

# Cost-Structure and the Volatility of Capitalism

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## Abstract

This conceptual paper explores the phenomena of changing cost-structures and the implications for the volatility of capitalism and the possibility to manage firms in such a hostile environment and proposes future research. It also provides an explanation of why the relevance of accounting is lost, the so-called “relevance lost” debate (see among others Francis & Schipper, 1999).

The changing cost-structures raises fundamental questions concerning the resulting volatility of capitalism and the management of firms in such an increasingly more volatile environment. In Philipson, Johansson & Scheley (2016), we raised the question if it was possible to “...to ride the dragon.” Considering the importance of these phenomena, it is astonishing that we have not found any empirical research concerning them. They rest research questions, based on the author’s almost 25 years of experience as a senior executive in Scandinavian industry.

## Key words

Cost-structure; volatility; risk.

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## 1. Introduction

Increased competition and, as a consequence, diminishing life cycles, have made differentiation strategies more important than economics of scale or cost leadership. "Competition has a large effect in shortening the longevity of products on the market." (De Figueiredo & Kyle, 2006:258) This is reflected in the shift in focus from Porter (1980) to Porter (1996), and is underscored by (Raia, 1993, after Wagner & Busse, 2008), who have shown that 60-70% of life cycle profits result from decisions before the offering is even launched.

After WWII a typical product life cycle was 20 years. In the 1980s it has been reduced to 7-8 years and today it is typically 3-5 years, and:

1. Individual products having life cycles of 3 - 6 months (e.g. mobile telephones).
2. These individual products might reside within a technology with longer life cycles (e.g. 7 - 10 years as the 4G mobile telephone systems).
3. The very concept of a technology as such (the mobile phone is 66 years old now).

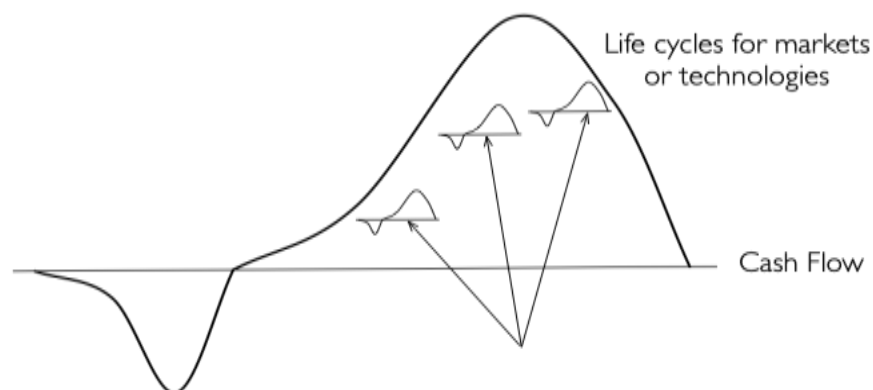
## 2. Shorter Product Life Cycles

The average product life cycle has been declining, ever since the capitalist system was born.

Figure 1 shows a typical product life cycle with an investment phase (the curve below the 0 cash flow line) and an exploitation phase with incoming revenues (the positive cash flow curve). When the product is a technology, e.g. 4 G, individual products have their life cycles within the technology life cycle.

Figure 1

### Life cycles within life cycles



Source: Own elaboration.

Products do not last forever; they are developed, launched onto the market, grow, and eventually decline and die as they are finally supplanted by new or substitute products. The average product life cycle has been declining, ever since the capitalist system was born.

Shorter life cycles (Rink & Swan, 1979; Young, 1964, after Qualls, Olshavsky & Michaels, 1981; Olshavsky, 1980), result from increased competition. In the 19th century it was not unusual for a product to last for a century. The common claim of shorter life cycles has seldom been empirically verified, and the above studies are all problematic. But Magnier, Kalaitzandonakes & Miller (2010) provide such empirical evidence for a 12-year period in the US corn hybrid industry. "...corn hybrids with more advanced biotech features tend to have shorter product life cycles." (Magnier et al., 2010:33).

