The impact of supply chain disruptions caused by the COVID-19 pandemic on inflation and its effect on consumer goods companies – Case Study "The Kraft Heinz Company"

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Thesis to obtain the Master of Science Degreee in

Industrial Engineering and Management

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December 2022

Abstract

Since the outbreak of the Covid-19 pandemic, consumer goods supply chains have been severely disrupted. Lockdowns and other restrictions imposed by governments to combat the virus' spread have resulted in increased demand and supply shortages. Due to a scarcity of some materials, prices have risen dramatically. Furthermore, logistics networks were damaged, resulting in longer delivery lead times, and logistics operational costs escalated drastically due to increases in energy, fuel, and labor prices. The situation has gotten significantly worse since Russia's invasion of Ukraine. Energy and fuel costs have risen, and there is little indication that they will decrease. All these cost increases have had a significant impact on consumer goods companies, which need to pass on some of these increases to the final consumers despite their best efforts to prevent it, or risk losing their profit margins. This paper provides insights into all these concerns in depth, demonstrating how the pandemic has impacted supply chains and how this has resulted in price rises and supply shortages that are affecting consumer goods companies around the world. Furthermore, it demonstrates how all these risks may be turned into opportunities if organizations develop cost-cutting strategies to offset these additional costs and, as a result, are able to provide more competitive prices. Furthermore, a case study is offered that demonstrates how the problem has impacted The Kraft Heinz Company and how the company is addressing it. All the issues discussed are supported by literature. Following that, the methodologies used to reach conclusions are presented, followed by the results reached through the application of the same methodologies. Lastly, a conclusion is reached on the themes studied and concrete answers are provided.

Keywords: Covid-19 pandemic; Supply chains; Supply shortages; Lead times; Cost increases; Consumer goods companies

Resumo

Desde o começo da pandemia da Covid-19, as cadeias de abastecimento de bens de consumo têm sido gravemente perturbadas. Os confinamentos e outras restrições impostas pelos governos para combater a propagação do vírus resultaram no aumento da procura e na redução da oferta, o que levou à escassez de alguns materiais e, consequentemente, ao aumento dos preços. Além disso, as redes de logística foram danificadas, resultando em prazos de entrega mais longos, e os custos operacionais de logística aumentaram drasticamente, devido a aumentos nos preços da energia, do combustível e da mão-de-obra. A invasão da Ucrânia pela Rússia agravou ainda mais a situação. Os preços da energia e dos combustíveis dispararam e não há previsão para que diminuam nos proximos tempos. Todos estes aumentos de custos tiveram um impacto significativo nas empresas de bens de consumo, que têm de passar alguns destes aumentos para os consumidores finais, apesar dos seus esforços para o evitar, ou arriscam-se a perder as suas margens de lucro. Este documento fornece uma visão aprofundada de todas estas preocupações, demonstrando como a pandemia teve impacto nas cadeias de abastecimento e como isto resultou em aumentos de preços e escassez de abastecimento, que estão a afectar as empresas de bens de consumo em todo o mundo. Além disso, demonstra como todos estes riscos podem ser transformados em oportunidades se as organizações desenvolverem estratégias de redução de custos para compensar estes custos adicionais e, como resultado, forem capazes de ter preços mais competitivos. Além disso, é apresentado um caso de estudo que demonstra como o problema teve impacto na The Kraft Heinz Company, e como a empresa está a lidar com esta situação. Todas as questões discutidas são apoiadas por literatura. Em seguida, são apresentadas as metodologias utilizadas para chegar às conclusões, seguidas pelos resultados alcançados com a aplicação das metodologias. Por fim, é feita uma conclusão sobre os temas estudados e são fornecidas respostas concretas.

Palavras-chave: Pandemia da Covid-19; Cadeias de abastecimento; Prazos de entrega; Aumento dos custos; Empresas de bens de consumo

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Acronyms

CEO – Chief Executive Officer

CPI – Consumer Price Index

CPO – Chief Procurement Officer

PPI – Producer Price Index

PPV – Purchase Price Variance

SKU – Stock Keeping Unit

UK – United Kingdom

US – United States

Chapter 1

1. Introduction

Consumer goods markets have been undergoing significant changes since the start of the Covid-19 pandemic. Government-imposed restrictions, along with an already-existing shift in consumer behaviour, resulted in shortages of specific materials, disrupting consumer goods companies' supply chains. As a result, the prices of these components skyrocketed to previously unimaginable heights. Factory closures in China in early 2020, as well as lockdowns in several other nations, labour shortages, strong demand for tradable commodities, logistics network disruptions, and capacity limits, have also resulted in significant increases in freight costs and delivery times (Wang & Kamali, 2021). With the relaxation of Covid-19 restrictions in 2021, additional supply chain issues arose because of the massive increase in demand, which caused prices to skyrocket. Companies try to predict raw material inflation and mitigate the impact of this inflation on profits. They can potentially turn the negative impact of inflation into a positive one by seizing opportunities to achieve a competitive advantage that allows them to grow their market share by lowering their pricing. As a result, the high inflation brought on by these disruptions can be a major opportunity for those organizations prepared to take advantage of it. Due to a scarcity of critical ingredients and packaging materials, food and beverage companies are suffering this effect in large quantities. Additionally, global logistical networks were severely impacted. The lack of people in distribution centres throughout the world, along with a continuing driver shortage and a few unique occurrences, caused damage on global logistics networks and spiked logistics operational expenses. Due to the pandemic's disruption of the network, international container costs are continuing to grow. It is hurting haulage throughout Europe, resulting in higher costs and decreased availability. As a result, both raw materials and final items are under tremendous cost pressure (Swiftpak, 2021). Russia’s invasion of Ukraine has aggravated the situation further, particularly with the escalation of energy and fuel prices.

It is critical to understand how supply chain disruptions induced by the pandemic, and later the war in Ukraine, are affecting supply performance and, as a result, prices, not only for consumer goods companies, but also for governments and other public organizations all around the world. The unpredictability of lockdowns and other Covid-19 restrictions, as well as the development of the war in Ukraine could cause more disruptions beyond 2022. As a result, it's essential to learn from past mistakes in order to predict and avoid future consequences, especially given the risk of inflation continuing high for longer than expected. These events have had a major impact on The Kraft Heinz Company, one of the world's leading food and beverage companies. As a result, the company is an ideal case study for this research.

This study’s objective is to demonstrate how these disruptions effect inflation, how inflation affects consumer products companies, and what these companies can do to turn this threat into an opportunity.

Lockdowns and other restrictions to prevent the spread of the pandemic have caused disruptions in the supply chains of thousands of consumer goods since the first half of 2020. The effects of the various disruptions have varied. The most significant of these, and the most relevant to this research, is higher inflation on a variety of items. Price rises across the supply chain are having a significant impact on consumer goods companies. As the cost of raw materials, packaging materials, labour, energy, and logistics rises, these businesses find it harder and harder to keep their prices competitive without drastically reducing their profit margins. Companies, such as The Kraft Heinz Company, must come up with cost-cutting efforts to offset these additional expenditures to stay competitive. To achieve these savings and maintain competitive prices, strong partnerships with suppliers are critical. Kraft Heinz will be used as an example in this study to demonstrate how companies have been affected by these problems and how they are dealing with them. This study will offer concise responses to such crucial queries as:

1. What are the primary causes of the present inflation and supply crisis?
2. Which sectors were most impacted by the crisis?
3. How can we breakdown the impact of inflation on a portfolio and understand what are the main cost drivers?
4. What opportunities resulted from the present inflation crisis and how might opportunities emerge from crises like this?
5. How can companies that manufacture consumer goods prepare themselves given the direction the world is taking?

Three methodologies will be used to assess the impact of supply chain disruptions on inflation, and thus on The Kraft Heinz Company, as well as what the company can do to mitigate this impact. To begin, a practical analysis will be conducted to demonstrate how businesses evaluate and comprehend the impact of inflation on their costs, using an ABC methodology. Furthermore, an example of a strategy to mitigate this impact, supported by a sensitivity analysis, will be given an analysed. Secondly, two interviews with Kraft Heinz employees who are directly involved with these issues will be done. These interviews will provide a thorough understanding of the problem, its impact on the business, and what the company is doing to tackle it. Finally, a SWOT analysis will be performed to determine the company's competitive position in the current circumstances. This form of analysis will reveal the company's current state and assist in determining what types of initiatives can be implemented.

This study will have five chapters. This introduction is Chapter 1. In Chapter 2, the problem analysed in this document will be defined and then applied to the case study. Chapter 3 will have the literature used in this research. Chapter 4 will present the methodologies used to assess the problem and provide answers. Lastly, Chapter 5 will describe the results achieve through the application of the methodologies applied in the previous chapter. The study will end with a conclusion, which will present the answers reached in the study.

Chapter 2

2. Problem definition

This chapter describes the problem addressed in this study as well as the company which will serve as case study. Firstly, Section 2.1 dip dives into the supply chain disruptions generated by restrictions to prevent the spread of COVID-19. Secondly, Section 2.2 shows the effects of the disruptions described in Section 2.1 on consumer goods companies. Lastly, Section 2.3 presents the Case Study of The Kraft Heinz Company.

2.1. Supply chain disruptions caused by the COVID-19 pandemic

Lockdowns and other restrictions were implemented by governments all around the world to prevent the spread of COVID-19. These measures had a big impact across diverse sectors.

One of the most serious issues was a lack of employees in industries, which reduced production, and in airports, seaports, and distribution centres, which disrupted global logistics networks. Furthermore, the closure of restaurants, cafes, and other food and beverage establishments resulted in a significant increase in supermarket product sales, putting pressure on its manufacturing and delivery. Consumers were also drawn to internet shopping because of the first lockdown, which resulted in a surge in demand for particular goods, and consequently shortages. Through all the lockdowns, online shopping became a necessity. In fact, the proportion of retail sales via the internet has nearly doubled to 27.9% in the last years, as seen in Figure 1.

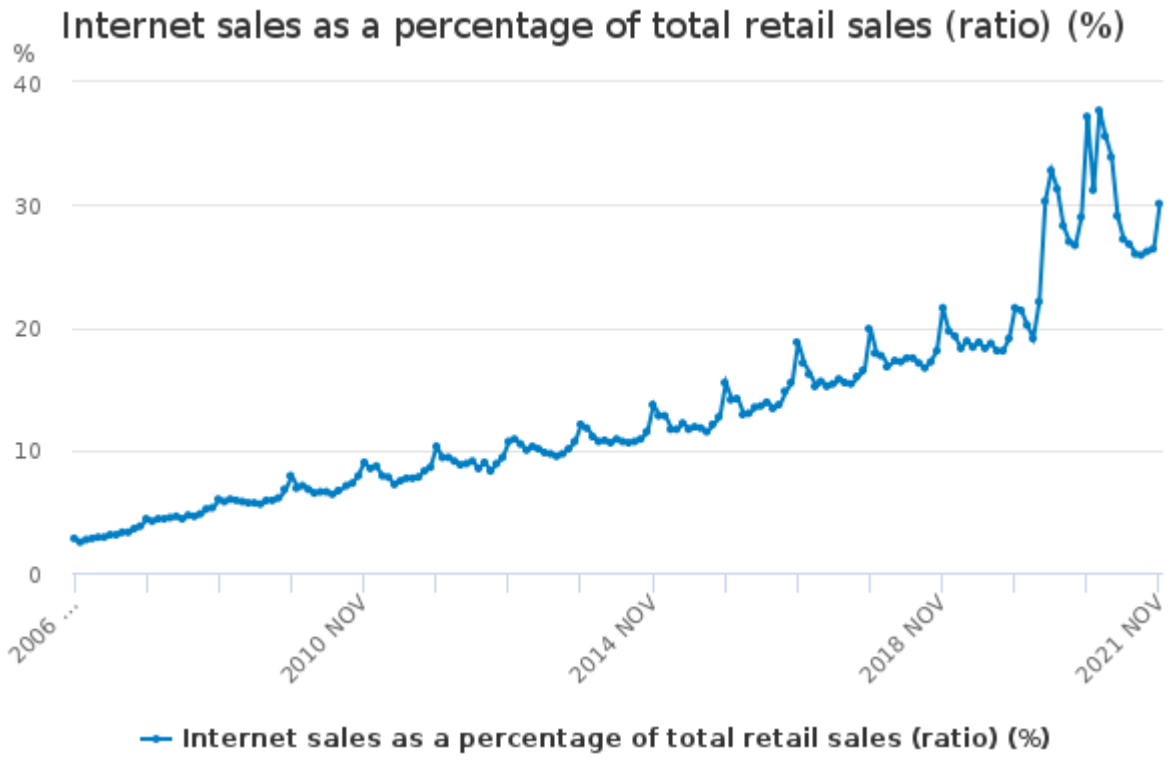


Figure 1. Internet sales as a percentage of total retail sales (ratio) (%)

Source: (Office for National Statistics, 2021)

After the Covid restrictions were lifted in 2021, consumption returned to pre-Covid levels. Due to this rise, as well as the changes in consumer behaviour brought on by the initial lockdown, certain resources were in limited supply. As a result, the cost of these resources has increased, as have their lead times. Paper and foil packaging materials were particularly vulnerable. As a result, consumer companies all over the world had a difficult time not only obtaining these materials, but also obtaining them at a reasonable cost.

Increased consumption necessitated adding more trucks to the fleets of European transportation businesses. This expansion coincided with a persistent driver shortage and rising fuel prices. As a result, to keep their drivers and be profitable, these companies had to raise costs for their consumers.

2.2. The effect on consumer goods companies

The disruptions described in the previous section, highly affected the supply chain of consumer goods companies.

In 2020, there was a big positive impact for certain companies as online retailers and supermarkets, due to the changes in consumer behaviour generated by the lockdown. However, the lack of personnel due to the restrictions, translated into lower production rates, which led to out-of-stock situations for dozens of products.

The establishment of hotels, restaurants, bars, and other venues in 2021 resulted in a large increase in demand for certain products, resulting in a shortage of certain materials. Due to the shortage, the prices of these materials increased, affecting the costs of finished goods and, as a result, the companies that sell them.

As previously said, paper was one of the most affected materials, with paper prices in the UK rising by between 38 and 45 percent by 2021. As a result, the costs of products packaged in this manner were significantly influenced. To remain competitive, consumer goods companies are absorbing some of the effects. However, because the increases are so significant, consumer prices will have to rise as well. As it can be seen from Figure 2, the Producer Price Index (PPI) for corrugated and solid fibre box manufacturing is at an all-time high.

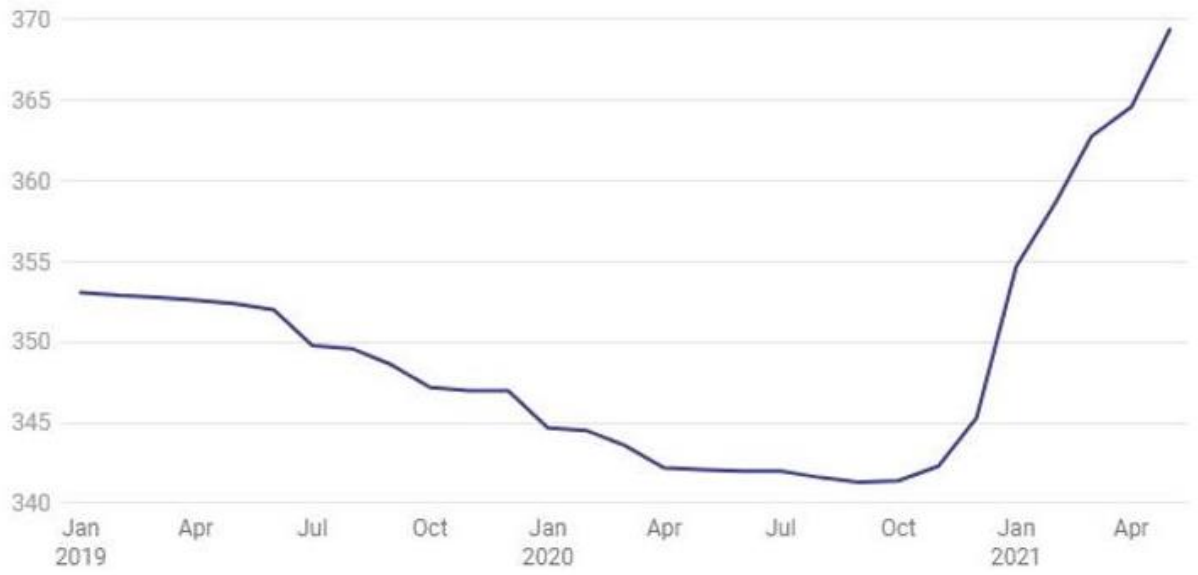


Figure 2. PPI for corrugated and solid box manufacturing

Source: (FRED, 2021)

Edible oils, for example, have become extremely scarce in the food and beverage business. As a result, the costs of these products skyrocketed, resulting in price hikes for all finished goods containing these products. Nearly all consumer-packaged goods companies use edible oils as a primary ingredient in products ranging from Apple Pop Tarts to Abe's Zucchini Bread. Continued high prices for edible oils are expected to require businesses to either pass on the increased costs to customers or accept the reduced profit margins.

Furthermore, the cost of fuel and energy continues to rise. In Europe, this increase, combined with growing truck driver salaries, resulted in higher logistics expenses, which had a significant impact on the final cost of finished goods.

2.3. Case Study – The Kraft Heinz Company

In line with the problem described in the previous section, the case study of the Kraft Heinz Company, where the student placement was performed, is explained in this section.

2.3.1. The Kraft Heinz Company

The Kraft Heinz Company is a multinational food and beverage company based in Chicago. It is now the third largest food and beverage company in North America and the fifth largest in the world, due to the merger of Kraft Foods and Heinz in 2015. Kraft Heinz owns several brands, eight of which are valued more than a billion dollars. Some of these brands are Kraft, Oscar Mayer, Heinz, Philadelphia, Lunchables, Velveeta, Planters, Maxwell House, Capri Sun, Ore-Ida, Kool-Aid, Jell-O, Primal Kitchen, and Classico, among others (Kraft Heinz, 2021).

The company's business is divided into two main zones: North America and International. The latest is then divided into Europe, Middle East and Africa, Asia-Pacific and Latin America. These are further subdivided into smaller zones, each made up of a single country or a small number of countries.

As with most international corporations, Kraft Heinz works with various company divisions such as Marketing, Sales, Operations, People, and Finance. It employs people from all business functions in all the zones.

Procurement is the most important business function to address in this paper. Procurement is responsible for acquiring the goods necessary to support the company's operations. It is possible to classify it as a part of Operations. However, because procurement teams do not exist in every country like some of the other business functions, Kraft Heinz has a distinct structure for this activity. Procurement can be divided into four categories: direct, indirect, logistics, and external manufacturing. Ingredients and Packaging are the two categories of Direct Procurement. These are the most significant Procurement activities for a food and beverage firm like Kraft Heinz, as they are related to the acquisition of the ingredients and packaging required to make the company's goods. Indirect Procurement oversees procuring the remaining items required to carry out the company's operations, such as computers or coffee makers for the offices. Logistics Procurement is responsible for purchasing logistics services coming from external vendors. Logistics Buyers need to obtain Warehousing, Transportation, and Re-packing services since Kraft Heinz does not own most of the warehouses and vehicles needed for its logistics operations. Finally, as the term suggests, External Manufacturing is responsible for purchasing products manufactured by other companies on behalf of Kraft Heinz. When external manufacturers have superior capabilities to produce particular products of the company's portfolio and can do so at a lower cost, this sort of procurement, also known as Co-pack, is used.

