Christa Hainz:

Business Groups in Emerging Markets - Substitutes for Missing Institutions

Munich Discussion Paper No. 2004-17

Department of Economics
University of Munich

Volkswirtschaftliche Fakultät
Ludwig-Maximilians-Universität München

Business Groups in Emerging Markets - Substitutes for Missing Institutions

Christa Hainz*
University of Munich and CESifo

March 2004

Abstract

Business groups in emerging markets perform better than unaffiliated firms. We study how business groups can substitute some functions of missing institutions, for example, enforcing contracts. In a two period model, there is no contract enforcement in the first period. The firms within the business group are connected to each other by a vertical production structure, resulting in externalities due to double marginalization, and an internal capital market. Our model derives the sequencing of investments and the credit contract offered by the headquarters that solve the *ex post* moral hazard problem. Thus, the business group's organizational mode and the financial structure facilitate relational contracting.

JEL-Classification: G31, K49, L22

Keywords: Business groups, internal capital market, institutions

*Department of Economics, University of Munich, Akademiestr. 1/III, 80799 Munich, Tel.: (49 89) 2180 3232, Fax.: (49 89) 2180 2767, e-mail: christa.hainz@lrz.uni-muenchen.de. Financial support by FOROST is gratefully acknowledged.

1. Introduction

In his famous essay, Gerschenkron (1962) argues that in relatively backward countries the productive and organizational structures differ from those used in established industrial countries. One of these organizational structures that dominate many emerging markets are business groups, which are a "[...] collection of firms bound together in some formal and/ or informal ways." (Granovetter, 1994, p. 454). There is widespread evidence that business groups perform better than unaffiliated firms. When explaining the success of business groups in emerging markets, one must consider that they operate under conditions that differ fundamentally from those in established market economies. First, the outside institutions, such as law enforcement, are much less sophisticated. This constitutes a major impediment for financial transactions and debt financing. Second, many producers possess market power in their industries. It has been conjectured that business groups are substitutes for missing institutions and therefore perform better than unaffiliated firms (Khanna, 2000). We provide a theoretical explanation of how business groups act as substitutes for contract enforcement. We argue in our theoretical model that the organizational mode and the financial structure of a business group facilitate relational contracting.

We set up a two-period model in order to study the features of a relational contract. In the first period, institutions are deficient because there is no contract

enforcement by a court. In the case of debt financing an *ex post* moral hazard problem exists; this has to be solved by a self-enforcing contract. However, in the second period, the legal institutions have improved and therefore contracts are enforceable by a court. The major players are a manufacturer, a retailer, and the investors. They have the option of forming a business group with an internal capital market. The characteristic feature of the business group is a headquarters that exerts common financial control. On the production side, the firms are linked by a vertical production structure and they are all monopolists in their markets. In the case of non-integration, this organizational structure creates externalities through double marginalization, resulting in production and investment levels that are lower than socially desirable. On the financial side, they are connected through the internal capital market. Therefore, an additional externality arises. Consider a firm that receives credit from the headquarters in the first period for a cost-cutting investment. If this firm defaults, investment in the second period by another firm of this vertical production chain will not be financed. This means that the defaulting firm does not enjoy a higher profit in the second period because the cost-cutting investment in the second period is not made. The contribution of our paper is to explain why it can be efficient to not integrate. We show that relying on the externalities present in a business groups allows us to design a relational contract that solves the *ex post* moral hazard

problem of finance. Thus, a business group allows credit financing in the first period which would fail otherwise due to the missing contract enforcement.

Russia provides an example for how difficult contract enforcement can be. Arbitrage courts, which are public courts dealing with economic issues, are inept at enforcing contracts. As a result, it takes a long time until a verdict is made. Moreover, there are substantial costs of going to court (Greif and Kandel, 1995, p. 312). After a verdict is made, the seizure of assets through the bailiff service can take an additional several months (Kahn, 2002).[1] Therefore, it is not surprising that many Russian firms do not rely on public contract enforcement; among 269 firms interviewed only 55.5 per cent said that courts can enforce contracts (Johnson, McMillan and Woodruff, 2002). Relational contracts have evolved to circumvent the legal system. The formation of Financial-Industrial Groups is one example.

