

# RULE 2: KNOW YOUR INDUSTRY AND ITS LIFE CYCLE PHASE

***The Ruthven Institute has developed 12 rules for business success. Based on 45 years of analysis of Australia's top 1000 companies, the Ruthven Institute has distilled the essence of a winning business strategy. Research undertaken by the University of Melbourne between 1998 and 2001 supported many of these rules. In this series, the RI Hub examines the literature to assess the validity and continuing relevance of these rules. In each of the following sections, the literature is summarised, the key issues for implementation highlighted, and the questions for future research identified.***

"The business you are in has to be defined first and foremost by what you do or make, be it goods or services – in other words, the industry in which you operate. For the purpose of fulfilling Rule 2, knowing which business you are in means knowing what class of industry (among the 509 classes) you are in...

No-one can generalise on strategy, organisational structures, leadership styles and cultures when it comes to being successful in business. How a manager approaches these factors depends on what phase their industry's life cycle is in, and where it is headed. Businesses need different mindsets, leadership styles and strategies, and a number of different modus operandi, throughout a full life cycle."

Ruthven Institute (2019) *Business Success: In Brief the 12 Golden Rules*

## What is the industry life cycle?

The industry life cycle (hereafter, ILC) has its origins in the product life cycle concept, where products go through stages of introduction, growth, maturity, decline, and death (Miles, Snow, & Sharfman, 1993).<sup>1</sup> However, unlike products, industries are much less likely to die out as an industry typically comprises multiple products.<sup>2</sup> This observation is supported by the findings of an RI analysis that suggest over 95% of industries have survived multiple peaks and troughs. Based on this evidence, Rule 2 posits that industries may go through multiple cycles before their eventual demise, if it ever comes. The overwhelming majority of academic studies, on the other hand, either implicitly assume or explicitly model the ILC as consisting of only one cycle or *wave* – i.e. having one peak much like in product life

<sup>1</sup> The words *stage* and *phase* are used interchangeably throughout the review.

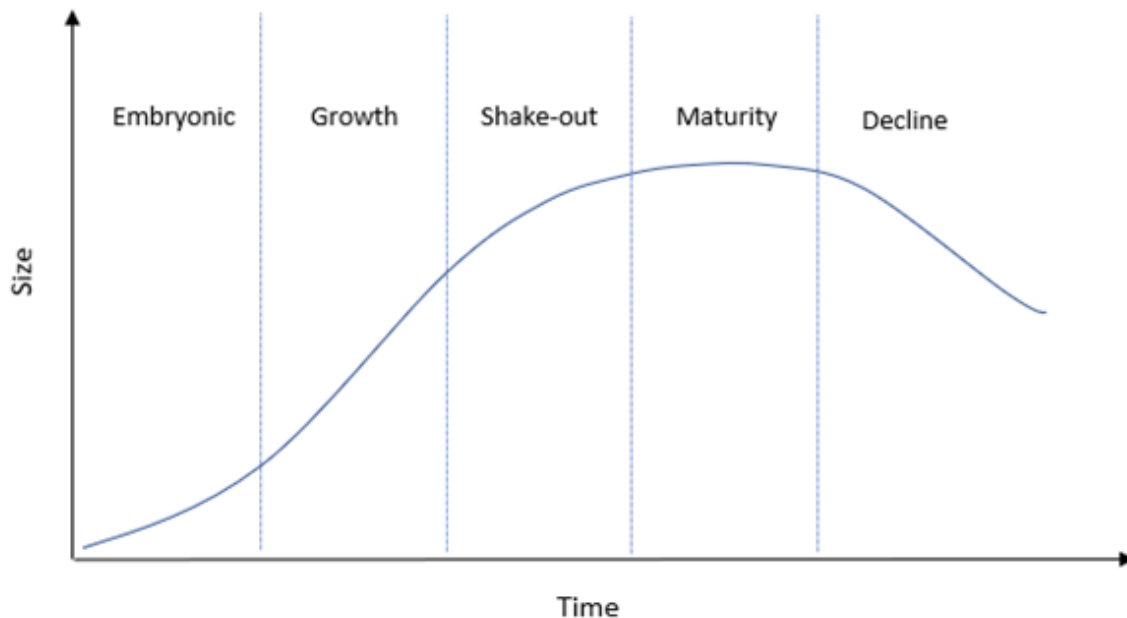
<sup>2</sup> The concepts and the literature related to the product life cycle, industry life cycle, and innovation are highly intertwined. However, the focus of this brief review is on the studies that are primarily concerned with the industry life cycle. Although some scholars have called product life cycle a self-fulfilling prophecy (e.g. see Dhalla and Yuspeh (1976)), the mainstream academic view is that products and industries go through stages.