We shall focus more on Procurement operations in Western Europe, specifically connected to External Manufacturing, later in this article. Figure 3 depicts the procurement team structure, which begins with

the CEO (Chief Executive Officer) and ends with the zone buyers. To keep things simple, the graphic only displays the structure of the Western Europe External Manufacturing team from top to bottom, with some additions to highlight where additional teams would be positioned. The CPO (Chief Procurement Officer) is the head of procurement and reports directly to the CEO. There are a variety of responsibilities that fall under the scope of the CPO. These responsibilities are divided between Global Procurement and Procurement Operations. We will only discuss the latest in this paper. All the actual operational activities of procuring goods are handled by Procurement Operations. Procurement Operations in the International Zone are overseen by the Head of Procurement International, who supervises the leaders of all international zones. Procurement in EMEA (Europe, Middle East and Africa) is divided into two parts: west and east. The breakdown for West is shown in Figure 1, starting with the Head of Procurement West. The four teams of each Procurement area are listed below this function. We may observe how the External Manufacturing team is structured as an example. It's split into three categories. One is overseen by a Senior Buyer, while the other two are overseen by three-person teams. Buyers are the lowest level in procurement teams. These, however, form the foundation of the entire system and are crucial because they are directly responsible for managing the suppliers.

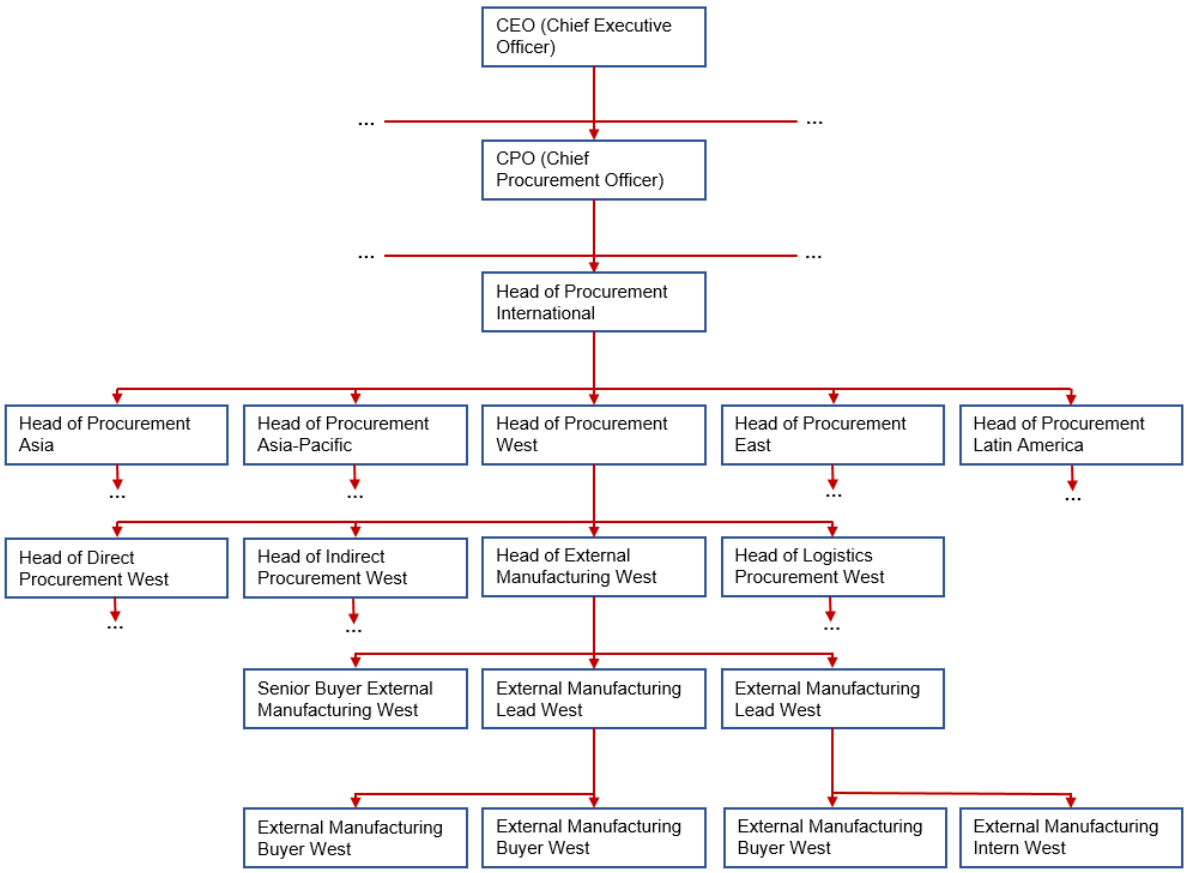


Figure 3. Procurement Structure

The Head of Procurement West went in-depth about the history of the procurement function in a recent interview. He remarked that the role of procurement is relatively recent, having just gained some traction

in the 1960s. Back then, concerns of prices dominated the function. That began to change in the 1990s with the advent of Strategic Sourcing, which essentially includes every aspect of where and when we may acquire a particular item while taking important factors like quality and service level into account. Since then, many organizations have seen procurement as a key function. Additionally, it is now responsible for aligning the company's bottom line for success through innovation and supplier collaboration. The function has been changing quickly over the past three years while also dealing with a major crisis, which is not always apparent in such a young role.

While Kraft Heinz is co-headquartered in Chicago and Pittsburgh, it has offices across the Zones. The Procurement team for Western Europe is based in Amsterdam, Netherlands. The Amsterdam office, known as the NoMa House, represents the European headquarters and is one of the most important and diverse offices around the Globe, counting more than 400 people.

In Europe, Kraft Heinz owns recognized brands as Bull’s Eye, De Ruijter, Brinta, Kwatta, Honig and Karvan Cevitam. Some of the products from these brands are produced by external manufacturers, also called Co-packers.

The External Manufacturing portfolio for Western Europe is divided into three main categories: Taste Elevation, Better Meals and Infant & Medical. The Taste Elevation portfolio includes all suppliers that produce mostly sauces, whereas the Better Meals portfolio includes suppliers that produce mostly products from other categories as Beverages and Brunch, Soups, Taste Elevation includes all suppliers who primarily make sauces, whereas Better Meals includes suppliers who mostly produce items in other categories such as Beverages and Brunch, Soups, Frozen Meals, and Ambient Meals. Finally, the Infant & Medicinal portfolio covers infant and medical food vendors. This is the smallest of the three portfolios, and it is only available in Italy.

Most external manufacturing vendors provide products for both retail and food service. Food service products are sold to businesses in the hospitality industry, such as hotels and restaurants, who then sell them to end customers, whereas retail products are sold to wholesalers such as supermarkets and grocery stores, who then sell them to end consumers. Food service products include servings or packages containing large amounts of food.

The Kraft Heinz Company is separated into different entities, as are most global corporations. "H.J. Heinz Supply Chain Europe B.V.", commonly known as The Supply Chain Hub, is the major entity in Europe. Each country has at least one entity, which can be either Business Units or Factories. H.J. Heinz B.V. for the Netherlands, Heinz Italia S.p.A. for Italy, H.J. Heinz Foods UK Limited for the United Kingdom, and so on. Kraft Heinz has distribution centers all over Europe. Wigan NDC in the United Kingdom, AG Ede in the Netherlands, and Alfaro in Spain are among the most important.

The Supply Chain Hub purchases products from suppliers for the agreed purchase price and sells to the different Business Units for a price called “standard cost”. The Finance department determines the standard cost, which is based on the previous 12 months' actual pricing. When the Supply Chain Hub buys an SKU from a supplier for the first time, the Procurement team transmits the agreed purchase price to the Finance department, which costs the SKU at that price. As a result, the costed price becomes

the year's standard cost. The standard cost for the following year, on the other hand, is based on the previous year's actual price. As a result, if the agreed purchase price for the following year differs from the agreed-upon price, a difference between the agreed purchase price and the standard cost arises. This deviation is called Purchase Price Variance (PPV). If the agreed purchase price is less than the standard cost, the PPV is positive, resulting in cost savings for the organization. The PPV effect is determined by the market in which the SKU is sold. For example, if an SKU is manufactured in the Netherlands and sold in the United Kingdom, it has an impact on the PPV in the United Kingdom.

2.3.2. Case Study

This study will focus on The Kraft Heinz Company. Kraft Heinz, as one of the world's largest food and beverage companies, has been adversely hurt by high inflation and supply performance issues.

Costs of raw materials, packaging materials, energy, and logistics are all rising rapidly. Miguel Patricio, Kraft Heinz's CEO, has told BBC that people will have to get used to higher food prices (Josephs, 2021).

Paper is one of Kraft Heinz's most used types of packaging, and, as previously said, it is also one of the most affected, not only by rising consumption and production shortages, but also by disruptions in logistics networks. More pressure has been placed on the paper industry because of the drop in imports to Europe from the rest of the world, as well as present global shipping issues. Paper allocation from mills has been constrained because of the situation, forcing lead times to be stretched and costs to continue to climb.

Many countries suffered a drop in raw material output, ranging from crops to vegetable oils. Controlling the virus, as well as the resulting illness, constrained output, and delivery. As the economy has recovered, the supply of these products has been unable to keep up with the increased demand, resulting in higher costs. Furthermore, manufacturers have been burdened by rising labor and energy expenses.

In the United States, logistic costs have risen significantly, and there is a labor shortage in certain sectors of the economy. In the UK, the shortage of truck drivers is particularly problematic, which combined with the increased energy and fuel costs is massively increasing logistics costs. This increase is of course impacting the costs of the finished goods to a great extent.

Kraft Heinz is trying to mitigate this impact as much as possible. However, as mentioned before, some of the impact will have to be passed on to the customers and final consumers. Later in this study we will see how Kraft Heinz is addressing the issue and what kind of initiatives can be created to fight it.

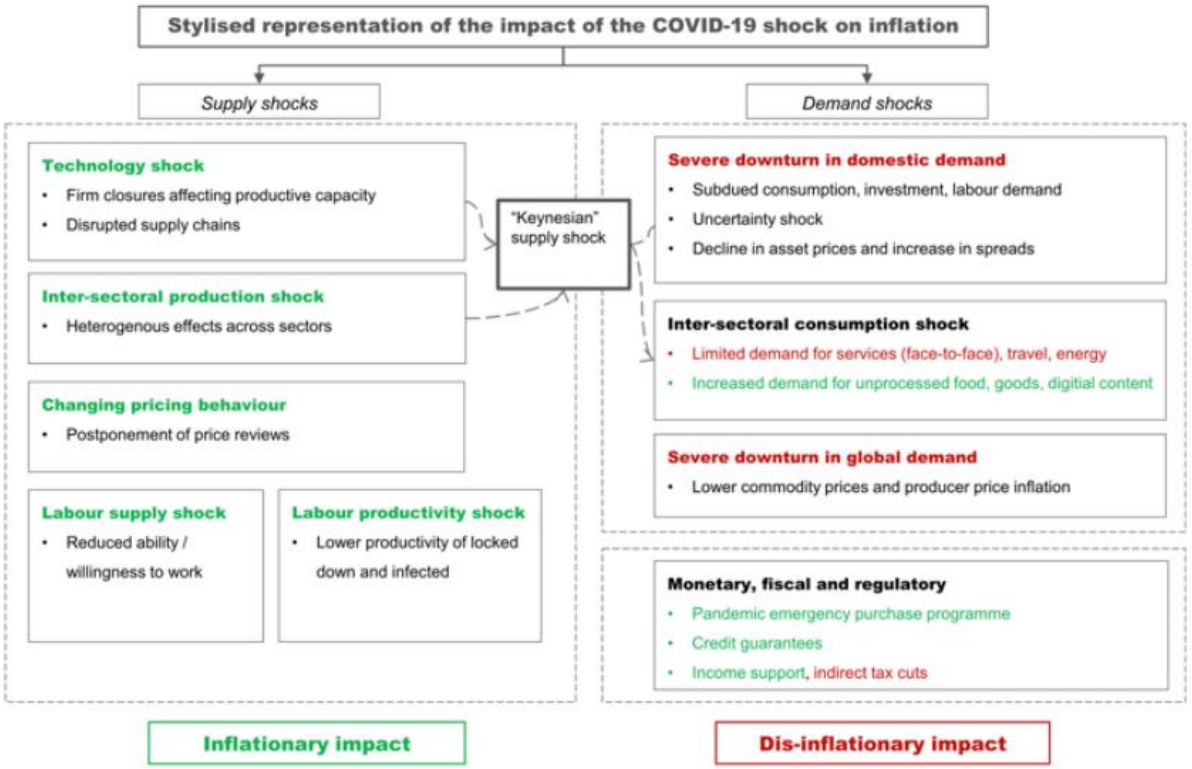
Chapter 3

3. Literature Review

The supply bottlenecks are caused by several factors. Some of these explanations have to do with the pandemic. According to a study from 2021 published by the European Policy Department for Economic, Scientific and Quality of Life Policies, the pandemic-related constraints have shifted private household consumption away from services, which were less available (and less appealing) to consumers during the pandemic, and toward durable consumption goods. As a result, demand for raw materials and intermediates such as wood, metals, chemicals, and semiconductors has risen, and because producers of these items were unable to supply this demand instantly, delivery times have risen significantly. These shortages worsened because many businesses did not expect such a swift recovery in economic activity following the economic downturn at the start of the epidemic, as recoveries from previous economic crises had been slower. For example, many vehicle manufacturers decreased their semiconductor orders at the start of the pandemic in anticipation of having to limit production, and as a result were unable to adjust when demand increased. Finally, due to transportation difficulties, supply was limited. The economic recovery's geographical heterogeneity generated logistical issues in maritime transportation, which were aggravated by other disruptions like the closure of considerable port capacity in China due to COVID-19 outbreaks and the temporary closure of the Suez Canal (Beckmann, Gern, Hauber, Jannsen, & Stolzenburg, 2021).

The COVID-19 pandemic produced a shock that was unlike any other in terms of content and size. The shock has characteristics that are like both a supply and demand shock, according to most economists. A negative supply shock happens when the economy's capacity to create goods and services at a given price falls, whereas a negative demand shock occurs when consumers' willingness or ability to buy goods and services at a given price falls. A study by Blot, Bozou and Creel last year describes how the pandemic led to both a supply and demand shock. Inflation has reacted in diverse ways to the health problem and the various actions taken by governments. A supply shock emerged in the first phase of the crisis because of lockdown measures and subsequent business closures to prevent the spread of the virus, impacting production and supply chains to some extent. Prices and activity varied in opposite directions in this setting, resulting in inflationary pressure. As a result of the lockdown and uncertainty about the pandemic's progression, households reduced their consumption, resulting in a demand shock. Some industries, such as tourism, energy, and services, have been notably hit by the drop in demand, while others, such as unprocessed food, commodities, and digital content, have seen demand rise without supply adjustment, putting inflationary pressure on prices. The different shocks that impacted inflation during the COVID-19 epidemic are summarized in Table 1. (Blot, Bozou, & Creel, 2021).

Table 1. Supply and demand shocks during COVID-19 crisis



Source: (Bobeica, Hartwig, & Nickel, 2021)

2021 studies by PwC UK have shown that the high inflation trends in Advanced Economies measured through the Consumer Price Index (CPI) are mainly driven by extreme price changes of specific components and not across the whole economy. The unpredictability of the lockdowns generated a distortion in demand information within the supply chain due to variances in orders among supply chain participants, also known as the bullwhip effect. This effect combined with the recent global constraints in the logistics networks has led to the recent shortages in certain materials (Kupelian, 2021).

A report by the European Central Bank in 2021 provides a good insight into how the fall of pandemic related restrictions affected prices. As more limitations loosened, economy swiftly reopened and people resumed their travels and visits to restaurants. They started buying more with the money they weren't able to spend during the lockdowns. Businesses found it easier to raise prices without losing customers while the economy was growing. However, not everything moves at the same speed. As companies rebuilt supply systems that were severely harmed by the pandemic, they are found it hard to keep up with fast expanding demand. Transporting goods became more complex and expensive due to challenges such as a shortage of shipping containers. The longer such problems persist, the more likely corporations are to pass these expenses on to their customers in the form of higher pricing. The epidemic has altered the way we live and work, as well as the items we require. Consumers are buying more of certain things, such as electronics and home improvement supplies, than manufacturers had anticipated. Prices rise when businesses can't keep up with the rate at which people desire to acquire items (European Central Bank, 2021).

Although price pressures were expected to moderate and then fall over the next 5 years, in the end of 2021 there were already concerns these could keep increasing. Investors started to believe the disruptions seen in supply chain and the material shortages could be more permanent than initially expected. Price pressures could also be seen in emerging economies. In Figure 4, it is possible to notice these concerns, as for all three regions the probability of inflation greater than 3% increased with time (Global Financial Stability Report, 2021).

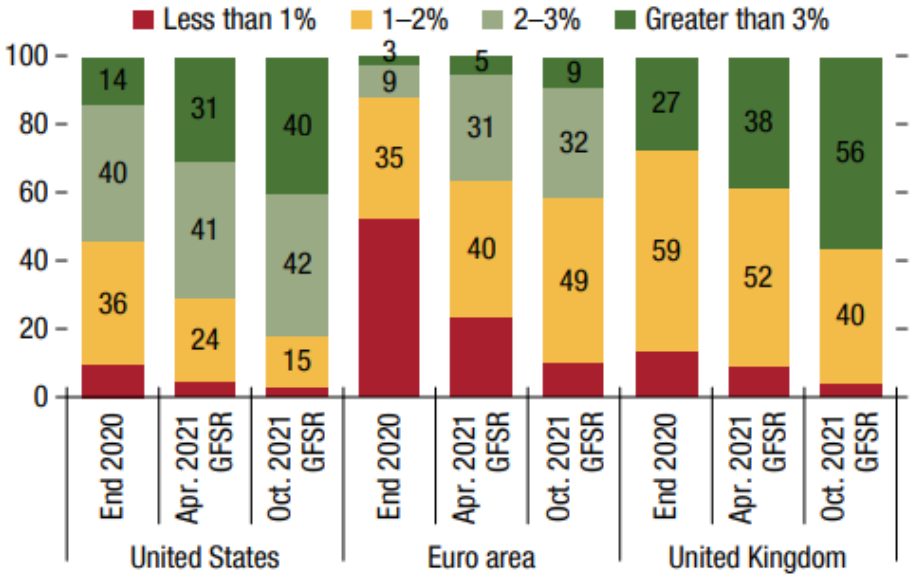


Figure 4. Market-Implied Probability of Inflation Outcomes (Percent, over five years)

Sources: Bloomberg Finance L.P.; Goel and Malik (forthcoming); Goel and others (2021); Haver Analytics; national authorities; and University of Michigan

In 2021, inflation rates increased fast both in Advanced Economies and in emerging market and developing economies with the pandemic, as seen in Figure 5. Furthermore, core inflation, which subtracts the influence of food and energy prices, also increased, but to lower levels than regular inflation (IMF, 2021).

