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Capturing Share and Losing Ground

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Abstract

The key point in this paper is that there is a competitive risk involved in inflicting excess capacity on a competitor. The argument goes as follows: A firm with excess capacity will face sharply reduced incremental costs associated with investing in human- and organizational capital, since the value of forgone production is low, or even zero, when human resources are idle. The reduction in the cost of these investments means that they are likely to be sharply increased. If so, the human and organizational capital accumulation is likely to be sped up significantly for the firm that experiences excess capacity, but not for the firm winning market share as this firm presumably operates at high capacity utilization and have to bear the full incremental cost of using employees for other purposes than producing and selling. We propose a set of hypotheses about conditions that affect the size of this risk, and also offer some reflections regarding how the above mechanism may have contributed to the trend towards a reduction in the average life span of competitive advantage.

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ABSTRACT

The key point in this paper is that there is a competitive risk involved in inflicting excess capacity on a competitor. The argument goes as follows: A firm with excess capacity will face sharply reduced incremental costs associated with investing in human- and organizational capital, since the value of forgone production is low, or even zero, when human resources are idle. The reduction in the cost of these investments means that they are likely to be sharply increased. If so, the human and organizational capital accumulation is likely to be sped up significantly for the firm that experiences excess capacity, but not for the firm winning market share as this firm presumably operates at high capacity utilization and have to bear the full incremental cost of using employees for other purposes than producing and selling. We propose a set of hypotheses about conditions that affect the size of this risk, and also offer some reflections regarding how the above mechanism may have contributed to the trend towards a reduction in the average life span of competitive advantage.

INTRODUCTION

Our key point in this paper boils down to the argument that there is a competitive risk involved in inflicting excess capacity on a competitor, and we propose a set of hypotheses about conditions that affect the size of this risk. We also offer some - admittedly speculative - reflections regarding how the mechanism we are discussing may have contributed to the trend towards a reduction in the average life span of competitive advantage, or what is often referred to as a move towards hyper-competition (D'Aveni, 1994; D'Aveni, Dagnino, & Smith, 2010; Wiggins & Ruefli, 2005).

The argument goes as follows: A firm with excess capacity will face sharply reduced incremental costs associated with investing in human- and organizational capital, since the value of forgone production is low, or even zero, when human resources are idle. To put it more bluntly; employees with nothing better to do might as well work on innovation, increasing their knowledge and skills, or focus on solving organizational problems and bottlenecks. The reduction in the cost of these investments means that they are likely to be sharply increased. If so, the human and organizational capital accumulation is likely to be sped up significantly. Note also that this boost does not occur for the firm winning market share, because this firm presumably operates at high capacity utilization and have to bear the full incremental cost of using employees for other purposes than producing and selling.

The asymmetry this creates is what the noted competitive risk is all about. Given that the firm with excess capacity is now investing and accumulating human and organizational capital at a faster rate than the firm without, the former is more likely to catch up - or to catch up faster - than it would have without the presence of this mechanism.

There is actually a substantial amount of empirical evidence to support the existence of this mechanism, but this evidence is on the aggregate level and is found in the business-cycle

literature in macroeconomics (e.g. Aghion, Askenazy, Berman, Cette, & Eymard, 2008). The basic point here is that recessions create booms in productivity improvements by reducing the cost of focusing on productivity improvements vs. producing output. When the economy is in a boom, the emphasis is on producing output, while when the economy goes into recession and excess capacity arises, more attention is shifted to productivity improvements (Davis & Haltiwanger, 1990; Hall, 1991). This spurs future productivity growth (Aghion & Saint-Paul, 1991). We are basically suggesting a generalization of this point from the business cycle literature to any setting where firms move abruptly from high- to significantly lower capacity utilization - and the effects of this on investment in, and accumulation of, human- and organizational capital, and ultimately competitive outcomes.