Numerous empirical studies demonstrate the superior performance of business groups, such as Financial-Industrial Groups, compared to unaffiliated firms in emerging markets (e.g. Khanna and Palepu, 1999, Perotti and Gelfer, 2001, Recanatini and Ryterman, 2000). In his survey, Khanna (2000) suggests four different sources that improve group performance. First, pyramidale ownership

[1]Kahn (2002) argues that the bailiff's incentives for addressing cases with a substantial value of a claim are destroyed by the wage structure. Moreover, bailiffs are only poorly supervised and their endowment, e.g. with telephones and computers, is insufficient.

structures might be used to expropriate minority shareholders. Second, groups engage in rent-seeking and in times of financial distress receive government assistance because they are perceived as "too big to fail". Third, these groups can exert market power. Fourth and most importantly, business groups can enhance efficiency by alleviating market imperfections.[2] In emerging markets, internal product, labor and capital markets can foster efficiency since outside markets function imperfectly.[3]

There are several papers analyzing theoretically the effects of internal capital markets. Some of them emphasize the positive aspects of internal capital markets. For example, headquarters optimizes the allocation of funds by reallocating cash flow across divisions (Stein, 1997). However, this "winner-picking" policy also has a dark side. The *ex ante* incentive of a divisional manager may suffer if he anticipates that cash flow generated in this division will be reallocated by the headquarters (Brusco and Panunzi, 2002). Moreover, power struggles and lobbying are value-destroying effects of internal capital markets. As Khanna (2000) suggests, institutional imperfections play an important role in emerging markets. Therefore, the results from the theoretical literature on internal capital markets cannot easily be transferred to study business groups in emerging markets.

[2] Pyle (2002) shows that the lack of contract enforcement together with missing credit registers reduces the scale of commercial lending.

[3] Therefore, an important conclusion of the survey is: "It is perhaps sensible to see groups acting as substitutes for missing institutions, which would normally facilitate the functioning of markets, in the economy (...)." (Khanna, 2000, p. 754)

Kali (1999, 2002) studies the interdependence of business groups and institutions. In a general equilibrium model, he analyzes how business networks can substitute functioning institutions. This model shows that the network absorbs honest agents and thereby has a negative impact on the anonymous market where transactions are insufficiently protected by legal institutions (Kali, 1999). Kali (2002) shows the transition from relational contracting to arms-length explicit contracting that takes place when market intermediaries and institutions develop. In his model, business groups are used for relational contracting. The result here is that during the transition period, when institutions work imperfectly, both modes of contracting complement each other (Kali, 2002).

The model closest to our analysis is that by Bolton and Scharfstein (1990). They study the *ex post* moral hazard problem of financing if it is impossible to enforce a debt contract that is contingent on profit. In a two-period setting, the investor will refinance the firm in the second period only if the firm repaid its loan in the first period. This repayment has to be high enough to cover the investor's expected loss from financing in the second period.

Like Bolton and Scharfstein, we focus on problems of contract enforcement. Therefore, we do not factor in problems of asymmetric information between creditor and debtor. Our analysis deviates from the Bolton-Scharfstein model by incorporating several firms. We derive the organizational structure and the terms

of the credit contract that constitute a relational contract. In this theoretical framework, we point out the advantage of an internal capital market in an economy with imperfect institutions. We find that business groups are substitutes for missing institutions. Thus, we contribute a theoretical argument that explains the superior performance of business groups in emerging markets.

The paper is organized as follows. In section 2, the model of *ex post* moral hazard is presented. There we characterize the organizational structure, the timing of investment and the terms of the credit contract. The welfare implications of the results as well as the incentive to integrate are discussed in section 3. Section 4 concludes.

2. A Model of *Ex Post* Moral Hazard

2.1. Model

Our model captures two periods. In the first period, the institutions are still imperfect. For the investor, this means that repayment cannot be enforced by going to a court. In the second period, the institutions have improved and contracts are enforceable by court. This is common knowledge.. Consequently, the problem of *ex post* moral hazard disappears.[4]

[4]The evidence from transition countries shows that after 13 years of transition, the "law on the books" developed much faster than law enforcement (EBRD, 2001). Thus, the improvement of the institutional environment can be seen as a gradual development. In a n-period framework,

We consider a model with a chain of monopolies. The monopolistic firms capture the imperfect competitive environment in emerging markets.[5] The chain of monopolies reflects the externalities between producers in a business group. The monopolistic producer of the intermediate good is called manufacturer M. M produces an intermediate good at constant marginal costs of c. The retailer R, who is also a monopoly, then faces a marginal cost for its input (the intermediate good) of p_M. For selling one unit of the intermediate good, the retailer incurs constant marginal costs of k, e.g. for servicing customers. The retailer sets a price p. The final-demand function is $D(p) = 1 - p$. It is straightforward to show that the manufacturer produces $q = \frac{1-c-k}{4}$ units of the intermediate good which is sold to the retailer at a price of $p_M = \frac{1+c-k}{2}$. Thus, the manufacturer's profit is $\Pi^M = \frac{(1-c-k)^2}{8}$. The retailer sells these goods at a price of $p = \frac{3+c+k}{4}$ and gets a profit of $\Pi^R = \frac{(1-c-k)^2}{16}$ (Tirole, 2000). In this standard model of a vertical structure, double marginalization is responsible for a production level that is too low from a social welfare perspective.