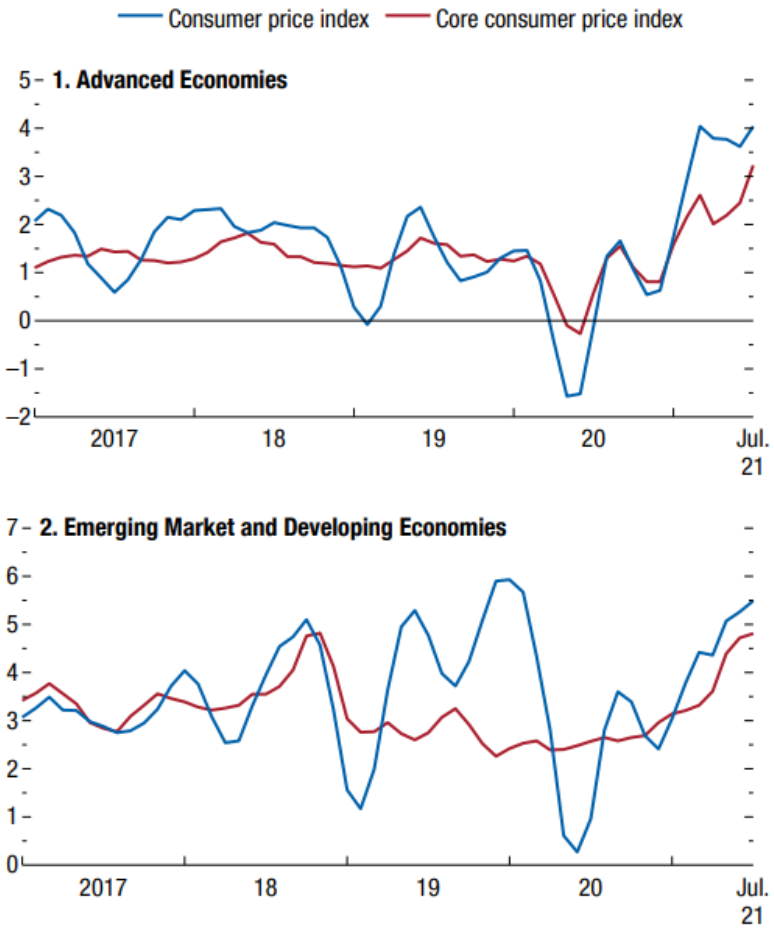


Figure 5. Inflation Trends (Three-month moving average; annualized percent change)

Sources: (Consensus Economics, 2021); (Haver Analytics, 2021)

The Consumer Price Index numbers show how extreme price changes are. The CPI increased 6.2 percent from the previous year in October 2021, the highest rate since December 1990. It grew 0.9 percent monthly, compared to a forecast of 0.6 percent. The core CPI increased by 0.6 percent, compared to a forecast of 0.4 percent. Annual core inflation was 4.6 percent, higher than the 4 percent forecast and the highest level since August 1991 (Cox, 2021).

The increased inflation reflects the latest changes as the supply-demand mismatches caused by the pandemic and other policy-related developments. Examples of these developments are the expiration of the temporary valued-added tax cut in Germany or the in the shelter component of US consumer prices. When the pandemic hit in 2020, businesses cut raw material orders. For this reason, when restrictions started to drop in 2021 a lot of businesses were unable to keep up with the increased demand. Furthermore, the pandemic generated huge disruptions in worldwide logistics networks. Shipping containers routes were disrupted, and lead times increased enormously, aggravated by events such as the closure of the Suez Canal (IMF, 2021).

Since the beginning of 2021, producer prices in the eurozone have risen rapidly. Although the rebound in energy price inflation is a significant contributor to this increase, the quick rise in core producer prices

(excluding energy and construction) suggests that there are other significant variables at play (Figure 6). The key drivers of this considerable increase in euro area core producer prices are supply constraints of raw materials and intermediate products, rising commodity price inflation, and record increases in shipping costs. Pipeline pressures, which put downward pricing pressure on firms' inputs early in the manufacturing and distribution chain, might eventually affect consumer goods costs, but usually with a lag. As a result, underlying supply-side changes in core producer prices are critical for estimating medium-term inflation (Bernoth & Ider, 2021).

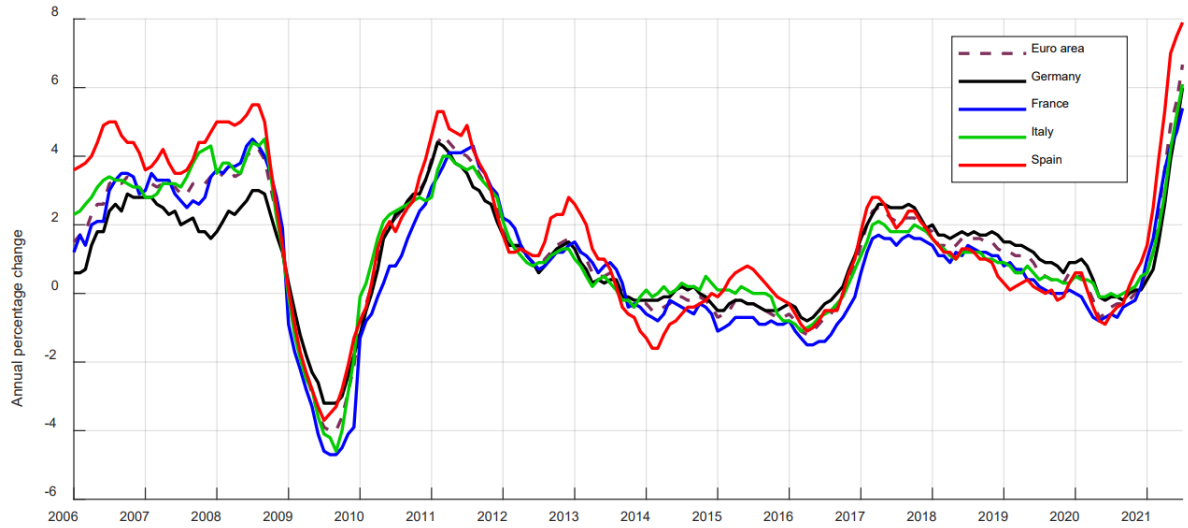


Figure 6. Producer price inflation (excluding construction and energy)

Source: (Eurostat, 2021)

As expected, commodity prices also increased in huge proportions as seen in Figure 7. In 2021, oil prices were expected to increase almost 60% and other commodities almost 30% compared to 2020.

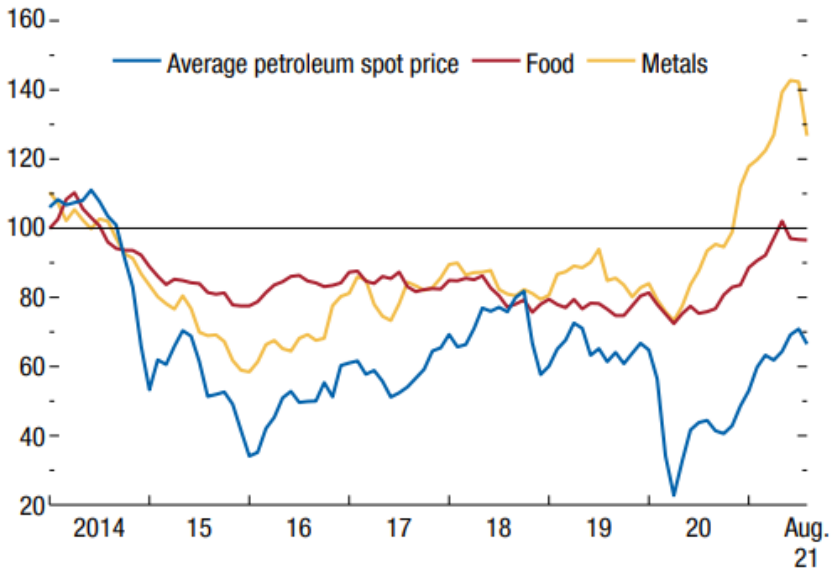


Figure 7. Commodity Prices (Deflated using US consumer price index; 2014 = 100)

Sources: (IMF, 2021)

In the same 2021 study published by European Policy Department for Economic, Scientific and Quality of Life Policies mentioned earlier, concerns were expressed regarding metal prices. Supply restrictions and strong demand, which are partly tied to stimulus programs and investments to hasten the energy transition, were pushing up metal prices, which could lead to ongoing price pressure. For iron and steel, the situation was different than for nonferrous metals. Despite the modest decrease in 2021, pre-crisis pricing levels have been greatly exceeded, and prices remain historically high. Due to the pandemic's negative impact on production, a significant increase in demand was matched by a temporary reduction in supply. Longer term, supply is constrained by the fact that, in recent years, investment in production facilities has been curtailed in the face of low prices, and any growth of capacity will take a long time to materialize. Part of the rise in metals demand is due to government stimulus initiatives aimed at boosting the economy, which are expected to stimulate investment over several years (Beckmann, Gern, Hauber, Jannsen, & Stolzenburg, 2021).

Before Russia's invasion of Ukraine and consequent sanctions imposed by European governments, oil, gas, and electricity had already all increased in price across the globe. Many variables influenced energy prices: less wind in the UK caused windmills to stop spinning, droughts in Brazil caused dams to produce less power, and 2020's harsh winter reduced oil and gas stocks. This, combined with rising demand in 2021, caused prices to skyrocket. Because energy accounts for a big portion of both companies' and people's spending, the price of oil, gas, and electricity has a significant impact on total inflation: rising energy prices accounted for half of the 2021 increase in inflation. Because they are influenced by so many factors, energy costs are known to fluctuate a lot (European Central Bank, 2021).

In terms of the July 2021 price increase numbers, the most significant price rises were seen for electricity, gas, and other fuels, as well as the operation of transport equipment, which had seen a price increase of more than 10% year-over-year and is linked to energy prices as seen in Figure 8 (Blot, Bozou, & Creel, 2021).

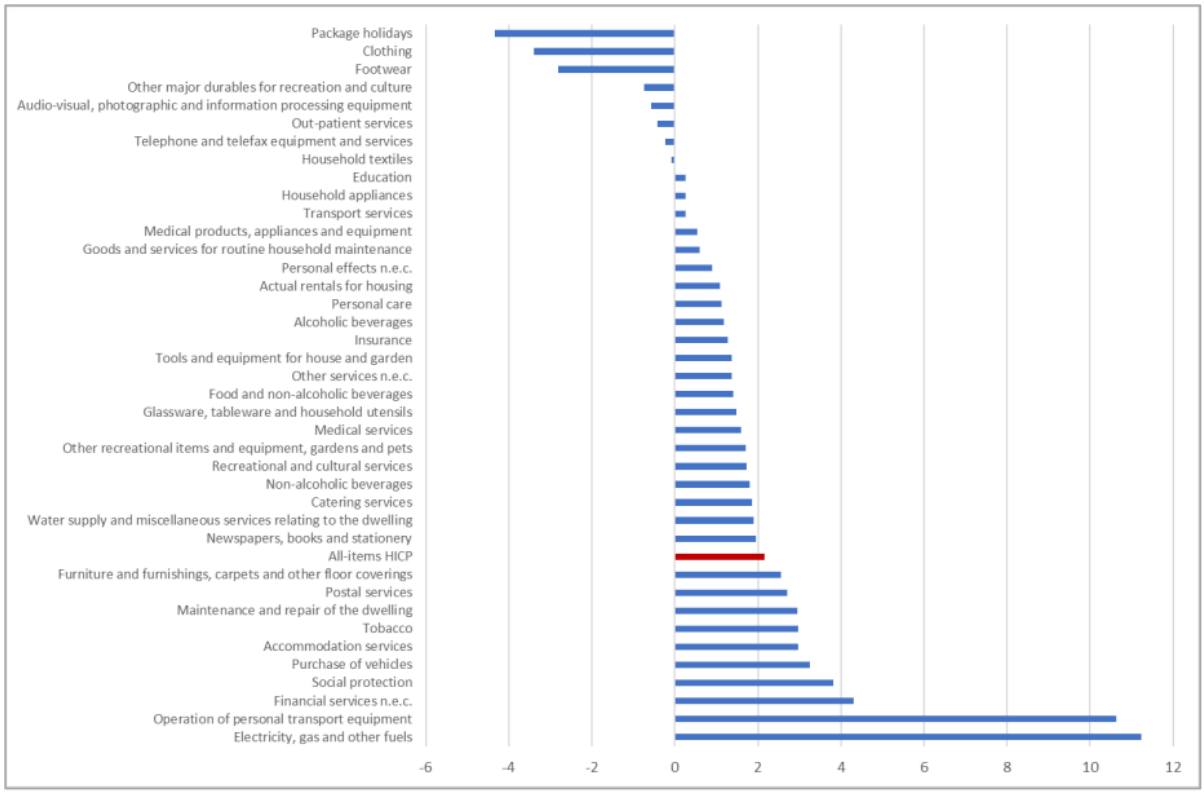


Figure 8. Inflation at a disaggregated level in July 2021 (annualized percent)

Source: (Eurostat, 2021)

In 2021, fuel oil prices rose 12.3% month over month, bringing the year-to-date increase to 59.1 percent, in October 2021. Energy costs increased by 4.8 percent, bringing the same year-to-date increase to 30 percent (Cox, 2021).

Wages also increased across different sectors. One of the biggest increases has been in Transportation and warehousing activities, as seen in Figure 9. These increases have highly impacted logistics costs, which consequently impact consumer goods prices.

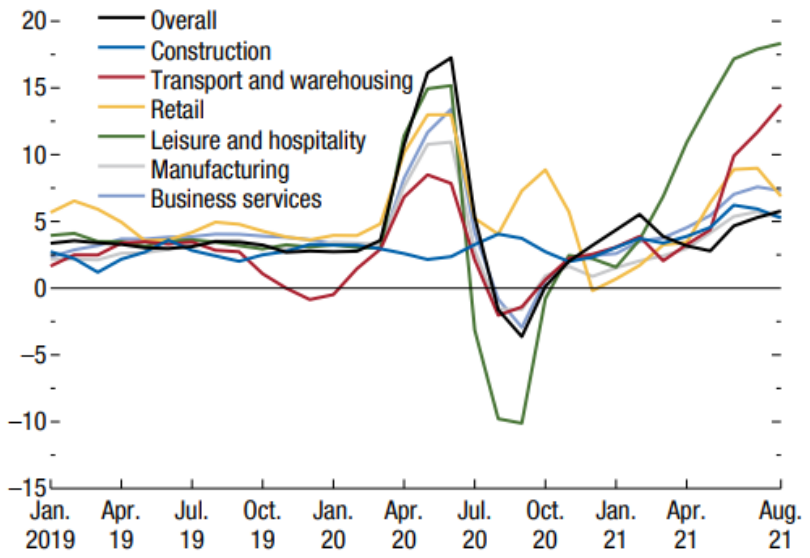


Figure 9. US Average Hourly Earnings: Overall and Selected Sectors (Annualized percent change of three-month moving average)

Sources: (Haver Analytics, 2021)

In 2021, used vehicle costs rose 2.5 percent month over month and 26.4 percent year over year, contributing significantly to the increase. Prices for new vehicles increased by 1.4 percent and 9.8 percent, respectively. Food costs also increased significantly, rising 0.9 percent and 5.3 percent, respectively. Meat, poultry, fish, and eggs gained 1.7 percent month over month and 11.9 percent year over year in the food category (Cox, 2021).

Figure 10 indicates that since late 2020, delivery times for suppliers in the United States and the European Union have reached new highs (the data goes back to 2007). The Purchasing Managers Index business surveys are used to create IHS Markit's suppliers' delivery times index, which represents the level of supply chain delays. Purchasing managers are asked if their suppliers' delivery times are on average slower, faster, or unchanged from the preceding month to calculate the index. Faster delivery times are indicated by readings over 50, no change is shown by readings at 50, and slower delivery times are indicated by readings below 50 as compared to the previous month. The recent steep reduction in the delivery times index can be attributed to increased demand, widespread supply restrictions, or a combination of the two. Suppliers typically have more pricing power at these times, resulting in a price increase.

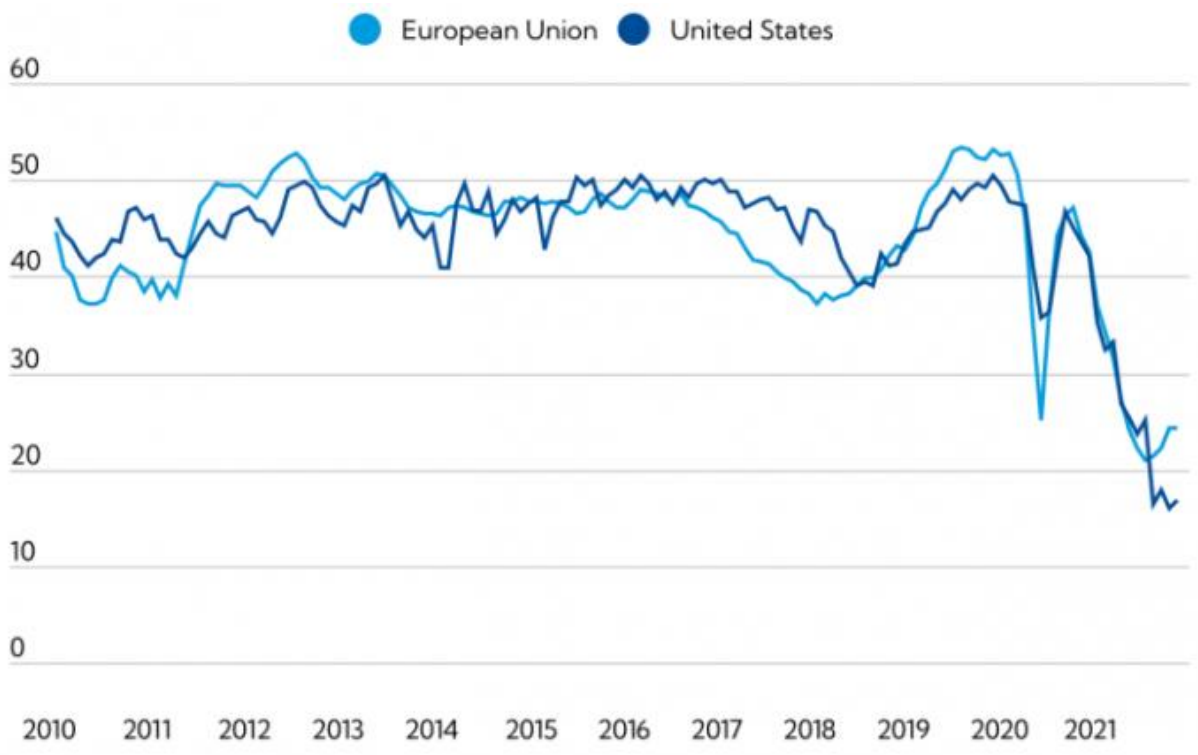


Figure 10. Manufacturing PMI, supplier's delivery times

Source: (IHS Markit, 2021)

Inflation expectations must be closely checked, especially during periods of rising inflation, as is the situation now. Because the expected inflation rate feeds into companies' pay and price decisions, as well as families' consumption and investment decisions, the evolution of inflation expectations and their anchoring are critical for the future development of actual inflation (Bernoth & Ider, 2021).

In advanced and emerging market economies, headline consumer price index (CPI) inflation has risen since the beginning of 2021, owing to firming demand, input shortages, and quickly rising commodity prices, while it has remained relatively stable in low-income countries, as seen in Figure 11. Despite the substantial ambiguity surrounding the measuring of output gaps in the aftermath of the epidemic, there is still a strong link between economic slack and inflation. In 2021, the World Economic Outlook by the IMF mentioned long-term inflation expectations had remained largely stable, with little evidence that extraordinary policy actions had de-anchored them. It also mentioned that headline inflation was to return to pre-pandemic levels by mid-2022 for both advanced economies and emerging market nation groups, which unfortunately did not happen. However, it was mentioned in the same report that given the uncharted nature of the recovery, there was still a lot of ambiguity, especially when it came to assessing economic slack. Long-term supply disruptions, commodity and housing price shocks, longer-term expenditure commitments, and a de-anchoring of inflation expectations could all lead to far greater inflation than the baseline forecast (IMF, 2021).

