

Prices, Margins and Liquidity Constraints: Swedish Newspapers 1990-1996*

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Abstract

For Swedish newspaper firms, a market with high switching costs, the subscription market, and a market with low switching costs, the advertising market, are of approximately equal importance. When Sweden enters a deep recession, we find that liquidity constraints influence the pricing decision in the former, but not the latter market. This gives support to theories stressing the magnifying effect of liquidity constraints on the business cycle.

Key words: Liquidity constraints; switching costs; price adjustment; newspaper industry.

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I. Introduction

Several hypotheses have been advanced to explain how price and margins vary over the business cycle. In particular, economists have provided a number of models where firms have the incentive to keep prices relatively low in times of high demand and vice versa. Such behavior, if quantitatively important, would tend to amplify economic fluctuations. These models can broadly be classified into three categories. First, recessions are often accompanied by tight credit markets and liquidity constraints for some firms. Liquidity constrained firms can, provided that consumers have switching costs, boost short-run profits by increasing prices to avoid default at the cost of foregone future profits; Chevalier and Scharfstein (1996) and Gottfries (1991). Second, in switching cost models, if periods of high demand are associated with an inflow of new customers, not attached to a firm, firms will use aggressive pricing behavior in order to capture them for the future; Bilal (1989). Third, in implicit collusion models firms gain more by deviating from fully collusive prices in high demand states than in low. To sustain an implicitly collusive equilibrium, the prices in high demand states must be lower than fully collusive prices; Rotemberg and Saloner (1986).

To test the mechanisms sketched above, we provide an empirical examination of price adjustments in an industry that experienced dramatic changes in macroeconomic conditions: the Swedish newspaper industry in 1990 to 1996. In 1990, Sweden entered a deep recession, with a falling real GDP for three consecutive years, a quadrupling of unemployment, and a tightening of credits which caused a threefold increase in bankruptcies. A strong recovery began in 1994 with three years of high/medium-high GDP growth and a gradual loosening of credit. Such substantial changes in macroeconomic conditions may, at a first approximation, affect all newspapers to an equal extent. The question is if they all responded in a similar manner. We test whether the patterns of price adjustments for subscriptions and advertising space depended on firm specific factors, in particular the existence of liquidity constraints, and market specific factors. Our data are especially well suited for testing for effects of switching costs since newspapers set prices in two markets:

the subscription market, where switching costs are important, and the advertising market, where buyers are less attached to a particular newspaper.

The most important result is that newspapers with weak financial standings showed the highest increases in subscription price during the recession, which improved their margins in the short run. Financial standings could not explain differences in the price increases for advertising space, however. This suggests that newspapers with liquidity constraints attempted to raise short-term profits by exploiting readers' high switching costs, but could not improve their profitability at the expense of advertisers. These results are fully in line with the predictions of Chevalier and Scharfstein (1996). We find no support for the other two forces (inflow of new customers and implicit collusion) behind counter cyclical margins. In the recovery period none of the mechanisms had any significant impact on the pattern of prices and margins.

II. Theories and Tests of Pricing over the Business Cycle

A priori, price-cost margins are expected to be pro-cyclical: in times of high demand, margins are also high. However, it is conceivable that the mechanisms mentioned above make margins counter-cyclical, or at least add a counter-cyclical component. This possibility has spurred a significant empirical literature. Most of the early empirical studies (e.g. Domowitz et al, 1988) employed aggregate inter-industry data and found precious little evidence of counter-cyclical tendencies. Rotemberg and Woodford (1999) give references to more recent work in this vein. In this section, we briefly discuss the theories of mark-ups over the business cycle and previous empirical works that have relied on intra-industry data. We also discuss how the theories can be tested with data from Swedish regional newspapers.

Switching Costs and Liquidity Constraints

In the models of Chevalier and Scharfstein (1996) and Gottfries (1991) consumers incur a cost when changing supplier (see Klemperer, 1995, for a discussion of switching costs). In the short run, switching costs will reduce the price sensitivity of a firm's customers which, effectively, allows it to exploit captured customers by setting

a high price to raise profitability. Doing so, however, will induce consumers to search for other alternatives, and customers once lost are costly to win back. When firms are able to borrow against future profits they will not sacrifice long-run profits for short-run gains, but liquidity constraints, for instance in a recession, increases the default risk, which lowers the expected profits from investment in future market share.

