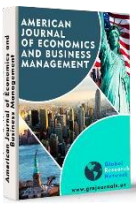

American Journal of Economics and Business Management

Vol. 8 Issue 4 | **pp**. 1403-1421 | **ISSN:** 2576-5973

Available online @ https://www.globalresearchnetwork.us/index.php/ajebm

Measuring the Opportunity Cost of Late Access to the Market of Products

Dunya Jalil Jaafar ALMusawi [1], Hiba Mahmood Mohammed Saeed [2]

[1,2] Post-Graduate Institute for Accounting and Financial Studies, Baghdad University, Baghdad, Iraq

Abstract:

The purpose of this study is to measure the opportunity cost of late access to the market. This opportunity cost is measured by the percentage of sales or revenue loss from to 2018-2022 of an Iraqi textile companies. This opportunity cost gives more attention to an important factor in the decision process regarding market access, which is time to market. The study focused on one product of the companies that is cotton clothing as data were collected for the period 2018-2022 to calculate the percentage of sales or revenue loss due to the late introduction of this product to the market. This study adopts a model developed by Prasad (1997) with a market window of 30 days or one month, which was used by these companies. The results show that the opportunity cost increased during the period of the study because of late introduction of the products indicating that the firms will lose the market share for their competitors. The main implication of this study is that managers should make a decision to use the idle energy and introduce a product faster to maintain its market share and reduce the level of competition.

Keywords: opportunity cost, late introduction, early introduction, product market, Iraq.

1. Introduction

Companies face very strong competition around the world and have no choice but to be "competitive" locally and globally, which is becoming increasingly complex in the manufacturing environment owing to technological factors and new production systems used in manufacturing (Avdullahi and Fejza, 2015). Dominguez and Cannella (2020) point out those competitive markets are complex because there are three main actors (suppliers, customers, and retailers) with three different decision models that can affect the markets. In the new global manufacturing environment, competition is no longer between companies but between supply chains. In response to this new situation, companies have adopted strategies to align their capabilities with the opportunities available in the market to achieve their goals. Companies rely on coordination among manufacturing, logistics, marketing, and accounting systems to ensure the timely flow of goods and products to the market. According to Al-Shboul (2017), this coordination has made companies more dynamic and flexible in the new manufacturing environment.

The production management plays a critical role in monitoring and improving the efficiency of manufacturing innovative products, and there is a need to use an innovative product costing system that includes important measures to cope with new changes (Alexopoulou et al., 2024). Several measures are used to assess competition and gain competitive advantage, such as the price of the product, the cost of the

Citation: ALMusawi , D. J. J. ., & Saeed , H. M. M. . (2025). Measuring the Opportunity Cost of Late Access to the Market of Products . *American Journal of Economics and Business Management*, *8*(4), 1403–1421. Retrieved from https://globalresearchnetwork.us/index.php/ajebm/article/view/3450

Received: 12 Feb 2025
Revised: 28 Feb 2025
Accepted: 15 Mar 2025
Published: 14 Apr 2025

product, the number of competitors, the potential consumers of the product and the intensity of competition (Bylykbashi et al., 2021).

According to Hilmersson et al. (2022), focusing on time-to-market has become a critical source of sustainable advantage for many companies, including small and medium enterprises (SMEs) worldwide. Time, along with cost, quality, and reliability, are the three main indicators used to measure the performance of the supply chain, as they relate to meeting customer requirements at the lowest cost, as quickly as possible, and on time (Martel, 2018). In addition, they enable companies to establish a superior position by responding to the market in an effective and timely manner· Al-Shboul (2017) asserts that time-to-market has become a key strategic success factor in an increasing number of industries, as it enables companies to be more flexible and responsive to market demands. Shannak and Al Masri (2012) find that using time-to-market as an indicator of firm performance allows firms to be creative and innovative. Aljanabi and Nouri (2020) note that companies are beginning to reconsider many important factors related to cost reduction, and time is an important factor. Lameijer et al., (2021) and Abidalreda and Jawad (2019) assert that time is an important factor in continuous improvement strategies and production processes of firms operating in a highly competitive environment. Ahmadi et al. (2025) point out that time is an important factor in responding to customer demands in different industries, as it reduces costs and increases sales and market share. Ji and Abdoli (2023) argue that industrial firms strive to reduce costs, accelerate time to market and improve product, service quality and flexibility in the new global manufacturing environment.

There is widespread agreement in the Iraqi textile manufacturing sector that texture producers or suppliers require improved access to their local markets to increase productivity and flexibility, and to protect their products from increased competition from foreign products. The dominant policy narratives on market access in Iraq are characterized by three main features. First, the Iraqi market is one of the most complex markets in the world, and Iraqi industrial firms operate in a highly competitive environment where customer expectations are diverse and widely varying (Deherab and Yaquoop, 2020). Specifically, Iraqi textile manufacturers operate under poor market access conditions and generally face high levels of competition. Second, the raw materials needed for Iraqi textile products are not available locally and have to be imported from outside, creating a problem of remoteness. Third, they operate with high marketing costs, risks and poor access to support services. These poor access conditions are generally perceived to have stagnated or worsened in recent decades. Many Iraqi industrial companies have not experienced significant infrastructural changes since the last war in 2003, and the private sector has generally not filled the void left by the withdrawal of the state from texture markets after the start of market liberalization programs. This is the case for most of Iraqi industrial companies including our sample.

Accordingly, Iraqi textile companies (public and private) have very poor financial performance indicators and most of them have exited the market. The level of production is decreased, they were unable to compete with the other foreign producers by introducing the products to the market on time, the cost of late access to the market is not calculated and considered by the managers of these companies, they did not discuss any plan to improve their performance and no significant infrastructural changes were introduced by the managers of these companies to reduce the negative effect of late access to the market. However, to the best of our knowledge, measuring the opportunity cost of late entry to the market has not been explored. The present study aims to fill this gap by measuring the opportunity cost of late market entry in one public Iraqi textile companies. The aim of this study is to measure the opportunity cost of late access to the market. This opportunity cost is measured by the percentage of sales or revenue loss from to 2018-2022 of an Iraqi textile companies. The Iraqi textile industrial companies produces six types of

products from 2018 to 2022, namely, cotton clothing, polyester, briefs, knitwear, socks and military clothing. There are several motivations behind this study. First, this study focused on a case of one type of product, cotton clothing, because the industrial companies were responsible for 86% of its total production in 2018, which was reduced to 49% by 2022. Despite the fact that the volume of production decreased during the period of the study 2018-2022, the managers of the companies decided not to stop their production process and they agreed to work within a high level of compaction. Second, this study is in line with the new trend of the Iraqi government to identify the stuttering industrial companies to find a solution on how to improve their performance. Third, the study highlights that an issue such as the opportunity cost of late access to the market can drive managers to produce high-quality decisions about their companies. Therefore, this study answers the question: What is the opportunity cost to the company as it decided to continue to manufacture and sell this product despite the reduction in the size of production during the study period? More specifically, what is the impact of the late introduction of this product on the decrease in the market share of the company? This study aims to calculate the percentage of sales or revenue loss from to 2018-2022 due to the late introduction of this product. The study selects one product (cotton clothing) because it has a high demand and supply, low price, various models, and the Iraqi companies have long experience in producing this type of the products. These companies are working with a high level of competition from regional companies from Syria, Iran, and Turkey, which have the same products available in the local market, difficulties in obtaining raw materials, and, recently, products being introduced late in the market, resulting in a lower market share for the Iraqi industrial companies.

The remainder of this paper is organized as follows. First, a review of the relevant literature is presented, followed by the research methodology adopted. Next, we present and discuss the research findings. Finally, the conclusions and implications are presented.