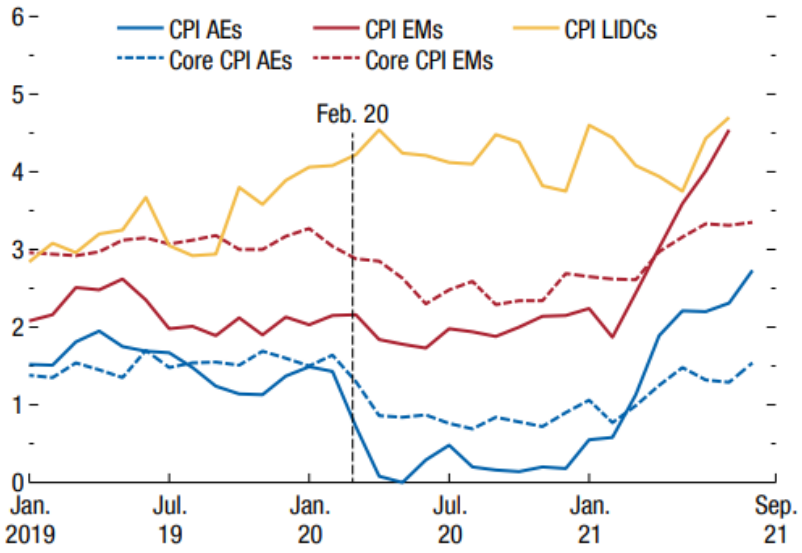


Figure 11. Consumer Price Inflation, by Country Group (Median, year-over-year percent change)

Sources: (Haver Analytics, 2021)

According to financial experts at the European Central Bank, over the course of 2022, inflation was predicted to decrease. Energy costs were expected to fall as the supply catches up with demand, and base effects would be removed from the yearly price comparison used to assess inflation. However, they also highlighted that because the epidemic was unprecedented in contemporary history, the recovery process could be unique. The significant supply chain disruptions could take longer to overcome, which was what we are seeing happening in real time. They also mentioned in a report in November 2021, that because of the green transition, energy prices could continue to grow. Of course, at this point the war in Ukraine was still too far ahead to be considered (European Central Bank, 2021).

The divergent perspectives on inflation forecasts in 2021 reflected the significant level of uncertainty surrounding the price-movement outlook. The evolution of housing, structural transformation in labor markets, and food prices are all factors that contributed to the uncertain inflation prognosis. Since the outbreak of the pandemic, global food prices had risen by nearly 40% at this point. This had ramifications for low-income countries, where food accounts for a large portion of consumption baskets. Another source of uncertainty was the wage processes that had emerged because of the pandemic, with rising labor demand colliding with anticipated temporary labor shortages, raising concerns about a wage-price spiral. Signs of higher wage growth were visible in industries that were hit hardest by the COVID-19 shock early on, which was consistent with a resumption of greater activity. According to data from a sample of 23 advanced economies, the average hourly wage increased significantly in 2020 (Blot, Bozou, & Creel, 2021). However, pay rise coincided with a decrease in hours worked, and the impact of the cut was borne disproportionately by low-skilled workers and teenagers, who typically earn less. Hiring challenges in particular sectors could ease when health metrics improved, and special income support measures expired. However, there was still a lot of uncertainty, which was dependent on

whether companies could hold off on filling vacancies, how long labor shortages would last, and how workers' health-risk-adjusted reservation salaries changed.

The Phillips curve relationship is an important part of central banks' policy frameworks. This is a trade-off between low slack (low cyclical unemployment, for example) and high inflation. The inflation process is also linked to cost-push shocks caused by supply disruptions and long-term inflation expectations in the Phillips curve. Long-term inflation expectations have grown more important in explaining inflation outcomes as inflation-targeting regimes have become more prevalent. Understanding the inflation process requires a firm grasp on inflation expectations and supply shocks. The conditions under which previous inflation surges could persist, such as when expectations become unanchored and self-fulfilling inflation spirals, are a critical question (IMF, 2021).

According to (Baccarin & de Oliveira, 2021), which compares inflation on food and beverage between 2007 and 2019 with the pandemic period in Brazil, in the first semester of 2020 home food had a higher price variance of 4.75 percent, compared to 2.59 percent for food outside the home, unlike what was seen between 2007 and 2019. This can be explained by the restrictions imposed by Covid 19 on the operation of hotels, restaurants, pubs, and snack bars, whose demand fell, as seen by the substantial loss in employment. As a result, demand for and sales of food in supermarkets increased in the first half of 2020, as did employment levels. From 2007 to 2019, food inflation in Brazil was practically constant. This appears to be related to growing farm producer pricing rather than changes in the food sector and distribution networks, particularly food retailing. Inflationary pressures on food persisted in Brazil in the first half of 2020. As before, commodities or goods with a limited degree of processing stood out as the primary cause of inflation, referring to the process' agrarian origins. However, the commodities or lightly processed products have changed, with vegetables, fruits and greens, rice, and beans taking precedence over beef in the most previous period. This was owing to a shift in consumer expenditure towards food at the expense of less important products and services, or those whose consumption was limited due to sanitary measures in the fight against Covid 19.

Packaged food producers, which benefited in 2020 from a pandemic-driven pantry-stocking rush, have been struggling with higher raw material costs and freight expenses because of supply chain disruptions caused by the COVID-19 pandemic. Paulo Basilio, Kraft Heinz's global chief financial officer, stated in correctly in October 2021 that 2022 would be an extremely volatile year, and that, nonetheless, the company would continue to anticipate that, on a topline basis, it would be able to maintain higher consumption than pre-pandemic levels. Despite the reopening of dine-in restaurants and bars, Kraft Heinz expected solid pricing in the first half of 2022 to counter rising inflation, as at-home dining preferences that arose during the pandemic would keep up (Reuters, 2021).

The inflation crisis worsened after Russia invaded Ukraine. Energy prices did not begin to decline in 2022, contrary to earlier estimates made in late 2021. Instead, prices have increased massively and are still very unstable.

Following Russia's invasion of Ukraine, prices for oil, coal, and gas skyrocketed and have been unstable ever since. As stated in an European Central Bank report, when news of a potential Russian invasion

of Ukraine increased in December 2021, volatility in the price of energy commodities started to rise. The cost of gas, coal, and oil all increased over the first two weeks following the invasion by roughly 40%, 130%, and 180%, respectively, as it can be seen in Figure 12. The cost of gasoline also increased the cost of wholesale electricity in the euro zone. Since then, the price of energy commodities has moderated, with oil and coal prices now 27% and 50% higher than they were before to the invasion, respectively, and gas prices 11% lower. As a result of China's relaxation of COVID-19 limitations and the EU's decision to impose an embargo on the majority of imports of Russian oil, oil prices have begun to rise once more. Although wholesale power costs have increased by 8% since the invasion, they have remained extremely volatile, particularly as a result of the legislative changes made in response to the price rises (Schuler, Adolfsen, Kuik, & Lis, 2022).

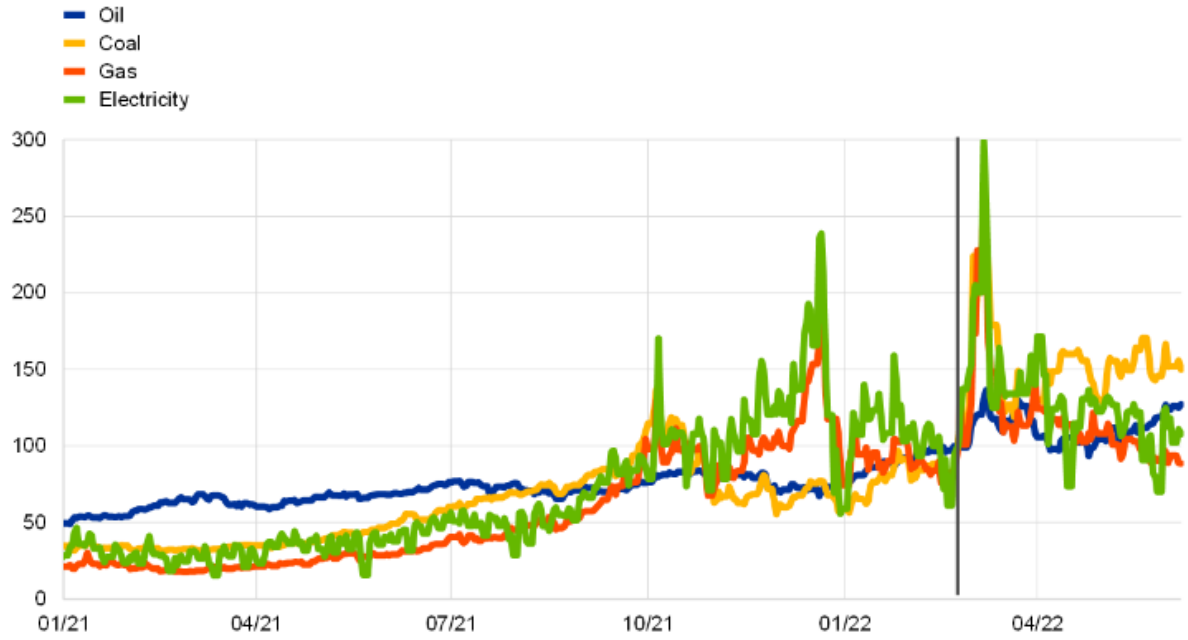


Figure 12. Energy prices before and after the invasion of Ukraine

Sources: Refinitiv, Bloomberg and ECB staff calculations

Russian energy supply constraints could have an impact on both direct deliveries and global market prices in the euro region. Russia produced 16% of the world's gas, 5% of the world's coal, and 12% of the oil in 2019. The nation supplied 23% of all energy imports to the euro area in 2021, making it the region's top supplier of energy commodities, as seen in the panel a of Figure 13. In 2020, Russia supplied 23% and 43% of the crude oil and coal that the euro area imported, which corresponded to 9% and 2% of the region's primary energy consumption. However, the euro area is particularly reliant on Russian natural gas imports, which in 2020 accounted for 35% of the euro area's gas imports and 11% of its primary energy consumption, as demonstrated in the panel b of Figure 13. Among the major member states of the eurozone, Germany and Italy are most dependent on Russian gas. Any examination of the economic effects of the war on energy costs and supplies in the euro area must take into account how substitutable various energy sources are (Schuler, Adolfsen, Kuik, & Lis, 2022).

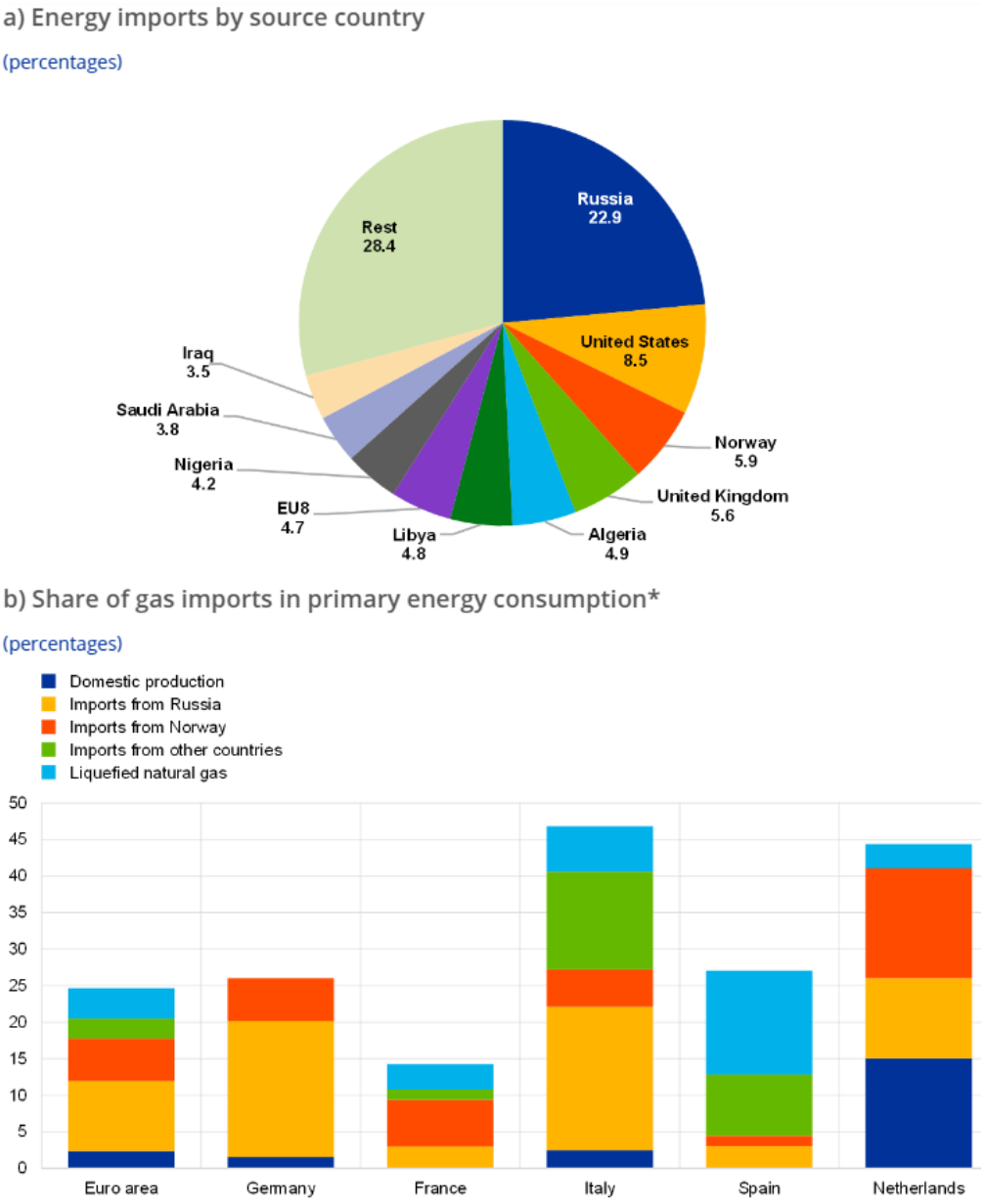


Figure 13. Russia's share in euro area energy and gas imports

Sources: Eurostat and ECB calculations.

In February and March 2022, increased energy commodity prices increased the pressure on consumer energy prices. Prior to a slight decline to 38% in April and 39% in May, HICP energy inflation increased to 32% in February and 44% in March, as shown in the panel a of Figure 14. The rises up until March represented the significant month-over-month growth in all major energy components (liquid fuels, electricity, and gas), which was driven by the expansion of the world's commodity markets and rising refining margins (Schuler, Adolfsen, Kuik, & Lis, 2022).

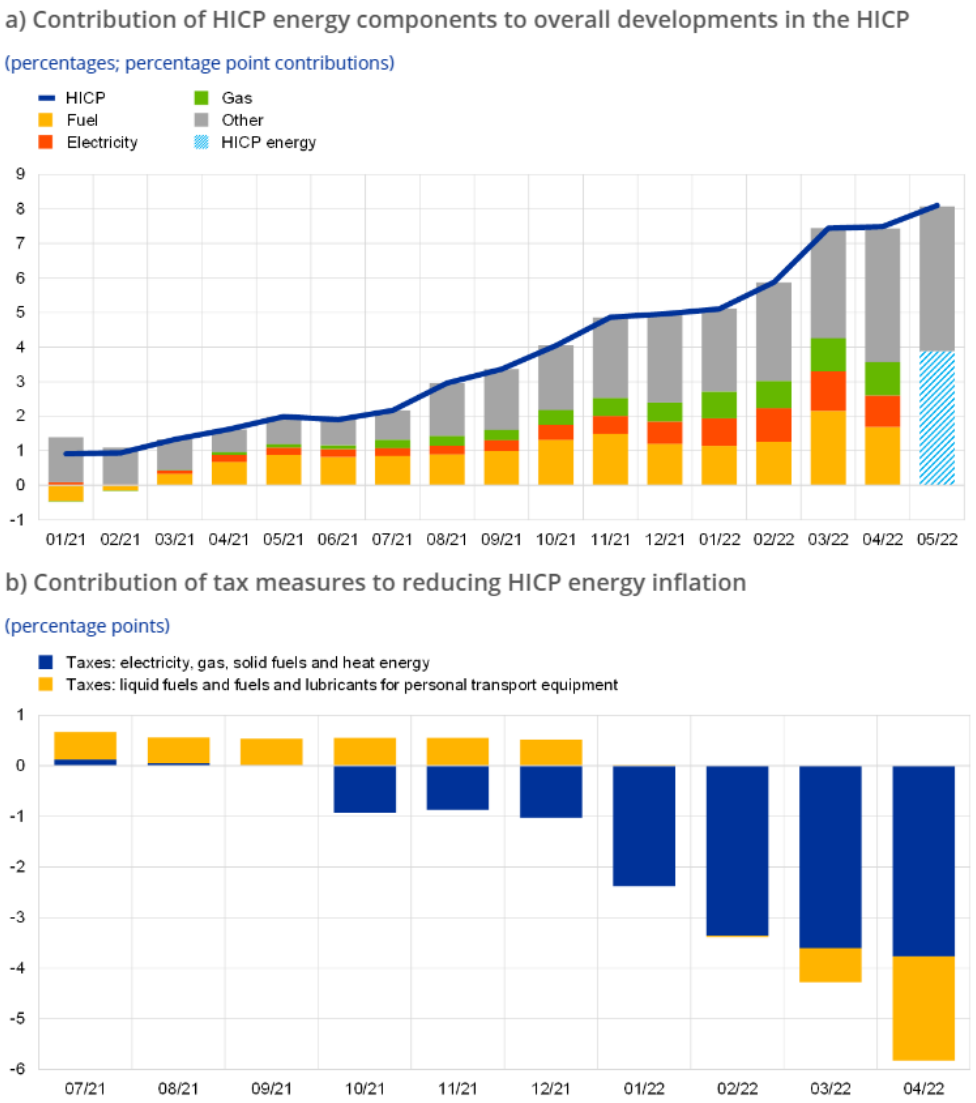


Figure 14. Rising HICP energy inflation curbed by government tax measures

Sources: Eurostat and ECB calculations.

HICP energy inflation remained high in April and May 2022, although pressures subsided as a result of governments' mitigation efforts as well as the aforementioned changes in the price of energy commodities. Numerous governments in the euro zone have offered assistance to households as restitution for excessive energy costs. The majority of them also decreased the rates of excise taxes and value-added taxes, which had a direct bearing on consumer costs. Energy inflation was reduced by approximately 4.3 percentage points in March and 5.8 percentage points in April 2022 as a result of changes to indirect taxes implemented in numerous nations beginning in the fall of 2021, as seen in the panel b of Figure 14 (Schuler, Adolfsen, Kuik, & Lis, 2022).