In their empirical application, Chevalier and Scharfstein (1996) used samples of supermarkets in the U.S. to test their hypothesis that liquidity-constrained firms tend to increase their prices (see also Chevalier, 1995). The evidence suggests that firms likely to face liquidity constraints raised their prices relative to others, but the difference is only a few percent. The results in Phillips (1995) also indicates that financial constraints often lead to price increases. Borenstein and Rose (1995) report evidence of the opposite in their study of airlines in (or close to) bankruptcy: these firms lower their prices. Although Borenstein and Rose can not detect any effect on rivals, Kennedy (2000) finds the adverse effects on the profits and sales that would be expected if a competitor close to bankruptcy cut its prices.

There are some attractive features of the present data for a test of the predictions on liquidity constraints in markets with switching costs. First, as noted in the introduction, when Sweden entered a recession in 1990, credits were tightened as a result of very large credit losses for all major banks. With accounting information from newspaper firms, we can broadly categorize them as being more or less liquidity constrained by their solvency (i.e. the ratio of own equity to total assets).¹ Firms with low solvency are likely to be the ones most affected in the event of a tightening of credit markets. Second, as the probability of default increases with time to the next buyer-seller interaction, the time between interactions is of importance when investing in customer stock. Newspaper subscriptions are usually renewed once a year compared to the much more frequent interaction with e.g. supermarket customers. Third, the revenue of a representative local newspaper roughly splits equally between the sales of subscriptions and advertising space. We argue that the average buyer of advertising space is much less attached to a particular newspaper than the average

¹ Studies of investment behavior have used profit margins, dividend payments and solvency to measure the extent of liquidity constraints; for references see Hubbard (1998). Chevalier and Scharfstein (1996) partly rely on variables relating to leveraged buy-outs to measure the importance of liquidity

subscriber. This is motivated by the ease with which advertisers can change source in response to a change in the cost of reaching consumers.² The reader, on the other hand, has grown accustomed to a newspaper's content and style, and is therefore unwilling to switch because of a modest increase in the subscription price. Using the language of Klemperer (1995), the reader incurs a “psychological cost of switching” induced by a change of preference in favor of the product previously chosen. The importance of switching costs for daily newspapers is supported by empirical studies, which usually find a highly inelastic relation between circulation and subscription price in the short run for newspapers; see references quoted in Lewis (1995).

Sales of subscriptions and advertising space are interrelated. As advertisers have a preference for newspapers with a large circulation, increasing the subscription price will involve a loss of advertising revenue.³ However, as circulation is price insensitive in the short-run, a subscription price increase may not force a reduction of the price of advertising, which would imply a short-run increase in total revenue and profits. This motivates our empirical specification, which treats the growth rate of the subscription price as independent of the growth rate of the advertising price.⁴

The prediction from the model of Chevalier and Scharfstein (1996) is that firms with the lowest solvency (as of 1989) should have the highest price increases for subscriptions in the 1990-1992 recession. It is not immediately clear that any prediction can be made for the 1994-1996 recovery. First, as the general economic conditions improved during this period, it gradually became easier to obtain new credits even for firms with low solvency. Second, it may be too costly for newspapers that have lost subscribers in a recession to win some back by lowering their prices. In both periods, prices for advertising space should be essentially independent of the financial position.

constraints. However, there is an issue whether LBO firms is a valid test group as a change in ownership may lead to substantial changes in firm strategy, not directly related to liquidity constraints.

² Advertisers in national newspapers and on TV, usually producers of branded consumer products and large retail chains, are likely to have more long-term relationships that are costly to terminate, for instance due to quantity discounts. However, the advertising content of local newspapers is dominated by occasional promotions by local businesses, which suggests a reliance on short-term contracts.

³ There is mixed evidence on the relation between subscription price and advertising sales. Thompson (1989) and Dertouzos and Trautman (1990), among others, have estimated systems of equations for cross section data. Dertouzos and Trautman used a cross-section of U.S. newspapers and found some effects of subscription price on sales of advertising, with a price elasticity of -0.45. On the other hand, Thompson fails to find a clear price-quantity relationship for either subscription or advertising price with British and Irish data.

Customer Flows

The demand functions might be more elastic during booms such that prices should be kept relatively low. One reason for this is that high demand states are associated with an inflow of consumers who have not previously bought the product. If these develop switching costs after their initial purchase then firms would lower their prices in high demand states in order to capture these new consumers for future exploitation; see Bils (1989). However, the argument rests on the assumption that the demand increase stems from an inflow of new customers rather than higher demand from repeat purchasers (which would lead to higher prices).

Our data allows us to discriminate between high demand per consumer and a large inflow of new consumers. Although an upturn in the economy affects the demand per consumer in all local markets, certain areas will benefit relatively more. We measure this variation at the market level by the growth rate in the average per capita disposable income. To measure the importance of an inflow of consumers we use statistics on migration patterns within the country. From this hypothesis, we expect to find lower subscription price increases in markets with a high inflow of consumers, measured as a percentage of the population. For the advertising market, on the other hand, large inflows would lead to higher demand for advertising from local business and would be more likely to raise than to lower advertising prices.

