse of the Public Corporation", Harvard Business Review, 5, 61-74.

Jensen, M.C., and W. H. Meckling (1976), "Theory of The Firm: Managerial Behavior, Agency Costs, and Ownership Structure", Journal of Financial Economics, 11, 5-50.

Kale and, J. R., and T. H. Noe (1990), "Risky Debt Maturity Choice in a Sequential equilibrium", Journal of Financial Research, 13, pp. 155-165.

Lang, L., E. Ofek, and R. Stulz (1995), "Leverage, Investment and Firm Growth", mimeo.

Meyer, C. (1988), "New Issues in Corporate Finance", European Economic Review, 32, 1167-89.

Myers, S. C. (1977), Determinants of Corporate Borrowing", Journal of Financial Economics. , 5, pp. 147-175.

Nikell, S., and D. Nicolitsas (1995), "How Does Financial Pressure Affect Firms?", University of Oxford, Applied Economics Discussion Paper Series, 170, Oxford.

Opler, T.C., and S. Titman (1994), "Financial Distress and Corporate Performance", The Journal of Finance, XLIX, 3, 1015-1040.

Rajan, R. (1992), "Insiders and Outsiders: The Choice Between Relationship and Arms's-length debt", Journal of Finance, 47, September, 1367-1400.

Rajan, R. G., and L. Zingales (1995), "What Do We Know About Capital Structure? Some Evidence From International Data", The Journal of Finance, December, 1421-1460.

Schiantarelli, F., and A. Sembenelli (1995), "Form of Ownership and Financial Constraints: Panel Data Evidence on Leverage and Investment Choices by Italian Firms", CERIS-CNR, Working Paper Series, 1/95, Torino.

Stulz, R. (1990), "Managerial Discretion and Optimal Financial Policy", Journal of Finance, 26, 3-27.

Wruck, Karen (1990), "Financial Distress, Reorganization and Organizational Efficiency", Journal of Financial Economics, 27, 419-444.

Table 1

Structure of the Samples

	UK	UK		Italy	Italy
Period	1976-1991			1977-1990	
Firms	604			750	
Num. obs.	Num. cases	Num. firms		Num. cases	Num. firms
16	112	7		0	0
15	630	42		0	0
14	602	43		952	68
13	221	17		208	16
12	312	26		444	37
11	154	14		583	53
10	300	30		590	59
9	567	63		693	77
8	712	89		800	100
7	665	95		630	90
6	474	79		1062	177
5	495	99		365	73
Total	5244	604		6327	750

Table 2

Descriptive statistics on maturity for the UK and for Italy

	UK	UK	UK	UK	Italy	Italy	Italy	Italy
Year	Cases	Mean	Std. Dev.	Median	Cases	Mean	Std. Dev.	Median
1976	91	0.48241	0.34493	0.52029				
1977	223	0.47127	0.36532	0.51233	246	0.41318	0.30393	0.37955
1978	244	0.46161	0.35996	0.45703	251	0.45824	0.31469	0.41849
1979	259	0.41114	0.33293	0.40286	300	0.46346	0.32201	0.44544
1980	279	0.39672	0.33233	0.36257	367	0.43090	0.29278	0.41629
1981	295	0.41160	0.34507	0.36155	427	0.46408	0.30006	0.45242
1982	307	0.39881	0.34385	0.33815	497	0.44762	0.29500	0.43083
1983	400	0.41814	0.33586	0.40172	538	0.44514	0.29258	0.42800
1984	455	0.40584	0.31268	0.39868	553	0.43014	0.28937	0.40920
1985	465	0.42232	0.31249	0.42784	624	0.46293	0.30905	0.43482
1986	470	0.43084	0.31190	0.43933	610	0.47875	0.32707	0.46020
1987	464	0.44588	0.31014	0.46391	554	0.46418	0.31653	0.44342
1988	433	0.44842	0.30297	0.45115	505	0.49638	0.33767	0.48950
1989	391	0.45236	0.29658	0.45271	459	0.47639	0.34457	0.41865
1990	348	0.45165	0.30830	0.45548	396	0.49264	0.34770	0.43033
1991	120	0.47296	0.31803	0.51236				
Average	5244	0.43198	0.32359		6327	0.46041	0.31460	

Legend:

maturity = LTFD /(LTFD+STFD)

where:

