

## THE EVOLUTION OF INDUSTRIAL CLUSTERS: A CASE STUDY OF SCOTLAND

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### ABSTRACT

The aim of this study was to look at the evolution process of industrial clusters, which was noted in the study as one of the most fundamental concepts that can be used to examine and predict the probable course of industrial clusters in Scotland. It was noted that a typical industrial cluster's life cycle, is marked by four distinctive stages, namely embryonic, growth, maturity and decline, although industrial clusters do not evolve into the exact stages that one would expect because some technologies die quickly, whilst others continue to evolve and remain in the decline stage for a prolonged time before rotating back into the embryonic stage through the development of new technology. With regard to the stages themselves, meanwhile, it was noted that the embryonic stage begins in most cases with a group of firms known as lead or anchor firms, situated in the same geographical area, where they find a new technology idea and develop it into actual technology. Another interesting result arising from this study is the presence of characteristics of genuine industrial clusters in the embryonic stage – features such as geographical proximity, innovation, communication, interactions and linkages, to name but a few. In addition, it emerged that the embryonic stage is also known as a period of slow sales growth as technology is introduced to the market. Profits are negative or nonexistent in this stage because of the heavy expenses of technology introduction and distribution. A great deal of money is needed to attract distributors and build inventories, meaning that the embryonic stage is characterised by high expenditures (for market research, test marketing and launch costs) and possibly by financial losses. By contrast, it was noted that the growth stage is a period of rapid market acceptance and increasing profits, hence the establishment of vertical linkages by the original occupiers of an industrial cluster. Although not many industrial clusters have reached the mature and decline stages it was noted in the study that, at the beginning of the mature stage of any industrial cluster, the cooperation and proximity of suppliers and customers become still less important than was the case in the initial stages of the industrial cluster's life cycle. The maturity stage, as this study revealed, is known as a period of slowdown in sales growth because the technology will have achieved acceptance by most potential buyers. Profits during the maturity stage level off or decline due to the increased marketing expenses that are meant to defend products against competition. Firms in a mature cluster encounter diseconomies of externalities that are associated with the problems of managerial co-ordination experienced by most small firms as they develop into large firms. In fact, in the mature phase, the overall rate of innovation fades and technology becomes less competitive, since firms that have been located near to their competitors will discontinue exchanging information with one another for fear of labour-market poaching.

The decline stage is also known as a period when market saturation causes sales to fall off and profits to drop, leading to a loss of confidence on the part of investors, falling share prices and eventually to bankruptcy. This study showed that the evolution process of industrial clusters is the most fundamental concepts used to examine and predict the probable course that clusters may take and this is good for regional economic strategists for future planning.

**KEYWORDS:** Industrial clusters, Technology, Evlution of technology, Evolution of Technology, Scotland