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cycles (see figure below). Despite this, the key findings and insights from prior studies regarding the characteristics of the ILC's various phases and their implications for firms' strategies should be generalisable to multi-cycle models, because the rise and decline of industries follow similar patterns in both types of models. We provide a brief discussion of the multi-cycle models later in the review. Throughout the review, we also draw attention to any differences between RI guidelines and the insights from the literature while closely following the terminology used in prior studies.



**Figure 1: A stylised model of an industry life cycle**

## How to identify the phases of the ILC

Conceptually, many of the structural changes during an industry's life cycle are driven by the demand for the industry's products. Therefore, in prior studies an industry is commonly assumed to reach maturity when the demand for its products peak/stabilise and assumed to decline when there is a consistent drop in demand over the course of several years.

### *Empirical measurement: The academic literature vs Rule 2*

Empirically identifying the different phases of the ILC is a challenging task, because it is very difficult to discern long-term changes in demand for industry products. Consequently, a diverse list of empirical measures has been used in prior studies (and by RI) for identification purposes. Since many of these measures relate to

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industry size in one way or another, the vertical axis in Figure 1 is named size rather than demand.

A common thread through almost all measures used in the literature is that they are based on a pattern of changes in a specific measure observed across the ILC stages. For example, as will be discussed in the next subsection, the entry and exit rates of firms in a given industry tend to vary significantly across the different phases of the ILC, and these changes follow a somewhat predictable pattern in most industries. Consequently, many studies use the structural changes in firm numbers and/or industry concentration to mark the start of a new phase (e.g. Klepper, 1997; Klepper & Grady, 1990; Lieberman, 1990). Total industry output, investment/divestment trends, sales growth rate, and major technological changes are some of the other factors that have been used for identification purposes (Lieberman, 1990; Maksimovic & Phillips, 2008; Miles et al., 1993).<sup>3</sup> Yet other large sample studies have used econometric techniques (such as Hamilton (1989)'s Markov-switching model) or certain cash flow patterns at the industry level to identify the ILC's phases (Cantrell & Dickinson, 2020; Karniouchina, Carson, Short, & Ketchen Jr, 2013).

The RI approach to determining the current phase of the ILC differs from that of most academic studies but is not limited to a single measure. The primary measure used by the RI is value-added (wages plus gross profit and depreciation) as a share of GDP. This measure is intended to capture the relative importance of the industry within the economy. One implication of this identification method is that rising industry sales or profit will not be indicative of growth if the industry growth rate is not high relative to other industries. In a way, the rationale behind this measure is similar to that employed in Maksimovic and Phillips (2008). In addition to value added, RI also uses the ratio of industry-level capital expenditures to gross capital expenditures as a lead indicator. Other secondary measures include the ratio of industry revenue to the country's total revenue and the ratio of the number of people employed by the industry to the national workforce.

### *The characteristics of each stage*

Since the empirical measures used in academic studies are based on the characteristics of the ILC's stages, it is important to know the attributes unique to each stage. This section synthesises theories and empirical evidence from two broad

<sup>3</sup> See Lamberg, Ojala, and Peltoniemi (2018) for the discussion of empirical measures used in prior studies to identify declining industries.

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presearch areas to depict the characteristics of each stage: evolutionary economics and technology management (see Agarwal, Sarkar, and Echambadi (2002)). Theoretical models and empirical regularities suggest that at their inception industries are populated by a small number of firms, and are characterised by high uncertainty, extensive innovation, and high product prices.<sup>4</sup> The latter, with the prospect of high returns, attracts many additional entrants to the industry, and as a result, innovation thrives, output starts growing at a fast pace, and prices start falling. The growth stage is usually followed by a decline in the number of firms, as technological laggards and firms that cannot imitate industry leaders are forced out of the industry due to their inefficiency (and hence, low profit margins) or lack of innovation. Consolidation often also includes mergers and acquisitions. Such a rapid decline in the number of firms – also called the *shakeout* stage – typically signals the transition into the maturity stage (Peltoniemi, 2011).