2. Literature review

2.1. Opportunity cost of delayed sales delivery

Persson and Tinghög (2020) note that opportunity costs are the foregone benefits of options that are not chosen. If opportunity costs are neglected in public policy decisions, there is a high risk that the best option will be overlooked. Vallejo-Torres (2023) point out that when analysing the cost-effectiveness of any system, the measurement of opportunity costs is necessary and cannot be ignored. According to Prasad (1997), the opportunity cost of sales is the loss of revenue owing to delays in delivering products to the market. Haghpour et al. (2022) defined opportunity cost as the amount that each alternative is worth consuming, and the extent to which consumers are willing to pay for it. Opportunity cost plays an important role in the introduction of products, because it depends on whether it is difficult or easy for customers to switch to a newer product and wait for the same product when it is available in the market. If a firm is not the first in the market, it must enter the market by setting a relatively low entry price for its product, because it has lost the opportunity to introduce the product to the market early. If the firm is the first in the market, its market share will be larger than that of the other firms, its demand will increase, and its profit will be higher. However, if the firm is not the first to enter the market, its market share will be smaller than that of other firms, demand will decrease, and profit will decrease. Therefore, early entry gives the firm more options to deal with other firms entering the market, such as reducing the product price or developing new products, while these options are very limited for firms entering the market late.

Most previous studies (e.g., Prasad, 1998; Rycroft, 2006; Belay et al., 2011; Nohýnková, 2022) used the lost sales model developed by Prasad (1997). This model is used to calculate the opportunity cost of a delayed product launch. The revenue or sales

generated in the case of timely and delayed introduction to the market can be calculated by calculating the total revenue for early (or timely) introduction to the market and the total revenue for delayed introduction to the market; the difference between them is equal to lost sales or revenue.

The early and late delivery of products have been extensively studied in various industries and service firms because they are part of the strategic decisions of firms (Salmen, 2021), which are more related to the innovation process of products (Kanagal, 2015). The most notable study in this area is Prasad (1997) , who investigated the relationship between early and late delivery and total sales. According to Prasad (1997), time-to-market is one of the eight measures that companies should use to determine the total value to customers. Hendricks and Singhal (2008) examine the effect of product introduction delays on accounting-based measures of operating performance. They find that delays have a statistically significant negative impact on profitability. Belay et al. (2011) examined two models of time-to-market strategies to predict total losses due to product delivery delays. Khudhur and Ali (2019) established a link between cost and time, concluding that the cost of a construction project increases when the firm is unable to complete the project on time. Gallino et al. (2022) examined the impact of in-process delays on customer behavior. They found that delayed service introduction affects customer abandonment differently at different stages of the shopping journey. Zhan et al. (2022) examined the relationship between supply chain decisions and the delay time required to implement those decisions. They found that delay time is an important reference for supply chain members when choosing decision modes such as product promotion decisions, sales decisions, and brand reputation. Puente et al. (2023) noted that a sales order delay is one of the most important problems affecting the performance of companies. In a case study of selected companies in Peru, they found that more than 15% of total orders were delayed. Hamali et al. (2020) investigated the causes of project delays and reported that delays in project completion have a negative effect on the timely delivery of projects, leading to an increase in project costs. Ravula (2023) examined whether customers would reward vendors for early delivery and penalize them for late delivery. The results of the study show that customers give much lower (slightly higher) ratings to orders delivered late (early) compared to orders that are delivered on time. Shi et al. (2023) found that delayed production leads to an increase in the total cost of the products. Guzik (2023) noted that a company may fail to introduce a new product if its costs and lead times for introducing the product cannot be predicted accurately.

The main conclusion of the abovementioned studies is that the common factor among them is time to market, as it is the critical factor for increasing market share, revenues, and profit.

2.2. Time to Market value

As a particularly strategic issue, market performance becomes the extent to which marketing functions contribute to the achievement of organizational goals. Within market performance, output performance includes sales volume, and sales growth and profitability are the main indicators used to evaluate this type of performance (Suherly et al., 2016). Islam et al. (2022) describe the decision to enter a new market as one of the more risky decisions because it has a long term effect on the market performance. However, a new indicator or value, market access, or time value is considered the focus area of market performance (Correia et al., 2021; Carvalho et al., 2022, Hilmersson et al., 2022). This value reflects the early and timely delivery of the product compared to that of other competitors. Within the total value approach invented and discussed by Prasad (1997), time-to-market value is one of the values companies should use to measure customer satisfaction. Time-to-market value is the period of time required to design and develop a marketable product, which focuses directly on the final cost, delivery, and usefulness of

the manufactured product to the customer. Islam et al. (2022) define market entry as the ability of a firm or producer to sell goods and services in the market on time, locally, or internationally. At the international level, the speed of market entry is discussed in the literature as it represents a crucial issue for international expansion (Moher et al., 2018). The speed of market entry can be defined as how quickly a firm gains a position in the foreign market network (Johanson and Johanson, 2021).

Yamin and Kurt (2018) note that the new business environment perspective views markets as a system of long-term interdependent relationships between customers and suppliers. Firms adapt and modify their activities in these relationships, creating reciprocity and interdependence. In this process, firms establish new positions, develop old ones, or increase coordination between positions in the market. A firm's position is better developed when it has more long-term and robust relationships, and the strength of these relationships reflects the degree and symmetry of interdependence in the relationships. To strengthen their relationships, firms need to consider time-to-market as the main value to improve their position in the market. This value provides several advantages for firms. Dündar and Öztürk (2020) noted that early delivery of a product creates customer satisfaction and customer loyalty. Carvalho et al. (2022) argued that early delivery reflects the level of flexibility that firms must use to deliver their products on time, such as fast delivery and a high level of flexibility. Yang (2023) argues that in the new business environment, as the industry becomes more sophisticated, early delivery becomes more important in competitive markets to maximize the market share. However, the time required to design products is one of the most important factors in the life cycle of innovative products (Zhao and Ghasvari, 2021). Therefore, Karim et al. (2010) noted that early delivery is related to the rapid growth of technological innovation, as the life cycle of new products is much shorter than before, which reduces the cost of these products and creates value for both the customer and company. Afonso et al. (2008) assert that early product introduction improves profitability by extending the sales life of the product and providing development and manufacturing cost advantages. Al-Shboul (2017) noted that time-to-market value, as a competitive advantage, improves supply chain agility and infrastructure that firms need to improve firm performance. Pascucci et al. (2023) argue that digital investment in industrial firms is increasing in order to reduce time to market and introduce products faster than competitors. This can be done through agile manufacturing and supply chain management, promote operational efficiency, and advance data exploitation.

Early product delivery is highly related to the new fashion in the global manufacturing environment, as diverse product mixes, minimum cycle time requirements, complex planning and control, product quality, and manufacturing flexibility are the main features of this environment. These factors are considered the main competitive factors in today's manufacturing environment. Faris and Maan (2020) and Maseer et al. (2022) noted that traditionally, most companies pay more attention to the quality and cost of products; however, many industrial companies have worked to change the balance of competition by adopting time-value strategies and have been able to improve their time to market through new product management systems and practices. Many success stories have demonstrated how companies use time-to-market strategies to achieve their goals. One such story is that of Motorola, which used a time-to-market strategy that focused on customer needs and the global financial supply chain; the result was that the time to market was reduced by 46% (Blackman et al., 2013). Knudsen et al. (2023) find that the firms that use time as a value to develop new products achieve a radical and significant reduction in product cycle times, as they have faster cycle times (about 27%) than the rest of the firms. This is because they focus more on entering new markets on time to increase market share, reduce risk in the long term, and strive for growth.

