Financing Capacity with Stealing and Shirking

In new and fast-changing markets, businesses invest in capacity under considerable demand uncertainty. The operational challenges involved are well established: as firms match capacity and demand, they must trade-off overage vs. underage costs. The financing of capacity investments involves challenges too. Indeed, having to share profits with investors raises governance issues (Shleifer and Vishny 1997). These can impact both capacity and demand: Firm insiders may divert capital away from its intended use, thus reducing effective capacity and increasing underage risk; They may also fail to allocate suitable resources to market development, thus deflating demand and increasing overage risk. How should firms match capacity and demand when governance issues affect both? How should they account for the impact of capacity choices on funding needs, and thus on governance problems?

This paper studies how capacity investment under demand uncertainty should adjust to finance-implied governance issues affecting both capacity and demand. Responses may be contractual, with incentives set through a financing package, or operational, with deviations from optimal capacity. To consider both, we frame the problem as one of optimal contracting in which a firm facing uncertain demand optimizes both capacity and the financial claim issued to fund it, given two governance problems: diversion ("stealing") of capital which reduces effective capacity, and "shirking" on market development which deflates demand. We characterize the jointly optimal financing and capacity choices.

This analysis yields new insights about capacity financing and investment when capacity and demand are both subject to moral hazard. First, debt financing is optimal: it minimizes the
incentives to both divert and shirk.

Second, the firm underinvests (resp. overinvests) if the diversion problem is relatively more (resp. less) severe than the shirking problem. Hence, a worsening of the same governance problem can lead to over- or underinvestment depending on circumstances.

Third, and more importantly, the diversion and shirking problems interact to impact capacity investment: If the shirking problem is mild enough, the more severe the diversion problem, the less the firm invests; However, if the shirking problem is severe enough, the effect of diversion is reversed: the more severe the diversion problem, the more the firm invests.

The key for these findings is a form of complementarity between diversion and shirking, which stems from the complementarity between demand and capacity in the problem of matching supply with uncertain demand. Due to complementarity, it is most tempting for the firm not to divert or shirk, but to divert and shirk.

Our results provide new predictions in both finance and operations. In particular, while more severe shirking or diversion problems lead to less investment in the governance literature (Tirole 2006, Burkart et al. 1998), we show that either can lead to more investment when funding capacity under demand uncertainty. Similarly, our paper is the first to study diversion in the related operations literature (Boyabatli and Toktay 2011, Li et al. 2013, de Véricourt and Gromb 2016, Alan and Gaur 2017) and how it affects capacity choices.

Our results also have empirical implications. For instance, they caution against considering different dimensions of governance in isolation. For instance, the staggered adoption of business combination laws in different U.S states has been extensively used to identify effects of corporate governance (Bertrand and Mullainathan 2003). To the extent that these laws reduced
the threat of hostile takeovers, they reduced the expected “punishment” associated with diversion-type activities. However, our analysis warn that the effect of this regulatory shock may be modulated by other governance problems, and identification strategies ignoring this issue may generated biased estimates.

References