Implicit Collusion and Market Structure

It is often claimed that the intensity of competition varies with demand conditions and that firms have difficulties in sustaining implicitly collusive agreements when demand is unstable. Rotemberg and Saloner (1986) formalized the intuition in a model where demand fluctuates randomly between high and low states, but where firms can observe the realization of demand. The key intuition behind their result that price-cost margins may have a counter-cyclical tendency is that firms have a greater incentive to deviate when the value of future collusive profits is low, compared to the value of a current deviation. With no correlation in demand, it may be impossible to sustain fully collusive prices in periods with high demand. The issue of the temporal dependence

⁴ In our data, the correlation between the growth rates of the annual subscription price and price for

of demand shocks has been addressed in several extensions of the model. Bagwell and Staiger (1997) consider the effects of randomness in the growth rates in demand (see Haltiwanger and Harrington, 1991, and Kandori, 1991, for other types of demand fluctuations). Under the empirically plausible assumption of positive correlation of growth rates in demand, Bagwell and Staiger show that price-cost margins tend to be pro-cyclical rather than counter-cyclical. Another situation, where firms cannot observe the state of demand, is modeled in Green and Porter (1984). This might lead to an equilibrium with temporal punishments following a low demand state, which could be observed as a pro-cyclical tendency of price-cost margins.

A number of studies have attempted to test predictions from the models of implicit collusion. One of the most comprehensive studies to date is Ellison's (1994) structural model of supply and demand in a railway shipping cartel in the 1880's, designed to test predictions from competing models of implicit collusion. He finds little in terms of support for the mechanism in Rotemberg and Saloner (1986) but some evidence in favor of that in Green and Porter (1984). Borenstein and Shepard (1996) study the dynamics of prices and margins in regional retail gasoline markets in the U.S., using the fact that demand fluctuates over the year and that there is a delayed pass-through of some cost components. They find that predictable increases in future demand (cost) tend to increase (decrease) price-cost margins, which is consistent with models suggesting that implicitly collusive agreements are more difficult to sustain when the gains from deviation are large.

The bottom line is that the theories of implicit collusion are sensitive to the fine details of the game. While it is possible in some cases to explicitly model the game, it is more common, as is done here, to test whether prices move in the direction predicted by some model in response to changes in demand. The most robust prediction of models based on implicit collusion is that the pattern of price adjustments should vary with the market structure, in the sense that monopoly firms do not need to take strategic interaction into account.⁵ The data contains a number of

advertising space is 0.15 and 0.01 for the 1990-1992 and 1994-1996 period, respectively.

⁵ Prices and margins might only gradually adjust to new conditions and it is possible that the speed of the adjustment process depends on the market structure. Fisher and Konieczny (1995) find that monopoly newspapers adjust their prices more frequently, and by smaller nominal amounts than newspapers with one competitor. However, Thompson (1988) found no evidence of market structure or circulation being important determinants of the speed of adjustment of advertising prices. While it is conceivable that our market structure dummy also picks up differences in the speed of adjustment, we

newspapers that can be considered as monopolies, and there are also instances where a local newspaper has a very high market share and only faces weak competition from other local and/or national newspapers. Other markets are characterized by close competition between two newspapers. In the regressions, we use a dummy variable for whether the market is a monopoly or duopoly to capture the possibility that the intensity of competition varies with the state of demand.

III. Data

The Swedish daily newspaper industry is well documented. Advertisers have an interest in knowing the circulation and geographical coverage of newspapers as well as prices for advertising. This information has been provided by the Swedish audit bureau of circulation, Tidningsstatistik AB. The Swedish association for newspaper publishers, Tidningsutgivarna, collects information on subscription rates. The government subsidizes some newspapers and its agency, Presstödsnämnden, monitors the publishers' economic performance. In addition to these sources, we employ census data from Statistics Sweden (Statistiska Centralbyrån). The full data set contains information on all (133, as of 1992) newspapers in Sweden over the period 1975-1996. Our analysis, covering the turbulent period 1990-1996, is restricted to local morning newspapers with three or more issues per week, which gives a sample of approximately 90 newspapers in each of the years.⁶ The time dimension is limited, as balance sheet variables, used to measure liquidity constraints, are only recorded from 1989 to 1996.

The Swedish Economy over the Sample Period

Most of the changes in demand and cost conditions, such as wages, interest rates, paper costs and general inflation, are the same, irrespective of the local market in

believe the two-year intervals we use to be sufficiently long for prices to be fully adjusted to new conditions.