Both firms can invest in order to reduce their costs which, in turn, increases the quantity supplied in equilibrium. If the manufacturer invests I^M, its costs decrease from c_H to c_L. The retailer achieves a cost cut from k_H to k_L if he

contract enforcement has to work only in the last period.

[5] In Eastern Europe and the former Soviet Union the transition to a market economy started a decade ago. Therefore, the market structure is in many respects still determined by central planning. Consequently, many large industrial enterprises remain monopolies in their respective industries (for Russia see Greif and Kandel, 1995, p. 312, and Broadman, 2001).

invests I^R. We assume that carrying out the investment is efficient in the sense that the sum of profits generated by both firms in both periods exceeds the costs of investment. Furthermore, we assume that $c_H + k_H \leq 1$.

M and R, together with other firms some of which have excess funds, decide to form a business group. The crucial feature of this business group is that it has a common headquarters H that makes financial decisions. H collects excess funds and grants credit to firms within the business group that need financing. H can commit to financing even if the repayment does not cover the amount of credit granted. However, H also faces a zero-profit constraint in the long run. Thus, H establishes central financial control. Information between the members of the business group is assumed to be symmetric because they have had previous interaction.[6] There is no financing from outside investors due to enormous informational asymmetries. Since neither M nor R get credit from outside banks, H has a monopoly in financing them.

2.2. *Ex Post* Moral Hazard and Market Failure

The moral hazard problem cannot be solved in a one period framework. Suppose that H grants credit in the amount of I^M to M. M would always be better off by defaulting. As the bank anticipates this opportunistic behavior it would not

[6] In our model, the agent exerting common financial control is called headquarters. It could also be a common bank that finances all investment projects of the group. Further interpretations and applications are found in the Conclusion.

grant credit at all. Thus, no investment would be made (Bolton and Scharfstein, 1990). This result implies that it is also impossible to finance both investments I^M and I^R in the first period when the institutions are still imperfect.

Next, we show that credit will only be granted if a relational contract can be designed. In our case, a relational contract is self-enforcing if the timing of the investment decisions is chosen appropriately. From the result above, it is evident that the investment projects have to be financed subsequently. First, we study the case where investment in the first period is undertaken by M and in the second period by R. Second, we study the case where investment is undertaken by R in the first period and by M in the second period.

2.3. Case 1: M Invests in the First Period

The time structure of this model that features two periods of production is as follows: Before the financial decisions are made, M, R and the other firms decide about forming a business group. First, M makes a credit proposal that can be accepted or rejected by H. In the first period, M invests if he is awarded the funds. Then he decides on the price for the intermediate good. Based on that, R determines its price. The prices determine the production level. At the end of period 1, M either repays H or defaults, depending on which action maximizes profit. After M's action, H can decide about financing R. In the second period, R

invests. Both firms M and R set second-period prices and make their production decisions. The time structure is illustrated in Figure 1.

[Figure 1]

We assume that the additional profit for R generated through I^R in the second period is lower than the investment needed, i.e. $\frac{1}{16}\left((1-c_L-k_L)^2-(1-c_L-k_H)^2\right) < I^R$. Therefore, R would not self-finance the investment. However, it is assumed that the investment increases the profits generated for M and R by more than I^R, i.e. $\frac{3}{16}\left((1-c_L-k_L)^2-(1-c_L-k_H)^2\right) > I^R$. Moreover, M's investment increases the net profits of M and R in both periods as we assume that $\frac{3}{8}\left((1-c_L-k_H)^2-(1-c_H-k_H)^2\right) > I^M$. We assume that firms are not able to finance the investment I^R through their profits generated in the first period, i.e. $\frac{3(1-c_L-k_H)^2}{16} < I^R$. To simplify the analysis, there is no discounting.

The following proposition describes the credit contract offered, i.e. the repayment in period 1, denoted by Z^{1M}, and in period 2, denoted by Z^{2R}.

Proposition 1. *In case 1, the headquarters H offers credit if the repayment in period 1 is $Z^{1M} \geq I^R + I^M + \frac{(1-c_L-k_H)^2}{16} - \frac{(1-c_L-k_L)^2}{16}$. In period 2, it demands as repayment $Z^{2R} = \frac{(1-c_L-k_L)^2}{16} - \frac{(1-c_L-k_H)^2}{16}$.*

Proof:

Provided that M has cut its costs to c_L, R invests in the second period only if he is not worse off than without a credit financed investment. Formally, his

participation constraint is

$$\frac{(1-c_L-k_L)^2}{16} - Z^{2R} \geq \frac{(1-c_L-k_H)^2}{16}. \qquad \text{(PC-R)}$$

H will increase Z^{2R} so that R's participation constraint binds.[7] H offers credit if it obtains a non-negative payoff from this two-period relationship with M and R. After inserting the optimal Z^{2R}, the headquarter's zero-profit constraint can be written as

$$Z^{1M} + \frac{(1-c_L-k_L)^2}{16} - \frac{(1-c_L-k_H)^2}{16} - I^R - I^M \geq 0 \qquad \text{(PC-B)}$$

Solving for the first period repayment $Z^{1M} \geq I^R + I^M + \frac{(1-c_L-k_H)^2}{16} - \frac{(1-c_L-k_L)^2}{16}$ is determined. Q.E.D.