As we can see in Figure 15, consumer price indexes for both the United States and the eurozone are on the same levels in 2021 and 2022. However, producer price indexes in the eurozone have skyrocket in comparison with the ones in the United States, due to the gas crisis rooted in the Ukraine war. Energy prices, which are the main cause of inflation, rose by 45 percent in March and 38 percent in April in

Europe. The core inflation rate in the eurozone, which excludes energy, food, alcohol, and tobacco, was 4.2 percent in June. This rate set a record but also highlights how unevenly distributed the total rate is. Although consumer price indexes are still on the same level for both the US and the eurozone, the eurozone's CPI can escalate once manufacturers start passing through prices to consumers.

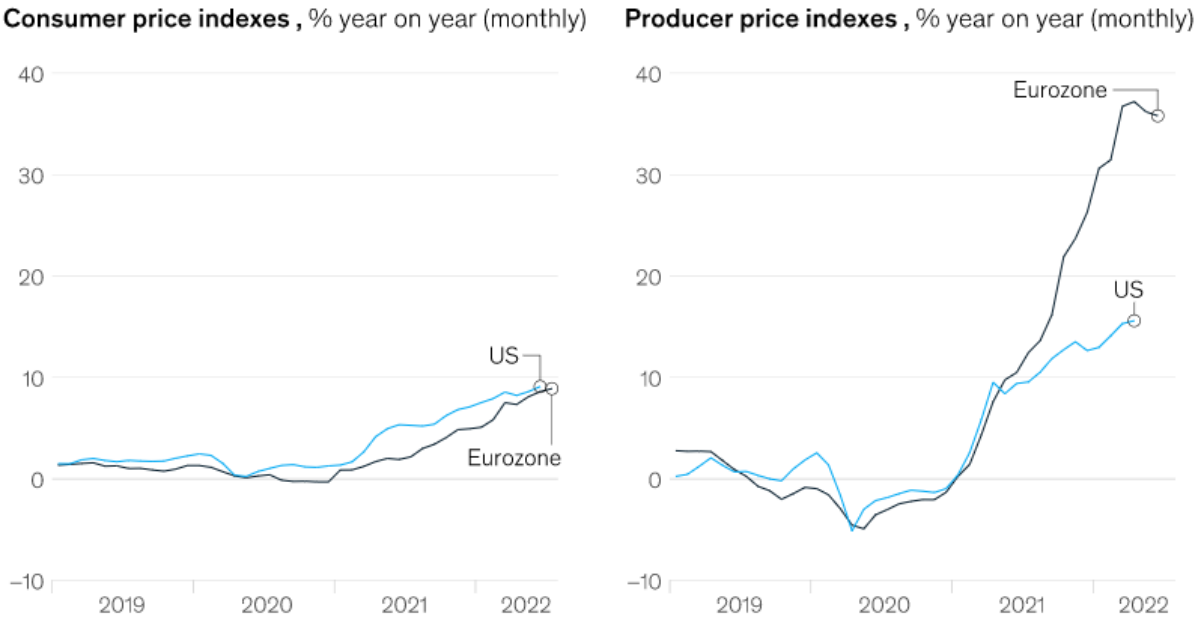


Figure 15. Consumer- and producer-price inflation surged in the United States and the eurozone in 2021 and 2022

Source: Eurostat; national-statistics websites; McKinsey's Global Economics Intelligence analysis

The largest producer of sunflower oil in the world is Ukraine. Together with Russia, it accounts for more than half of all vegetable oil exports worldwide. Additionally, the region exports 36% of the world's wheat. The supply of important essential goods has drastically decreased as a result of the war in Ukraine and the sanctions imposed on Russia. As a result, food costs have increased globally. As "the breadbasket of Europe," Ukraine and Russia provide food imports that many developing and emerging market nations rely on to supplement domestic food production. For instance, Turkey, Vietnam, and Indonesia were the top three importers of Russian wheat in 2018. Similarly, that year, the top three importers of Ukrainian wheat were Indonesia, the Philippines, and Morocco. Therefore, the war's instability will have a negative impact on the countries that import food (Emediegwu, 2022).

According to statistics at the national level, sub-Saharan Africa experienced the most increase in food price inflation between February and March 2022. Over this time, some of these nations have seen food prices rise at rates above the average global rate (12.6%). For instance, during February and March, Lebanon (396%), Zimbabwe (75%) and Turkey (70%) had the greatest rates of food price inflation (see Figure 16)

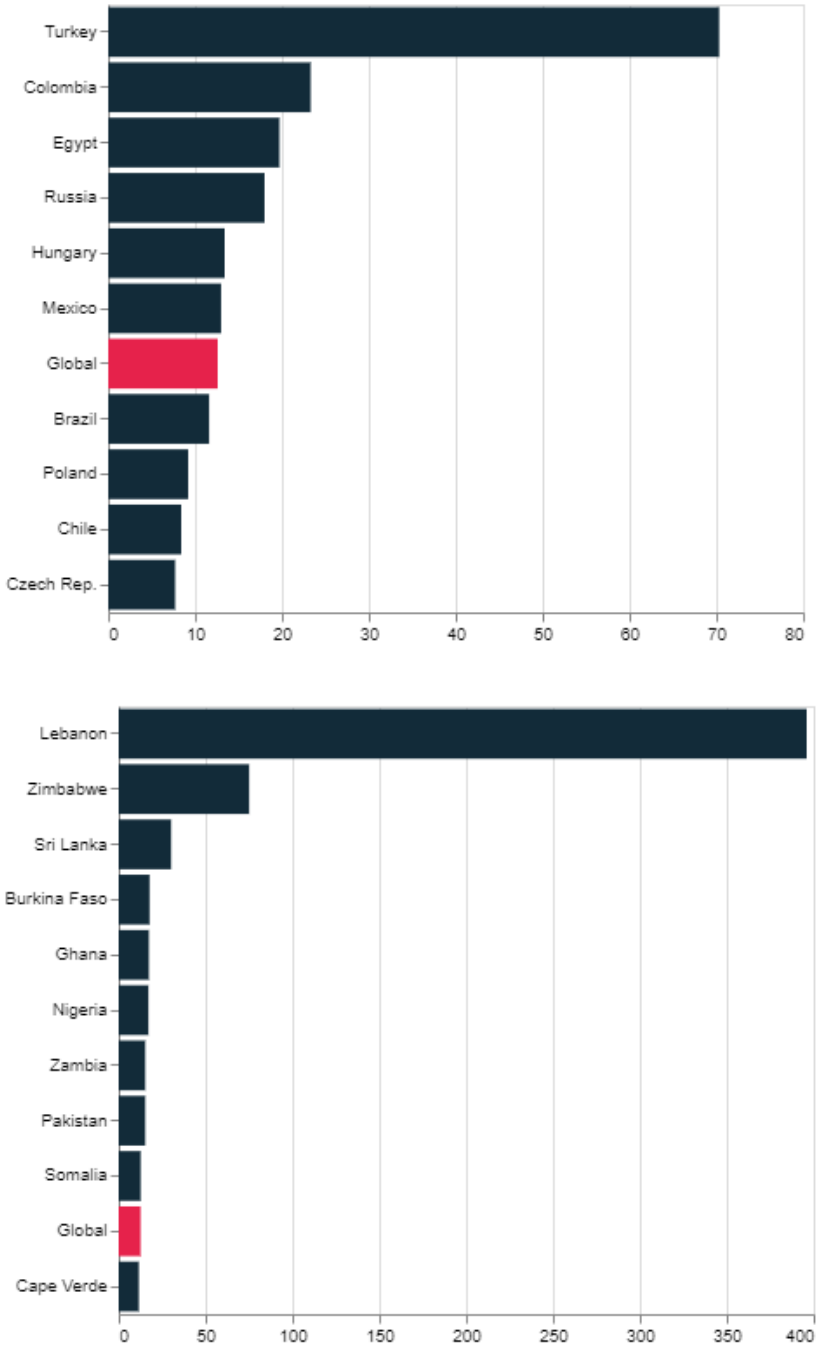


Figure 16. Developing and emerging market economies with the highest food price inflation change between February and March 2022

Source: (FAO, 2022)

Further increases in energy costs have been seen on the global market as a result of sanctions against Russian oil businesses and the upcoming bans on Russian energy exports. Although the European Union (EU) will purchase 42% of Russia's total oil production in 2021, the member states have been able to diversify their economies and start importing more oil from other sources.

In contrast, many developing and emerging markets have what is known as a "monocultural economy," in which they rely heavily on a single basic resource like oil. For instance, although oil accounts for 40%

of Nigeria's GDP, 70% of its budgetary income, and 95% of its foreign exchange profits, Nigeria is still the only OPEC (Organization of the Petroleum Exporting Countries) member to purchase refined gasoline for domestic use.

As a result, changes in the global oil market have an impact on the price of fuel locally in these markets. The burden of increasing production, storage, and transportation expenses eventually trickles down to the consumer in the form of higher food prices.

Referring to Figure 16, the nations with the highest rates of food price inflation are frequently those with the most unstable political systems. Some developing and rising economies already had higher food costs because of internal strife or climate-related issues before the crisis in Ukraine started.

For instance, according to a study from the United Nations (UN) in 2016, Boko Haram bombings in Northern Nigeria interrupted commercial routes between Chad and Nigeria, halting the delivery of essential supplies and driving up local prices (UN, 2016). There is a good chance that the fighting in Ukraine has made food price crises already present in several developing economies worse.

A high-inflation climate is unstable and unsafe for many businesses to operate in. Responding to inflation is crucial right now, but any actions taken must carefully consider future inflation, how it will affect the business model of the organization, and how long it will take for a reaction to take effect. A report by McKinsey & Company explains how in a setting of high inflation, analytics can be utilized to enhance decision-making, with the sophistication of the analytics being based on the needs of the firm. Analytics will need to be more accurate in industries with highly specialized operations and narrow margins, such consumer packaged products, to help create a sophisticated understanding of risks. However, high-margin businesses (such as those in software development or luxury items) may benefit from a more conceptual approach, which does not need the creation of deep analytics. The majority of organizations employ forecasts and scenarios created externally when creating inflation reactions, yet inflation forecasting is a distinct and complicated topic in and of itself. On the other hand, analytics for decision-making cannot be outsourced. Businesses can utilize a flexible, analytically complex strategy to help them decide how and when to react without having to resort to direct inflation forecasts. In the technique, the sorts of exposures are broken down and the extent of exposure is evaluated (Govindarajan, Comolli, Zhang, & Venkatesh, 2022).

Companies can utilize analytics to size and rank the main inflation risk elements based on exposure and inflation decomposition. Then, strategies can be chosen based on how well they manage the risk variables that expose a corporation to the most risk. Potential tactics include pass-through pricing, vertical integration along the value chain, and hedging to lessen price volatility. Hedging tactics have been used by organizations for a long time to reduce and manage the risk of price changes to their operations. Companies can use many organizational components to handle hedging risks, including actively managing inventory pricing risks and commercial contracts, constructing analytics capabilities like scenario testing, and creating governance and regulations for supervision. Strong analytical skills, such as forecasting and optimization, are most necessary for the hedging option. The hazards associated with feedstock price fluctuations, which mostly relate to changes in relative prices, can

frequently be reduced by it. Using a financial hedge, for instance, a chemical business was able to lock in natural gas costs and significantly reduce the risk of rising prices. Companies can adopt a dynamic pricing strategy as a response to rising input prices and price volatility. By choosing the appropriate price, maximizing discounts and rebates, and controlling margin leakage, they may frequently get greater value from pricing. Strong analytical skills are needed for this choice, including the ability to estimate the impact of pricing and conduct advanced market segmentation (Govindarajan, Comolli, Zhang, & Venkatesh, 2022).

The exposure matrix in Figure 17 demonstrates how it is possible to discover a wide range of commercial and technical levers that support a defensive position against inflation by taking inflation (or deflation) and the degree of exposure to market forces into account. Some controls can stop cost rises right away, while others strengthen future resilience.

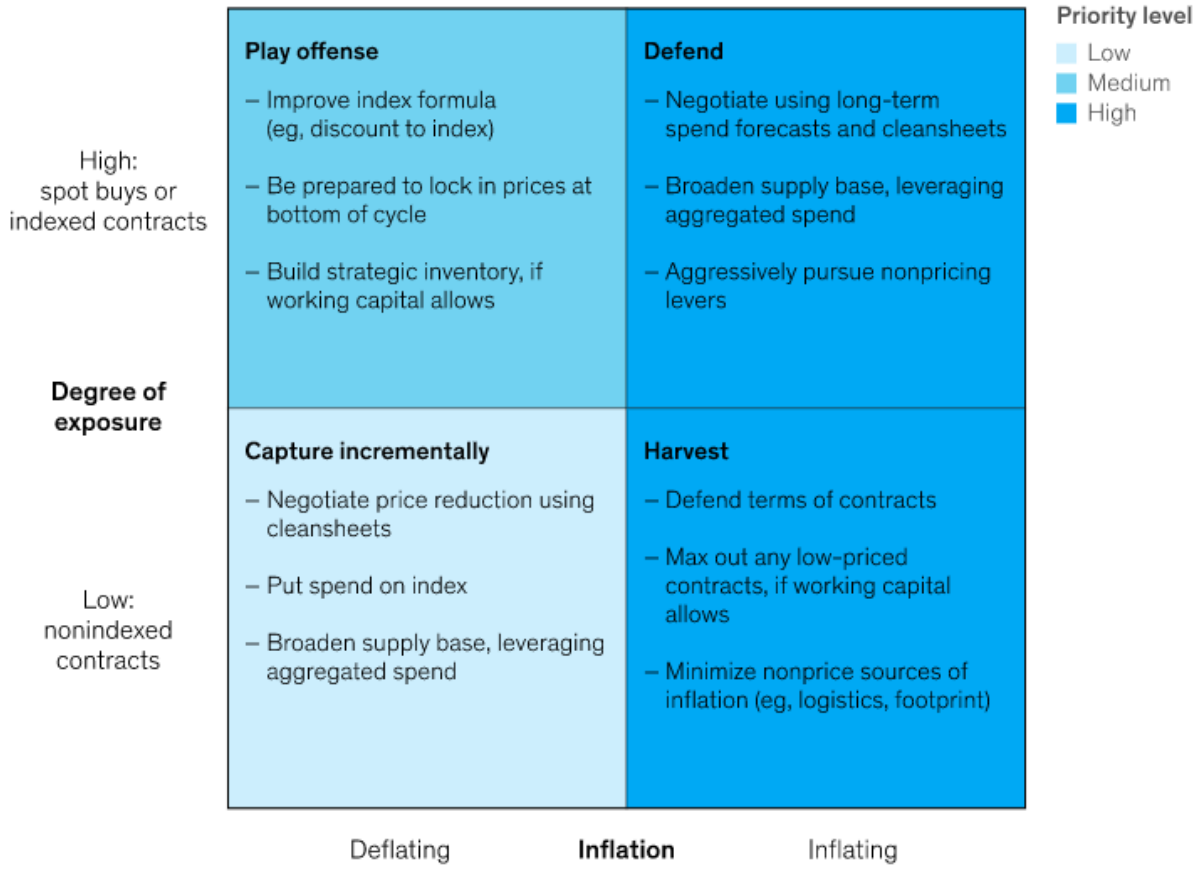


Figure 17. Procurement nerve center's exposure matrix

Source: McKinsey & Company

A different report also by McKinsey & Company provides deep insights into Procurement strategies in unstable times with high inflation predictions. Maximizing spend on current contracts whose prices aren't inflation-indexed and pursuing clawbacks on unindexed contracts that covered periods when commodities prices declined are often two immediate commercial opportunities to reduce volatility. Managers can quantify the degree to which inflationary pressure should effect supplier costs by using

digital and analytics technologies to boost cleansheet research and identify how much purchases should cost for significant portions of corporate spending. Collaboration between suppliers can increase efficiency and possibly aid the business in looking beyond pricing to changes in quality or requirements or strategies to utilize less in order to increase future resilience. In order to assess the potential impact of inflation on the prices the company charges its own consumers, businesses might also think about enhancing coordination between the pricing and procurement departments. Accelerating value engineering and modifying batch sizes or order frequency are two defensive, technical levers to combat inflation. A potential medium-term technological lever that can help enhance resilience is reducing SKUs or high-cost features and qualities by altering specifications. Depending on the industry, optimizing supplier footprints for better control over logistics, cost, tariffs, and inventories are alternatives to combat volatility in the short-to-medium term. Strategic inventory stockpiling, a greater reliance on vendor-managed inventory, increasing cross-industry collaboration to share commodity exposures, and working along the end-to-end supply chain to derisk specific nodes could be longer-term volatility challenges (Ibáñez, Rugamas, Kuehl, & Kohli, 2022).

Although no one can accurately forecast the arrival of the next round of inflationary pressures, it is reasonable to believe that they will eventually do so. Leaders may get ready now to lessen the effects once that day comes. A variety of sourcing and contracting strategies can be used by businesses to limit their exposure to additional expenses. For instance, expanding the range of suppliers for essential raw materials gives businesses more options in case costs rise. Utilizing fixed, long-term contracts, it is occasionally possible to collaborate with suppliers to share supply-chain risk. Contract terms and conditions can be added by businesses to alter the time of contract expiration and risk exposure. For instance, long-term volumes could be agreed upon, with pricing regularly adjusted to reflect changes in the market. Another strategy is to tie contract pricing to market prices for a certain class of commodities or underlying cost drivers by creating synthetic price indexes or using public indexes. Hedging tactics in the financial markets that transfer risk to counterparties can be extremely important, yet businesses shouldn't rely solely on them. However, having an internal financial team that is familiar with the potentially complex positions is a requirement. Otherwise, a business risk creates more risk than it manages. The development of flexibility in product development and manufacturing is the key to internal mitigation. When costs increase, flexibility enables businesses to switch to less expensive raw materials or move their manufacturing to a new region where there are tactical or financial advantages. Additionally, businesses might accumulate raw resources when costs are low and use them up when costs rise. When raw material prices are highly volatile, the costs of maintaining high inventory numbers may be outweighed by the advantages.

Research on negotiation is becoming more and more popular, unlike most other research. A book on negotiation theory by Leigh L. Thompson explores what is making negotiation grow as a field. The increased demand for negotiation courses in business schools is a leading factor for the growth, as more and more scholars are required to teach these courses.

Negotiation research comes from economic theory. Therefore, there are clear performance measures. One of these measures is the level of integrative agreement, which refers to mutually beneficial

outcomes. The opposite of these agreements are compromise agreements, which require parties to put important interests behind. Research on negotiation has revealed that people lose hundreds of thousands of dollars during negotiations, because they are unable to reach mutually beneficial agreements, mostly due to the parties' mental framework (Thompson, 2006).

Parties can use different negotiation strategies based on the situation. High-stakes negotiations frequently result in high levels of anxiety. Dealmakers become preoccupied with (perceived) dangers as a result, rather than identifying all potential sources of leverage and considering all available solutions. Negotiators are more prone to make poor tactical decisions in those circumstances, either caving to pressure from the other side or unintentionally bringing about their own worst fears. Selecting a cooperative or competitive stance is only one part of a strategic negotiating technique, and thinking in such absolutes is nearly always fruitless. Dealmakers will be able to unlock much more value by analyzing connections between one negotiation and others with the same party over time (and even with other parties), examining carefully whether they are negotiating about the right issues, and concentrating on when and how to engage with the other side most effectively (Hughes & Ertel, 2020).

From analysis to raw data to the opinions of renowned economists, this chapter makes it clear that supply chain disruptions induced by pandemic-related restrictions have resulted in significant price rises that are harming businesses all over the world. Inflation and lead times are rising due to a variety of factors, including increased demand, supply performance difficulties, and broken global logistics networks. Furthermore, rising energy and labor costs play a significant role in overall inflation. This chapter also covered the possibility of greater inflation as a result of both high inflation expectations and low slack. The effects of Russia's invasion of Ukraine were also discussed, including how the prices of gas, coal, and oil surged and have been volatile ever since. Finally, a perspective on how businesses might manage risk in inflationary environments and develop strategies to mitigate this risk was provided, as well as an insight on negotiation research and approaches.