⁶ We have excluded four evening newspapers, sold almost exclusively as single copies, since these only compete with local morning newspapers to a minor extent. The second group excluded is morning newspapers with coverage in a very large number of local markets. This group includes three large national morning newspapers, and two newspapers tied to religious and political organizations, which cover most of the country but have very low local market shares. Finally, we do not consider 37 newspapers with only one or two issues per week, read as a local or political additive to a regular newspaper and viewed as distinctly different by government agencies and people involved in the industry. The exact numbers vary slightly over the years, the numbers above are for 1992.

which the newspaper operates. We do not account for the effects of changes in such general conditions, as our analysis is aimed at explaining differences across newspapers. In the years prior to our sample period, GDP growth rates were high and unemployment low, as shown in Figure 1. The beginning of the 1990's saw a very severe recession, with real GDP falling for three consecutive years (1991-1993) and a dramatic increase in unemployment. Tightening of firm credits was a prominent feature of the recession. All major banks suffered considerable credit losses, in total 5 percent of GDP in 1992, and had a large *ex ante* probability of bankruptcy. Indeed, the government had to intervene to save a number of banks from collapse. In the economy, the total number of firm bankruptcies almost tripled from 1989 to 1992. This recession was followed by a recovery, although unemployment remained at a high level. Naturally, there is some ambiguity as to when exactly the recession ended and the recovery began and we therefore split the sample into two sub-periods: 1990-1992 and 1994-1996.

[FIGURE 1 ABOUT HERE]

Market Data

Our definition of a market follows the standard Swedish municipal classification. We define a newspaper's home market as the municipality where it has its largest circulation.⁷ The median newspaper has 62 percent of the total circulation in its home market. A newspaper's market level data includes demographic and income statistics from its home market. As the circulation is concentrated to the home market, we do not try to incorporate the economic development in other municipalities where a newspaper is sold. The development in these, almost always neighboring, markets is also likely to be highly correlated with the home market. In the regressions we use the growth rate in disposable income per capita over the periods, denoted *INCGROWTH*. According to customer market theories, e.g. Bilal (1989), a change in the number of new consumers will cause a change in prices. We capture this with the difference in the ratio of immigration to total population, *IMMIGDIFF*.

⁷ In one case only does the municipality where a firm has its largest circulation change. Since this newspaper has roughly the same circulation in the two municipalities, we let its home market remain the same over the sample period.

Newspaper Data

To measure the development of nominal prices during the two periods, we use the annual subscription price and the price per millimeter for ads with non-specified placement, as of January 1.⁸ Although newspapers offer a large menu of advertising possibilities depending on the size and place of the ad, and often also sells subscriptions of different duration, these are the prices on which people in the industry usually rely in their comparisons. The dependent variables are the growth rates of the two nominal prices *PSUBGROWTH* and *PADVGROWTH*, defined as $100 \times (P[t] - P[t-2]) / P[t-2]$. We do not deflate the two prices, as general inflation is the same for all newspapers. The data also includes information from the income statement and some balance sheet variables such as own equity and total debt. Certain owners control several local newspapers but for the vast majority, accounting data are broken down per newspaper.⁹ In the cases where no separate figures exist, we assume the accounting variables to be the same for all newspapers in the same firm. The income statement gives our next dependent variable, the change in price-cost margin, *MARGDIFF*, defined as $100 \times (PMC[t] - PMC[t-2])$, where PMC is total revenues (including government subsidies) minus total costs, divided by total revenues. This measure is admittedly crude and is also the same for newspapers in the same firm, but it can give an indication of whether a newspaper's short-run performance improved or deteriorated during a certain period.

We are interested in whether a newspaper's behavior depends on its market position. As noted above, some municipalities are the home market for only one local newspaper, while others have two local newspapers. There are no municipalities with more than two local newspapers with three or more issues per week. If there is no competing local newspaper, the newspaper is referred to as a monopoly and the dummy variable *MONOPOLY* takes on the value one. In most of the monopoly

⁸ Subscription rates often remain unchanged for periods up to a year, potentially leading to a measurement problem in the dependent variable. However, most newspapers adjust prices in January such that this problem is likely to be of minor importance. Advertising rates are adjusted more frequently.