We assumed that R would never use equity to finance its investment I^R because the profit generated is too low.[8] However, the investment is socially desirable due to the strong externality that I^R has on M. In the second period, the repayment Z^{2R} that H demands can be no more than what investment I^R adds to the profit of R. Otherwise, it would hurt the firm's participation constraint. H extracts the

[7] In Bolton and Scharfstein (1990) only a proportion of the profit is verifiable. In contrast, in our analysis, the increase in profit in the second period is contractible as institutions function perfectly. However, the results generated in our model would still be obtained if only a proportion of the profit is contractible.

[8] This is also the reason why R does not contribute its profit generated in period 1 to reduce the amount of credit needed in period 2.

additional profit because it exerts its monopoly power. However, this repayment does not cover investment I^R; H makes an expected loss. H grants credit only if the loss in the second period is covered by the repayment from M in the first period. Thus, M has to subsidize R's investment in the second period. Proposition 2 shows when this contract is feasible.

Proposition 2. *In case 1, forming a business group solves the ex post moral hazard problem if* $\frac{3}{16}\left((1-c_L-k_L)^2-(1-c_L-k_H)^2\right) \geq I^R+I^M$ *and* $\frac{1}{16}\left((1-c_L-k_L)^2+(1-c_L-k_H)^2\right) \geq I^R+I^M$.

Proof:

For M, it has to be optimal to repay after period 1. Formally, this is expressed in its incentive compatibility constraint:

$$\begin{aligned} \frac{(1-c_L-k_L)^2}{8}-Z^{1M} &\geq \frac{(1-c_L-k_H)^2}{8} \text{ or} \qquad \text{(IC-M)} \\ \frac{3}{16}\left((1-c_L-k_L)^2-(1-c_L-k_H)^2\right) &\geq I^R+I^M. \end{aligned}$$

M's incentive compatibility constraint also guarantees that he demands credit to finance the investment in period 1, i.e. that $\frac{(1-c_L-k_H)^2}{8}+\frac{(1-c_L-k_L)^2}{8}-Z^{1M} \geq 0$. Moreover, the profit generated in period 1 has to be high enough to cover the

repayment Z^1. The liquidity constraint is given by:

$$\begin{aligned} \frac{(1-c_L-k_H)^2}{8} - Z^{1M} &\geq 0 \text{ or} \qquad \text{(LC-M)} \\ \frac{1}{16}\left((1-c_L-k_L)^2 + (1-c_L-k_H)^2\right) &\geq I^R + I^M. \end{aligned}$$

Q.E.D.

The driving forces for this solution are the two externalities generated in this model. First, due to the vertical structure, R's investment has a positive effect on M's profit. As I^R decreases R's costs to k_L, the quantity sold increases and, consequently, the profits of both R and M increase. Second, default by M has a negative externality on R. If M does not repay, H does not grant credit to R in the second period because it would make an expected loss. Accordingly, M anticipates that his default prevents R from investing in a cost-cutting technology, and that he loses the potential increase of his own profit Π^M. For the conditions given in Proposition 2, it is optimal for M to repay. If $(1-c_L-k_L)^2 > 2(1-c_L-k_H)^2$, the incentive compatibility constraint of M always holds if its liquidity constraint is fulfilled. For this parameter constellation, R's cost reduction has the additional effect of reducing M's incentive to default because he would not enjoy an increasing profit in the second period.

2.4. Case 2: R Invests in the First Period

Next, we study the reversed timing of investments. In this scenario, R invests in the first period and M in the second. All other actions remain the same as before. (Figure 2 illustrates the timing of events.)

In this case, we assume that the additional profit generated by M is too low to cover the costs of investment I^M, i.e. $\frac{1}{8}\left((1-c_L-k_L)^2-(1-c_H-k_L)^2\right) < I^M$. Still, both investments increase the profits for M and R in an amount that is higher than the costs of investment, i.e. $\frac{3}{16}\left((1-c_L-k_L)^2-(1-c_H-k_L)^2\right) > I^M$ and $\frac{3}{8}\left((1-c_H-k_L)^2-(1-c_H-k_H)^2\right) > I^R$. Moreover, we assume that the firms do not have enough liquid means to finance I^M themselves in the second period, i.e. $\frac{3}{16}(1-c_H-k_L)^2 < I^M$.