In our opinion this offers useful insights for the literature on competitive interaction and the sustainability of competitive advantage. For example we identify an overlooked cost of emphasizing the capture of volume- and market share versus emphasizing margins. To the extent that this creates excess capacity, these competitors will accelerate investments in ways that may undermine the advantage that made the market share transfer possible in the first place. Or more generally, that asset stock accumulation processes can be significantly affected by capacity utilization (Dierickx & Cool, 1989), but somewhat counter-intuitively that excess capacity can speed up accumulation processes.

We should also stress that we do not claim that accelerated accumulation of organizational and -human capital is always the result of excess capacity. On the contrary, a key part of our analysis is our hypotheses about the likely strength of this mechanism. For example, an alternative will always be to shed the excess capacity through layoffs. This means that the mechanism is likely to be strong when firms have incentives to hoard labor, for example to avoid future employee search and training costs. Firms also need a certain financial robustness to act in the manner we describe. The savings from layoffs will appear in the short

run, while the benefits from labor hoarding and increased human and organizational capital are gains further down the road. A firm with serious financing constraints may be forced to focus on the short term. Also, a firm that initially has substantial excess capacity is unlikely to have its investment incentives strengthened by additional excess capacity. So we expect the investment boost to be most likely to occur for firms that move from a situation of high capacity utilization to a situation of significantly lower capacity utilization over a relatively short period of time.

The more speculative part of our argument concerns the possibility that the conditions favorable for this type of situation have become strengthened over time. As the knowledge intensity has increased, the ability of the average worker to contribute solving problems and add to his or her skills has likely grown. Furthermore, as the need for firm specific skills and training has increased, so have the incentives to hoard labor to avoid the cost of hiring and training new employees. Finally, as access to finance have become gradually better since WW2, the ability to find financing to get through periods of reduced earnings while keeping excess capacity has become better. If the conditions have indeed become more favorable over time, one would expect industry leadership and competitive advantage to become less durable and stable, which is what many large sample empirical studies have found. If not the sole explanation, what we are describing here may have been an important contributing factor.

Our analysis proceeds as flows: In the first section we discuss labor hoarding in general, and discuss conditions that needs to be fulfilled for labor hoarding to take place. Then we link the concept of labor hoarding to development activities, before we discuss implications for competitive dynamics. We end the paper with some concluding remarks.

LABOR HOARDING

Any firm, at any given time, must decide on the allocation of resources between producing output, and what we might broadly term development activities (Hall, 1991). These development activities may include R&D and innovation, training of staff (internally and externally), and work to improve organizational structure and processes. The text book solution is to invest in the capacity to perform such activities until the expected return from adding more is zero on the margin for both of them.

Let us start with the basic assumption that a firm is in this situation, and then suddenly experiences a negative demand shock, creating excess capacity among personnel assigned to output production. The firm now faces the decision about what to do with the excess capacity. The firm can get rid of the excess capacity by laying off idle personnel and possibly rehire if demand picks up, or it can keep some or all the idle personnel, but reallocate them from output production to development. This decision will mainly depend on the following:

a) The likelihood that the idle capacity will be needed in the future. It is rather obvious that a pessimistic firm, i.e. one that does not expect that it will need the idle capacity anytime soon, will choose layoffs rather than labor hoarding.

b) The adjustment cost of hiring and firing employees. These adjustment costs may be driven by severance pay associated with layoffs, the costs of searching, screening and training new employees to bring them up to the productivity level of the employees one considers laying off. The higher the adjustment costs, the more a firm will chose labor hoarding over layoffs (CP).

c) The value employees can generate if reassigned from production to development. Clearly, the more value employees can create in development, the more attractive the option of labor hoarding will be.

d) The ability of the firm to finance labor hoarding. Labor hoarding creates short term losses, in the hope of future gains. A firm with binding financing constraints will be forced to realize the short term savings from layoffs, even if it believes that labor hoarding would be profitable in the long run. So the worse the financial constraints, the less the firm will hoard labor.