2.3. Time to market and management accounting

In management accounting literature, time as a value is one of the factors used to calculate costs and cost reduction (Hadi and Farhod, 2018), purchase on time for production purposes, and reduce time in the supply chain (ALobaidi and ALghabban, 2022). Time is an important factor in all stages of the value chain, as it is involved in various processes with the main objective of reducing the time taken. Companies can reduce their time to market by redesigning products and by redesigning products and processes, eliminating waste, and eliminating non-value-added activities (Bhuiyan, 2011). In addition, companies can reduce the time spent delivering products or services, reworking products, and unnecessary movement of materials and assemblies. Reducing non-value-added time seems to go hand-in-hand with improving the quality. As quality improves, the need for rework decreases and the time needed to produce a good product decreases. Elyazid (2016) asserts that the overall goal of an organization is to increase customer responsiveness by reducing product life cycles, and managers must be able to respond quickly to changing market conditions. The information they need to do this must be available through the management accounting system, because the link between cost and time is part of the management accounting system. Market access or time to market is an important concept in management for several reasons. First, information failures are prevalent in the market, leading to high transaction costs associated with product searches and transportation (Hélène et al., 2016). Second, DO et al. (2020) state that market-oriented firms should effectively use management accounting information to create superior value for customers and greater competitive advantage. For example, Keel et al. (2017) find that the use of time-driven activity-based costing as a management accounting technique has an impact on the cost structure in a new manufacturing environment. Third, Hlatshwayo et al. (2022) argue that the textile industry is small and that only a few producers face a high level of competition from foreign products. Therefore, they require information, especially management accounting information, to help them reach the market in a timely manner. Finally, Magingxa et al. (2009) noted that the main objective of smallholder producers is to find a profitable outlet for surplus products and improve their access to product markets. Management accounting information can facilitate market access in a timely manner.

3. Research method

In this study, the lost sales model developed by Prasad (1997) has been used. This model has been widely used in previous studies (e.g., Prasad, 1998; Rycroft, 2006; Belay et al., 2011; Nohýnková, 2022). This model focuses on the benefits of early product introduction such as increased market share, price, and cost advantages which are important for realizing profits from successful products that are introduced early. This study employed this model measure the opportunity cost of late entry to the market which is measured by the percentage of sales or revenue loss. Fig.1 shows the methodology of this study.

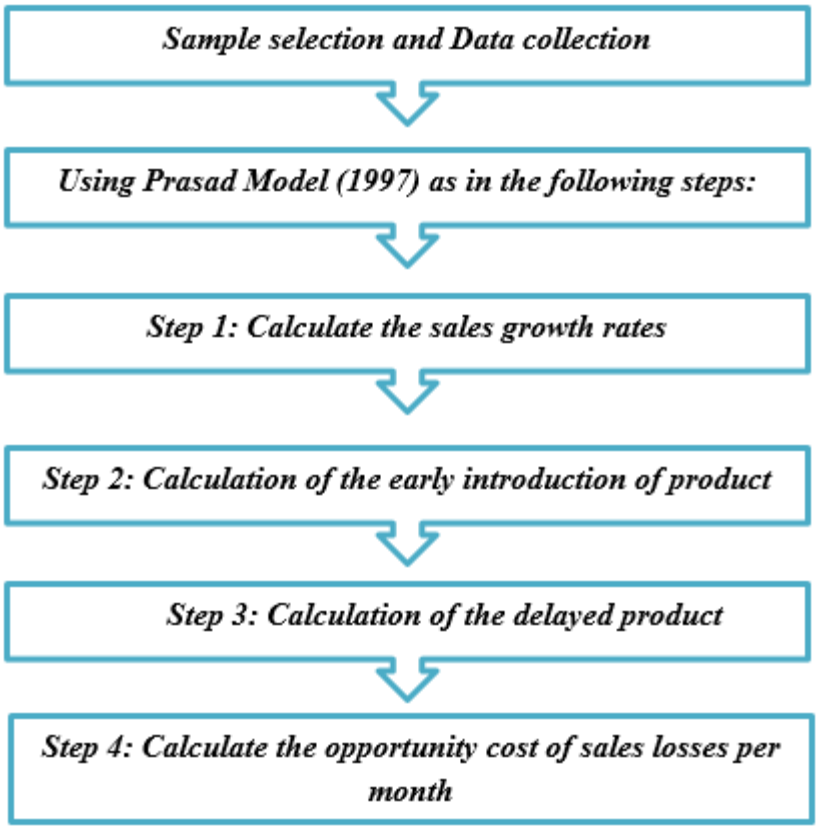

Figure 1. Steps of measuring the opportunity cost of sales losses

3.1. Sample selection

The sample of this study comprised of an important product during 2018-2022, which is cotton clothing produced by all 4 Textile companies (hereafter, the industrial companies) in Iraq for the years 2018-2022. These companies were established in 1970s and 1980s and produce a wide range of products. The companies operate with a high level of competition, which leads to a dramatic reduction in their products. For example, in 2019, one company produced about 59 types of products, including dresses, socks, shirts, briefs, and cotton clothing. The actual production is no more than 14% of the annual capacity of the company, which indicates that the cost of products has increased and there are real difficulties in selling the products. Through the data that obtained from the industrial companies, the study identified three major challenges facing this company. The first challenge is the cost of products which is high due to low production volume, high depreciation of fixed assets and high cost of raw materials which are not available locally and have to be imported from outside. Second, although there are new technologies to design and produce the products of clothing, the Iraqi industrial companies still use old product designs which open the door for the competitors to increase their market share and attract more customers. Third, the time access to the market is a problem for the companies. According to the records of the companies, it was very difficult to introduce the products on time due to several factors such as long product life cycle, a large number of power failures, and a large number of holidays. However, this study focuses on the last challenge which is time to market.

3.2. Data

This study uses secondary data of a cotton clothing product which were collected from the industrial companies. The data of production units of the product, the monthly sales and the market time, the data of monthly market window and time lag were obtained

from the records of the industry companies for the period of 5 years. Table no.1 shows the nature of data and the size of data for a period of the study.

Table 1. The Type of secondary data of the study.

Type of data	Nature of data	Size of data
production	Volume of production	Data per year (5 years)
Sales	Value in US Dollar	Data per Month (5 years*12 month=60 months)
Market time	Days	Data per Month
Market window	Days	30 days
Market lag	Days	Data per days

Moreover, Table no. 2 shows the production of the companies from to 2018-2022.

Table2. The Production of the c companies during period 2018-2022.

		2018		2019		2020		2021		2022	
	Unit M	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Cotton clothing-the companies	1000	1576580	81.0%	1171890	62.0%	741848	55.10%	631396	54.1%	272456	43.0%
Competitors			19.0%		38.0%		44.9%		45.9%		57.0%
Total		1948700	100.00%	1890145	100.00%	1230262	100.00%	1167754	100.00%	632651	100.00%

Fig. 2 shows the market share of cotton clothing products for this period.