The third proposition describes the credit contract offered by H.

Proposition 3. *In case 2, H grants credit only if the repayment in period 1 is $Z^{1R} \geq I^R + I^M + \frac{(1-c_H-k_L)^2}{8} - \frac{(1-c_L-k_L)^2}{8}$. In period 2, it demands as repayment $Z^{2M} = \frac{(1-c_L-k_L)^2}{8} - \frac{(1-c_H-k_L)^2}{8}$.*

Proof:

The terms of the credit contract are determined analogously to case 1.

In period 2, M's investment is insufficient to cover the costs of investment. Therefore, M would not self-finance the investment project. The loss that H

makes with this investment has to be covered by R's first period repayment. Proposition 4 determines the parameter values for which offering this contract solves the *ex post* moral hazard problem.

Proposition 4. *In case 2, forming a business group solves the ex post moral hazard problem if* $\frac{3}{16}\left((1-c_L-k_L)^2-(1-c_H-k_L)^2\right) \geq I^R+I^M$ *and* $\frac{1}{16}\left(2\,(1-c_L-k_L)^2-(1-c_H-k_L)^2\right) \geq I^R+I^M$.

Proof:

The repayment must fulfill R's incentive compatibility constraint and its liquidity constraint. Repayment Z^{1R} is incentive compatible if

$$\begin{aligned} \frac{(1-c_L-k_L)^2}{16}-Z^{1R} &\geq \frac{(1-c_H-k_L)^2}{16} \text{ or} \qquad \text{(IC-R)} \\ \frac{3}{16}\left((1-c_L-k_L)^2-(1-c_H-k_L)^2\right) &\geq I^R+I^M. \end{aligned}$$

This condition guarantees that R prefers the credit financed investment to the outside option of no investment. In either period, credit financing is associated with a profit of $\frac{(1-c_H-k_H)^2}{16}$. Moreover, R's first period profit has to be high enough to cover the repayment Z^{1R}. Formally, R's liquidity constraint is given by:

$$\begin{aligned} \frac{(1-c_H-k_L)^2}{16}-Z^{1R} &\geq 0 \text{ or} \qquad \text{(LC-R)} \\ \frac{1}{16}\left(2\,(1-c_L-k_L)^2-(1-c_H-k_L)^2\right) &\geq I^R+I^M. \end{aligned}$$

Q.E.D.

As before, the interaction of the two externalities can be exploited by H to design a self-enforcing contract. R's decision to repay influences M's opportunity to invest, and therefore increases its own profit because M's investment increases Π^R too.[9]

Comparing the results in Proposition 2 and 4 shows that the cost reduction in the second period plays a crucial role. In case 1, M has an incentive to repay if the cost reduction by the second period investment I^R exceeds the crucial value described in Proposition 2. In contrast, in case 2, the cost reduction by I^M has to be high enough to give R an incentive to repay. In general, the larger the cut in costs in period 2, the higher is the externality that increases the second-period profit of the firm investing in period 1. Hence, the incentive to repay in period 1 increases.

3. Discussion of Results

3.1. Welfare Implications

The arguments above have shown that the type of contract, especially the sequencing of investment, depends crucially on the characteristics of the projects,

[9] If the cost-cutting effect of M's investment is such that $(1 - c_L - k_L)^2 > 2(1 - c_H - k_L)^2$, R's incentive compatibility constraint always holds, provided that R's liquidity constraint is fulfilled.

as described by the parameter constellations. When designing a contract, three restrictions have to be considered. First, profit generated in both firms in the first period must not exceed the investment expenses in the second period. Otherwise, the firms could join forces and self-finance the second-period investment. Under these circumstances, the firm investing in the first period would no longer have an incentive to repay. Hence, no credit would be granted in the first period.[10]

Second, the profit generated in the firm which invests in the first period has to be high enough to cover the repayment that H needs to break even. This repayment always includes a transfer that the bank needs in order to cover the expected loss in the second period. This transfer can be interpreted as a subsidy for the firm investing in the second period. The more the profit of the firm investing in the second period increases by second period investment, the lower the subsidy needs to be.

Third, the firm investing in the first period must have an incentive to repay. Generally, this firm decides either to repay and to subsidize the firm investing in the second period, or to default. The incentive compatibility constraint, which guarantees that the firm investing in the first period repays its loan, is fulfilled more easily if the cost-cutting effect of the second period investment is higher

[10] Whether there would be financing in the second period depends on the payoffs of the projects compared to the investment needed. Without credit financing in the first period, profits in the second period should be lower as there was no cost cutting investment.

than the one in the first period. This implies that the externality from the second period investment is higher. Therefore, investment made in the second period increases the profit of the firm that has invested in the first period more strongly. Moreover, the profit of the firm that invests in the second period is higher and therefore the subsidy needed is lower. This renders the liquidity constraint of the firm investing in the first period less demanding too.