Chapter 4

4. Research Methodology

This chapter describes the different methodologies used to analyze the problem stated in chapter 2. Three different methodologies will be used in this paper: a practical analysis, a SWOT analysis and an interview process. Section 4.1 shows the practical analysis done to estimate the impact of the problem to the company studied. Following that, in section 4.2, there is a description of the SWOT analysis that will be applied to the case study. Finally, section 4.3 describes the interview process to be done.

4.1. Practical Analysis (ABC analysis)

Analytics can be used by businesses to calculate their inflation exposure. On the basis of the estimates, mitigation options might then be prioritized. Companies can link cost drivers, such as commodity prices, foreign currency rates, and labor costs, to real expenses in order to analyze risk. The relationship can be made in great detail, possibly even down to the level of the subproduct. Simulations and scenarios for the cost drivers can be produced using a range of analytical techniques (Govindarajan, Comolli, Zhang, & Venkatesh, 2022).

The West region's Drinks & Brunch External Manufacturing portfolio will be examined in detail. The costs of the various components of each product will be assessed in order to estimate the impact of inflation on the company in 2022.

There are six different suppliers in the Drinks & Brunch portfolio, totaling 65 products. The names of the suppliers will be represented as A, B, C, D, E, and F for reasons of confidentiality, and the product identification numbers will be represented as 1 to 65. In addition, all numerical figures such as component/product costs, volumes, total spend, and impact will be fictitious.

In Table 2, we can see the total 2021 spend with this portfolio. The goal of this research will be to calculate the estimated total spend in 2022 as well as the impact on the company. Because the figures do not reflect reality, this exercise is only to see how the business approaches the situation.

Table 2. 2021 Total Spend

Supplier	2021 Spend	
A	€	7,058,925
B	€	5,714,265
C	€	3,733,184
D	€	3,067,887
E	€	947,093
F	€	665,814
Grand Total	**€**	**21,187,167**

It is feasible to calculate the projected spend in 2022, as well as the impact on the company, by combining the pricing of each product in 2021 and 2022 with the expected total volume for 2022. Furthermore, all the pricing of each component of each product will be examined. This will help us to see which product components are causing the most price rises overall. It will also be possible to analyze which types of components are having the most impact on costs by categorizing all of the components and using a simple pivot table. As a result, it will be easy to determine which types of raw materials and packaging materials have the greatest impact on the company and require the most attention.

For further investigation, the different material categories will be grouped using an ABC analysis. Based on the Pareto principle, ABC analysis is a well-known and useful categorization. For instance, Group A inventory goods are those that account for around 70% of a company's sales yet only occupy 10% of the inventory. They are vital to the operation of the business. The items that make up Group B inventory account for around 20% of the company's sales and 20% of the inventory as a whole. Items in group C make up around 70% of inventory but only account for 10% of firm sales (Lung Ng, 2007).

Historically, inventory items have been divided into three categories – A, B and C. However, a single criterion is no longer sufficient to govern the management of inventories in most scenarios of the contemporary globalized, hyper-responsive corporate environment; instead, numerous factors must be taken into account. The early 1980s saw the realization of this fact by operations and inventory management researchers, and since then, many methods for multi-criteria ABC categorization have been presented. The textbooks on operations management and supply chain management, however, have not followed their example and still address ABC analysis using the concept of annual dollar volume. According to Misra and Ravinder in an article published by the Department of Management at Montclair State University Digital Commons in 2014, multi-criteria ABC analysis is a sophisticated idea that needs to be included in textbooks. They believe authors should update their articles to offer a thorough explanation of the idea and process behind multi-criteria ABC analysis, as a revision like this would give students the knowledge and abilities they need to function and contribute in the job while also making their textbooks more pertinent to the present business climate. As a result, businesses would be able to better manage their inventory and increase their level of market competition (Ravinder & Misra, 2014). However, for simplicity, in this study we will utilize the standard annual dollar volume concept present in textbooks on operations and management and supply chain management. Using an

ABC analysis will help understand the most important material categories of the portfolio and the impact of their price increases in 2022.

Prioritizing categories according to the company's exposure comes after examining a suggested price increase. It is easier to respond to suppliers when you are aware of the categories that are subject to inflation and the current conditions of the contracts that involve these categories (Govindarajan, Comolli, Zhang, & Venkatesh, 2022).

After evaluating the impact of price increases on the portfolio in 2022 using an ABC analysis, an example will be given on the evaluation of a possible strategy to mitigate the risk of volatile materials for the following year. The circumstances of when purchasing stock of a certain material in advance to reduce the impact of possible price increases in the future are feasible will be evaluated. A sensitivity analysis will be done as well to support the study.

4.2. Interviews

To analyze how the current supply chain disruptions are impacting the Kraft Heinz Company, two interviews will be conducted with different company stakeholders who work directly with these issues. One of them will be with a member of the External Manufacturing team for the West Region, who is in constant contact with the current price increases across different materials, and the other will be with a member of the logistics team for the UK, who is directly in touch with both the energy and fuel increases, as well as the lack of truck drivers, which are highly impacting logistics costs.

The interviews will begin with a quick introduction to the study's goal, followed by an introduction of the interviewee. Following that, a series of open-ended questions will be asked to gain a better understanding of the problem, how it has impacted the business, particularly in the interviewee's area, and the significance of this paper in understanding the issue. The interviews will be conducted through Microsoft Teams and recorded.

A script will need to be written to conduct the interviews. It is critical to perform research before drafting the script, as stated in a 2012 paper on how to write interview procedures and conduct interviews (Jacob & Furgerson, 2012). Knowing the research leads to the development of questions that are based on the literature, differ from previous research, and still require answers. It also aids in focusing or narrowing the questions in ways that produce useful data. Furthermore, it is important to ask open ended questions. The purpose of qualitative research is to learn as much as possible about the individuals and their circumstances, and yes or no questions prevent the interviewee from getting to the core of the matter. Although the interviews will take different routes depending on how the topics flow, they should be in line with the pre-aligned script presented below:

- Interviewer to introduce himself and the purpose of the interview

1. Could you tell me a bit about your background?
2. What is your role at Kraft Heinz?

- Interviewer to provide background on the topic:

"Lockdowns and other restrictions imposed by governments to combat the virus' spread have resulted in increased demand and supply shortages. Due to a scarcity of some materials, prices have risen dramatically. Furthermore, logistics networks were damaged, resulting in longer delivery lead times, and logistics operational costs escalated drastically due to increases in energy, fuel, and labor prices."

3. How do you see the pandemic has impacted supply chains and consequently prices?
4. How has this situation affected Kraft Heinz and specifically your role?
5. What are some of the strategies used to address this issue?
6. Does this situation also generate opportunities to gain competitive advantages? How?

- Interviewer to add provide background on the next topic:

"Russia's invasion of Ucraine has further aggravated the situation with gas, electricty and fuel prices going through the roof."

7. Did you feel a big impact of this aggravation?
8. Did this change the strategy previously defined by the business to fight inflation?
9. Overall how has Kraft Heinz in your opinion responded to the crisis?
10. What could the company have done better?

The information acquired from these interviews will be used not only to create overall conclusions for the study, but also to contribute to development of the SWOT analysis described in the next section. The two stakeholders can shed further light on how supply chain disruptions and price increases are affecting Kraft Heinz, as well as what the business is doing to address these challenges. Furthermore, because the stakeholders are all highly skilled professionals, they can explain how and why we arrived at this position, as well as what the future holds for the next few years.

4.3. SWOT Analysis

A SWOT analysis, which stands for Strengths, Weaknesses, Opportunities, and Threats, is a framework for assessing a company's competitive position and developing strategic planning. Internal and external aspects, as well as existing and future potential, are all evaluated using this tool.

It is portrayed by analysts as a square divided into four quadrants, each dedicated to a different aspect of SWOT, as seen in Figure 18. This visual representation provides a fast snapshot of the company's status.

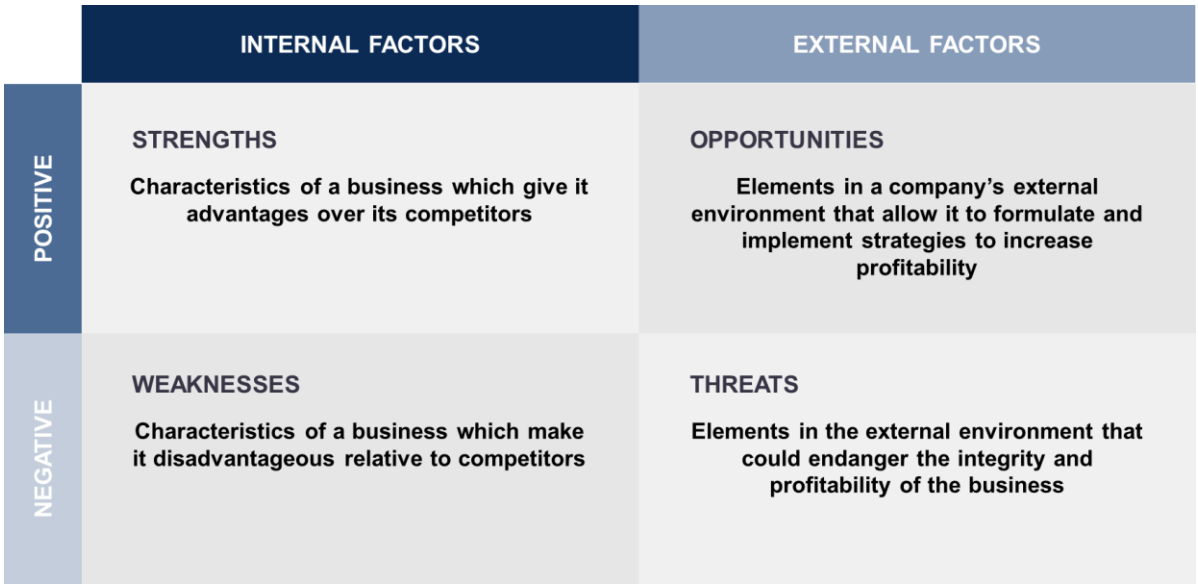


Figure 18. SWOT analysis

Source: (Corporate Finance Institute, 2022)

According to Alan Sarsby in his book *SWOT Analysis,* there is a tendency to want to start with the first quadrant (Strengths). However, this will most likely lead to a long list of strengths, not necessarily related to the external factors. Therefore, it is important to start with the external factors, and then build the internal ones based on whether these could help or harm the company. He argues that is the best way to classify the factors within the quadrants. Strengths are internal and helpful factors, whereas Weaknesses are internal and harmful factors. In the same line, Opportunities are external and helpful factors, whereas Threats are external and harmful factors. Furthermore, internal factors are helpful or harmful based on their effect on external factors. For this reason, Strengths are factors that can either aid an Opportunity or mitigate a Threat. On the contrary, Weaknesses are factors that can prevent the company from leveraging an Opportunity or that can expose the company to a Threat (Sarsby, 2016).

Examples of Strengths are a powerful brand, a loyal consumer base, a robust balance sheet, innovative technology, and so. On the other hand, Weaknesses prevent an organization from reaching its full potential. A bad brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or a lack of capital are examples of areas where the company must improve to stay competitive. Opportunities refer to favorable external factors that could give an organization a competitive advantage. If a country lowers tariffs, a car manufacturer, for example, can export its vehicles to a new market, boosting sales and market share. On the opposite side, Threats are circumstances that have the potential to cause harm to a company. A drought, for example, poses a risk to a wheat-producing company since it might destroy or reduce crop yield.

A study from 2015 that examines the impact of cheaper oil on the economic system and climate change is an excellent example of a study that employed a SWOT analysis to evaluate price fluctuations. The SWOT technique is used in this study to examine the impact of cheaper oil on the global economic system and carbon emissions, as well as the climate opportunities and problems that lower oil prices present (Wang & Rongrong, 2015).

Chapter 5

5. Results

This chapter presents the results obtained from the application of the methodologies described in the previous chapter to the problem in question.

5.1. Practical Analysis (including ABC analysis)

With the practical analysis done to Kraft Heinz's Drinks & Brunch External Manufacturing portfolio, it was possible to estimate the impact of price increases on the company. To calculate this impact all the components of each of the 65 products were analyzed.

In Table 3, we can see an example of the component analysis for products 9 and 10 from supplier A. By calculating the spend in 2021 and 2022 with the 2022 expected volumes, we can easily get to the impact of the increases in 2022. As we can see below, some components have suffered huge increases. This is caused by the supply chain disruptions we are currently experiencing.

Table 3. Supplier A product component analysis

Product ID	Component description	Category	2021 cost/1000 CS	2022 volumes (cases)	2022 cost/1000 CS	2021 Spend	2022 Spend	Price Increase	Impact	Total product price	Total Price Impact
9	component 1	Sweeteners	€ 572.150	67644	€ 573.15	€ 38,703	€ 38,770	0%	€ 67.78	€ 10.558	0%
9	component 2	Oil	€ 360.616	67644	€ 605.88	€ 24,394	€ 40,984	68%	€ 16,590.96	€ 10.558	2%
9	component 3	Flexible	€ 1,295.167	67644	€ 1,295.17	€ 87,610	€ 87,610	0%	€ -	€ 10.558	0%
9	component 4	Cartons	€ 753.536	67644	€ 841.00	€ 50,972	€ 56,889	12%	€ 5,916.41	€ 10.558	1%
9	component 5	Cartons	€ 435.302	67644	€ 462.89	€ 29,446	€ 31,311	6%	€ 1,865.95	€ 10.558	0%
9	component 6	FA	€ 19.837	67644	€ 20.36	€ 1,342	€ 1,377	3%	€ 35.09	€ 10.558	0%
10	component 1	Processed grains	€ 1,721.191	149863	€ 1,905.87	€ 257,943	€ 285,620	11%	€ 27,677.24	€ 4.747	4%
10	component 2	Cartons	€ 555.060	149863	€ 622.34	€ 83,183	€ 93,266	12%	€ 10,082.78	€ 4.747	1%
10	component 3	Corrugated	€ 287.958	149863	€ 340.44	€ 43,154	€ 51,019	18%	€ 7,864.57	€ 4.747	1%

By categorizing the components, it is possible to assess the impact per raw material category and analyze which raw materials have the highest impact on the costs. Using this analysis, the Procurement team can compare the increases requested by its suppliers with the overall market picture, which helps gain a leverage for negotiations.

Table 4 shows the summary of the raw material impact of Supplier A. As we can see, the most affected materials were blow molding materials (plastic), used for bottles, and oil. The latest is driven by the huge price increases in anise oil used in some of the products. As expected, carton, corrugated and metals are next in line in the list of materials with the highest price increases list, with carton bringing the biggest impact to the company, as this material is used in almost all products produced by Supplier A. As

discussed earlier in this study, these materials have been experiencing huge shortages worldwide, which have led prices to increase accordingly.

Table 4. Supplier A product category impact

Category	2022 Budget	Average Price Increase	Impact
Blow Molding	€ 48,713.52	28%	€ 10,556.92
Cartons	€ 923,465.85	14%	€ 155,357.59
Cocoa	€ 559,913.69	6%	€ 19,948.64
Corrugated	€ 186,187.49	15%	€ 33,146.45
Cotton	€ 2,197.96	0%	€ -
FA	€ 239,894.43	6%	€ 9,709.34
Flexible	€ 222,684.61	0%	€ -
Fruits	€ 203,099.31	-7%	€ (36,132.46)
Injection Molding	€ 41,794.25	9%	€ 3,560.25
Metals	€ 1,190.23	17%	€ 173.15
Oil	€ 40,984.48	68%	€ 16,590.96
Processed grains	€ 574,515.87	7%	€ 28,229.56
Sweeteners	€ 48,836.77	5%	€ 422.66
Grand Total	**€ 3,093,478.46**	**10%**	**€ 241,563.07**

As seen in Figure 19 below, not always the materials with the biggest spend are bringing the highest impact to the portfolio. Packaging materials like corrugated boxes had huge shortages in supply, causing long delivery lead times and massive price increases. Although these materials are a small percentage of the total budget for 2022, the impact of their price increases are drastic.

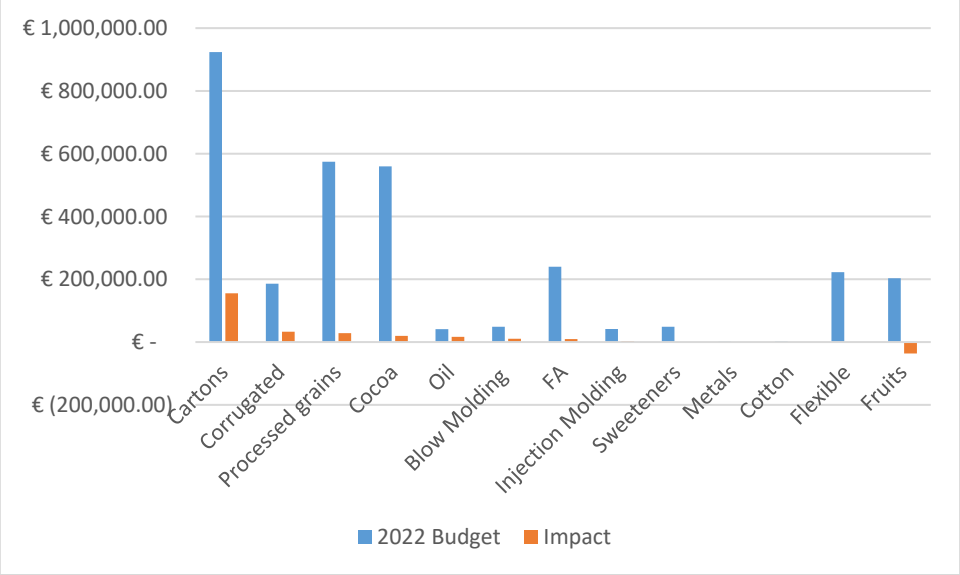


Figure 19. Supplier A spend and impact per product category

For a further analysis of the impact of price increases on Supplier A's portfolio, the different materials were categorized using an ABC analysis. As seen in Table 5, three materials were identified as type

"A", four materials as type "B" and six as type "C". Items A together represent only 23% of the total number of materials, but almost 70% of the spend with Supplier A. Items B represent 31% of the total number of materials and 28% of the spend. Lastly, items C represent almost 50% of the total number of materials, but only 5% of the spend.

Table 5. Supplier A ABC analysis

Item classification	Number of categories	% of categories	Amount spent (consumption)	% consumption	Impact	Impact %
A	3	23%	€ 2,057,895	67%	€ 203,536	84%
B	4	31%	€ 851,866	28%	€ 6,723	3%
C	6	46%	€ 183,717.2	6%	€ 31,304	13%

As expected, due to the high percentage of the total spend they represent, items A have the biggest impact in the portfolio, amounting for almost 85% of the total impact. Although it would be expected that items B would have the second biggest impact, that is not the case. Materials as oil and blow molding were categorized as items C, due to their low spend. However, since these materials suffered a massive price increase, in total. items C have a bigger impact on the portfolio than items B. In Figure 20, it is easy to identify this phenomenon. Items B have a higher budget spend than items C, but a way smaller impact, represented by the small circle.