In mathematical terms, these conditions specify that an individual employee will be hoarded when the following inequality holds:

$$\alpha + E(T)*\beta \geq E(T)*w + E(T)*\mu*w \qquad [1]$$

The left side of equation [1] represents the gains from labor hoarding, and the right side represents the costs. α refers to the adjustment costs of hiring and training a replacement. E(T) is the expected duration of the period of excess capacity[1]. β is the value created per time unit by the employee while reassigned from production to development. The product E(T)*β is then the expected value of the employees output during the period when she is reassigned to development. On the cost side, w is the wage rate per time unit, and the product E(T)*w is the expected forgone savings on wage from hoarding the employee. Finally, μ is a parameter that reflects the opportunity cost of capital. This latter term reflects that capital used for labor hoarding has alternative uses, and the more capital constrained the firm is, the higher this term will be. If the firms survival is at stake, this term may be considered infinite, leading the firm to refuse labor hoarding irrespective of the size of the left hand terms. If the firm is financially unconstrained, the parameter μ takes the value 0.

[1] E(T) can be thought of as the expected value of a probability density function over all possible durations of the excess capacity situation : $E(T) = \int_0^\infty t * f(t)dt$. Note also that E(T) is not strictly independent of β, since a high β might reduce E(T).

As presented here the formula ignores discounting, but one may note that introducing discounting is quite straight forward by multiplying each term with a discount factor. Another issue we have omitted is that employees may accept a reduction in the wage rate w, to increase the likelihood of being hoarded. This will most likely depend on an employee's outside options.

With these qualifications equation [1] represents the criterion for hoarding a given employee. The criterion might hold for some employees, and not hold for others. In general, we expect that employees will be laid off in the order prescribed by the size of this inequality.

There is in fact a lot of evidence that labor hoarding as a very real and substantial phenomenon. Labor economists have documented that labor hoarding occurs during recessions (e.g. Fay & Medoff, 1985), and that the conditions noted here are relevant to the labor hoarding decision (Becker, 1962; Hall, 1991; Oi, 1962; Rosen, 1966).

LABOR HOARDING AND DEVELOPMENT

Assume that a firm is initially in a full capacity utilization situation. This means that the firm has developed a capacity for performing development and production activities to the point where the incremental profit of expanding each is 0. Focusing on development activities, the incremental cost of expanding development activities can be characterized as:

$$\Delta c_d = \Delta w + \Delta \Omega \qquad [2]$$

where Δw is the incremental wage component and $\Delta\Omega$ is a composite measure of the required increase in all other costs, besides wage. For some development activities Δw will be large relative to $\Delta\Omega$, for other kinds of projects $\Delta\Omega$ will be a much higher share of Δc_d. For example, for projects related to organizational development and knowledge transfer within the

firm, the key input is time. So $\Delta\Omega$ will be small relative to Δw. For external training programs, $\Delta\Omega$ will be somewhat higher because of larger out-of-pocket costs related to instructor fees, travel, etc. For R&D and innovation projects, $\Delta\Omega$ might be very high relative to Δw if expensive equipment, materials, external services, etc. needs to be acquired.