The consequences of shortened life cycles are the increased importance of the development of new offerings, and hence differentiation, and the importance of intellectual property rights, as well as other strategies to increase temporal monopoly (short-term uniqueness) has increased (von Hippel, 1988). At the end of the 19th century the life cycles of products (or services, or experiences) were 50-100 years. Innovation was not a big issue. Product life cycles have become much shorter. After WWII a typical product life cycle was 20 years. In the 1980s it has been reduced to 7-8 years and today it is typically 3-5 years, with (1) individual products having life cycles of 3 - 6 months (e.g. mobile telephones). These individual products might reside within (2) a technology with longer life cycles (e.g. 7 - 10 years as the 4G mobile telephone systems) and the very (3) concept of a technology as such (the mobile phone is 66 years old now).

The "...shortening life cycles of new products. In the computer industry during the early 1980s, for example, hard disk drives would typically ship for four to six years, after which a new and better product became available. By the late 1980s, the expected shipping life had fallen to two to three years. By the 1990s, it was just six to nine months." (Chesbrough, 2007:24).

However, in mature industries that have not yet suffered from substitution competition, the life cycles are still long. E.g. Coca-Cola is 132 years old, the company 128 (Wikipedia, 2020-12-12).

Hundred years ago, thus only 1-2% of the turnover of the firm was at stake each year, while today one third! To replace lost business, to retain the same size of the company, the 1900 firm had to launch products that could replace 2% of its business each year. Hence, 12.5% new products had to be successfully launched each year to compensate for lost business, if we calculate with the average failure rate in new product development. Today, with an average life cycle of 3 years, one third of the business is up for auction every year. With a failure rate of innovations of at least 75% (Evanschinsky, Eisend, Calantone & Jiang, 2012; Van der Panne, van Beers & Kleinknecht, 2003), and a needed 10% yearly growth, it is clear that managers of highly successful companies do not necessarily know if the firm will exist at the end of the year! Since innovation is risky, the firm might need a product development portfolio that is as large as the current turnover, or even more! (Van der Panne et al., 2003).

Table 1 shows the percentage of a firm's turnover that has to be renewed each year and the consequences in the form of the size of the product development portfolio that is needed.

Table 1

### The volatility of capitalism

|                                       | 1890           | 1950     | 1980    | 2005        |
|---------------------------------------|----------------|----------|---------|-------------|
| <b>Average life cycle</b>             | 50 – 100 years | 20 years | 7 years | 3 – 5 years |
| <b>% of turnover at stake</b>         | 1 – 2%         | 5 %      | 15 %    | 30 %        |
| <b>Necessary Innovation portfolio</b> | 2 – 4%         | 10 %     | 30 %    | 60 %        |
| <b>Portfolio with growth</b>          | 2 – 4%         | 11 %     | 33 %    | 66 %        |

Source: Philipson et al. (2016).

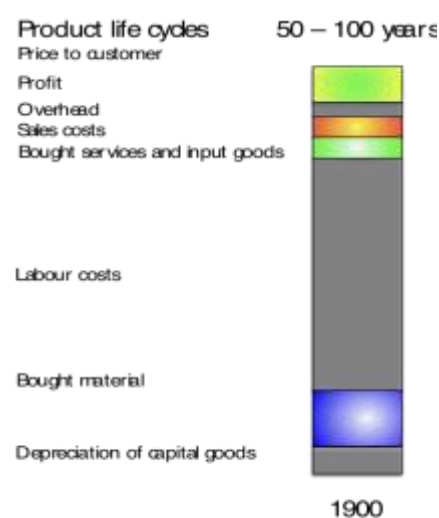
These shortening life cycles have consequences for the cost structure of products and hence for how firms make business.

### 3. Cost-structure

The cost structure of a typical company in 1900 could look as is shown in Figure 1.