Although shake-out is common in many industries, in some industries niche firms do co-exist with generalist firms (Bonaccorsi & Giuri, 2000; Buenstorf, 2007; Swaminathan, 1998). Additionally, some industries go through more than one round of shake-out over the industry's life cycle (Windrum, 2005). It is worth emphasizing that what is commonly referred to as the shake-out stage in academic studies occurs at the onset of maturity (see Figure 1) and does not indicate the industry's decline, which is also accompanied by a reduction in firm numbers. This has two implications. First, a change in the number of firms (i.e. entry/exit pattern) does not necessarily follow the changes in the industry's aggregate revenue or profitability.<sup>5</sup> Second, the terminology used by the RI regarding shake-out differs from that in the literature. In particular, Rule 2 defines shake-out as a sharp decline in firm numbers *after* maturity. Additionally, Rule 2 posits that there are typically two shake-outs: one right after the maturity stage and another following the dormant phase right before the industry reaches the end of its cycle.

Another important development that often occurs at the onset of maturity is the emergence of the so-called *dominant product design*, provided there is a sizeable homogenous set of consumers (Tushman & Anderson, 1986; Utterback & Abernathy, 1975).<sup>6</sup> Dominant design is a synthesis of various technological innovations and

<sup>4</sup> When unreferenced, the discussion in this section uses the insights from Gort and Klepper (1982), Klepper and Graddy (1990), Jovanovic and MacDonald (1994), and Klepper (1997).

<sup>5</sup> For example, in 1906 only 10 firms were producing automobile tyres in the US, but in 1922 there were 275 firms. In only a few years, this number came down to 132 and later down to just 30 (Jovanovic & MacDonald, 1994). In the meantime, industry sales kept rising.

<sup>6</sup> The RI guidelines suggest that the dominant design emerges earlier during the growth stage.

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product features that were introduced independently in prior products, and consequently, satisfies the needs of a broad class of users (Peltoniemi, 2011). The emergence of a dominant design is often argued in prior literature to have important implications for the competitive dynamics of an industry. After its emergence, competition tends to shift from product design to price, as firms leverage the cost savings from standardisation of key inputs (Teece, 1986; Utterback & Abernathy, 1975). In the meantime, variations in product design decrease. In some industries, however, more than one dominant designs may emerge, or several distinct niches with different product designs may co-exist (Windrum & Birchenhall, 1998). In these instances (i.e. markets with heterogenous preferences), product innovation is likely to be continuous instead of decreasing (Klepper, 1997; Windrum, 2005).

Once the industry reaches full maturity, output growth slows while the number and market shares of incumbents stabilise. Past learning-by-doing gives the incumbents an advantage over entrants, and incumbents become the primary innovators (Gort and Klepper 1982). This further increases the barriers to entry as higher levels of product innovation expertise is required for profitable entry. While in the growth stage a high number of new firms with varying resources and capabilities enter the industry, the maturity stage is usually characterised by changes that are less radical and more incremental (Karniouchina et al., 2013). Consequently, variety in strategies and innovations across firms decrease and industry norms and organisational routines become more rigid (Miles et al., 1993).

With respect to R&D, expenditures on product design and process efficiency, larger firms are likely to have an advantage over smaller firms (Klepper, 1996). However, small size becomes less of a liability during the maturity stage than during the growth stage of an industry. This is largely due to the opportunities created by the specialised assets, market knowledge, and reputation of small market participants (Agarwal et al., 2002).

Average firm profitability is also likely to vary across the different stages of the ILC. Evidence suggests that firms in growth industries tend to have the highest profits and ROA, followed by mature industries and declining industries (Cantrell & Dickinson, 2020; Karniouchina et al., 2013). Additionally, a bigger proportion of firm performance variance can be explained by industry-wide factors in declining and mature industries than in growth industries, likely due to a high level of firm heterogeneity in growth industries. An analysis conducted by RI suggests that the

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former result is conditional on the positioning of industry players. Specifically, if the industry is populated with companies that predominantly fall into one of what RI defines as *major*, *niche*, or *ultra-niche* categories (see Rule 5), the maturity stage tends to be more profitable than the growth stage. If the positioning of many firms falls outside of these market share categories, the growth stage is likely to be more profitable than the maturity stage.