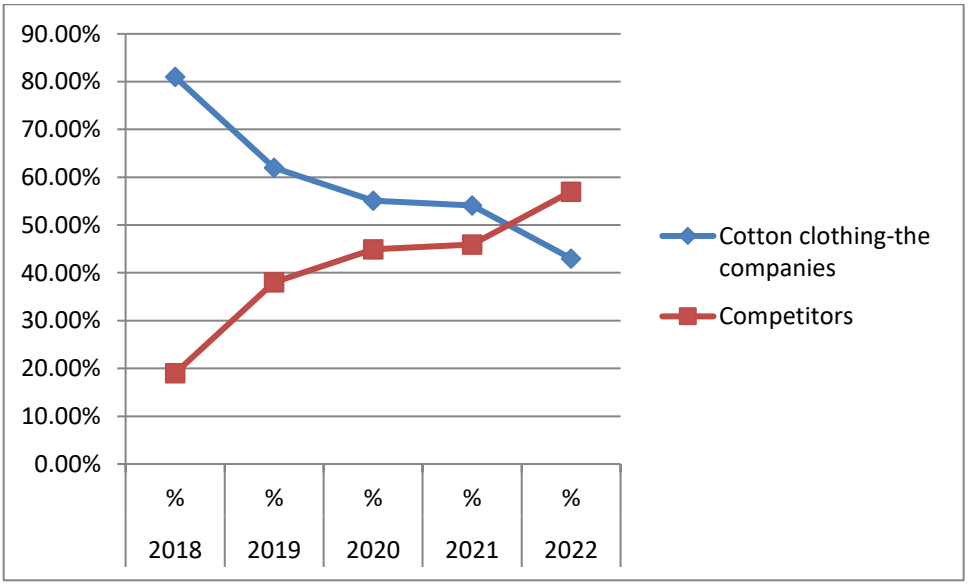

Figure 2 The production of cotton clothing products for the period

Table 2 and Fig. 2 show that the production of this product decreased over the study period. In 2018, it accounted for 81% of the total production, but by 2022, it is decreased dramatically to 43%. In 2020, 2021 and 2022, the sales price decreased by 11.5% compared to 2018 and 2019, but the companies lost about 50% of its market share, which shows that the competition between the companies and other competitors is not based on the sales price, but on other factors that should be considered by managers to make the right decision about this product. In addition, Figure 2 shows the market share of the companies and other competitors, which shows that the market share of the company is dramatically decreasing, while the market share of the competitors is dramatically increasing.

Table 2 and Fig. 2 provide a clear picture of the challenges the companies face in production management, market management, and difficulties in sustaining and surviving in the market.

3.3. Variables

Table 3 lists the variables, their measurements, and their codes.

Table 3. The Variables and measurements.

Variable	Code	Measurement	References
Sales or revenue on time (early introduction)	R_{early}	Percentage of early introduction of products	Prasad [19]
Sales or revenue delayed (late introduction)	$R_{delayed}$	Percentage of early introduction of products	
Loss from sales delayed	R_{loss}	Differences between R early and R delayed	
Sales growth rate	A	(Total sales in current month- total sales in last month)/ total sales in last month	
Market time	T_w	Number of days to introduce the sales to the market on time	
Market delayed	T_d	Number of days of late introduction	

3.4. Model specification

According to the early introduction model, the total revenue for early launch, the total revenue delay, and the revenue growth should be calculated based on the following equations:

$$R_{early} = \frac{(2T_w) * (\alpha T_w)}{2} \quad 1$$

$$R_{delayed} = \frac{(2T_w - T_d) * (\alpha T_w - \alpha T_d)}{2} \quad 2$$

$$R_{loss} = \frac{(R_{early}) * (R_{delayed})}{(R_{early})} \quad 3$$

However, according to Prasad (1997), equation (4) can be used to calculate the revenue loss:

$$R_{loss} = \frac{(3T_w - T_d) * T_d}{2\,(T_w)2} \quad 4$$

For example, if the R loss for one month is 20%, it means that a one-month delay in the market is a 20% loss in total revenue.

4. Results

The following steps are required to calculate the opportunity cost of delaying the introduction of a product.

4.1. Step 1: Calculate the sales growth rates

Initially, the study calculated sales growth rates from to 2018-2022. This is an important step for the model, as it is a factor in calculating revenue loss or sales loss. Table 4 shows the sales growth rates.

Table 4. The Sales growth rates (SGR) 2018-2022

Month	1	2	3	4	5	6	7	8	9	10	11	12
SGR 2018	0.17	-0.36	0.31	0.13	0.14	-0.74	2.36	-0.84	0.82	1.31	-0.15	0.92
SGR 2019	-0.012	-0.07	-0.2	0.02	-0.28	-0.54	1.43	-0.07	-0.19	-0.79	-0.33	0.18
SGR 2020	-0.004	-0.023	-0.067	0.007	-0.093	-0.18	0.48	-0.023	-0.063	-0.26	-0.11	0.06
SGR 2021	5.00	-0.94	-0.012	0.072	-0.079	-0.66	1.84	-0.48	-0.031	-0.17	-0.18	0.81
SGR 2022	-0.096	-0.60	0.92	0.12	-0.078	-0.66	1.96	0.012	-0.52	-0.32	0.22	0.48

Fig. 3 shows the monthly sales growth rates (monthly wise) for the study period.

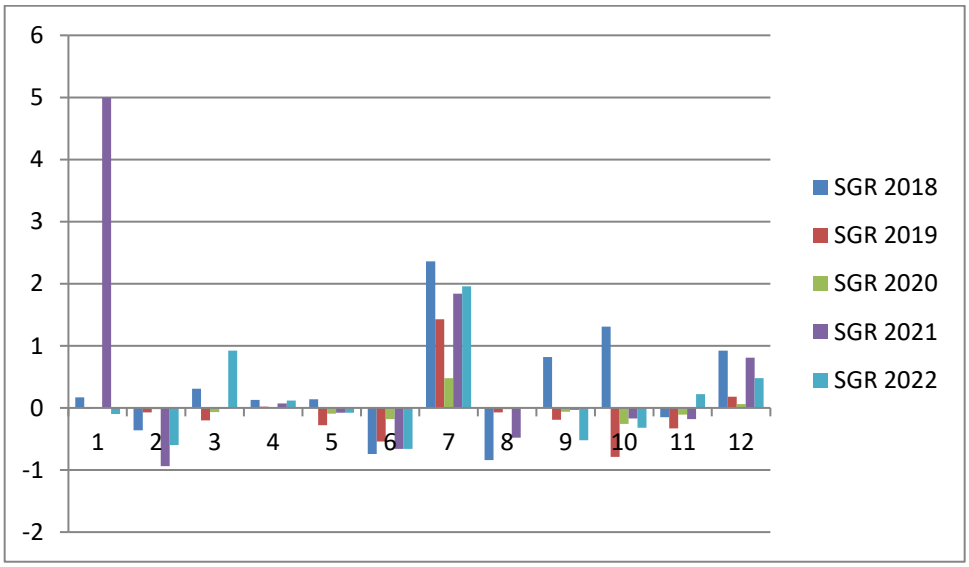

Figure 3 The sales growth rates of 2018-2022

The results in Table 4 and Fig. 3 show that the sales growth rate fluctuates. For example, in 2018, the rates were negative in February, June, August, and November, while the rates were positive in other months. The highest rate was recorded in July, while the lowest rate was recorded in August. However, the pattern of sales growth rates in 2019, 2020, 2021, and 2022 is different, which indicates that serious decisions about the companies market share and competitive position with other competitors were ignored by managers. It indicates that the managers have decided to continue to produce this product. During this period, competition was high, the cost of production was high, and some production lines were not working for a long time leading to instability in the sales rate. The results in Table 4 and Figure 3 show that the companies have difficulty in achieving stable sales at a high level, which leads to a reduction in its market share and profits. The curves of the sales growth rate show a slow growth in the beginning and rapidly increase and decrease its growth until it reaches the peak, which is consistent with the model of Prasad (1997) and the analysis of Belay et al (2011).

4.2. Step 2: Calculation of the early introduction of product

The next step was to calculate the percentage of early product introductions. The data that is used in this calculation is the market window which is 30 days and market time. The results are the percentage of sales on time which will be used in Equation 3. Table 5 shows the calculation of the percentage of early product introduction using Equation 1.

Table 5. Percentage of early introduction of products (equation 1).