These arguments already show a potential tension in the sequencing of investments. Basically, the sum of profits of the firms in the business group is influenced by two factors: the amount of cost-reduction reached in the first as well as in the second period, and the possibility to invest at all in the first period as the *ex post* moral hazard problem has to be solved.

If contract enforcement is possible but there are not enough funds to finance both investments simultaneously, the business group would undertake the investment that reaches a higher cost reduction in the first period. However, solving the *ex post* moral hazard problem may require postponing the investment which reduces costs more strongly to the second period, as the discussion above has shown. Facilitating investment in the first period is the dominant requirement since cost reduction in the first period cannot otherwise be obtained. These countervailing effects also highlight the inefficiency that arises if relational contracts have to be used as explicit contracts are not enforceable in this framework.

3.2. Incentive to Integrate

Naturally, the question arises why firms within the business group do not integrate in order to reduce double marginalization and, thus, increase profit. The theoretical analysis of the non-integrated business group has shown that the externality that investment of M has on R (and vice versa) provides an incentive for M to repay. In an integrated structure, these externalities would disappear, and with it, M's incentive to repay. A relational contract solving the *ex post* moral hazard problem would not be feasible in such an organizational setting. On the other hand, vertical integration would increase the group's output and thus profit to $\frac{(1-c-k)^2}{4}$. Depending on the parameter constellations, it could be optimal to remain un-integrated in order to design a relational contract solving the *ex post* moral hazard problem. The benefit of facilitating cost cutting investments comes at the cost of a lower level of production in the second period.

The following example shows a case in which firms do not have an incentive to integrate because the profit of the business group, denoted by Π^{BG}, is higher than the profit of an integrated firm, denoted by Π^{I}.

Example 1. *Suppose that* $I^M = 0.001, c_H = 0.5, c_L = 0.18$ *and* $I^R = 0.0192, k_L = 0.27, k_H = 0.5$. *In this case the profit of a business group are higher than the one of an integrated firm, i.e.* $\Pi^{BG} = 0.05719 > \Pi^{I} = 0.055425$.

The parameters are such that financing M in the first and R in the second

period is self-enforcing. With the relational contract, the total profit in both periods is $\Pi^{BG} = 0.05719$. The amount of goods produced is $q_1^{BG} = 0.08$ in the first period and $q_1^{BG} = 0.125$ in the second period. An integrated firm does not produce at all in the first period, but produces $q_1^I = 0.18$ in the second period. The total profit of an integrated firm amounts to $\Pi^I = 0.055425$.

For this example, the problem of poor institutions become evident at once. Due to missing contract enforcement, outside creditors are unwilling to lend in the first period. The (social) costs of credit rationing can be substantial. In our example, only a very small amount of credit is needed in order to reduce manufacturing costs dramatically. This cost reduction leads to an increase in the amount of goods produced. Integration destroys the possibility of designing self-enforcing contracts because it eliminates the externalities between M and R. Consequently, an integrated firm is not able to finance a cost saving investment by M in the first period. It can reap the benefits of lower manufacturing costs only in the second period.

4. Conclusion

We started this paper with the question of how business groups can substitute imperfect institutions, especially the impossibility of enforcing contracts. The model shows how a relational contract solves *ex post* moral hazard. The analysis reveals

that vertically related firms do not integrate but establish common financial control in the form of an internal capital market. The first result of our analysis is that firms in a business group can invest already in the first period when unaffiliated firms are credit rationed because of deficient institutions. The second result is that funds are reallocated within the business group. The reallocation is due to the externalities of the vertical structure which are thereby partially internalized.

In emerging markets, it can take much more than one period until contracts are enforced. However, if the relational contracts are repeated within this vertical structure until institutions that facilitate contract enforcement are in place, the moral hazard problem can be solved in several periods. Due to this argument, the positive effect of internal capital markets should increase compared to its negative effect, the lower production.[11]

The design of a relational contract that we have derived theoretically in the context of a business group should have further applications. Think about the organizations that provide micro-credit to entrepreneurs in developing and also transition countries (Armendáriz de Aghion and Morduch, 2000). In these countries, the institutions that allow contracts to be enforced are not in place. One prominent solution is a structure which, for example, Grameen Bank possesses

[11] However, while contracts can sustain financial transactions between firms that know each other, they do not help to develop new interactions (Johnson, McMillan and Woodruff, 2002).

where credit is granted with joint liability (Ghatak and Guinnane, 1999).[12] Another mechanism could be to exploit the market imperfections in the goods market which create vertical externalities like in our model. As long as there is the possibility to solve the *ex post* moral hazard problem for the firm that receives credit in the last period, e.g. by collateralization, the mechanism suggested in our paper should help to overcome credit rationing that is caused by poor institutions.