The key point we are getting at is that at full capacity utilization the incremental cost of increasing development activities includes both Δw and $\Delta\Omega$, while for a labor hoarding firm, only $\Delta\Omega$ is relevant. This means that many development activities that would not be conducted under full capacity utilization will be conducted under labor hoarding. In particular this effect will be strong for activities where $\Delta\Omega$ is small relative to Δw. We illustrate the effect of this in figure 1 below. In Figure 1, we provide two graph showing the incremental cost (Δc_d) and incremental benefit (Δb_d) of performing development projects, and the number of projects performed. The logic is that the incremental benefit curve sort potential development activities in declining order based on the incremental benefit[2] from performing the activities. The firm will conduct activities until the point where incremental costs equal incremental benefits. When a firm has full capacity utilization, the incremental cost is $\Delta c_d = \Delta w + \Delta\Omega$, which results in q_d^1 projects being performed. When the firm has excess capacity and is hoarding labor the incremental cost is reduced to $\Delta c_d = \Delta\Omega$, resulting in q_d^2 projects being performed. As we can see, the result of labor hoarding is a large increase in development activities, specifically the difference between q_d^2 and q_d^1. The difference between the upper (Figure 1a) and lower (Figure 1b) graph illustrates the effect of the ratio of Δw and $\Delta\Omega$ for the size of the increase in development activities. In the upper figure, Δw is much larger relative to $\Delta\Omega$, and this results in a much larger increase in q_d. The steepness and shape of the benefit curve will also be relevant for the increase in q_d. The steeper, the curve, the smaller the increase. One

[2] The incremental benefits may be a reduction in cost, an increase in price, an increase in volume, or some combination of these. Distinguishing among these is not important for our main point.

FIGURE 1: Development Activities as a Function of Incremental Benefits and Costs

Figure 1a

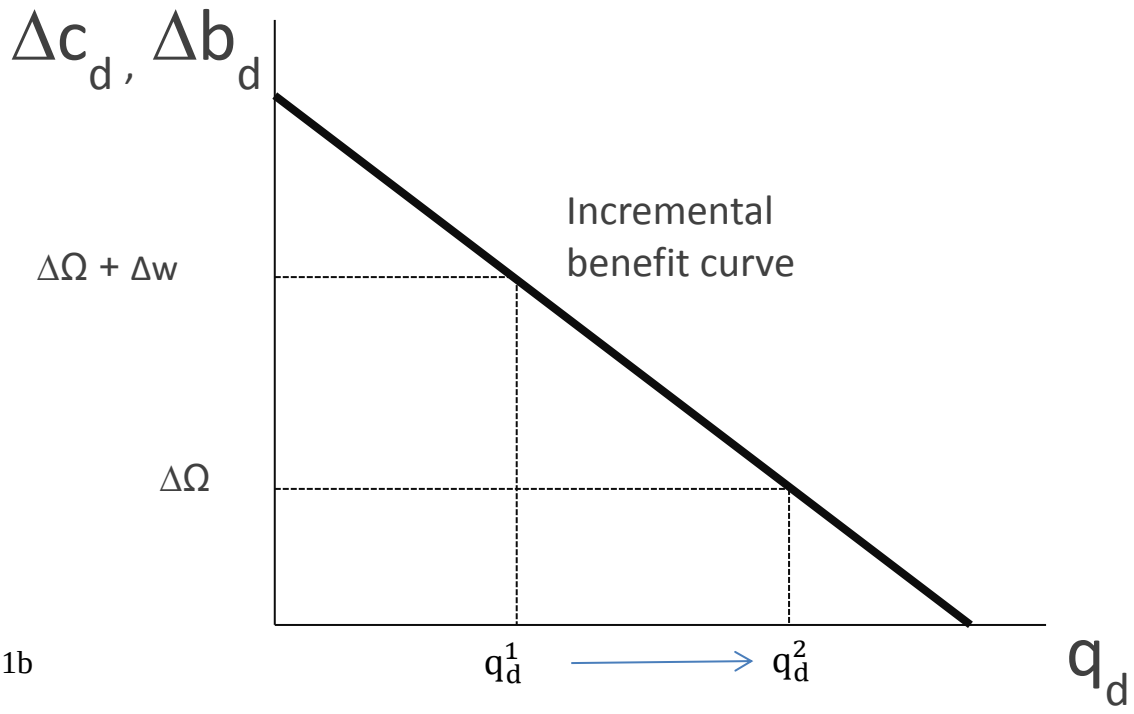
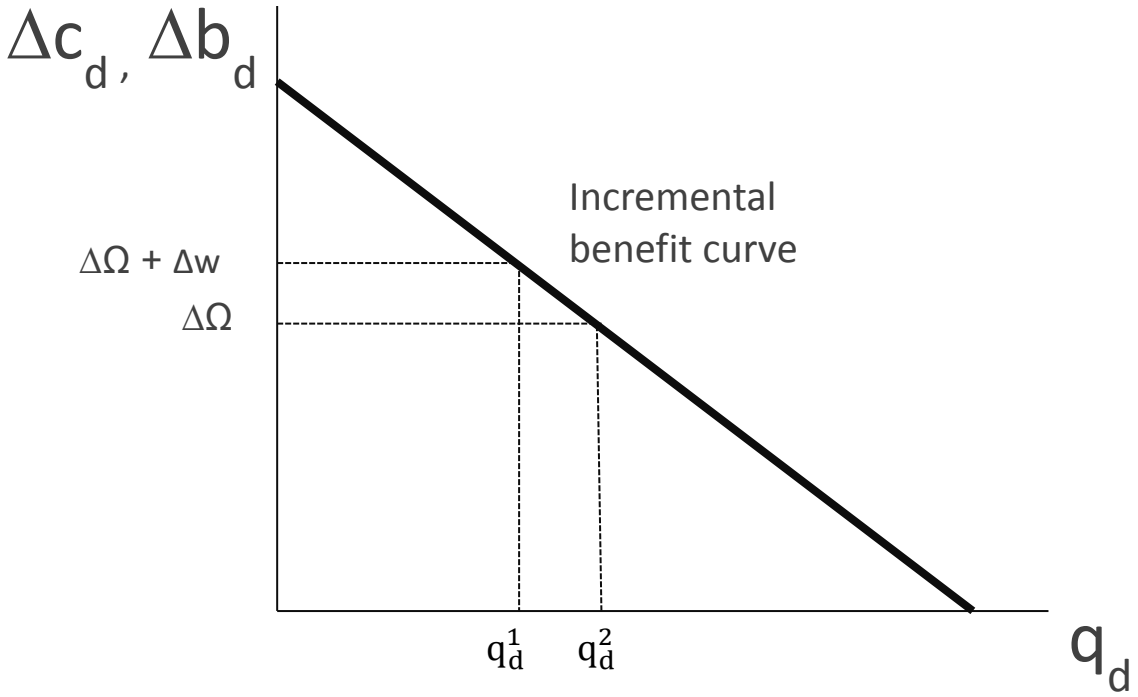