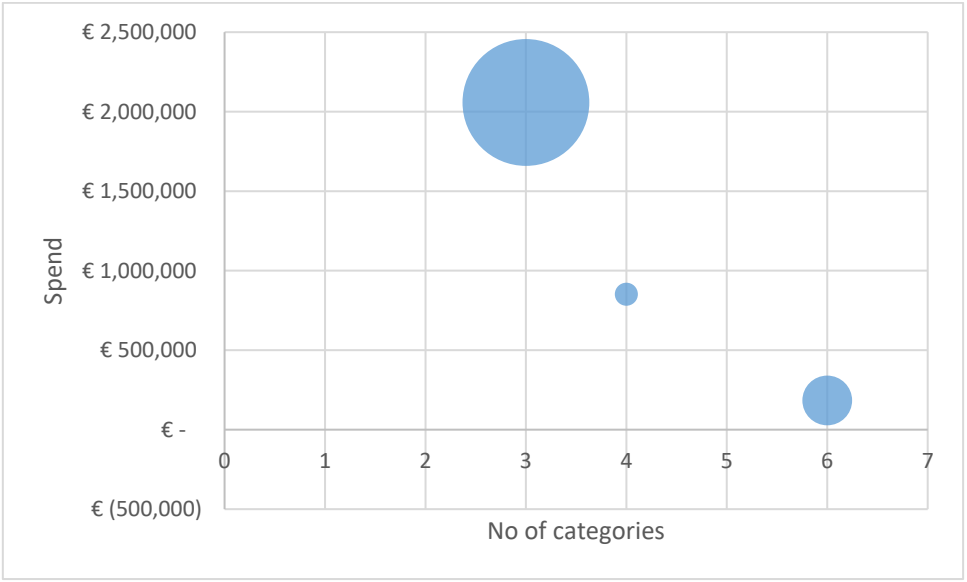


Figure 20. Supplier A spend and impact per item type (ABC analysis)

Table 6 shows the same data for Supplier B. This supplier delivers the products to Kraft Heinz's warehouse using its own logistics provider. Therefore, it has included in its products' costs logistics and pallet costs as well. As described previously in this study, logistics costs have increased massively recently due to the disruptions in logistics networks, fuel and energy cost increases, and driver shortages. Thus, as expected, logistics and pallet costs are among the most affected for Supplier B. Furthermore, cartons and flexibles prices, as expected when looking at the global market, have

escalated. Also, for this supplier, fruits have highly impacted costs, particularly due to the massive increases of apricot and redcurrant prices, which are used a lot in these products.

Table 6. Supplier B product category impact

Category	2022 Budget	Average Price Increase	Impact
Cartons	€ 388,029.81	16%	€ 35,595.22
FA	€ 313,377.19	-32%	€ (119,792.95)
Flexible	€ 258,732.13	12%	€ 27,660.84
Fruits	€ 1,492,588.69	32%	€ 369,428.14
Injection Molding	€ 400,567.17	8%	€ 32,373.65
Logistics	€ 197,069.86	10%	€ 17,915.44
Pallet	€ 74,253.96	46%	€ 20,617.48
Sweeteners	€ 624,983.09	17%	€ 46,442.11
Grand Total	**€ 5,634,044.19**	**9%**	**€ 430,239.92**

Supplier B has also shared the data for its conversion cost. As easily noticeable in Figure 21 below, Supplier B's conversion cost did not increase in 2022. The reason for this, is Kraft Heinz's contract with the supplier prevents them from increasing this cost. Therefore, despite the high spend, there will be no impact.

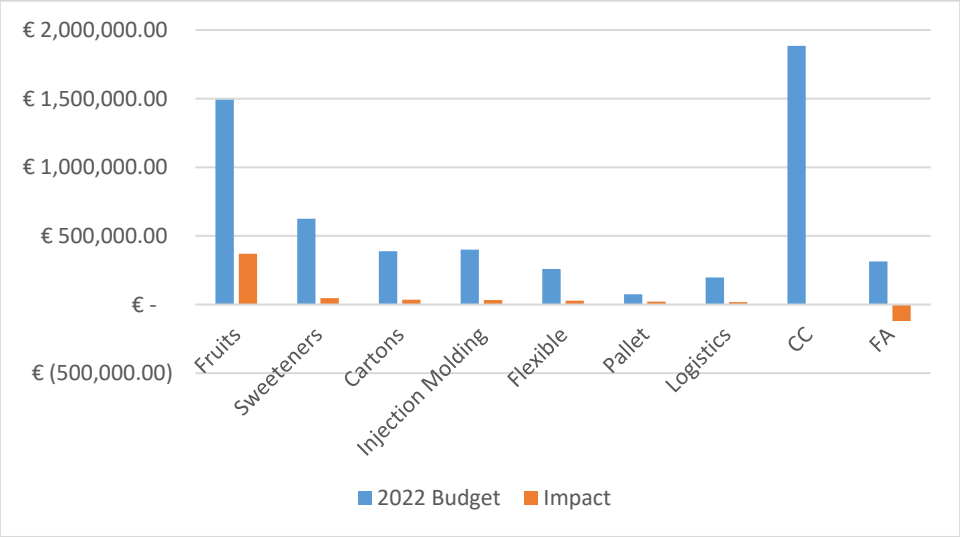


Figure 21. Supplier B spend and impact per product category

Costs with Supplier C were mostly impacted by price increases in plastic and oil, as seen in Table 7. The latest is mostly driven by price increases in palm oil and rapeseed oil, which are used in abundance in these products. As expected, cocoa, corrugated, dairy and flexible prices are also driving a big on-cost to this portfolio. For these reasons, the price increases brought on by Supplier C have had the highest impact on the company of all six suppliers from this portfolio.

Table 7. Supplier C product category impact

Category	2022 Budget	Average Price Increase	Impact
Cocoa	€ 416,292.97	10%	€ 38,679.66
Corrugated	€ 31,088.11	14%	€ 3,913.19
Dairy	€ 208,825.11	15%	€ 30,659.95
FA	€ 46,792.28	-7%	€ (2,163.94)
Flexible	€ 212,867.82	17%	€ 26,786.02
Glass	€ 288,813.64	-8%	€ (25,074.32)
Injection Molding	€ 347,375.98	31%	€ 98,635.44
Labels	€ 42,198.26	6%	€ 4,753.19
Oil	€ 852,499.95	46%	€ 271,862.61
Others	€ 34,659.89	0%	€ -
Sweeteners	€ 420,024.67	7%	€ 19,505.05
Grand Total	**€ 4,239,749.41**	**14%**	**€ 500,453.28**

Supplier C, as Supplier B, has also shared its conversion cost data. However, Kraft Heinz's contract with Supplier C does not prevent the supplier from increasing its conversion cost for the following year. In Figure 22, we can see that the increase in conversion cost had the fourth highest impact on the portfolio, since despite the small increase, conversion cost represents a huge part of the total spend.

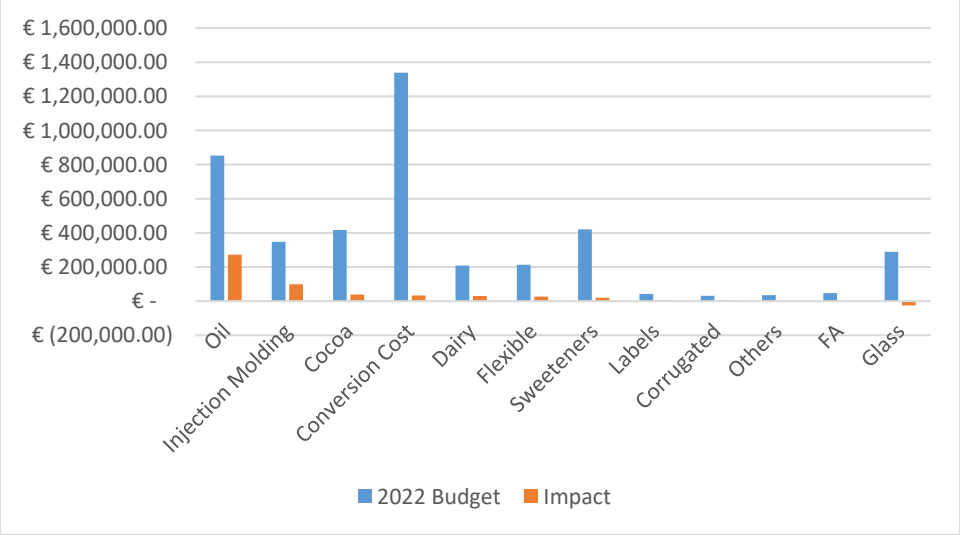


Figure 22. Supplier C spend and impact per product category

For Supplier D, Kraft Heinz supplies most of the ingredients itself to produce the final product. For this reason, the ingredients' line seen in Table 8, is only relevant for 2 out of 13 products produced by this supplier. As we can see in the table, carton, corrugated and flexible materials have suffered huge price increases, which follows the same pattern as the other suppliers and the markets worldwide.

Table 8. Supplier D product category impact

Category	2022 Budget	Average Price Increase	Impact
Cartons	€ 571,810.78	22%	€ 114,529.29
Corrugated	€ 186,627.41	32%	€ 48,562.81
Flexible	€ 58,006.16	20%	€ 9,347.03
Ingredients	€ 1,105,713.32	11%	€ 103,199.81
Grand Total	**€ 1,922,157.66**	**16%**	**€ 275,638.95**

In Figure 23, we can notice packaging materials had a tremendous impact on Supplier D's portfolio. Although the annual spend with the ingredients the supplier is purchasing is higher than with packaging, the impact of carton price increases alone is bigger than the ingredients impact. Once again, this is in line with current market disruptions seen across the world.

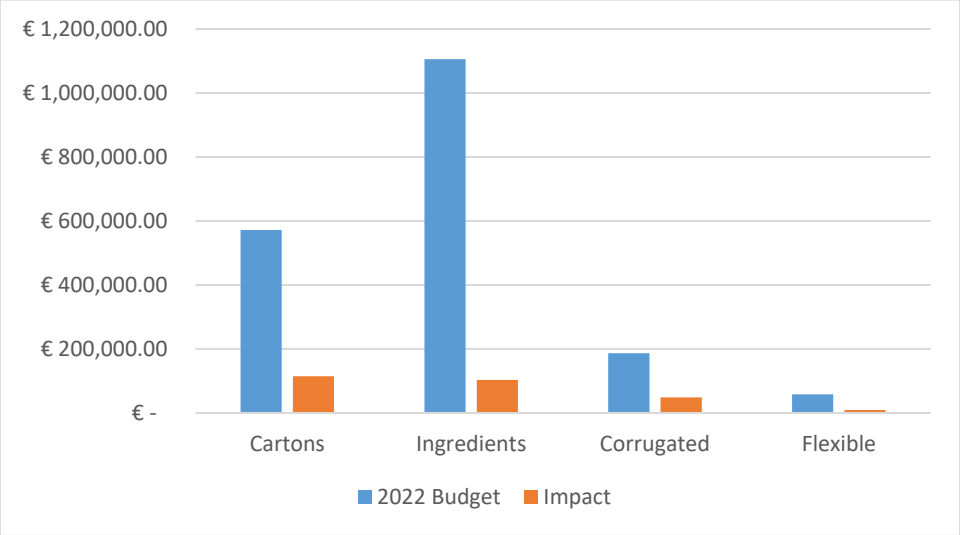


Figure 23. Supplier D spend and impact per product category

Supplier E does not share the cost data per component of each of its products, due to company policies. Therefore, it is only possible to analyze the split between Ingredients, Packaging and Conversion Cost. As we can see in Table 9, the impact coming from Supplier E was low.

Table 9. Supplier E product category impact

Category	2022 Budget	Average Price Increase	Impact
Conversion Cost	€ 12,013.63	1%	€ 77.80
Ingredients	€ 631,347.49	5%	€ 28,595.02
Packaging	€ 348,372.21	5%	€ 15,772.58
Grand Total	**€ 991,733.33**	**4%**	**€ 44,445.39**

For this supplier, it is not interesting to analyze the column graphic, as it is not possible to see which material categories are bringing the biggest impact to the portfolio.

Supplier F is Kraft Heinz's supplier with the lowest annual spend from this portfolio. As seen in Table 10, Supplier F's price increases follow the same pattern as the increases seen for the other five suppliers. Also, for this supplier there is a big impact coming from sweeteners, which for these products is honey. This could be expected, as global honey prices are at the highest level in years, due to a wave of consumer demand for natural sweeteners and declining bee populations.

Table 10. Supplier F product category impact

Category	2022 Budget	Average Price Increase	Impact
Corrugated	€ 29,239.60	27%	€ 6,201.64
Flexible	€ 52,237.92	10%	€ 4,754.82
Fruits	€ 68,372.65	7%	€ 5,391.91
Injection Molding	€ 44,371.15	21%	€ 7,716.72
Nuts	€ 118,644.62	6%	€ 7,062.18
Sweeteners	€ 216,376.13	23%	€ 39,742.55
Grand Total	**€ 529,242.07**	**18%**	**€ 70,869.83**

Although Supplier F has the lowest annual spend, it has the highest 2022 relative impact. As seen in Figure 24, this occurs not only due to the price increases in sweeteners, which represent the biggest percentage of the total spend, but also due to the increases in packaging material prices, as seen in the other suppliers' portfolios. Despite representing a small piece of the spend, injection molding and corrugated materials, amount for a huge portion of the total 2022 impact on the portfolio.

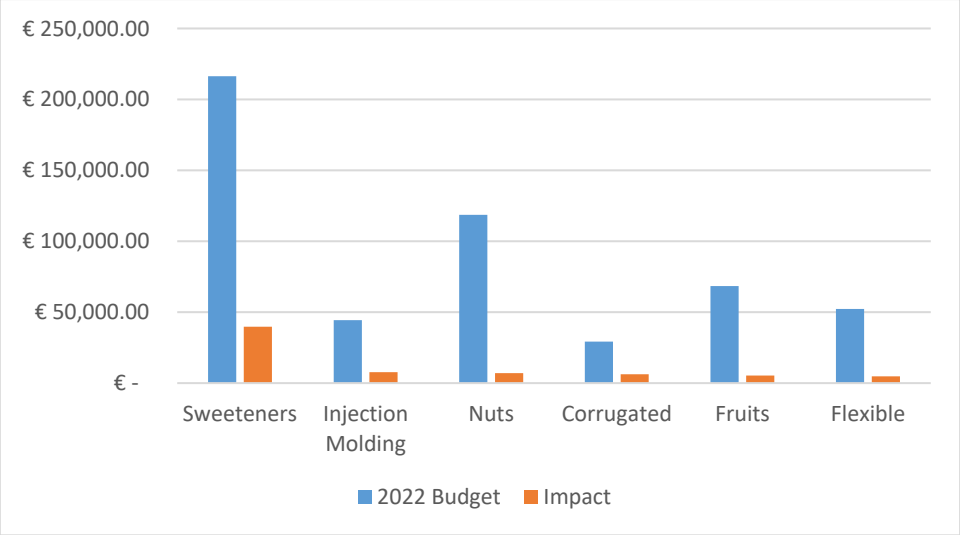


Figure 24. Supplier F spend and impact per product category

In Table 11, we can see the split of the total spend with all suppliers from Kraft Heinz's Drinks & Brunch External Manufacturing portfolio. As expected from the analysis so far, the material categories with the biggest impact were carton, corrugated and injection molding in regard to packaging materials, and fruits, oil and sweeteners in regards to ingredients.

Table 11. Total portfolio product category impact

Category	2022 Budget	Average Price Increase	Impact
Blow Molding	€ 48,713.52	28%	€ 10,556.92
Cartons	€ 1,883,306.43	17%	€ 305,482.09
Cocoa	€ 976,206.66	9%	€ 58,628.29
Corrugated	€ 433,142.62	24%	€ 91,824.10
Cotton	€ 2,197.96	0%	€ -
Dairy	€ 208,825.11	15%	€ 30,659.95
FA	€ 600,063.90	-13%	€ (112,247.56)
Flexible	€ 804,528.63	13%	€ 68,548.71
Fruits	€ 1,764,060.65	19%	€ 338,687.60
Glass	€ 288,813.64	-8%	€ (25,074.32)
Injection Molding	€ 834,108.54	16%	€ 142,286.06
Labels	€ 42,198.26	6%	€ 4,753.19
Metals	€ 1,190.23	17%	€ 173.15
Nuts	€ 118,644.62	6%	€ 7,062.18
Oil	€ 893,484.43	48%	€ 288,453.58
Others	€ 34,659.89	0%	€ -
Processed grains	€ 574,515.87	7%	€ 28,229.56
Sweeteners	€ 1,310,220.66	13%	€ 106,112.38
Grand Total	**€ 10,818,881.63**	**12%**	**€ 1,344,135.87**

In Figure 25, we can see once again, certain materials with average portions of the total 2022 budget, like oil or corrugated packaging, have a massive portion of the impact in the same year.

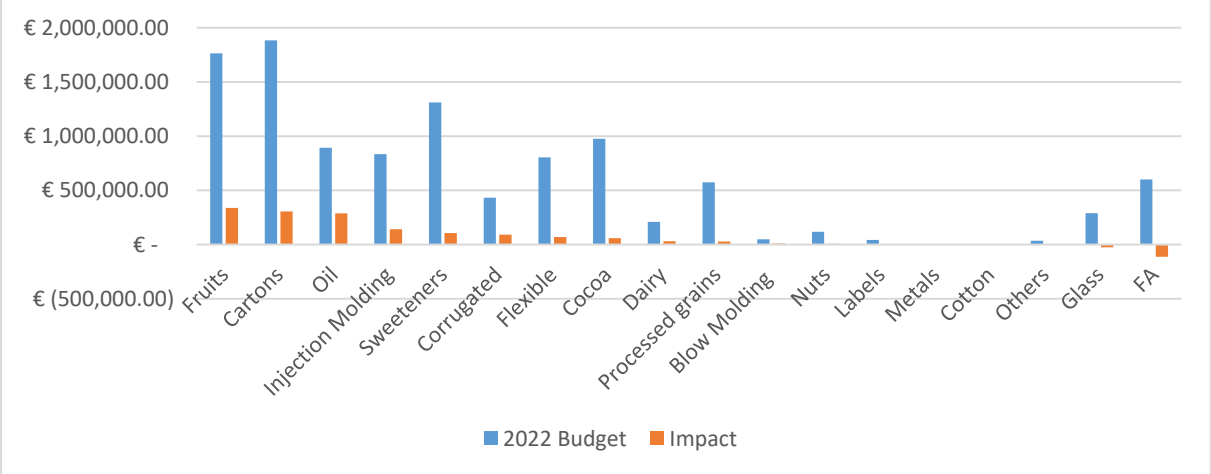


Figure 25. Total portfolio spend and impact per product category

As for Supplier A, the different material categories were categorized using an ABC analysis for a further analysis of the impact of price increases on the total portfolio. As seen in Table 12, four materials were identified as type “A”, five materials as type “B” and nine as type “C”. Items A together represent only 22% of the total number of materials, but 55% of the total spend. Items B represent 28% of the total number of materials and 33% of the spend. Lastly, items C represent 50% of the total number of

materials, but only 12% of the spend. The percentage split between items is quite different from Supplier A's. As the distribution is more even, items A represent a much smaller portion of the total spend.