LTFD = long term financial debt

STFD = short term financial debt

Table 3

Maturity and other firms' characteristics: UK

(Data sorted by maturity)

	Full sample	Below median	Above median	t-stat
Cases	5244	2622	2622	
Sorted by MAT	Mean (Std. dev.)	Mean (Std. dev.)	Mean (Std. dev.)	
MAT	0.432(0.324)	0.151(0.146)	0.713(0.173)	
ASS	0.555(0.155)	0.530(0.156)	0.580(0.151)	11.72
LEV	0.124(0.116)	0.121(0.090)	0.128(0.136)	2.38
LIQK	0.047(0.065)	0.038(0.065)	0.055(0.065)	9.68
CFK	0.100(0.060)	0.094(0.064)	0.106(0.055)	7.60
LY	6.119(1.710)	5.588(1.415)	6.650(1.813)	23.65
DLY	0.050(0.231)	0.047(0.247)	0.053(0.213)	0.89

Legend:

ASS = FC / (FC + GWC + LIQ)
LEV = (LTFD + STFD) / (FC + GWC + LIQ)
CFK = CF / (FC + GWC + LIQ)
LIQK=LIQ/(FC+GWC+LIQ)
LY = log of real sales
DLY = rate of growth of real sales
where:
FC = fixed capital
GWC = gross working capital (liquidity excluded)
LIQ = liquidity
CF = operational cash flow

t-stat test for the significance of the difference in the means

Table 4

Maturity and other firms' characteristics: Italy

(Data sorted by maturity)

	Full sample	Below median	Above median	t-stat
Cases	6327	3164	3163	
Sorted by MAT	Mean(Std. dev.)	Mean(Std. dev.)	Mean(Std. dev.)	
MAT	0.461(0.315)	0.194(0.142)	0.728(0.188)	
ASS	0.436(0.172)	0.396(0.160)	0.476(0.174)	19.18
LEV	0.230(0.167)	0.250(0.167)	0.211(0.164)	9.40
CFK	0.120(0.085)	0.111(0.077)	0.129(0.092)	8.07
LY	6.253(0.896)	6.204(0.844)	6.301(0.942)	4.34
DLY	0.036(0.160)	0.033(0.155)	0.040(0.164)	1.66

Legend:

ASS = FC / (FC + GWC)
LEV = (LTFD + STFD) / (FC + GWC)
CFK = CF / (FC + GWC)
LY = log of real sales
DLY = rate of growth of real sales
where;
FC = fixed capital
GWC = gross working capital (liquidity excluded)
CF = operational cash flow

t-stat test for the significance of the difference in the means

Legend:
Standard errors in round brackets. All standard errors are robust to time series and cross-section heteroskedasticity.
W_1 = Wald test of joint significance of the regressors (χ^2 distribution).
W_t = Wald test of joint significance of time dummies (χ^2 distribution).
M_1 = Test for first order correlation in the residuals (normal distribution).
M_2 = Test for second order correlation in the residuals (normal distribution).
Sargan = Sargan test of the correlation of the instruments with the error term (χ^2 distribution).
Degrees of freedom in square brackets.

Table 6

Measures of performance for the UK

(Data sorted by maturity)

	Below 1st quartile	Above 1st and belowe 3rd quartile	Above 3rd quartile
	Mean (Std. dev.)	Mean (Std. dev.)	Mean (Std. dev.)
$DLY_{t+1,t+4}$	0.046(0.136)	0.045(0.143)	0.056(0.134)
$IK_{t+1,t+4}$	0.110(0.076)	0.111(0.074)	0.116(0.075)
$CFK_{t+1,t+4}$	0.088(0.049)	0.095(0.051)	0.103(0.043)

Table 7

Measures of performance for Italy

(Data sorted by maturity)

	Below 1st quartile	Above 1st and belowe 3rd quartile	Above 3rd quartile
	Mean (Std. dev.)	Mean (Std. dev.)	Mean (Std. dev.)
$DLY_{t+1,t+4}$	0.033(0.070)	0.035(0.076)	0.041(0.075)
$IK_{t+1,t+4}$	0.117(0.074)	0.118(0.073)	0.120(0.073)
$CFK_{t+1,t+4}$	0.116(0.074)	0.118(0.070)	0.137(0.088)