Figure 1b



may for example expect that the benefits from adding R&D and innovation projects will drop faster than the benefits from training and transfer of best practices within the firm. So labor hoarding will increase the latter type of development activities more, than the former.

Until now we have not considered the possibility that even though the firm is hoarding labor, it may not have enough excess capacity to undertake all the development projects that become attractive when Δw is no longer relevant. If the number of such projects is larger than the excess capacity available, the firm must ration development projects. The criterion for rationing among the attractive projects is to maximize the following over all the potential projects:

$$\text{Max } \left(\frac{\Delta b - \Delta \Omega}{\Delta w}\right) \qquad [3]$$

The formula here just says that rationing should maximize the net benefit per unit of (hoarded) labor input. So while Δw is not relevant for deciding whether a project is worthwhile, Δw re-enters the choice among eligible projects, given that the projects exceed the capacity of the hoarded labor. An additional remark may be appropriate here. One may argue that reassigned personnel from production will produce less benefits per unit of wage than personnel that are specialists in development, and furthermore, that this productivity loss might vary over different development activities. Such variations should of course be considered when the terms in equation [3] are estimated. We do not suggest that people with law degrees can switch to do R&D without a loss of net benefit per unit of labor.

If capital is the scarce factor (assuming $\Delta\Omega$ reflects cash costs), the rationing criterion should maximize the net benefit per unit per unit of cash, which becomes:

$$\text{Max } \left(\frac{\Delta b - \Delta \Omega}{\Delta \Omega}\right) \qquad [4]$$

COMPETITIVE IMPLICATIONS

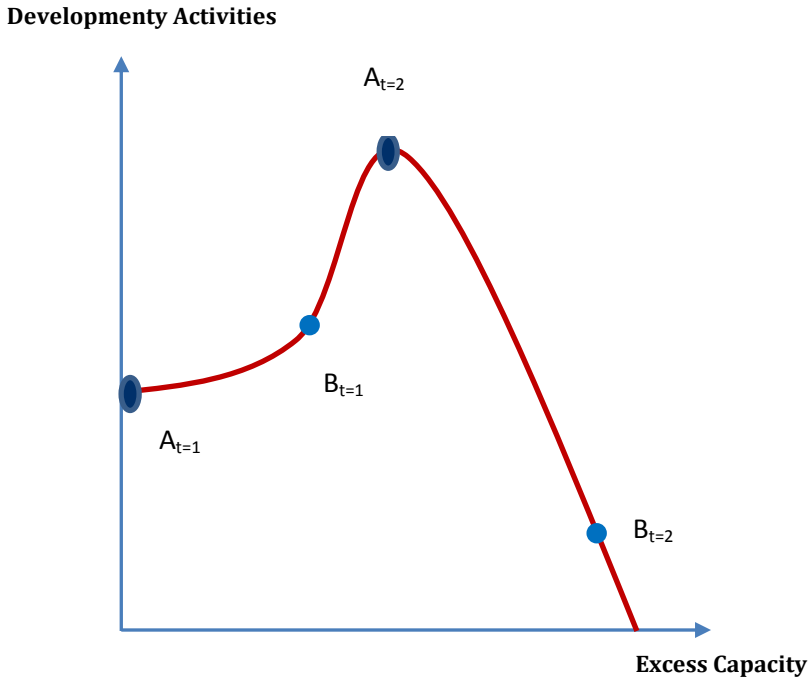
Development activities have the effect of increasing a firm's stocks of human- and organizational capital. From the previous section we have seen that labor hoarding will tend to lead to an increase in development activities under a wide set of circumstances. The more a firm invests in development, the faster the relevant asset stocks will grow. Put differently, these stocks experience a growth boost in the period the firm is hoarding labor. However, this boost will vanish when the firm is back at full capacity utilization because they are a direct result of labor hoarding. Full capacity utilization means that the wage component is again relevant to the incremental cost of development, and the firm will slow down its development pace again.

We can alternatively formulate this in terms of productivity changes. Initially productivity will drop as capacity utilization falls. If the firm hoards labor it will increase development activities laying the foundation for productivity increases that will fully materialize when the firm is back at high capacity utilization. At that time, the development activity is again normal, and future productivity growth is likely to slow down to more normal levels.

There are some important qualifications that need to be made to this general case. The first one deals with initial excess capacity. If a firm that experiences a negative shock to capacity utilization already had substantial excess capacity, further increases in excess capacity may not lead to increases in development activities. The reason for this is that if at some point the expected net benefit becomes negative even if Δw is not part of the incremental cost of development activities, and furthermore, because the likelihood that the firm will run up against a binding financing constraint increases with the amount of excess capacity. Either way, the firm reduces labor hoarding at some point. We therefore predict a nonlinear inverted U-shaped relationship between excess capacity and development activities. The

We illustrate this in Figure 2:

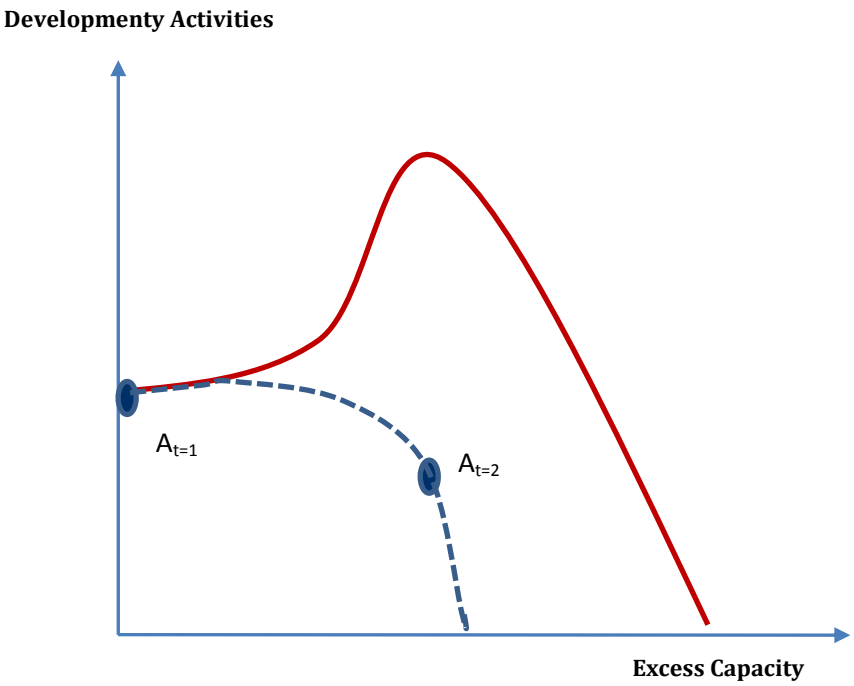
FIGURE 2: The Effect of Initial Excess Capacity on Development Activities



The firm A has high capacity utilization in t=1, when the negative shock occurs. This firm will increase its development activities as discussed above. Firm B on the other hand had substantial excess capacity at t=1. As the (similarly sized) shock occurs firm B actually responds by reducing development activities, as it moves to t=2. We can also see from Figure 2 that for a sufficiently large shock, even firm A would reduce development activities.

Another issue is financing constraints. Even a firm with no initial excess capacity might actually reduce development activities if it us unable to finance labor hoarding. We illustrate this in figure 3. The dashed line illustrates that a firm that cannot finance labor hoarding will have no (or a substantially smaller) growing portion of the curve, and the declining portion will be steeper. As we can see, firm A now responds by cutting development.

Figure 3: The Effect of Financial Constraints on Development Activities



Weaker incentives to hoard labor will have the same type of effect as financial constraints. It will flatten out the curve in the growing section, and make it steeper in the declining section.

Let us now turn to watch this effect from the perspective of a firm that has gained a competitive advantage. For simplicity, assume that the firm faces a simple choice between realizing the value of this advantage in the form of a margin- or a volume increase. Let us further assume that if the firm decides to go for a volume increase, it will inflict excess capacity on one or more of its closest competitors as these are forced to give up market share to the advantaged firm. In contrast, a margin strategy will not inflict excess capacity on competitors.

If the closest competitor(s) have strong incentives to hoard labor, a margin strategy will effectively manipulate them to boost their development activities, and speed up the accumulation of important assets stocks. This development boost will entail a competitive risk

to the firm holding the advantage, since it will serve to erode this advantage faster. If the firm instead decides to realize the advantage as a margin effect, there will be no such erosion. So the volume strategy will undermine the sustainability of the advantage. The stronger the labor hoarding incentives, the stronger this threat will be (Ceteris Paribus). This should bias firms in favor of margin strategies when competitors' labor hoarding incentives are strong. However, in the absence of labor hoarding, no such bias will be present.

Certainly, this is not the only condition that affects the choice between a margin and a volume strategy. Economies of scale, price elasticity of demand, and competitive responses along other dimensions than development, can also affect the decision (Besanko, Dranove, & Shanley, 2001). Nevertheless, on the margin the strength of competitors' labor hoarding incentives will influence how much a firms emphasizes margin- versus volume increases. Under strong labor hoarding effects, the mix will see a large shift towards margins, while there will be no such shift if labor hoarding incentives are weak.