⁹ As of 1994, one owner owned nine local newspapers, one owned seven, one owned five, two owned four and three owned three. In some cases, all newspapers are within the same firm, in other cases there are several separate firms. Matching the accounting data with circulations and subscription prices suggests that the major part of the firms' revenue stems from the industry, i.e. they seem to have very limited exposure to activities in other industries.

markets there are other (non-local) newspapers with a household coverage of more than three percent. However, as the home market accounts for 62 percent of the total circulation for the median newspaper we expect little strategic interaction between a local and a non-local newspaper. Monopoly markets tend to be small in terms of population and, consequently, monopoly newspapers have a low total circulation. The competitive situation for newspapers with one local competitor may differ depending on their relative market shares, but no attempt is made here to make a finer distinction between newspapers in this category.¹⁰

As the theory predicts that liquidity constraints should only play a role for newspapers facing a bankruptcy risk we use a dummy variable, *LOWSOLVENCY*, defined as a solvency below 15 percent.¹¹ The reason for not using a continuous variable is that for a firm with high solvency the bankruptcy risk is negligible. Solvency is measured one year prior to the period in question, which might be treated as exogenous since the recession was unexpected¹². For newspapers with one local competitor there might be interaction in the pricing decisions. For instance, if a liquidity constrained newspaper raises its subscription price, this may also give its rival the opportunity to raise price. This is captured by the variable *RIVAL_LOWSOLVENCY*, which takes the value one if the newspaper competes in the same market as a newspaper with solvency below 15 percent.

Bankrupt newspapers may face different demand conditions due to consumer uncertainty regarding future publication and quality of the newspaper. The dummy variable *BANKRUPT* denotes four newspapers, all with the same owner and having

¹⁰ We have, however, tried to assign a dummy variable to each newspaper according to its position in the home market. There is considerable heterogeneity among newspapers in the duopoly markets. Some duopoly markets have two newspapers with roughly the same coverage. Furthermore, there are asymmetric duopoly markets where one of the newspapers has significantly larger coverage. Preliminary regressions showed no evidence of differences in the pricing pattern between different types of duopoly newspapers.

¹¹ As mentioned above, several newspapers may have the same owner. In one case, the owner, Nya Wermlandstidningen, owns a subsidiary whose solvency was low in 1989, and eight subsidiaries with high solvency in that year. We treat all newspapers with this owner as having high solvency. This is motivated by our intention to let low solvency be a measure of bankruptcy risk. If the owner has a strong financial position it could, if needed, make a capital infusion to save a subsidiary from bankruptcy.

¹² Income from advertising is affected by business cycle fluctuations to a much larger extent than income from subscriptions. If the share of income from advertising was correlated with low solvency it would be unclear whether *LOWSOLVENCY* picks up the effects of liquidity constraints or some other effect of vulnerability to the business cycle. This is not the case however, as the share of income from advertising is about the same size for the two groups of firms, 0.50 for low solvency firms and 0.52 for other firms. If subsidies are included as a part of the income, the figures change to 0.45 and 0.51, as low solvency firms are over-represented among the small duopoly firms.

low solvency in 1989, that were bankrupt in 1992. They are still published in 1992 and quote prices for this year, but as no accounting data are available they are missing in the *MARGDIFF* regression. These newspapers were reconstructed in 1993, but had a significantly lower circulation in the 1994-1996 period. Analogous with the argument above, we use *RIVAL_BANKRUPT* to capture the possibility that the behavior may change for a newspaper that competes with bankrupt rival.

[TABLE 1 ABOUT HERE]

As seen in Table 1, the sample contains 19 newspapers whose solvency was below 15 percent in 1989, four of which were bankrupt in 1992. If the cutoff level had been 10 (20) percent solvency, 14 (27) newspapers would have been in the category. Low solvency newspapers are relatively less common among the monopolies (7/53 compared to 12/34 among the duopolies) but they do not stand out in terms of size.

[TABLE 2 ABOUT HERE]

Table 2 reveals that the average increases in the nominal price were higher in the first than in the second period, both in the subscription and the advertising market. Margins improved, on average, by 2.5 percent in the recession and declined by 5.5 percent in the recovery.¹³ In the first period, it is striking that those that eventually go bankrupt have much smaller price increases, 14 percentage points, than the average 22 percentage points. The other newspapers with low solvency in 1989 exhibit subscription price increases that are three percentage points higher than the average, but advertising price increases that are close to the average. A mirror image is that the group with low solvency managed to increase their margins by 4.8 percentage points, or 2.2 percentage points more than the sample average. For the recovery period, price changes are similar across groups of newspapers of different characteristics although margins fell by more for the monopoly group.