Figure 2

#### The cost structure of a company in 1900

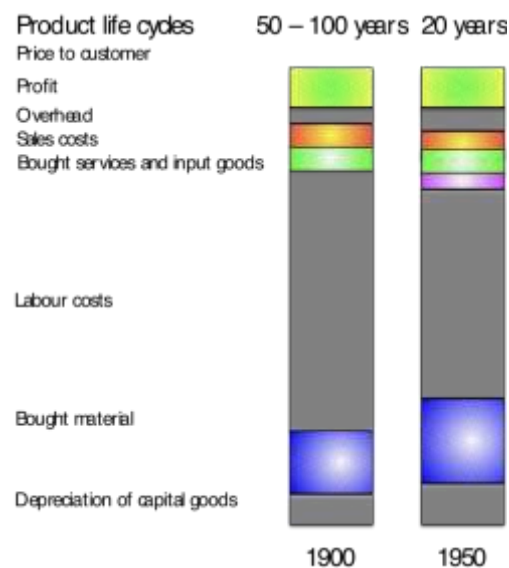


Source: Own elaboration.

In the following 50 years it only marginally changed. Management attention and a new science of management had evolved and focused on diminishing the direct labor costs, by introducing mean time measurement (MTM) and variable salaries. Of course, these managerial strategies go back to Taylor (1911/2001) but were widely employed only after the second world war; a consequence of the arrested development of capitalism as a result of the two world wars.

Figure 3

### Cost structure in 1950 compared to the cost structure in 1900



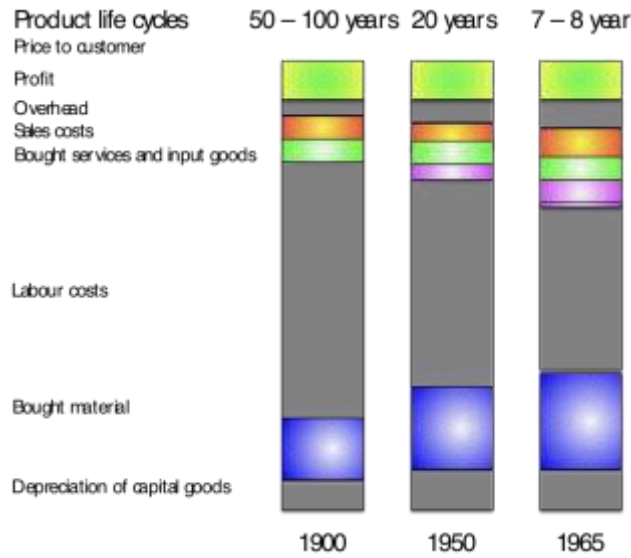
Source: Own elaboration.

In 1965, the efforts to diminish direct labor costs had resulted in radically increased costs of bought material and hence, management attention and academic research focused on Just-in-Time, JIT, capital rationalization, and other means to beat down the costs of bought material. These practices were typically subject to academic research a decade later (Aglietta, 1979; Palloix, 1976, both after Sayer, 1986).

By 1985 the new engineers that had been employed to work with the new management techniques had become Mintzberg's technostructure (Mintzberg, 1979); hence the overhead costs had become important enough to become the center of attention (see Johnson & Loewe, 1987). In 1982 the author slashed down central staff and services at the then Asea Brown Boveri (ABB) headquarters in Västerås, Sweden.