[12] An alternative solution is the exchange of information about firms through trade associations or informal business networks (Pyle, 2003).

5. References

Armendáriz de Aghion, Beatriz and Morduch, Jonathan, "Microfinance beyond Group Lending", *Economics of Transition* **8**, 2:401-420, 2000.

Bolton, Patrick, and Scharfstein, David S., "A Theory of Predation Based on Agency Problems in Financial Contracting" *American Economic Review* **80**, 1:93-106, March 1990.

Broadman, Harry, "Competition and Business Entry in Russia", *Finance and Development* **38**, 2:22-25, June 2001.

Brusco, Sandro and Panunzi, Fausto, "Reallocation of Corporate Resources and Managerial Incentives in Internal Capital Markets", CESifo Working Paper, 2002.

EBRD, *Transition Report 2001: Energy in Transition*, EBRD: London, 2001.

Gerschenkron, Alexander, "*Economic Backwardness in Historical Perspective. A Book of Essays*", Cambridge: Belknap Press of Harvard University Press, 1962.

Ghatak, Maitreesh and Guinnane, Timothy, "The Economics of Lending with Joint Liability: Theory and Practice", *Journal of Development Economics* **60**, 195-228, 1999.

Granovetter, Mark, "Business Groups", in: Smelser, N.J. and Swedberg, R. (Eds.), *The Handbook of Economic Sociology*, Princeton, Princeton University

Press, 1994, pp. 453-475.

Greif, Avner and Kandel, Eugene, "Contract Enforcement Institutions: Historical Perspective and Current Status in Russia", in: Lazear, E.P. (Eds.), *Economic Transition in Eastern Europe and Russia: Realities of Reform*, Stanford, Hoover Institution Press, 1995, pp. 291-321.

Johnson, Simon, McMillan, John and Woodruff, Christopher, "Courts and Relational Contracts", *Journal of Law, Economics, and Organization* **18**, 1:221-77, 2002.

Kali, Raja, "Contractual Governance, Business Groups and Transition", *Economics of Transition* **10**, 2:255-272, 2002.

Kali, Raja, "Endogenous Business Networks", *Journal of Law, Economics, and Organization* **15**, 3:615-636, 1999.

Kahn, Peter L., "The Russian Bailiffs Service and the Enforcement of Civil Judgments", *Post-Soviet Affairs* **18**, 2:148-173, 2002.

Khanna, Tarun, "Business Groups and Social Welfare in Emerging Markets: Existing Evidence and Unanswered Questions", *European Economic Review* **44**, 748-761, 2000.

Khanna, Tarun and Palepu, Krishna, "Is Group Affiliation Profitable in Emerging Markets? An Analysis of Diversified Indian Business Groups", *Journal of Finance* **LV**, 2:867-891, April 2000.

Perotti, Enrico and Gelfer, Stanislav, "Red Barons or Robber Barons? Governance and Investment in Russian Financial-Industrial Groups", *European Economic Review* **45**, 1601-1617, 2001.

Pyle, William, Reputational Flows, mimeo, Middlebury College, 2003, available at http://community.middlebury.edu/~wpyle/RepFlowsDraft.pdf.

Pyle, William, "Overbanked and Credit-Starved: A Paradox of the Transition", *Journal of Comparative Economics* **32**, 1:26-51, 2002.

Recanatini, Francesca and Ryterman, Randi, Disorganization or Self-Organization, mimeo, World Bank, Washington DC, 2000.

Stein, Jeremy, "Internal Capital Markets and the Competition for Corporate Resources", *Journal of Finance* **52**, 1:111-133, 1997.

Tirole, Jean, "*The Theory of Industrial Organization*", Cambridge and London: MIT Press, 2000, eleventh printing.