¹³ The differences in averages across periods can partly be attributed to growth in CPI and input costs. Growth in CPI, measured as of January, was 16 percent between 1990 and 1992, and 4 percent between 1994 and 1996. Hence, real prices increased by roughly 6 percentage points in each of the periods. In the two periods, journalist wages increased by 7 and 3 percent, and the newsprint price declined by 5 percent in the recession and increased by 26 percent in the recovery. The improvements

A maintained assumption in the analysis is that readers have switching costs and that circulation is relatively insensitive to price in the short run, such that it is possible to, temporarily, improve margins. Although our data is insufficient to estimate demand functions for the newspapers (we lack measures of their quality) it is still possible to use information about circulation to provide some evidence to support the claim. During the recession, subscription prices rose on average by 22 percent nominally and 6 percent in real terms, while average circulation fell only by 1.5 percent. The correlation coefficient for growth in the subscription price and the change in circulation was -0.28. In the same period, the correlation between the change in margins and the growth in subscription price was 0.34. Together, this suggests that price sensitivity was indeed low, and that the newspapers increasing their subscription prices the most, were able to improve their margins substantially.

[TABLE 3 ABOUT HERE]

Table 3 gives the means and standard deviations of the independent variables. Most importantly, we see that there is very little variation in *INCGROWTH* and *IMMIGDIFF*. The fraction of firms categorized as *MONOPOLY* has risen from 60.3 percent in 1992 to 64.4 percent in 1996, due to the exit of three duopoly newspapers.

IV. Results

We use separate, reduced form specifications with *PSUBGROWTH*, *PADVGROWTH*, and *MARGDIFF* as dependent variables.¹⁴ The results for the two periods, ending in 1992 and 1996 respectively, are shown in Table 4.¹⁵ Examining the adjusted R-square in the different regressions reveal that the included variables can help explain the development of prices and margins in the 1990-1992 recession but not in the 1994-

in margins in the recession and the decline in the recovery thus, to some extent seem to be caused by the movements in newsprint price.

¹⁴ The correlation between the error terms in the subscription price and the advertising price regressions are 0.02 and 0.05 in the 1990-1992 and the 1994-1996 periods, respectively. This supports our specification that treats the rates of price changes in the two markets as unrelated.

¹⁵ The difference in the number of observations in Table 4 is due to missing accounting data for the firms for 1992; hence it is not possible to compute the margin. In four cases, the lack of accounting data is due to bankruptcy. For the period 1994-1996, the difference in number of observations is due to missing accounting information for one newspaper.

1996 recovery. This might be attributed to the fact that the recovery is less pronounced (e.g. unemployment remained at high levels) than the recession. However, the pattern is not inconsistent with predictions from the model of Chevalier and Scharfstein (1996). Although liquidity constrained firms deplete their customer stock by raising prices in the recession, when credit conditions ease in the recovery they may not find it profitable to reduce prices in an attempt to regain market share. In the following, we will focus our discussion to the first period.

[TABLE 4 ABOUT HERE]

Switching Costs and Liquidity Constraint

Newspapers with low solvency raised their subscription prices 3.6 percentage points (or 17 percent) and their margins increased by 2.5 percentage points more than others did.¹⁶ In the advertising market there is no significant difference between the groups and thus the sharp improvement in margins should be attributed to the higher subscription prices. Together this is evidence that firms with a high default risk can, and do, exploit their customer base to raise short-run profits. This, in turn, leads to softer competition: newspapers with liquidity constrained rivals also exhibit significantly larger increases in subscription prices. The main results from the three regressions on the 1990-1992 data support the model of Chevalier and Scharfstein (1996).

The newspapers that went bankrupt in 1992 had much smaller price increases than the average.¹⁷ There may be two explanations to this finding. First, if it becomes clear to readers that a newspaper will inevitably become bankrupt in the near future, then the demand for subscriptions will drop. In order to keep its circulation, the

¹⁶ Using 10 percent as the cutoff level for *LOWSOLVENCY* changes the estimates for *LOWSOLVENCY* to 2.48**(1.26) and 2.20(1.68) and for *RIVAL_LOWSOLVENCY* to 1.47(2.39) and 2.96*(1.80), in Table 4, columns (1) and (3), respectively.

Using 20 percent as the cutoff level changes the estimates for *LOWSOLVENCY* to 3.00** (1.20) and 2.05 (1.37) and for *RIVAL_LOWSOLVENCY* to 2.53 (1.93) and 3.50*(1.88), in Table 4, column (1) and (3) respectively. Estimates for 1994-1996 are essentially unchanged.