Figure 4

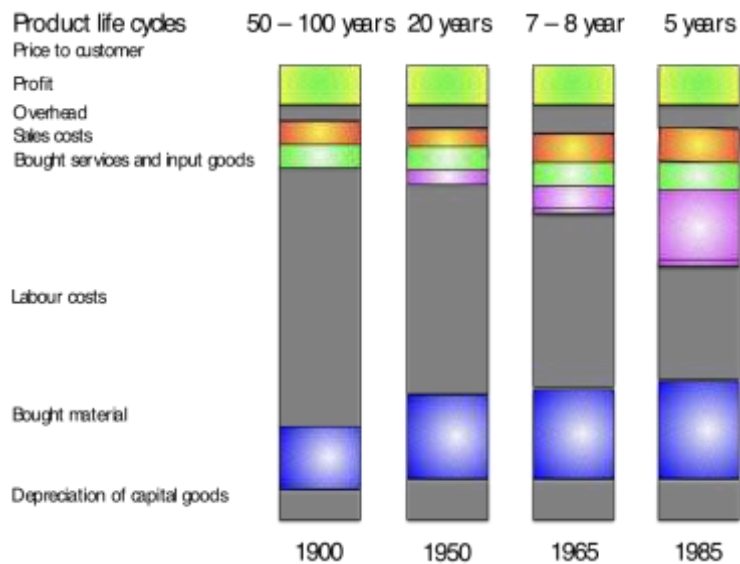
Cost structure in 1965 compared to those of 1950, and 1900



Source: Own elaboration.

Figure 5

Cost structure in 1985 compared to those of 1965, 1950, and 1900



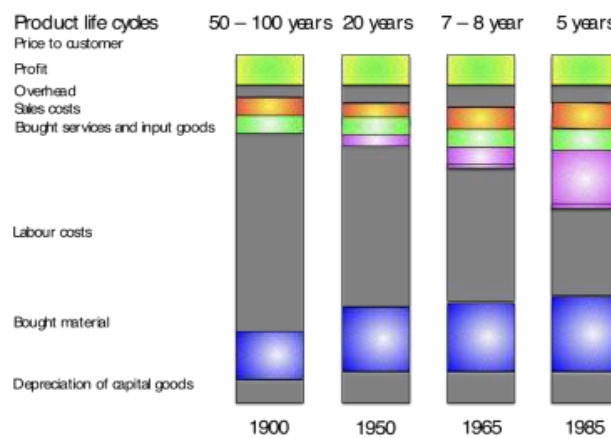
Source: Own elaboration.

By 2000 the cost structure had again radically changed. Increased competition had made innovation and the costs of global niche marketing the dominant elements and the center of attention.

In Figure 6 the business risk costs, innovation, organizing the value chain, and fixed marketing costs are identified as the lion’s share of the cost structure.

Figure 6

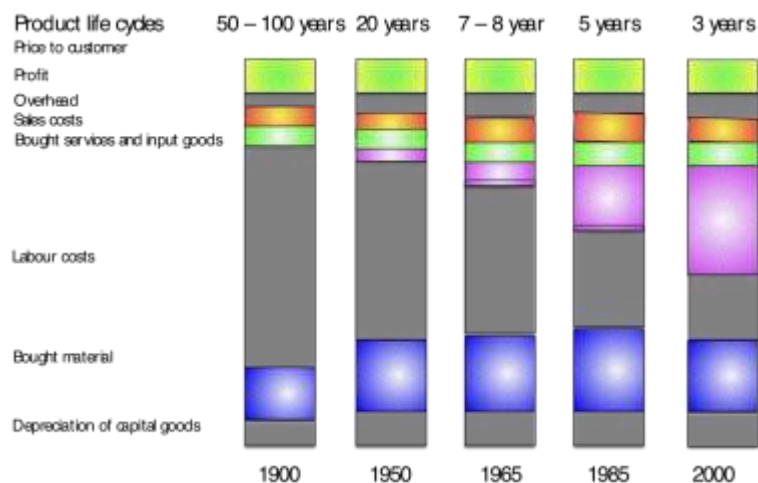
**Cost structure in 2000 compared to those of 1985, 1965, 1950, and 1900**



Source: Own elaboration.

Figure 7

**The Cost structure in 2000**



Source: Own elaboration.

