

Dar Al Riyadh Insight #83

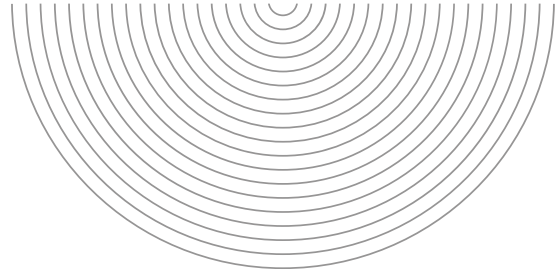
Internal Diseconomies of Scale

Dar Al Riyadh Insights reflect the knowledge and experience of our Board, executives and staff in leading and providing PMC, design and construction management services. Dar Al Riyadh believes in the importance of broadly sharing knowledge with our clients and staff to improve project outcomes for the benefit of the Kingdom of Saudi Arabia.

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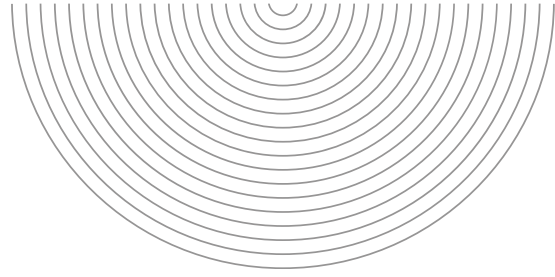
Internal diseconomies of scale include those arising from:

- Poor communication – Communication challenges grow as organizations grow larger, adding layers with increased risks of inconsistent messaging. Poor communication can also arise as site-based workforces are spread out and as the number of suppliers and subcontractors grows.
- Lack of coordination – scale brings with it more work fronts, more work shifts, and larger crew sizes. These combine to challenge coordination both within and across crews and project teams.
- Limited employee engagement – scaling of the workforce may result in larger spans of control and a reduced ability to involve all members of the project team in workface planning and other more spontaneous or informal employee engagement activities. A degree of formality sets in.
- Loss of connectedness – as projects scale, additional layers of management are often introduced, creating more distance between the leadership team and line employees. This lack of connectedness impacts productivity, morale, and retention.
- Loss of speed – Decision making processes lose any sense of informality as more formal approval processes are established to provide a higher degree of control. This is further exacerbated by both the likely presence of additional management layers and growth in specialized staff departments, which place emphasis on process over performance.
- Increasing fixed costs – larger project organizations involved with trying to achieve economies of scale are associated with growing fixed overheads (additional management layers; more elaborate processes and documentation; and specialized staff departments working with scale and complexity challenges as well as responding to project needs that come with scale.)
- Higher overheads and general conditions costs – overhead costs grow as staff and supplier requirements become more complex. Any local labor challenges may require introduction of incentives of various forms that normally are not required at smaller scales. Support resources that may have been available within



the local community may now not adequately serve an expanded workforce (canteen; medical; transportation to site; and other infrastructure deficits that emerge).

- Managerial inefficiencies and diseconomies – these are associated with additional managerial layers; increased managerial coordination and training time; challenges with covering any expansion of shift work; and inefficiencies created with respect to training and supervision of any expanded crew sizes.
- Lack of morale/motivation of employees – these results from both reduced interaction with line supervisors and managers and loss of contact with the leadership team as additional layers are introduced. Employees lose a sense of belonging and commitment and increasingly feel isolated from a project's vision and goals. Organizational culture can suffer on a scale.
- A high proportion of nonproductive employees – increased workforce size naturally results in a larger number of nonproductive employees. But the degradation of morale and the loss of a sense of belonging previously described further act to reduce productivity.
- Loss of clarity of management direction as number of layers increases.
- Inertia that grows with scale.
- Time lags in flow of information that impedes response – the “value of time” is not consistent throughout the various layers of the project organization or across a broadened expanse.
- Growing disadvantages of division of labor (over-specialization) – construction often requires contingent execution, for example, doing something earlier than planned because a scheduled activity is delayed. Overly specialized work crews limit the flexibility to undertake such execution.
- Loss of economies of scope – specialist resources become project dedicated vs project shared.
- Reduced economy of scope on company equipment if percentage of specialized equipment grows – this is not a material issue in the absence of specialized equipment. As scale grows, however, so too does the need for specialized equipment.
- Increased difficulty in realizing learning curve – learning is uneven across the workforce, driven by increased numbers of work crews, presence of larger proportions of specialized labor and equipment, and often challenges associated with lower labor retention rates. Lessons are often “observed” but not “learned.”
- Infrastructure (company, project related) does not keep up (infrastructure inefficiency) – growth in scale begins taxing the capabilities and capacities of various company and project systems such as HR, accounting, procurement, quality assurance, risk management, logistics, and physical systems such as IT. After a certain level of growth, major investments are required to create the step change necessary to handle further increases in scale. This results in both cost and performance diseconomies.
- Increasing complexity – while not direct, scale and complexity have a strong relationship. Scaling often creates a step change in project complexity, narrowing the bandwidth available for risk mitigation as risks



move into more significant areas. Complexity demands strengthened risk and quality systems that are often not accomplished by merely adding additional staff into these functional areas.

- Increasing communication challenges – the what, when, and how of communications changes as execution scales up. The number of potential communication paths grows exponentially as staff and key activities grow.
- Increased number of coordination and consultation points – scaling and growth in complexity require a more transparent supply chain with greater visibility of several supplier sub-tiers. The project team must engage, monitor, consult, and coordinate more deeply. This reflects the aggregation of risk that comes with scaling up. Management demands grow with scale and existing supply chain staff and systems may require step changes to support scaling up. At some point the law of diminishing returns sets in. Further growth in scale comes with progressively higher marginal costs.
- Increase in capital inefficiencies with scale (longer time to first revenue; working capital lock-up; changed enterprise risk portfolios) – at the company level, bonding capacity may be tied up in larger amounts for longer periods of time.
- Increased sequential and complimentary activities (coupling and correlation) – scaling up may involve a larger number of conditions precedents for a significant activity to occur. Delays in any one condition precedent can impact a major, now consolidated activity, along with a larger potential for delay in a project. One other manifestation can be seen in delayed reviews and approvals as one large scale review may replace a dozen more discrete ones. Nothing can proceed until all are addressed by the one approval. This can be further exacerbated by staffing shortages in any one discipline or department with nothing able to move faster than the slowest path.
- Custom or bespoke designs limit the learning curve – the development of a unique design or solution at scale often has one replace many. Inherently the one goes through a normal learning curve associated with first of a kind or first of a series. When many replace one, there is a learning gain after the initial incidence. At some point scale and complexity grow and the more difficult learning curve outweighs multiple incidences that benefit from a strong learning curve.
- Project scale characteristics that appear to lower cost also lengthen the design and construction period – cost reductions must especially value any extended permitting, design, procurement, fabrication, inspection, or logistics time frames. Often the focus on cost is not balanced by a full consideration of all schedule impacts and associated costs.
- Standardization typically associated with economies of scale is often difficult to realize – absence of strong scope discipline often results in each subsequent copy “improving” on the prior version, thus negating many of the benefits from standardization.
- Longer schedules increase exposure to negative events – time is a risk aggregator.