¹⁷ There is only minor changes on estimates in the regression for subscription price changes for 1990-1992 if bankrupt newspapers are excluded; the point estimate for *LOWSOLVENCY* changes to 3.63***(1.29). For the advertising price regression for 1990-1992, adjusted R-square almost falls to zero, which is not surprising since *BANKRUPT* is the only significant variable in that regression.

newspaper may be forced to lower its subscription prices. Second, these firms may have gone bankrupt just because they did not raise prices sufficiently. A closer examination of price changes for the periods 1990-1991 and 1991-1992 suggest that it is in the latter that the bankrupt newspapers behave differently. Between January 1 1991 and January 1 1992, the bankrupt newspapers increased their subscription prices by only 3.6 percent compared to 10.7 for the sample average, and 12.6 for those with low solvency that avoided bankruptcy. In the year before, there were no marked differences between the pricing behavior of different types of newspapers. For the full sample, circulation fell by on average one percent in both 1990-1991 and 1991-1992. The circulation for the newspapers that went bankrupt in 1992 fell by 14 percent and 15 percent in each of the two years, respectively. Taken together, this indicates that readers may have realized already in 1990-1991 that some newspapers would not survive, and that these were therefore forced to limit price increases in 1991-1992.

Customers Flows

Markets with large inflows of new consumers should exhibit lower prices (Bils, 1989) and a change in inflows will then cause a change in the price. The econometric results in Table 4 show no support for this and neither did further testing on other years between 1975 and 1996. The reason can be that new subscribers are targeted with discounted introductory offers, making it unnecessary to cut the regular price to capture the (relatively few) new subscribers. This is supported by our companion paper, Asplund et al (2001), where we show that the fraction of circulation sold at a discount (usually between 3 and 10 percent) is slightly higher in areas with large inward migration. Contrary to our expectations, the estimated coefficient on *INCGROWTH* is negative in the *MARGDIFF* regression. The likely reason is that small local differences in the economic conditions make it difficult to trace any effect.

Implicit Collusion and Market Structure

We find no significant differences in either subscription price or advertising price, or in price cost margins, between firms facing competition and monopolies in any of our regressions. For subscription prices these findings are not surprising, as any newspaper can rapidly detect the moves of its rivals, which is contrary to a basic

assumption in the model. Whether the same is true for advertising prices is unclear. The prices in our data are list prices per millimeter of non-specified placement, but the possibility remains that some large advertisers get secret discounts. According to people in the industry, this is quite common for the period studied.

V. Conclusions

In this paper, we have examined the behavior of prices and margins in the Swedish newspaper industry during a sharp economic downturn and a following recovery. The purpose was to evaluate some mechanisms that could lead to a countercyclical tendency of prices and margins. In particular, we focused on the effects of liquidity constraints in a recession that more than tripled the number of bankruptcies in the economy.

We find that newspapers with low solvency at the beginning of the recession increased their subscription prices and that their margins improved, relative to other newspapers. Our interpretation, consistent with the prediction from Chevalier and Scharfstein (1996), is that their low solvency implied a bankruptcy risk, which could only be avoided by exploiting readers whose switching costs were high. In the same period, increases in advertising prices did not depend on financial strength. The reason is that buyers of advertising space are not tied to the same extent to a particular supplier and may switch in response to a price increase. Our use of the advertising market as a control strengthens the idea that it is the presence of switching costs that explain the relative increase in subscription price for the liquidity constrained firms in the downturn. In the recovery, when credit conditions gradually eased, measures of solvency could not explain any of the variation in pricing behavior. We also examined whether pricing patterns differed between monopoly newspapers and duopoly newspapers, as might be expected if the possibility to sustain implicitly collusive agreements depends on the state of demand, see e.g. Rotemberg and Saloner, 1986, and Green and Porter, 1984. However, we find no evidence for this hypothesis. Neither were the pricing pattern dependent on regional differences in migratory patterns and income growth, as suggested by models along the lines of Bils (1989).

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Table 1. Newspapers sorted by firm type, as of 1992, regression sample.

	Total number of obs.	<i>LOW-</i> <i>SOLVENCY</i>	<i>RIVAL_ -</i> <i>LOW-</i> <i>SOLVENCY</i>	<i>BANK-</i> <i>RUPT</i>	<i>RIVAL_ -</i> <i>BANK-</i> <i>RUPT</i>	<i>Mean</i> <i>Circulation</i>
All newspapers	87	19	11	4	5	27600 (33200)
<i>LOWSOLVENCY=1</i> (<i>Solvency<15%</i>)	19	19	2	0	0	27500 (20300)
<i>BANKRUPT=1</i>	4	4	0	4	0	13000 (4400)
<i>BANKRUPT=0</i>	15	15	2	0	0	33500 (67700)
<i>LOWSOLVENCY=0</i> (<i>Solvency>15%</i>)	68	0	9	0	5	26700 (20500)
<i>MONOPOLY=1</i>	53	7	0	0	0	20400 (15200)
<i>MONOPOLY=0</i>	34	12	11	4	5	39100 (48200)

Standard deviations in parenthesis.