Month	Monthly market window (days)	Percentage of sales on time				
		2018	2019	2020	2021	2022
1	30	153	-10.8	-3.6	4500	-86.4
2	30	-324	-63	-23	-846	-540
3	30	279	-180	-67	-10.8	828
4	30	117	18	-6	64.8	108
5	30	126	-252	-84	-71.1	-70.2
6	30	-666	-486	-151	-594	-594
7	30	2124	1287	429	1656	1764
8	30	-756	-63	-21	-432	10.8
9	30	738	-171	-57	-27.9	-468
10	30	1179	-711	-237	-153	-288
11	30	-135	-297	-99	-162	198
12	30	828	162	49	729	432

According to the results in Table 5 and Equation 1, the companies fixed the monthly production schedule to 30 days. However, the percentage of on-time sales is negative in February and June of the five years because the sales growth rate is negative in these months, indicating a decline in the companies performance. On the other hand, this percentage is positive in April and July of the four years, indicating that these two months show good companies performance. However, because the sales growth rates fluctuate dramatically, the companies market share is unstable throughout the year, resulting in a potential loss of revenue.

4.3. Step 3: Calculation of the delayed product introduction

Delayed product introduction was calculated as the data was collected from the sales and marketing departments. The range of delayed sales is between 1-12 days due to some internal and external conditions that the industrial companies could not control. Table 6 shows the delayed product introduction over 12 months during the study period.

Table 6. Percentage of delayed introduction of products (equation 2).

	Delayed Sales Late in: (days)					Percentage of delayed sales				
Month	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
1	5	2	6	6	6	116.875	-8.352	-2.784	3240	-62.208
2	5	5	10	6	5	-247.5	-46.2	-15.4	-620.4	-412.5
3	4	4	12	5	6	225.68	-134.4	-44.8	-8.25	596.16
4	5	3	6	4	5	89.375	13.68	4.56	52.416	82.5
5	3	4	8	5	6	107.73	-188.16	-62.84	-54.3125	-50.544
6	2	6	10	6	4	-600.88	-349.92	-116.64	-427.68	-480.48
7	6	5	9	8	6	1529.28	943.8	354.6	1052.48	1270.08
8	8	8	8	7	8	-480.48	-43.68	-14.19	-292.56	6.864
9	4	4	6	5	8	596.96	-127.68	-41.56	-21.31	-297.44
10	3	2	3	4	6	1008.045	-549.84	-188.28	-123.76	-207.36
11	3	1	2	5	5	-115.425	-233.64	-71.88	-123.75	151.25
12	2	2	2	5	3	747.04	125.28	49.76	556.875	369.36

The results in Table 6 show that the range of the percentage of delayed sales in 2018 is between -600.88 and 1529.28, 2019 is between -549.84 and 943.8, in 2020 is between -188.28 and 354.6 in 2021 is between -620.4 and 3240, and in 2022 is between -480.48 and 1270.08. These results can be used to calculate the impact of delays in launching a product,

indicating a reduction in the companies market share. In general, the satiation of the product is undesirable, and these companies are unable to find a solution for the issue of delayed in time since 2018.

4.4. Step 4: Calculate the opportunity cost of sales losses per month

After calculating the on-time and delayed sales, the last step is to calculate the opportunity cost of lost sales per month if the company introduces the product late. Table 7 shows the results for the opportunity cost of lost sales per month.

Table 7. Percentage of sales loses (equations 3 or 4).

Month		Revenue Loss (opportunity cost)				Explanation for 2018 only*
	2018	2019	2020	2021	2022	
1	0.236	0.226	0.215	0.28	0.28	In the first month, market delay of 5 days means 23.6 percent loss in total revenue for that month.
2	0.236	0.266	0.293	0.266	0.236	In the second month, market delay of 5 days means 23.6 percent loss in total revenue for that month.
3	0.19	0.253	0.32	0.236	0.28	In the third month, market delay of 4 days means 19 percent loss in total revenue for that month.
4	0.236	0.24	0.28	0.191	0.236	In the fourth month, market delay of 5 days means 23.6 percent loss in total revenue for that month.
5	0.145	0.253	0.26	0.236	0.28	In the fifth month, market delay of 3 days means 14.5 percent loss in total revenue for that month.
6	0.0978	0.28	0.296	0.28	0.191	In the sixth month, market delay of 2 days means 9.78 percent loss in total revenue for that month.
7	0.28	0.266	0.291	0.364	0.28	In the seventh month, market delay of 6 days means 28 percent loss in total revenue for that month.
8	0.364	0.307	0.357	0.323	0.364	In the eighth month, market delay of 8 days means 36.4 percent loss in total revenue for that month.
9	0.19	0.253	0.26	0.236	0.364	In the ninth month, market delay of 4 days means 19 percent loss in total revenue for that month.
10	0.145	0.227	0.187	0.191	0.28	In the tenth month, market delay of 3 days means 14.5 percent loss in total revenue for that month.
11	0.145	0.213	0.179	0.236	0.236	In the eleventh month, market delay of 3 days means 14.5 percent loss in total revenue for that month.
12	0.0978	0.227	0.187	0.236	0.145	In the twelfth month, market delay of 2 days means 9.78 percent loss in total revenue for that month.
Average	0.197	0.251	0.20	0.256	0.264	

- The explanation is for 2018 only as an example.

Table 7 shows that the revenue loss in 2018 ranged from 0.0978 in June and December to 0.364 in August. However, the market was very sensitive and the company experienced losses throughout the period of study. The opportunity cost of revenue loss increases from 0.197 in 2018 to 0.264 in 2022, because the companies did not make appropriate decisions regarding the manufacturing and selling of this product. The results indicate that these companies have accumulated losses in terms of opportunity cost during the period of the study as it is noted that this cost is increased in 2022 for some months in comparison to the same period in 2018, but the management did not take any decision to stop such losses to reduce the accumulated revenue losses.

5. Discussion

The results of this study effectively address the key research questions. The results show

the opportunity cost of the firm's decision to continue manufacturing and selling this product despite the reduction in production during the study period. The opportunity cost increased because of the wrong decisions made by the company's managers. The results show that the managers did not examine the effect of the late introduction of this product in the market on the decrease of the company's market share. The industrial companies were unable to use its energy efficiently to compete with other competitors and grow its market share.

This issue is being discussed in detail with management. First, although the companies reduced the price of the product during the year, this had no impact on increasing the market share of the product. Second, no other recommendations were made to improve the company's competitive position with respect to this product because managers did not examine other factors that influence the decision-making processes related to this product. At that time, the managers did not examine the impact of the time-to-market factor to answer the main question of decreasing the market share of the product. Managers focused on selling price as the main factor in their decision to increase sales, ignoring other factors such as time to market. Third, the retail stores that agreed with the companies did not carry other brands of the same products. As a result, customers did not visit these stores for long periods of time to see if the product was available, and the companies lost a significant number of customers. Fourth, since the products are in high demand, it would not be difficult for customers to switch to a newer competing product. In this regard, customers will not find it difficult to start the whole process again by switching to other brands. Fifth, the industrial company did not have a plan to use idle energy and achieve its goals to return to the market and compensate for the losses for the past years. Unfortunately, being a public company which depends on governmental grants will not help it to achieve its goals. This result is in line with Prasad (1997). For commodity-like products such as consumer goods, customers value only the features they find useful in the products; they do not care how a product manufacturer gets there. In reality, if the product being manufactured does not meet the needs of the market or the customer, demand and profits will decrease. As margins shrink, the window of opportunity for a company to make a profitable transformation is narrowing. In addition, suppliers and other partners are feeling the squeeze as their customers begin to cut costs and reduce time to market. For such products, if a firm is not the first to market, it can only enter the market by setting a relatively low entry price. These results are consistent with those of Belay et al. (2011), who find that firms that enter the market earlier can achieve higher sales, while firms that enter the market later face a greater penalty. If firms extend their product introduction period, they will lose their market share and their sales will decrease significantly. These findings are in line with those of Nohýnková (2022), as firms that continuously lose market share expose their market share to decrease, giving competitors the opportunity to enter the market, and time to market becomes a crucial factor in determining profits and survival. The results are consistent with those of Du et al. (2023) who find that the delay in delivery of the product has a negative effect on the customer's willingness to buy the product and pay its value and this is exactly the case for this Iraqi textile companies.