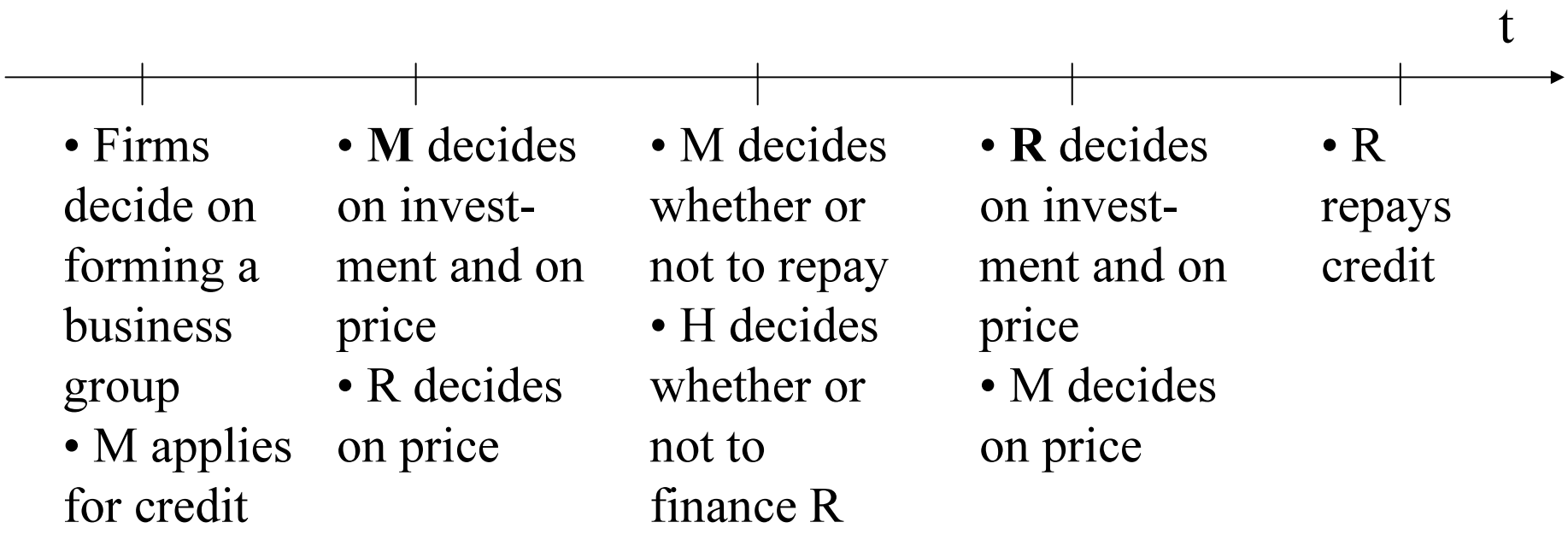

Figure 1: Time structure

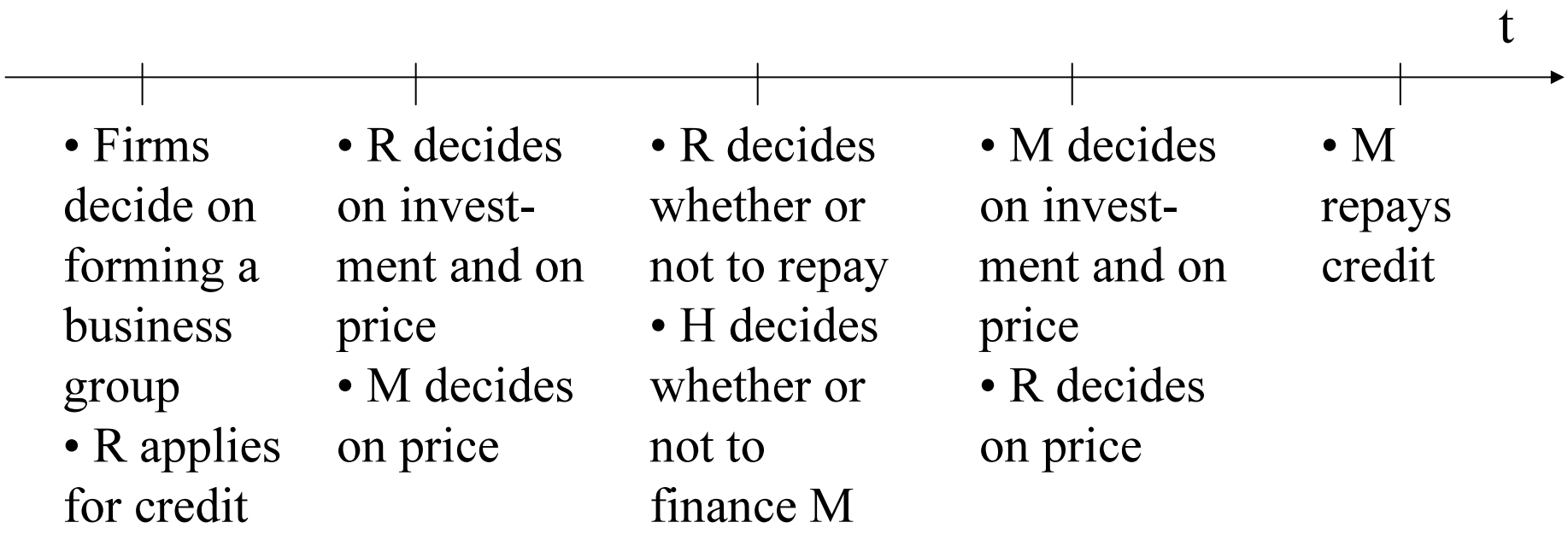

Figure 2: Time structure