Table 2. Descriptive statistics by firm type as of 1992, regression samples

	<i>PSUBGROWTH</i>		<i>PADVGROWTH</i>		<i>MARGDIFF</i>	
	1990-92	1994-96	1990-92	1994-96	1990-92	1994-96
All newspapers	22.5 (5.59)	9.94 (6.55)	16.5 (4.07)	9.77 (4.30)	2.58 (5.45)	-5.57 (6.55)
<i>LOWSOLVENCY=1</i> (<i>Solvency<15%</i>)	23.4 (6.25)	10.2 (7.67)	14.6 (4.92)	8.78 (5.05)	4.79 (5.42)	-5.26 (8.43)
<i>BANKRUPT=1</i>	14.3 (3.28)		8.87 (6.96)			
<i>BANKRUPT=0</i>	25.8 (4.27)		16.1 (2.97)		4.79 (5.42)	
<i>LOWSOLVENCY=0</i> (<i>Solvency>15%</i>)	21.8 (5.61)	9.88 (4.17)	16.6 (4.28)	10.0 (4.13)	2.07 (5.37)	-5.64 (6.11)
<i>MONOPOLY=1</i>	22.0 (5.26)	9.53 (4.23)	17.1 (3.10)	9.89 (3.37)	2.01 (5.56)	-6.38 (5.78)
<i>MONOPOLY=0</i>	23.2 (5.99)	10.6 (6.02)	15.5 (5.15)	9.56 (5.69)	3.53 (5.22)	-4.08 (7.67)

Standard deviations in parenthesis.

Table 3. Descriptive Statistics, Independent Variables,
for the Periods 1990-1992 and 1994-1996.

	1990-1992	1994-1996
<i>LOWSOLVENCY</i>	0.218 (0.415)	0.184 (0.389)
<i>RIVAL_LOWSOLVENCY</i>	0.126 (0.334)	0.0805 (0.273)
<i>BANKRUPT</i>	0.0460 (0.211)	
<i>RIVAL_BANKRUPT</i>	0.0575 (0.234)	
<i>IMMIGDIFF</i>	-0.489 (0.416)	-0.230 (0.405)
<i>INCGROWTH</i>	18.1 (1.38)	2.19 (1.02)
<i>MONOPOLY</i>	0.602 (0.491)	0.644 (0.482)

Standard deviations in parenthesis.

Table 4. Regression Results, Price Changes and Changes in Margins 1990-92 and 1994-96

Variable	1990-92			1994-96		
	<i>PSUBGROWTH</i>	<i>PADVGROWTH</i>	<i>MARGDIFF</i>	<i>PSUBGROWTH</i>	<i>PADVGROWTH</i>	<i>MARGDIFF</i>
<i>CONSTANT</i>	27.2*** (7.68)	15.9*** (4.72)	22.6** (9.13)	3.31** (1.49)	9.61*** (1.65)	-5.30** (2.26)
<i>LOWSOLVENCY</i>	3.61*** (1.30)	-0.725 (1.09)	3.47** (1.57)	-0.170 (1.61)	1.32 (1.32)	-0.249 (2.12)
<i>RIVAL_LOWSOLVENCY</i>	4.13** (2.03)	0.209 (1.87)	3.18 (1.97)	-0.664 (2.19)	-2.85 (2.07)	-4.06 (2.79)
<i>BANKRUPT</i>	-11.5*** (2.00)	-7.03** (3.35)				
<i>RIVAL_BANKRUPT</i>	-0.215 (2.11)	-0.00171 (2.20)	1.94 (2.6)			
<i>IMMIGDIFF</i>	0.607 (1.46)	0.781 (0.960)	0.947 (2.09)	-2.06 (1.35)	1.07 (0.889)	-1.31 (1.35)
<i>INCGROWTH</i>	-0.298 (0.421)	0.103 (0.265)	-1.15** (0.481)	-0.139 (0.390)	-0.236 (0.385)	-0.490 (0.712)
<i>MONOPOLY</i>	-0.550 (0.67)	1.01 (1.51)	-0.404 (1.89)	-1.21 (1.21)	-0.263 (1.32)	-2.95 (1.81)
Adjusted R-squared	0.168	0.117	0.069	-0.011	-0.007	0.006
Number of observations	87	87	81	87	87	86

Standard errors, using White's robust covariance matrix, in parenthesis.

Variables starred *** are significant at the 1% level, with ** at the 5% level and with * at the 10% level.

Figure 1. The Swedish Economy 1985-1996.