From a practical point of view, the results of this study serve as a guideline for managers of these companies to avoid such wrong decisions by considering the time-to-market factor. Understanding this factor is crucial for designing effective strategic decisions that enhance firm performance and competitiveness of the company. For example, managers should critically examine the situation of the market and establish strategic marketing research channels that can be used to study the competitors, their products, the cost structure of these products and competitive advantages. This will help them to take sound strategic decisions to improve the firm’s performance, profitability, reduce the revenue losses and competitiveness of the company. The results have implications for

investors as they can use the insights from the study to make informed decisions, assess the possibility of investments and new technology that are needed in such companies. It is very important for investors who are considering investing in such companies to examine the potential costs and benefits of such investments. However, the results of this study can help them make informed decisions about their investments. Finally, the results of this study can help policy makers make informed decisions about this company and other companies that face the same challenges. Nowadays, the Iraqi government has to find a solution to the stuttering industrial companies on how to improve their performance and avoid the closure of these companies.

This study has several implications for the managers of the industrial company. First, this study draws the attention of the managers of these companies to the amount of sales or revenue loss achieved every month during the period 2018-2022, which will help them avoid such situations in the coming years. Managers should decide to use idle energy and introduce products faster to maintain the company's market share and reduce the level of competition. One of the negative consequences of this decision is that the revenue loss has increased from 0.197 in 2018 to 0.264 in 2022. In addition, the company's market share against its competitors was 81:19 in 2018, which is reduced to 43:57 in 2022, which indicates that the company has lost its competitiveness and profitability and increased operating losses; finally, it refers to the inability to continue its operations in the future. Second, the results of this study provide appropriate insights into revenue loss to implement the improvements needed to learn how to introduce products over time. This study provides suitable insight for managers about the idle energy and how they should attract investments they need to improve the system of introducing products on time and convert the idle energy into cash and income flows. Managers should identify and discuss possible investment alternatives, such as using new technology or raising new funds from local or international investors to sustain and survive the company. Third, Hashai and Markovich (2017) argue that innovation is an important internal factor that helps firms to enter and sustain in the market and then compete with other competitors. The results of our study will help managers decide whether to focus on the innovation process to develop new products. Such innovative products should be developed over time, because the length of development affects the performance of the company in terms of profitability and market share.

6. Conclusions

The aim of this study is to measure the opportunity cost of late access to the market. This opportunity cost is measured by the percentage of sales or revenue loss from to 2018-2022 of an Iraqi textile companies. This opportunity cost gives more attention to an important factor in the decision process regarding market access, which is time to market. The study gives attention to the idle energy in terms of time to market which puts the industrial company out of competition with the other competitors. The results show that high sales are achieved when firms enter the market on time and earlier than their competitors. However, if the company extends its product introduction period, it will lose its market share and its sales will decrease significantly. The results show that the largest sales loss or opportunity cost occurred in August (36.4%) each year when the product introduction period was delayed by eight days and the opportunity cost of delayed product introduction increases over the study period. These results affect the competitive situation of the companies as they lost their market share and a big part of their profit. When a company loses a significant portion of its profits, it becomes difficult to replace these profits and the company will be at a competitive disadvantage because it will be unable to continue production, distribute profits, compete, or consider offering alternative products. It will also take a very long time for the company to improve its competitive advantage and achieve the profit then profitability.

This study presents several contributions to the time-to-market practice. First, the main contribution of this study is to analyse a real case of one Iraqi textile company that faced significant challenges to sustain and survive in the market. This difficult situation for the company is because the managers did not study the idle energy in terms of time-to-market factors as a main factor in their plan to introduce the product to the market. They preferred to move slowly to the market, but competitors moved faster, and the company lost a significant market share of this product. Second, this study is an application of the Prasad Model (1997) to present actual results that can serve as a guideline to calculate the opportunity cost of late access to the market. Third, this study highlights the issue of time-to-market to mitigate the consequences of a high level of competition among companies. Fourth, the results of the study show the impact of the incorrect decision made by managers to use the idle energy and to continue manufacturing and selling the product without considering the time-to-market factor as a major factor in their decision model.

The study recommends that companies can use this study as guideline to calculate the opportunity cost of revenue sales and the results can be used to support their strategic decisions regarding market share and profitability.

The results should be interpreted with caution because of potential limitations and related issues that require further research. First, this study focuses on one factor that affects market share and revenue: the time to market. There are other internal and external factors such as cost, quality, type of competition and price, but this study does not address these factors. Future studies should focus on developing the relationship between these factors and investigating their effects on the company's market share and sales. Second, the results of this study may not be generalized to other regions because the data are only related to one product, one sector and one country. Future studies can provide data for other products from these companies, other sectors and regions which will make the results comparable. Finally, this study uses Prasad model (1997), which is an old model, but this model is mainly focused on a value of time as a major factor in the decision model of managers in a highly competitive business environment such as Iraq. However, this model is valid as previous studies (Prasad, 1998; Rycroft, 2006; Belay et al., 2011; Nohýnková, 2022) used it until new model will be developed. Future studies can investigate this issue to discuss new models theoretically and empirically.

Authors' contributions

Dunya Jalil Jaafar ALMusawi: Conception and design, supervision, methodology, intellectual content, analysis and interpretation data, original draft preparation.

Hiba Mohammed Saeed: Conception and Reviewing and prepare the final manuscript.

Conflicts of interest: The authors have no conflicts of interest to declare.

Source of Funding Statements: Not Applicable

Acknowledgments: Not Applicable

References

1. Abidalreda, N. Y., and Jawad, S.A. (2019). Using Some of Quality Techniques in Supply Chain Management to Improve the Production Processes. *International Journal of Supply Chain Management*, 8(4), 772-787. https://doi.org/10.59160/ijscm.v8i4.3491.
2. Afonso, P., Nunes, M., nio Paisana, A., and Braga, A. (2008). The influence of time-to-market and target costing in the new product development success. *International Journal of Production Economics*, 115, 559–568. doi:10.1016/j.ijpe.2008.07.003

3. Ahmadi, T., Hesaraki, A.F., Mahmoodi, A. and Marandi A. (2025). Managing customer waiting times in an inventory system using Conditional Value-at-Risk measure. *Annals of Operations Research* **344**, 1–45 (2025). https://doi.org/10.1007/s10479-024-06221-z

4. Alexopoulou, S., Balios, D., and Kounadeas, T. (2024). Essential Factors When Designing a Cost Accounting System in Greek Manufacturing Entities. *Journal of Risk and Financial Management*,17(8):366. https://doi.org/10.3390/jrfm17080366

5. Aljanabi, A. K., and Nouri, M.A. (2020). Responsible Accounting and Its Role in Achieving Competitive Advantage. *International Journal of Innovation, Creativity and Change*, 10(11), 577-611. https://dhsjournal.id/index.php/SBAMR/article/download/24/12/#:~:text=Responsibility%20accounting%20is%20identified%20as,levels%20of%20the%20organizational%20structure.