Table 8

Productivity equations for the UK and for Italy

Dependent variable: LYK_t

	UK	UK	Italy	Italy	Italy
	GMM	GMM	GMM	GMM	GMM
	First differ.	First differ.	First differ.	First differ.	First differ.
Period	1980-1991	1980-1991	1981-1990	1981-1990	1981-1990
Firms	604	604	750	750	750
Observations	2828	2828	3327	3327	3327
LMK_t	0.701 (0.001)	0.703 (0.001)	0.707 (0.004)	0.709 (0.004)	0.704 (0.004)
LNK_t	0.164 (0.002)	0.164 (0.002)	0.279 (0.005)	0.276 (0.006)	0.275 (0.006)
LK_t	-0.104 (0.001)	-0.102 (0.001)	-0.013 (0.004)	-0.021 (0.005)	-0.027 (0.005)
LEV_t		-0.116 (0.004)		-0.018 (0.003)	-0.025 (0.003)
LEV_{t-1}	-0.109 (0.003)	-0.088 (0.003)	-0.049 (0.006)	-0.041 (0.006)	-0.040 (0.006)
MAT_t		0.028 (0.001)		0.036 (0.002)	0.216 (0.025)
MAT_{t-1}	-0.005 (0.001)	-0.019 (0.001)	0.019 (0.002)	0.009 (0.003)	0.070 (0.035)
MAT_t*AG_t					-0.570 (0.082)
$MAT_{t-1}*AG_{t-1}$					-0.168 (0.110)
W_1	405603.3 [5]	361445.6 [7]	106074.4 [5]	101109.6 [7]	111284.4 [9]
W_t	26854.9 [12]	33290.1 [12]	1072.5 [10]	1409.8 [10]	885.3 [10]
M_1	-1.12 [505]	-1.12 [505]	-4.16 [677]	-4.00 [677]	-3.93 [677]
M_2	-0.96 [426]	-1.03 [426]	-2.10 [500]	-2.09 [500]	-2.10 [500]
Sargan	442.3 [434]	441.0 [432]	394.5 [375]	393.8 [373]	391.3 [371]
Instruments	t-2,t-3,....	t-2,t-3,....	t-3,t-4,....	t-3,t-4,....	t-3,t-4,....

Legend:

LYK_t = log of salesdivided by the capital stock

LMK_t = log of materials divided by the capital stock

LNK_t = log of employment divided by the capital stock

LK_t = log of the real capital stock

For other definitions see the legend in Table 5

Table 9

Investment equations for the UK and for Italy

Dependent variable: IK_t

	UK	UK	Italy	Italy	Italy
	GMM	GMM	GMM	GMM	GMM
	First differen.	First differen.	First differen.	First differen.	First differen.
Period	1980-1991	1980-1991	1981-1990	1981-1990	1981-1990
Firms	604	604	750	750	750
Observations	2828	2828	3327	3327	3327
IK_{t-1}	0.082 (0.007)	0.081 (0.007)	0.064 (0.008)	0.063 (0.008)	0.063 (0.008)
CFK_t	0.091 (0.024)	0.089 (0.024)	0.210 (0.043)	0.208 (0.044)	0.204 (0.043)
DLY_t	0.144 (0.010)	0.143 (0.010)	0.034 (0.014)	0.039 (0.014)	0.035 (0.014)
DLY_{t-1}	0.031 (0.005)	0.031 (0.005)	0.021 (0.006)	0.024 (0.006)	0.021 (0.006)
LEV_{t-1}	-0.273 (0.012)	-0.271 (0.012)	-0.062 (0.024)	-0.051 (0.025)	-0.063 (0.023)
MAT_t	0.020 (0.004)		-0.019 (0.014)	-0.247 (0.147)	
MAT_{t-1}	-0.022 (0.003)		0.011 (0.009)	-0.020 (0.144)	
$DMAT_t$		0.021 (0.003)			-0.013 (0.009)
$MAT_t * AG_t$				0.701 (0.451)	
$MAT_{t-1} * AG_{t-1}$				0.046 (0.434)	
W_1	1534.4 [7]	1531.2 [6]	92.4 [7]	103.9 [9]	89.2 [6]
W_t	599.6 [12]	630.2 [12]	77.6 [10]	73.6 [10]	78.6 [10]
M_1	-7.25 [505]	-7.25 [505]	-8.20 [677]	-8.23 [677]	-8.16 [677]
M_2	-0.55 [426]	-0.56 [426]	-0.96 [500]	-1.06 [500]	-0.94 [500]
Sargan	315.1 [313]	315.9 [314]	231.9 [213]	225.1 [211]	231.8 [214]
Instruments	t-2,t-3,....	t-2,t-3,....	t-2,t-3,....	t-2,t-3,....	t-2,t-3,....