The profitability of companies that choose to remain in a declining industry can vary widely across industries (Harrigan & Porter, 1983). The degree of profitability and volatility depends on how readily industry incumbents pull out and how fiercely the remaining companies compete over the shrinking industry sales. Some companies enjoy a highly profitable end-game due to the premature departure of their competitors, while others exit the industry by correctly reading the signs of decline and avoid the high operating losses of remaining incumbents.

The patterns of ILC discussed above may not readily apply in three cases: industries producing complex products and systems, service industries, and cultural industries. Complex products and systems (e.g. off-shore oil equipment) are capital goods that are one-off projects or produced in small batches (Hobday, Rush, & Joe, 2000). Due to the large size and complexity of these products and the absence of mass production, barriers to entry are high throughout the life cycle and there is no mass entry or exit of firms (Davies, 1997). It has been argued that progress through innovation tends to be slow in services industries, leading to a productivity gap between services and manufacturing industries (most famously proposed by Baumol (1967)). Since innovation and changes in the technological landscape are key elements in many theories explaining the ILC phenomenon, such differences between manufacturing and service industries may affect how the latter evolve over time. However, the argument that innovation is slow in service industries has been criticised on the grounds that it is inherently more difficult to define and measure service output, and hence, many studies suffer from mismeasurement issues (see Gallouj and Savona (2009) for a detailed discussion). Additionally, Cainelli, Evangelista, and Savona (2006) document a positive impact of innovation on productivity and growth and selection based on innovation in service industries. Rule 2 does not generally distinguish between manufacturing and service industries either.

Cultural industries are also fundamentally different from manufacturing industries

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with regard to not only the nature of innovation but also the constant requirement for creativity and originality (DeFillippi, Grabher, & Jones, 2007).<sup>7</sup> Consequently, even though content producers tend to conform to a genre or a trend, they still consciously strive to differentiate themselves in terms of originality and creativity, which increases variety as the market evolves (see Peltoniemi (2011) for a more detailed discussion).

## **Which firms are more likely to survive the stages of the ILC?**

Several factors have been proposed to explain the survivability of firms, but perhaps the most commonly suggested factor is the timing of entry. Most studies find that early entrants have a higher survival rate than later entrants.<sup>8</sup> Additionally, the likelihood that a firm will fail decreases with firm size (Evans, 1987). Evidence also suggests that start-up size is an important factor (more important than initial productivity and ownership type) in explaining the evolution of a firm's size over its early life (Ayyagari, Demirguc-Kunt, & Maksimovic, 2017). That is, small (large) start-up firms tend to remain small (large) as the industry goes through different stages. Similarly, entrants with high initial productivity have higher future productivity and profits. Results from the study of firm demographics on 10 OECD countries indicate that once firm size is taken into account, there are no significant differences in firm turnover rates across countries (Bartelsman, Scarpetta, & Schivardi, 2005). However, average firm size and post-entry growth of successful entrants may vary from country to country.

First-mover advantages are often attributed to leadership in technology and cumulative learning, controlling scarce assets such as process inputs or space (geographic space, shelf space etc.), and the need for the late entrants to spend extra resources to attract customers away from the first-movers (Lieberman & Montgomery, 1988). Access to complementary strategic assets such as distribution channels, complementary technology, and strong organisational linkages can give early entrants an additional advantage over late entrants (Taylor & Helfat, 2009; Tripsas, 1997). On the other hand, late entrants can free-ride on many developments made by first-movers, learn from first-movers' mistakes or borrow from their strategies, and are likely to be more agile than first-movers (Lieberman & Montgomery, 1988; Miles et al., 1993). However, first-mover advantages have been

<sup>7</sup> Firms in cultural industries produce goods and services that require constant originality and creativity, may be cultural in nature, and are typically protected by intellectual property rights (UNESCO). Music, film, video games, tourism, and publishing industries are some of the examples.

<sup>8</sup> See Table 3 in Peltoniemi (2011) for the list of the studies that find support or challenge this finding.



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decreasing over time, likely due to the easier transfer of knowledge and skills across firms and globalisation (Agarwal & Gort, 2001). In industries and time periods when there is an intense technological activity, new entrants may even have higher survival rates as the incumbents' technology becomes obsolete quickly (Agarwal, 1996).