6. ALobaidi, S.H.D.J., and ALghabban, T.H.S.M. (2022). The Effect of Applying The Six-Sigma Approach On The Costs Of Activities of The General Company For Textile and Leather Industries. *Journal of Positive School Psychology*, 6(5), 3971-3990. https://journalppw.com/index.php/jpsp/article/view/6961

7. Al-Shboul, M. A. (2017). Infrastructure framework and manufacturing supply chain agility: the role of delivery dependability and time to market. *Supply Chain Management: An International Journal,* 22 (2), 172-185, https:// doi.org/10.1108/SCM-09-2016-0335

8. Avdullahi, A., and Fejza, V. (2015). The Role of Competitive Strategies on Developing a Strong Competitive Advantages. *Research Journal of Economics, Business and ICT* ,10(2), 1-5. https://ojs.journals.cz/index.php/RJEBI/article/view/710

9. Belay, A.M., Kekäle, T., and Helo, P. (2011). Time-to-market and concurrent engineering in product development processes. *International Journal of Innovation and Learning*, 10(1), 60-84. Time-to-market and concurrent engineering in product development processes

10. Bhuiyan, N. (2011). A framework for successful new product development. *Journal of Industrial Engineering and Management*, 4(4), 746-770, https://doi.org/10.3926/jiem.334

11. Blackman, I.D., Holland, C.H.P., and Westcott, T. (2013). Motorola's global financial supply chain strategy. *Supply Chain Management: An International Journal*, 18(2), 132–147. DOI 10.1108/13598541311318782.

12. Bylykbashi, S., Roehrich, G., and Assala, K. (2021). How to Measure Competitive Intensity? *European Journal of Economics, Law and Social Sciences,* 5(1), 22-42. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://brest-bs.com/wp-content/uploads/2022/01/BYLYKBASHI.S_How-to-measure-competition-intensity-EJELS.pdf

13. Carvalho, H., Naghshineh, B., Govindan, K., and Cruz-Machado, V. (2022). The resilience of on-time delivery to capacity and material shortages: An empirical investigation in the automotive supply chain. *Computers and Industrial Engineering*,171, 108375. https://doi.org/10.1016/j.cie.2022.108375

14. Correia, R.J., Dias, J.G., and Teixeira, M.S. (2021). Dynamic capabilities and competitive advantages as mediator variables between market orientation and business performance. *Journal of Strategy and Management*, 14(2), 187-206. https://doi.org/10.1108/JSMA-12-2019-0223

15. Deherab, M.S., and Yaquoop, F.A. (2020). Management accounting techniques in product development and achievement customer requirements by adopting the technique of Quality Function Deployment Applied Research in Baghdad Company for Soft Drinks. *Journal of Accounting and Financial Studies,* 15(51), 36-58. https://repository.uobaghdad.edu.iq/articles/jpgiafs-908

16. Do, T.H., Le, H.M., Luong, D.T.T., and Tran, Q.T. (2020). Relationship between the Management Accounting Information Usage, Market Orientation and Performance: Evidence from Vietnamese Tourism Firms. *Journal of Asian Finance, Economics and Business* 7(10), 707–716 doi:10.13106/jafeb.2020.vol7.no10.707

17. Dominguez, R., and Cannella, S. (2020). Insights on multi-agent systems applications for supply chain management. *Sustainability*, 12 (5), Article No. 1935, doi: 10.3390/su12051935.

18. Du, Z., Fan, Z-P. and Chen, Z. (2023). Implications of on-time delivery service with compensation for an online food delivery platform and a restaurant. *International Journal of Production Economics*, 262, 108896https://doi.org/10.1016/j.ijpe.2023.108896

19. Dündar, A.O., and Öztürk, R. (2020). The Effect of On-Time Delivery On Customer Satisfaction And Loyalty In Channel Integration. *Business and Management Studies: An International Journal*, 8(3), 2675-2693, doi: http://dx.doi.org/10.15295/bmij.v8i3.1520

20. Elyazid, S. (2016). Performance Measurement: Quality, Cost, and Time Is New System: So Called Strategic Cost Management .*Research Journal of Finance and Accounting*, 7(17), 1-11. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://core.ac.uk/download/pdf/234631808.pdf

21. Faris, H.M., and Maan, H.Y. (2020). Evaluation of Green Supply Chain Management Practices Under Uncertainty Environment: Case Study in The Company for Batteries Industry. 3rd International Conference on Sustainable Engineering Techniques (ICSET 2020. IOP Conf. Series: Materials Science and Engineering IOP Conf. Series: Materials Science and Engineering. IOP Publishing doi:10.1088/1757-899X/881/1/012085. http://dx.doi.org/10.1080/00207540802642245

22. Gallino, S., Karacaoglu, N., and Moreno, A. (2022). Need for Speed: The Impact of In- Process Delays on Customer Behavior in Online Retail. *Operations Research*, 71(3), 876-894. https://doi.org/10.1287/opre.2022.2262

23. Guzik, A. (2023). Overview of new product development strategies and models. *Catallaxy*, 8(1), 21–34. https://doi.org/10.24136/cxy.2023.002.

24. Hadi, R., and Farhod, S.F. (2018). The role of TD-ABC approach in decreasing of cost per unit Applied study in the General Company of Hydraulic Industries \ Plastic Factory. *Journal of Accounting and Financial Studies*,13(45), 96-107. https://doi.org/10.34093/jafs.v13i45.316

25. Haghpour, B., Sahabeh, E., and Halvari, H. (2022). Opportunity cost in consumer behavior: Definitions, operationalizations, and ambiguities. *International Journal of Consumer Studies*, 46, 1942–1959. DOI: 10.1111/ijcs.12842

26. Hamali, S., Nurfanka, A.G.R., Firdausi, A.M., and Setiawati, M.S. (2020). Evaluation of the delayed fiber optical installation project on pre-sales division at PT XYZ. IOP Conf. Series: Earth and Environmental Science IOP Conf. Series: Earth and Environmental Science 452 (2020) 012081 IOP Publishing IOP Publishing doi:10.1088/1755-1315/452/1/012081 doi:10.1088/1755-1315/452/1/012081 1 1

27. Hashai, N. and Markovich, S. (2017). Market Entry by High Technology Startups: The Effect of Competition Level and Startup Innovativeness. Strategy Science, 2(3):141-160. https://doi.org/10.1287/ stsc.2017.0033

28. Hélène, D.B., Norontsoa, A., Helgina, S., Chiara, C., Noro, R., and Bezaka, R. (2016). Improving access to market information: a driver of change in marketing strategies for small producers? Paper prepared for presentation at the 149th EAAE Seminar 'Structural change in agri-food chains: new relations between farm sector, food industry and retail sector' Rennes, France, October 27-28. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://agritrop.cirad.fr/584174/1/David-Benz%20et%20al%20_Improving%20access%20to%20market%20information_EAAE%2016%2009%202016.pdf

29. Hendricksn, K., and Singhal, V.R. (2008). The Effect of Product Introduction Delays on Operating Performance. Management Science, 54(5), 878-892. DOI: 10.1287/mnsc.1070.0805

30. Hilmersson, M., Schweizer, R., and Chetty, S. (2022). The Relationship Between Timing, Speed, and Performance in Foreign Market Network Entry. *Management International Review,* 62,325–349 https://doi.org/10.1007/s11575-022-00470-5

31. Hlatshwayo, S.I., Ojo, T.O., Modi, A.T., Mabhaudhi, T., Slotow, R., and Ngidi M.S.C. (2022). The Determinants of Market Participation and Its Effect on Food Security of the Rural Smallholder Farmers in Limpopo and Mpumalanga Provinces, South Africa. *Agriculture*, 12(7), 1072. https://doi.org/10.3390/agriculture12071072

32. Islam, T., Meade, N., and Sood, A. (2022). Timing Market Entry: The Mediation Effect of Market Potential. *Journal of International Marketing*, 30(1), 40-54. DOI: 10.1177/1069031X211068072