But again, this prediction needs the same qualifications as the ones made above. If the close competitor(s) already have substantial excess capacity before the stronger firm implements makes its decision, a volume strategy might instead lead to a reduction in development activities - as illustrated in figure 2. If the competitor(s) face a binding financial constraint, the result may also be a reduction in development activities. In both of these cases, the bias against a margin strategy is weakened or even removed.

We can crystalize the discussion above into a set of propositions on the industry- and firm level. Starting at the industry level, our first proposition is that in industries where labor hoarding incentives are strong, performance ranking will be less stable than in industries without such incentives, ceteris paribus. The reason is that labor hoarding provides a

mechanism that stimulates lagging firms to catch up with a performance leader, a mechanism that does not exist in the absence of labor hoarding:

P1: The stronger the labor hoarding incentives in an industry, the more turbulent the performance rankings (Ceteris Paribus)

The second proposition argues that an industry that experiences a boost of development activities will see a stronger subsequent productivity growth if it has strong incentives to hoard labor:

P2: The stronger the labor hoarding incentives in an industry, the higher the productivity growth following a negative shock to capacity utilization (Ceteris Paribus)

Two qualifications need to be made to P2, since initial excess capacity and binding financing constraints may weaken or reverse this effect (as seen in Figure 2 and 3):

> P2.1: The effect described in P2 will be weaker, the higher the excess capacity in the industry at the time the negative shock occurs
>
> P.2.2 The effect described in P2 will be weaker, the higher the dependence on external finance in the industry at the time the negative shock occurs

Moving on to the firm level, we predict that labor hoarding biases a firm against using volume strategies against competitors with strong incentives to hoard labor:

P3: The stronger the labor hoarding incentives of close competitors, the less (more) likely that a firm will emphasize volume (margin) strategies (Ceteris Paribus)

Exactly the same two qualifications need to be made to P3, since initial excess capacity and binding financing constraints may weaken or reverse this effect (as seen in Figure 2 and 3)

P3.1: The effect described in P3will be weaker, the higher the initial excess capacity of the close competitors

P.2.2 The effect described in P3 will be weaker, the higher the dependence of close competitors on external finance

CONCLUDING REMARKS

In this paper we have argued that labor hoarding will stimulate development activities in a reasonably predictable way. The business cycle literature in macroeconomics identified this mechanism and documented its existence empirically. This mechanism is however underexploited in the macroeconomics literature in several ways. Macro economists are generally not interested in "the details"- that is- the details of the conditions that affect the strength and competitive implications of this mechanism, and how this varies across firms and industries. For strategy scholars the details that macro economists tend to ignore, are the core questions. When will labor hoarding undermine competitive advantage, and when will it not? How will it affect firm behavior and the outcome of competitive interactions? How does firm heterogeneity matter? How is firm heterogeneity affected? What are the implications for industry dynamics? And so on. In this paper we have only scratched the surface of these questions, pointing out a few core issues that are likely to be important going forward, but perhaps our most important contribution is to call attention to this mechanism in the first place. As far as we know it is not recognized in the strategy literature.

A more speculative part of our argument concerns the possibility that the conditions favorable for this type of situation have become strengthened over time. As the knowledge intensity has increased the ability of the average worker to contribute solving problems and add to his or her skills has likely grown. Furthermore, as the need for firm specific skills and training has increased, so have the incentives to hoard labor to avoid the cost of hiring and training new employees. Finally, as access to finance have become gradually better since WW2, the ability to find financing to get through periods of reduced earnings while keeping excess capacity has become better. If the conditions have indeed become more favorable over time, one would expect industry leadership and competitive advantage to become less durable and stable, which is what many large sample empirical studies have found. If not the sole explanation, what we are describing here may have been an important contributing factor.

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