The other two factors that are commonly found to improve the likelihood of firm survival are prior experience from related industries and innovation.<sup>9</sup> For instance, a firm with experience in manufacturing radios will likely have a higher chance of survival in the television industry than an entrepreneurial firm that has just entered the television industry. With respect to innovation, the speed of adoption of new technologies, whether the firm adopts the dominant design, location near the technological frontier, incremental product innovation, and adoption of radical manufacturing technologies have all been shown to play an important role in survival.<sup>10</sup>

In declining industries, the extent of divestiture – rather than investment – becomes a major factor that determines a firm's survivability. Theory suggests when firms can adjust their production capacity, large firms are likely to be first to reduce production (Ghemawat & Nalebuff, 1990). Empirical evidence is consistent with this theory: in declining industries, large-share firms make more frequent reductions in capacity, and small firms are more likely to exit the industry (Lieberman, 1990).<sup>11</sup> The latter finding is consistent with theoretical models as well (Jovanovic, 1982).

## What strategies are best employed at each stage?

### *General strategies*

One of the key assertions of Rule 2 is that firms need to adopt new strategies as the industry moves from one phase to another, and this assertion is supported by the collective evidence from the ILC literature. Specifically, findings from prior studies suggest that in new and growth industries firms' strategies are likely to revolve around areas such as product design, innovation, market research, and advertising. In mature industries, however, they are more likely to concern areas such as production efficiency and plant design (Klepper, 1996; Miles et al., 1993).

<sup>9</sup> See Table 4 and Table 5 in Peltoniemi (2011) for the list of the studies that document these findings, respectively.

<sup>10</sup> See Lawless and Anderson (1996), Fontana and Nesta (2009), Banbury and Mitchell (1995), Sinha and Noble (2008), and Christensen, Suárez, and Utterback (1998).

<sup>11</sup> Some theoretical models also predict that under certain conditions, large firms will be the first to exit industry because smaller firms can *hang on* longer than larger firms (Ghemawat & Nalebuff, 1985; Londregan, 1990).



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Lieberman and Montgomery (1988) argue that “firms whose entrepreneurial vision and new-product R&D are excellent will tend to find first-movership attractive, whereas firms having relative skill bases in manufacturing and marketing may not”. Findings from Robinson, Fornell, and Sullivan (1992) support these arguments. Specifically, their results indicate that first entrants tend to have high R&D spending but low manufacturing skills.<sup>12</sup> While early followers are likely to have stronger manufacturing skills, firms that enter the industry at its maturity tend to have higher marketing expertise. When examined in light of the discussion presented in the previous section, these findings suggest innovation is more important at the early stages of the industry, whereas higher efficiency and better marketing may give firms a greater competitive advantage in later stages of the industry. As Wernerfelt and Karnani (1987, p. 191) recommend, a firm should focus its resources “on the scenario under which it has the strongest position relative to its competitors”.

Christensen et al. (1998) provide two insights that can be generalised to other industries. First, firms that are likely to incorporate the key elements of the dominant product design after its emergence have a much higher probability of survival. There also appears to be a window of opportunity just before the emergence of a dominant design that may be particularly advantageous. Suarez, Grodal, and Gotsopoulos (2015) suggest that this window of opportunity opens upon the emergence of what the authors call *dominant category* and end when the dominant design emerges.<sup>13</sup> The second insight from Christensen et al. (1998) relates to the risk of investing in new technologies versus entering new markets. Specifically, entering an emerging market with proven technologies is likely to be less risky than entering into an established market with new component technologies that improve performance. These findings have implications for the timing of entry into a new industry that could be especially profitable.

### *Strategies for declining industries: the ILC literature*

Picking a winning strategy when the industry is declining requires even more delicate understanding of the situation and intensity of future competition. Although in some cases a decline can be temporarily reversed, it is generally beyond the incumbents' control once all available remedies have been exhausted (Harrigan & Porter, 1983). To formulate a successful strategy, companies thus need to determine how many firms will be remaining in the industry and how fiercely they will fight.

<sup>12</sup> The latter finding could also be due to the fact that manufacturing a new product is inherently difficult, and that imitation is cheaper and faster than innovation (Mansfield, Schwartz, & Wagner, 1981). See Table 3 in Peltoniemi (2011) for the list of the studies that find support or challenge this finding.