33. Ji, X. and Abdoli, S. (2023). Challenges and Opportunities in Product Life Cycle Management in the Context of Industry 4.0. *Procedia* CIRP, 119, 29–34. https://doi.org/10.1016/j.procir.2023.04.002

34. Johanson, J., and Johanson, M. (2021). Speed and synchronization in foreign market network entry: A note on the revisited Uppsala model. *Journal of International Business Studies*, 52: 1628–1645 https://doi.org/10.1057/s41267-021-00407-4

35. Kanagal, N.B. (2015). Innovation and product innovation in marketing strategy. *Journal of Management and Marketing Research*,18, 1-25. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.aabri.com/manuscripts/152209.pdf

36. Karim, M.A., Samaranayake, P., Smith, A.J.R., and Halgamuge, S.K. (2010). An on-time delivery improvement model for manufacturing organisations. *International Journal of Production Research*, 48(8), 2373-2394. https://doi.org/10.1080/00207540802642245

37. Keel, G., Savage, C., Rafiq, M., and Mazzocato, P. (2017). Time-driven activity-based costing in health care: A systematic review of the literature. *Health Policy,* 121(7), 755–763. doi:10.1016/j.healthpol.2017.04.013

38. Khudhur, T.S., and Ali, H.S. (2019). Role of Project Managers Skills in Supply Chain Management of Small Project's Marketing. *International Journal of Supply Chain Management*, 8(1), 488-502. https://www.researchgate.net/publication/332448230_Role_of_Project_Managers_Skills_in_Supply_Chain_Management_of_Small_Project's_Marketing

39. Knudsen, M.P. von Zedtwitz, M. Griffin, A and Barczak, G. (2023). Best practices in new product development and innovation: Results from PDMA's 2021 global survey. *Journal of Product Innovation Management*, 40:257–275. DOI: 10.1111/jpim.12663

40. Lameijer, B. A., Boer, H., Antony, J., and Does, R. J. M. M. (2021). Continuous improvement implementation models: a reconciliation and holistic metamodel. *Production Planning & Control*, *34*(11), 1062–1081. https://doi.org/10.1080/09537287.2021.1974114

41. Magingxa, L.L., Zerihun, G.A., and D van Schalkwyk, H. (2009). Factors influencing access to produce markets for smallholder irrigators in South Africa. *Development Southern Africa*, 26(1), 47-58, DOI: 10.1080/03768350802640081

42. Martel, J. (2018). Quality, price, and time-on-market. *Economics Letters,* 171, 97-101. https://doi.org/10.1016/j.econlet.2018.07.025

43. Maseer, R.W., Zghair, N.G., and Flayyih, H.H. Relationship Between Cost Reduction and Reevaluating Customers' Desires: The Mediating Role of Sustainable Development. *International Journal of Economics and Finance Studies* 2022; 14 (04), 330-344. doi:10.34111/ijefs. 20220116

44. Moher, A., Batsakis, G., and Stone, Z. (2018). Explaining the effect of rapid internationalization on horizontal foreign divestment in the retail sector: An extended Penrosean perspective. *Journal of International Business Studies*, 49, 779–808. https://doi.org/10.1057/s41267-017-0138-0

45. Nohýnková, B. (2022). Calculation of the Lost Profit in Business Damage Cases. *European Financial and Accounting Journal*; 1, 25-44. https://doi.org/10.18267/j.efaj.266

46. Pascucci, F., Savelli, E. and Gistri, G. (2023). How digital technologies reshape marketing: evidence from a qualitative investigation. *Italian Journal of Marketing*, 1, 27-58, https://doi.org/10.1007/s43039-023-00063-6

47. Persson, E., and Tinghög, G. (2020). Opportunity cost neglect in public policy. *Journal of Economic Behavior and Organization*, 170, 301-312. https://doi.org/10.1016/j.jebo.2019.12.012

48. Prasad, B. (1997). Analysis of pricing strategies for new product introduction. *Pricing Strategy and Practice* 1997; 5(4), 132-141. https://doi.org/10.1108/09684909710184626

49. Prasad, B. (1998) A method for measuring total value towards designing. *The TQM Magazine*, 10(4), 258-275. https://doi.org/10.1108/09544789810222621

50. Puente, C.A.S.C., Gamarra, J.P.L.W., and Flores, R.M.V. (2023). Application of the Abc Methodology to Reduce the Delay of Sales Orders in A Company Warehouse in Barranca City. Proceedings of the 4th South American

Conference on Industrial Engineering and Operations Management Conference, Lima, Peru, May 9-11, 2023 © IEOM Society International. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://cris.ulima.edu.pe/files/43762608/Proceeding_Peru_77.pdf

51. Ravula, P. (2023). Impact of delivery performance on online review ratings: the role of temporal distance of ratings. *Journal of Marketing Analytics* 2023; 11,149–159 https://doi.org/10.1057/s41270-022-00168-5

52. Rycroft, R.W. (2006). Time and technological innovation: implications for public policy, *Technology in Society*, 28(30),281–301. https://doi.org/10.1016/j.techsoc.2006.06.001

53. Salmen, A. (2021). New Product Launch Success: A Literature Review. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 69(1), 151–176. https://doi.org/10.11118/actaun.2021.008

54. Shannak, R.O., and AL-Masri, A. (2012). The Relationship between TTM (Time To Market) Tool and Evaluating the Performance of Products' Launching Process: A Case Study of Orange Jordan. *European Scientific Journal*, 8 (17), 114-135. https://www.researchgate.net/publication/257922749_The_Relationship_between_TTM_Time_To_Market_Tool_and_Evaluating_the_Performance_of_Products'_Launching_Process_A_Case_Study_of_Orange_Jordan

55. Shi, Z., Li, Y., and Lu, C. A study on optimization of delayed production mode of iron and steel enterprises based on data mining. *PLoS ONE*, 18(1), e0278750. https://doi.org/10.1371/ journal.pone.0278750

56. Suherly, H., Affif, F., Arief, H., and Guterres, A.D. (2016). Marketing Performance as the Impact of Marketing Mix Strategy (7P) with Determination of Market Attraction and Company's Resources: Survey on Performance of Tourism Industry in Timor Leste. *International Journal of Economics, Commerce and Management*, IV (9), 569-587. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ijecm.co.uk/wp-content/uploads/2016/09/4937.pdf

57. Vallejo-Torres, L. (2023). The Broader Opportunity Costs in the Broader Cost-Effectiveness Analysis Framework. *Applied Health Economics and Health Policy* 21:373–384 https://doi.org/10.1007/s40258-023-00801-z

58. Yamin, M., and Kurt, Y. (2018). Revisiting the Uppsala internationalization model: social network theory and overcoming the liability of outsidership. *International Marketing Review*, 35(1), 2–17. https:// doi:10.1108/IMR-11-2014-0345

59. Yang, J. (2023). Research on After-sales Problems in the Express Delivery Industry. F. Cao et al. (eds.) Proceedings of the 2023 5th International Conference on Economic Management and Cultural Industry (ICEMCI 2023 (Advances in Economics, Business and Management Research 276, https://doi.org/10.2991/978-94-6463-368-9_84

60. Zhan, L., Shu, H., Zhou, X., and Lin, X. (2022). A Quality Decision Model Considering the Delay Effects in a Dual-Channel Supply Chain. *Sustainability*, 14(10), 6240. https://doi.org/10.3390/su14106240

61. Zhao, M., and Ghasvari, M. (2021). Product design-time optimization using a hybrid meta-heuristic algorithm. *Computers & Industrial Engineering*, 155, 107177. doi:10.1016/j.cie.2021.107177