Legend: as in Table 5

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS1678	Financial Development and Economic Growth: Views and Agenda	Ross Levine	October 1996	P. Sintim-Aboagye 38526
WPS1679	Trade and the Accumulation and Diffusion of Knowledge	Pier Carlo Padoan	November 1996	M. Pateña 39515
WPS1680	Brazil's Efficient Payment System: A Legacy of High Inflation	Robert Listfield Fernando Montes-Negret	November 1996	T. Ishibe 38968
WPS1681	India in the Global Economy	Milan Brahmbhatt T. G. Srinivasan Kim Murrell	November 1996	S. Crow 30763
WPS1682	Is the "Japan Problem" Real? How Problems in Japan's Financial Sector Could Affect Developing Regions	Shigeru Otsubo Masahiko Tsutsumi	November 1996	J. Queen 33740
WPS1683	High Real Interest Rates, Guarantor Risk, and Bank Recapitalizations	Philip L. Brock	November 1996	N. Castillo 33490
WPS1684	The Whys and Why Nots of Export Taxation	Shantayanan Devarajan Delfin Go Maurice Schiff Sethaput Suthiwart-Narueput	November 1996	C. Bernardo 37699
WPS1685	Macroeconomic Crises and Poverty Monitoring: A Case Study for India	Gaurav Datt Martin Ravallion	November 1996	P. Sader 33902
WPS1686	Institutions, Financial Markets, and Firms' Choice of Debt Maturity	Asli Demirgüç-Kunt Vojislav Maksimovic	November 1996	P. Sintim-Aboagye 37644
WPS1687	Regionalism versus Multilateralism	L. Alan Winters	November 1996	A. Kitson-Walters 33712
WPS1688	Risk, Taxpayers, and the Role of Government in Project Finance	Michael Klein	December 1996	S. Vivas 82809
WPS1689	Is Economic Analysis of Projects Still Useful?	Pedro Belli	December 1996	K. Schrader 82736
WPS1690	Stock Markets, Banks, and Economic Growth	Ross Levine Sara Zervos	December 1996	P. Sintim-Aboagye 38526
WPS1691	Integrating the Unofficial Economy into the Dynamics of Post-Socialist Economies: A Framework of Analysis and Evidence	Daniel Kaufmann Aleksander Kaliberda	December 1996	S. Torres 39012

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS1692	Regulating Market Risk in Banks: A Comparison of Alternative Regulatory Regimes	Constantinos Stephanou	December 1996	P. Infante 37642
WPS1693	Famines and Economics	Martin Ravallion	December 1996	A. Ramirez 85734
WPS1694	What Can New Survey Data Tell Us about Recent Changes in Distribution and Poverty?	Martin Ravallion Shaohua Chen	December 1996	A. Ramirez 85734
WPS1695	Are There Dynamic Gains from a Poor-Area Development Program?	Jyotsna Jalan Martin Ravallion	December 1996	A. Ramirez 85734
WPS1696	South-North Migration and Trade: A Survey	Maurice Schiff	December 1996	M. Patena 39515
WPS1697	Strategies to Develop Mortgage Markets in Transition Economies	Dwight M. Jaffee Bertrand Renaud	December 1996	R. Garner 37670
WPS1698	Regulatory Structure and Risk and Infrastrcuture Firms: An International Comparison	Ian Alexander Colin Mayer	December 1996	R. Schneiderman 30191
WPS1699	The Maturity Structure of Debt: Determinants and Effects on Firms' Performance—Evidence from the United Kingdom and Italy	Fabio Schiantarelli Alessandro Sembenelli	January 1997	B. Moore 38526
WPS1700	Child Nutrition, Child Health, and School Enrollment: A Longitudinal Analysis	Harold Alderman Jere R. Behrman Victor Lavy Rekha Menon	January 1997	A. Ramirez 85734
WPS1701	Monitoring Environmental Standards: Do Local Conditions Matter?	Catherine Dion Paul Lanoie Benoît Laplante	January 1997	B. Laplante 85878