<sup>13</sup> Dominant category is the product category in which the firm chooses to position its products.

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The volatility and profitability of the *end-game* will depend on many factors. First, companies need to understand the reasons behind the industry's decline as each has different implications for the intensity of competition among the remaining incumbents (Harrigan, 1980; Harrigan & Porter, 1983). Demand could decline due to technological advancements in a related industry, shrinking customer groups, changes in customer tastes and preferences, and the increase in the cost of inputs or complementary products. Accurate or not, competitors' perception of future demand is also very important. If most or all industry participants believe that the demand will revitalise or level off, they will try to hold on to their positions, which will make the decline stage very volatile and potentially less profitable. In an un hospitable industry environment where later exits are unlikely to be more profitable, an early exit may be the best option (Harrigan, 1980). Remaining companies can still make a profit in price-insensitive industries, but holding on to a declining industry is likely to be costly in price-sensitive industries. Brand loyalty and favorable position can even earn the company above-average profits in such cases (Harrigan, 1980; Harrigan & Porter, 1983).

Another factor that will affect the number of remaining incumbents - hence the volatility and profitability of a declining industry - is exit barriers. Firms with hard and specialised assets that are hard to sell will find it costly to exit the industry (this is consistent with RI Rule 8). Consequently, remaining in an industry that mostly comprises such firms will likely be unprofitable due to strong competition.

In general, companies need to ask whether their core competencies match the remaining *pockets of demand*. If it doesn't, an early exit is likely the best strategy. If it does, staying in the industry is likely to be profitable provided that the company can achieve a leadership position or become a niche competitor through selective divestment (Harrigan, 1980; Harrigan & Porter, 1983). Leadership and niche positions are favoured by RI Rule 5 in other stages of the ILC as well. Leadership in a declining industry is attainable when the other companies leave early, when the company can reduce the competitors' exit barriers, or when it can reinvest and make staying costly for the competitors. These decisions should be evaluated in conjunction with the companies' other needs. For example, a company may decide to remain in the industry even in hostile conditions if that industry is an important part of its corporate strategy, if its brand within that industry is central to the company, or if that industry constitutes a chain in vertical integration.

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## *Strategies for declining industries: Rule 2 perspective*

Rule 2 proposes several strategies for declining industries. While some of these strategies overlap with those from prior studies, others differ mainly because the RI recommendations assume multi-cycle models. One alternative for firms in declining industries is to shrink through selective divestment and become a niche or ultra-niche player until the industry transitions into the next cycle. This, however, may not be feasible if there is considerable uncertainty regarding the transitioning stage or if the transitioning is expected to last long. In such cases, firms can diversify into related areas where they can use their core skills and resources.<sup>14</sup> Ideally, core resources should be allocated between the two industries in a way that would allow the firm to pull out from the new industry when necessary (e.g. if there is uncertainty regarding the future prospects of the declining industry). While in the transitioning stage, Rule 2 also recommends that firms assess and compare the future viability of the technologies that fuel the two industries. If the new industry is expected to grow fast due to its technology, firms can fully transition into the new industry and focus all of their resources on the new business line. An alternative route that firms in declining industries can follow is international expansion (consistent with Rule 1). But this should be pursued only by companies that are highly skilled in their areas and/or have the critical mass to be successful in the new market.

## **Key implementation challenges**

Firms may face several challenges when implementing strategies highlighted above. For those strategies to be successful, firms must first accurately identify the phase their industries are going through. As emphasized before, this is easier said than done as many times an industry may have temporary rises while in decline or temporary setbacks while growing. Using multiple tools such as the empirical measures discussed earlier and a qualitative assessment of the industry may prove particularly helpful.

Another implementation challenge is that not only different stages of the ILC require different strategies but they also likely require a different leadership style and management regime. This is at least in part because many of the changes necessitated by the shift in phases may require a significant overhaul of the company's operations or involve a major investment. For this reason, companies

<sup>14</sup> Although Rule 1 argues for a need to focus to maximise profitability, it also recognises that diversification strategies may be essential for survival in declining industries.