Products such as personal computers and mobile telephones, have a variable production cost of 10-15%, a Lacoste t-shirt 8%; a music CD 2%. Most of the costs are fixed production and marketing costs, paid upfront before any revenues can be collected. All these costs are risked in advance not only of any revenues, but even of any industrial production. A failed investment in innovation means that all these costs are sunk. Lost. Capitalism as we know it has become very risky. But still, some of the most successful firms do it. Why?

The fixed costs that are risked include:

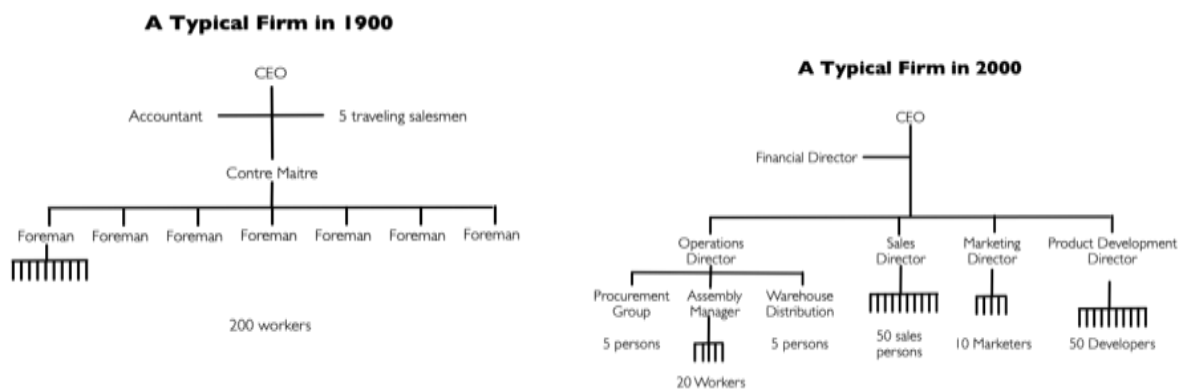
1. 'Pure' product development, R&D, development of the product or service architecture, interfaces between components, standards (proprietary or open).
2. Fixed production costs, certain parts of production costs have to be taken before any product is sold, be it setting up plants, buying machines, and for developing machine tools.
3. Fixed marketing costs, the production of marketing, buying 'space', etc., in order to be able to roll out the marketing when the 'window' of opportunity opens.
4. Organizing the value chain.

#### 4. Societal consequences

These changing cost structures have also had societal consequences. The typical firm in the year 2000 is very different from that of 1900, see figure 8. As a consequence, society is very different. In 1900 the class distinctions and living conditions were sharply different between on the one hand the owner-capitalist and the "contre-maitre" (production director) and on the other the rest of the employees. In 2000 the spread in living conditions can be as large or larger, but the employees are "all over the place", not at either ends of the spectrum.

Figure 8

#### A typical firm with some 200 employees 1900 and in 2000



Source: Own elaboration.



There are three major reasons why firms develop new offerings:

1. To replace products that are no longer competitive. Customers' needs evolve. If the company does not adapt competitors will. Hence, companies have to develop their offerings to meet competition or, if they fail to do so, must develop new offerings to compensate for the loss of those. Offerings hence have a "life cycle"; they will not last forever.
2. To grow. If the company want to grow, it must add new offerings or increase market share for existing offerings.

To gain (temporary) monopoly rent, abnormal earnings.

## 5. Conclusions

The changing cost-structures raises fundamental question concerning the resulting volatility of capitalism and the management of firms in such an increasingly volatile environment. In Philipson et al. (2016), we raised the question of if it was possible to ride the dragon. Considering the importance of these phenomena, it is astonishing that we have not found any empirical research concerning them. They rest hypotheses; here based on the author's almost 25 years of experience as a senior executive in Scandinavian industry.

## 6. Proposed further research

1. Longitudinal case study of the product cost structure of one or several products, based on internal company archive.
2. Longitudinal study of variable costs as a percentage of corporate annual returns of listed companies and if identified business risks are compensated by lower financial risks, increased solidity, to balance the total risk.

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