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should use KPIs that incentivise managers to be flexible and responsive to industry-wide changes and to focus on the long-term survival and profitability of the company. The recommended strategies for each stage have their own unique challenges as well. In mature industries, the main challenge is managing for tight control of costs to improve production efficiency while investing the right amount into innovative activities. Declining industries are perhaps the hardest to navigate. Firms have to not only operate in an environment where there are considerable uncertainties regarding when demand may pick up, but also accurately gauge other companies' perceptions of demand. If a company decides to stay, it has to make another crucial decision, which is to either divest just enough to remain a niche player or find the right industry to diversify into. Even after diversifying the company will be at a crossroads: fully transition into the new industry or hold on to the older one with the hopes that it will pick up. All these decisions involve significant risks and managerial judgement and have strong implications for the company's survival. That is why it is very important to have an organisational culture and managerial structure that encourage flexibility and long-term profitability over short-term performance.

## **Conclusions and the applicability of results to multi-cycle models**

In summary, there is strong evidence from the literature that industries move through distinct stages during their lifetime and those phases have unique characteristics. Young industries are characterised by high uncertainty, extensive innovation, and high product prices. Such an environment attracts many firms and the industry grows rapidly, leading to higher output and lower prices. In the maturity stage the number of firms and their market shares stabilize, and innovation tends to be less radical due to converging product designs. Since each new phase has attributes that differ from the previous stage, firms will have to change their strategies across stages. While a strong innovation culture and high media exposure are likely to be stronger assets during the growth stage, firms in mature industries are likely to be rewarded more for production efficiency and for implementing product designs that appeal to a broad customer base. In declining industries, whether the firm needs to pull out or *stay and fight* depends on the intensity of competition among the remaining incumbents.

As should be clear by now, these findings can easily be extended to multi-cycle models, especially if the cycles are fueled by technological changes. Some multi-cycle models of the ILC have their roots in Kondratieff waves. The Kondratieff waves,

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named by Joseph Schumpeter after the Soviet economist Nikolai Kondratieff, are the cycle-like phenomena that are hypothesised to occur at the aggregate economy level. Specifically, economies are proposed to complete a cycle every 45-60 years (on average, but may vary across countries). Consistent with this phenomenon, Ayres (1988) proposed that technological breakthroughs open up new territories for exploitation and give rise to a new wave of *technological* life cycle that continues until firms hit a new technological barrier. Hence, continuous technological innovation can result in repeated cycles during an industry's life (Ayres, 1997; Henderson, 1995).<sup>15</sup> The arguments driving Rule 2 are consistent with this theory.

Technological changes are not the only reason why industries may have multiple cycles. Another significant driver is consumer demand. For example, a product that is well received by consumers may in time fall out of fashion and be replaced by a similar product from a different industry. The decline in this industry can be reversed if the industry participants keep innovating and eventually develop a product that gains back consumers' attention, hence kicking off a new cycle. Consider another example in the context of mining industry. In the event of declining demand for one mineral, firms specialised in mining this mineral can shift their operations to mining another mineral (assuming an increased demand for it) if it requires similar core resources and skills. Depending on the extent of changes in the relative demand for these two minerals, we may thus observe repeated cycles for the mining industry in general. The discussion presented in this section suggests that while some industries may go through only one cycle, others may have to live through multiple cycles before their permanent decline.

## Future research opportunities

The research opportunities around ILCs are numerous. The strategy implications of multi-cycle models are underexplored. Examining the survival rates of firms across the transitioning phases between cycles would be illuminating, as would identifying the key success drivers of the survivors.

RI have gathered extensive data on ILCs in the Australian context (often over a century or more). Bringing these data to a broader audience, and challenging researchers on other developed (and developing) economies to follow suit could greatly boost our grasp of the underlying patterns and dynamics of such cycles.

<sup>15</sup> Note that Kondratieff waves function at the aggregate economy level, whereas the multi-cycle models discussed here and in Rule 2 function at the industry level.

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The interaction between ILCs and other planks of the RI Hub research program require further exploration. As highlighted above, diversifying to exit a declining industry (and/or to enter a growth industry) may be investigated as a specific form of diversification which may have varied success versus other forms of diversification. Likewise, firms with differing market share may experience ILCs differently. This can be examined empirically. Furthermore, understanding the relationship between the stages of the ILC and appropriate leadership styles and organisational culture may help bridge the strategy choice-to-ILC stage connection.

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