Table 12. Total portfolio ABC analysis

Item classification	Number of categories	% of categories	Amount spent (consumption)	% consumption	Impact	Impact %
A	4	22%	€ 5,933,794	55%	€ 808,910	57%
B	5	28%	€ 3,565,328	33%	€ 478,865	34%
C	9	50%	€ 817,499.02	12%	€ 127,024	9%

Once again, as the distribution of the total spend is more even, items A have less impact than in the Supplier A only analysis, but still have the biggest impact in the portfolio, amounting for almost 60% of the total impact. As seen in Figure 26, for the total portfolio, since it is a bigger sample with more categories, items B have the second highest impact, represent by the middle circle,, and items C the lowest, represent by the smallest circle, while before we had seen that for Supplier A this was not the case.

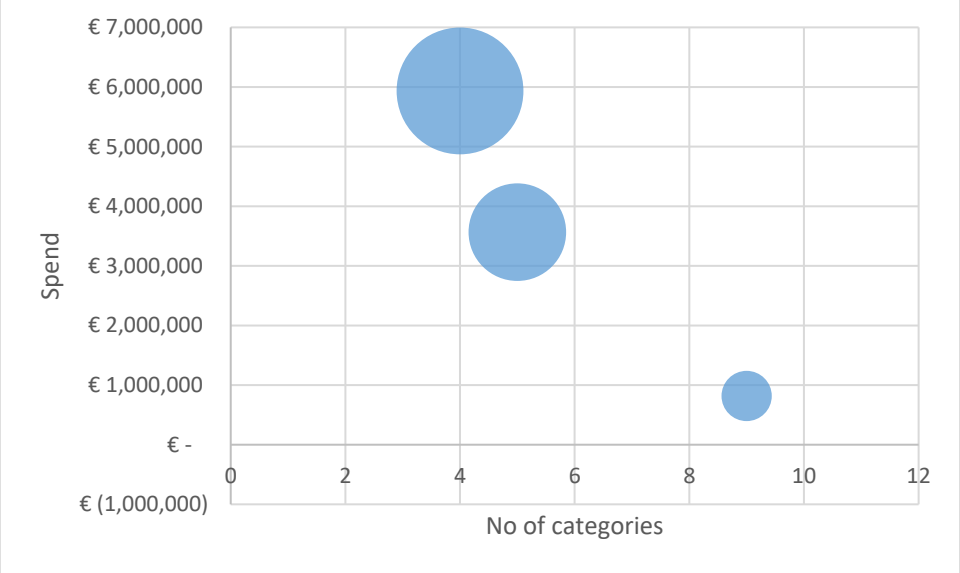


Figure 26. Total portfolio spend and impact per item type (ABC analysis)

As described in a report by McKinsey & Company, when considering market conditions, should-cost models and other fact-based techniques can determine whether a price rise is reasonable. Even while costs are rising for numerous commodities, these costs still make up a small portion of overall costs. Buyers can ultimately employ fact-based studies to start conversations about particular areas of increase, with evidence needed to support a price rise. Alternatives might be available to reduce the impact of a cost increase even if it seems inevitable in the current market and is supported by credible facts. If all else fails, reevaluating a vendor matrix and looking into ways to work with additional suppliers can be very successful. A strategic review might help uncover nonincumbent suppliers or suppliers for other areas who might be able to deliver better price or service, even if this procedure won't be as quick.

By investigating both short- and long-term commercial and technical levers, buyers can get ready for discussions. Alternatives may still be available to reduce the impact of the cost rise on the category even if a price increase looks inevitable in the current market and is supported by realistic, supplier-provided data (Ibáñez, Rugamas, Kuehl, & Kohli, 2022).

As previously mentioned in the literature of Chapter 3 and will be reinforced several times throughout this chapter, buying stock in advance of a material whose price is volatile and/or expected to increase can be a solid option to mitigate the risk of both a cost impact and a supply constraint. Long-term suppliers with high value contracts might even be willing to lock prices without shipping the materials to the customer, which does not translate into any extra storage costs. However, for the purpose of studying the feasibility of purchasing stock in advance, we will exclude this option and run an analysis considering the company would have to store the goods.

Kraft Heinz will continue to serve as our case study. As seen from the analysis done above, prices of carton and corrugated packaging materials were highly impacted. Therefore, we will use these as an example and evaluate the feasibility of purchasing a high amount of carton and corrugated packaging for one of the company's best-selling SKUs in the Netherlands, to mitigate the risk of high volatility in 2023. For this analysis of product X, we will take the below assumptions:

- The SKU is a case with 20 units – the SKU will have 1 corrugated box and 20 carton boxes
- 1 pallet of carton boxes can transport 1000 boxes
- 1 pallet of corrugated boxes can transport 200 boxes
- The corrugated box costs 20 cents and each carton box costs 10 cents, both including scraps

The demand planning team expects sales volumes for 2023 to be 300 thousand cases, which amounts for 6 million units. The packaging procurement team expects the prices of corrugated and carton boxes to increase 25% in 2023. Table 13 shows how much the price impact will be in 2023 if no action is taken.

Table 13. Impact of 2023 price increases in the packaging materials of product X

Product ID	Component Description	Quantity per 1,000 cases	2022 price	Volume 2023 (cases)	2022 spend	Expected price increase	Impact
X	Corrugated Box	1,000	€ 0.50	300,000	€ 150,000	25%	€ 37,500
X	Carton box	20,000	€ 0.25	300,000	€ 1,500,000	25%	€ 375,000

The sales volumes are assumed to be equally distributed throughout the year. The storage fee for 2023 is € 1.50 per pallet per week. In Table 14 we can see the storage levels for both types of packaging throughout the year in pallets.

Table 14. Storage levels of packaging materials of product X

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
Corrugated Box	1.500	1.375	1.250	1.125	1.000	875	750	625	500	375	250	125
Carton box	6.000	5.500	5.000	4.500	4.000	3.500	3.000	2.500	2.000	1.500	1.000	500

In these conditions, if Kraft Heinz would take the decision to purchase the packaging materials now and store them throughout 2023, the company would lose 21 thousand euros on the corrugated boxes and would save 141 thousand euros on the carton boxes. Therefore, in these conditions, the ketch up company should only take the approach of purchasing stock in advance for the carton boxes of Product X.

For further analysis, a sensitivity analysis was done using two variables – price increase of the packaging material and 2023 sales volumes, for both corrugated and carton boxes. In Table 15, we can see that for carton boxes the price increase in 2023 needs to be at least close to 20% for the strategy of purchasing stock and store it to be sued throughout 2023 to be feasible. If the price increase of the material is higher than 20%, an increase in sales volumes will lead to higher savings.

Table 15. Sensitivity analysis Carton

		Price increase Carton						
	€ 141.000	5%	10%	15%	20%	25%	30%	35%
Volume	100.000	- 53.000 €	- 28.000 €	- 3.000 €	22.000 €	47.000 €	72.000 €	97.000 €
	150.000	- 79.500 €	- 42.000 €	- 4.500 €	33.000 €	70.500 €	108.000 €	145.500 €
	200.000	- 106.000 €	- 56.000 €	- 6.000 €	44.000 €	94.000 €	144.000 €	194.000 €
	250.000	- 132.500 €	- 70.000 €	- 7.500 €	55.000 €	117.500 €	180.000 €	242.500 €
	300.000	- 159.000 €	- 84.000 €	- 9.000 €	66.000 €	141.000 €	216.000 €	291.000 €
	350.000	- 185.500 €	- 98.000 €	- 10.500 €	77.000 €	164.500 €	252.000 €	339.500 €
	400.000	- 212.000 €	- 112.000 €	- 12.000 €	88.000 €	188.000 €	288.000 €	388.000 €
	450.000	- 238.500 €	- 126.000 €	- 13.500 €	99.000 €	211.500 €	324.000 €	436.500 €
	500.000	- 265.000 €	- 140.000 €	- 15.000 €	110.000 €	235.000 €	360.000 €	485.000 €

From Table 16, it is possible to see that for the corrugated boxes, even if the price increase in 2023 is 35%, it is still not worth it to buy the stock in advance and store it, as this will still lead to extra costs for the company.

Table 16. Sensitivity analysis Corrugated

		Price increase Corrugated						
	€ (21.000)	5%	10%	15%	20%	25%	30%	35%
Volume	100.000	€ -17.000	€ -14.500	€ -12.000	€ -9.500	€ -7.000	€ -4.500	€ -2.000
	150.000	€ -25.500	€ -21.750	€ -18.000	€ -14.250	€ -10.500	€ -6.750	€ -3.000
	200.000	€ -34.000	€ -29.000	€ -24.000	€ -19.000	€ -14.000	€ -9.000	€ -4.000
	250.000	€ -42.500	€ -36.250	€ -30.000	€ -23.750	€ -17.500	€ -11.250	€ -5.000
	300.000	€ -51.000	€ -43.500	€ -36.000	€ -28.500	€ -21.000	€ -13.500	€ -6.000
	350.000	€ -59.500	€ -50.750	€ -42.000	€ -33.250	€ -24.500	€ -15.750	€ -7.000
	400.000	€ -68.000	€ -58.000	€ -48.000	€ -38.000	€ -28.000	€ -18.000	€ -8.000
	450.000	€ -76.500	€ -65.250	€ -54.000	€ -42.750	€ -31.500	€ -20.250	€ -9.000
	500.000	€ -85.000	€ -72.500	€ -60.000	€ -47.500	€ -35.000	€ -22.500	€ -10.000

This analysis provides a clear example of how consumer goods companies like Kraft Heinz can leverage different strategies to reduce the impact of inflation on their costs. There are different approaches a company can take in order to mitigate risks in situations of high inflation. As mentioned in chapter 3, accelerating value engineering and modifying batch sizes or order frequency are other two defensive, technical levers to combat inflation. Another potential medium-term technological lever that can help enhance resilience is reducing SKUs or high-cost features and qualities by altering specifications. Consumer goods companies many times have different SKUs for the same product, for example, for a different number of units per case. Reducing the number of SKUs can concentrate sales in the most important SKUs. This can lead to the reduction of manufacturing costs, since it is possible to have less changes in the factory lines, as well as the costs of the raw materials, since it is possible to have bigger

volumes of the same packaging, for example. Depending on the industry, optimizing supplier footprints for better control over logistics, cost, tariffs, and inventories are alternatives to combat volatility in the short-to-medium term. Strategic suppliers can be selected and an analysis can be done on their logistics and raw material costs to evaluate whether there are any synergies between customer and supplier which can lead to cost reductions.

5.2. Interviews

As mentioned earlier in this paper, two important interviews were conducted to further understand how the events described previously have really affected supply chains, particularly for FMCG's as The Kraft Heinz Company. Both interviews were done and recorded through Microsoft Teams. In the annex of this paper, you can find the full transcript of the interviews.

The interviews will be broken down in chronological order. The first interviewee was Stuart Alldridge. Stuart is the current Strategic Project Manager for Northern Europe Logistics at Kraft Heinz. For your reference, there are two Kraft Heinz Business Units included in Northern Europe – UK&I (United Kingdom and Ireland) and the Nordics (Denmark, Sweden, and Finland), where the UK is the biggest KHC market in Europe. Stuart has been with Kraft Heinz for 25 years. Over time he has alternated between Operations and Projects functions. He has been Head of Physical Distribution, Transition manager for the Heinz's NDC, and was involved in procuring transportation and warehousing contracts, before the Procurement Logistics team was introduced at the Supply Chain Hub, in Amsterdam. Therefore, he has a deep understanding of Heinz's operation in Northern Europe and how internal and external demand and supply shocks can affect this operation.

After Stuart formally introduced himself, he gave his perspective on how the pandemic and the consequent lockdowns impacted Kraft Heinz, as well as other companies. In Mr. Alldridge's opinion, the first 4-to-5-week period when Covid hit was critical, as the uncertainty was high. Sales tripled for products like Heinz beans, and the supply was not enough to meet the demand. As countries implemented lockdowns and other measures to control the spread of COVID-19, consumers throughout the world stored up on basic necessities, particularly pulses. Particularly dry beans flew off the store shelves. According to Nielsen data for the week ending March 14, 2020, retail sales of dry beans and chickpeas increased by 230% and 157%, respectively, in the United States. It was critical do get the most manpower and dispatch as many pallets as fast as possible. Heinz did very close to record weeks, 4 weeks in a row, right at the start of the pandemic, in terms of pallet dispatches. As the pandemic evolved, several employees got sick. The sick rate went as high as 10% in the worse weeks. Therefore, contingency plans had to be put in place. At the beginning of the pandemic costs were still low, particularly as employees that worked for industries that stopped due to the lockdowns, were now available to work for the industries where demand had massively increased. Drivers are the best example of this. Overall, in this first stage the main strategy applied was to work closely with the retailers to try and deliver the most essential SKUs in the fastest way possible.

The second stage of the pandemic, particularly in the UK, according to Stuart, started late 2020 with Brexit. In the Logistics area particularly, this was firstly felt by the lack of heavy goods vehicle drivers. The UK as whole was missing around 100,000 drivers. Brexit contributed for about a third of this lack of supply. The Road Haulage Association (RHA) conducted a poll to determine the number of drivers needed. The RHA previously attributed the lack of drivers to a variety of problems. It said that previous issues with hiring, work-life balance, and the high expense of training were all to blame. It also said that the pandemic had an effect and that many Eastern European drivers had returned home as a result of Brexit (Miskin, 2021). Truck driver openings in Europe rose by 41% in 2021 compared to 2020. It is noteworthy that in 2021, the UK (80,000–100,000), Poland (80,000), Romania (71,000), and Germany (57–80,000) all experienced the worst driver shortages (measured in absolute numbers) (Zsofia, 2022). When lockdowns started to drop and the economic activity started to increase, the demand for moving consumer goods around increased, as it was already mentioned various times throughout this paper. In the summer of 2021, due to this lack of drivers, Kraft Heinz struggled to meet customer service targets. Supplier W, our transport provider for the UK&I, was calling *force majure* and not respecting our contractual prices, since they could not find drivers whilst respecting these prices. As Heinz was leaving close to a million dollars a day behind at the NDC, the team quickly realized it had to pay whatever it took to distribute the products. So, for several months until the end of 2022, Heinz was paying a 75% uplift on freight-to-customer transportation. After Christmas 2021, the market got a bit better, with more drivers available, particularly due to the 30% increase in driver's wages.

In 2022, another massive event disturbed logistics costs once again. Russia's invasion of Ukraine led to fuel prices skyrocketing. Kraft Heinz transportation contracts work with a fuel floater mechanism, which means we pay or are credited according to fuel price variations. Therefore, Heinz passed from the usual 1 to 2% credit to a 10% monthly on cost. Furthermore, the same happened with energy. As Wincanton operates Kraft Heinz' NDC, all energy costs are passed on to us. Heinz was looking at 30 to 40% increased costs in energy at the warehouse, particularly due to the massive gas price increase. At one point, the price of oil surged to $139 per barrel, the highest level in nearly 14 years, while the wholesale price of gas for next-day delivery more than doubled (BBC, 2022).

As Covid, Brexit and the Ukraine war came with very little gaps in between, Kraft Heinz's strategy was always the same – to bring the best service possible. Although the situation is now slowly improving, we are still not back to the buying model we had pre-covid, and as the future is uncertain, it can still take some time until this is a possibility again. In Stuart's opinion there were areas where Kraft Heinz could have done a better job. As the UK's NDC is an automated warehouse, programmed to get less 1% loads back, greedy plans to load too much as quickly as possible became a problem, as almost 10% of loads were coming back since no truck was available. Therefore, Heinz had to put a cap on transportation and let the warehouse recover. Furthermore, the consumer goods company trusted fully in its partner, Supplier W, since they are one of the largest logistics companies in the UK. However, they quickly realized that the problem was too deep and that even with the support of Supplier W things would still not go as planned.

Adverse situations create opportunities to get ahead of the competition. Projects that were not interesting before, since the UK warehouse is automated and deliveries are 85% full loads, can now be interesting, as the base cost went up. Fuel and electricity price increases can create opportunities for projects that were not relevant before. Options as railways, direct deliveries from factories, new warehouses, and other network redesigns become more and more interesting for the Business. As Stuart said, “it changes the potential root to market, and it changes the footprint.

Overall, considering Heinz’s demand increases, Stuart is happy with its performance during Covid, as it is seen by his quote – “I would say that for warehousing I am very proud in terms of what we did from an outbound perspective. There have been challenges all the way through, but I think we are in control. In transportation I think there is still a bit more work to do.”

Stuart’s take on the development of the impact of government-imposed lockdowns, topped with Brexit and Russia’s invasion of Ukraine gives us a deep insight into Kraft Heinz’s situation during this tough period from a logistics perspective. It draws a clear image on the problems Heinz logistics team had to deal daily, and how critical the situation was.

The second interviewee was Cristina Pires Pedroso. Cristina is the External Manufacturing Lead for the Better Meals category, which represents around $100 million yearly spend, and between 20 and 30 different external manufacturers with over 1000 SKUs. She is responsible for the relationship with these companies, as well as all contracts and negotiations involved. Furthermore, she manages projects with these same companies to drive savings and innovation. Therefore, her take on the same subject will be from a different perspective. However, it overlaps with the logistics’ point of view on various points.

Cristina splits the impact of lockdowns on prices in two parts. The first part is the direct impact on the supplier, which is the impact on the conversion cost. The energy increases and the lack of labor in the market were the two main factors driving this. The second part is the indirect impact on ingredients and packaging. As most of Kraft Heinz agreements with external manufacturers are based on open books, which means ingredients and packaging are paid according to the market price, suppliers do not suffer in case the cost goes up, since it passes on directly to Kraft Heinz. Cristina mentioned that the main issue was not only the cost increase, but also the availability in the market, since without the goods available, the supplier cannot produce and Kraft Heinz cannot sell, which brings a big sales loss to the company and risks the loss of shelf space to other competitors. Supply chain disruptions have coincided with the unanticipated increase in consumer goods demand. Unusual during an economic slump, the jump in goods demand caught many suppliers off guard, and they soon found themselves pressed for time to meet demand. As a result of this uptick, production of consumer goods was slowed down due to shortages in essential resources (Remes & Kohli, 2021). From a price perspective, her biggest supplier, which represents 50% of the portfolio, had a cost increase of over 10% this year on ingredients and packaging alone, which is a big hit on the company’s budget. On top of that, the service level of this same supplier has been very low, due to the lack of labor and late ingredient deliveries, which consequently delay production and delivery to KHC. According to a research by the British Chambers of Commerce (BCC), 90% of manufacturers and 75% of businesses with more than 50 employees had a shortage of skilled workers in their own business or those in their supply chain.

Regarding the strategies put in place, Cristina mentioned Kraft Heinz was lucky with the way we work with External manufacturers. As Heinz books ingredients and packaging stock in advance, it locks a price for a certain material. This means that if the market price goes down the company loses possible profit, but if there is a lack of that same material in the market and the price goes up the company is not only safe from the hit, but also guarantees the delivery of that stock on time.

The war in Ukraine is where the external manufacturing point of view differs the most from the logistics point of view. The electricity and fuel increases don't make as big of an impact on the external manufacturing business as they do on the logistics business. Although they did see some lack of labor originated by the war, ingredients and packaging used by Heinz are not coming from either country.

Regarding the KHC Procurement team's performance, Cristina said the team is great and it has done a good job. At the beginning the company thought the inflation was coming from a bad Procurement strategy, but quickly realized it was a massive market problem. When comparing the work done by KHC versus the market, she believes we managed to offset the extra costs much more than most competitors.

Cristina's insight on how Kraft Heinz and its external manufacturing suppliers were impacted by the lockdowns and consequent inflationary pressures is unique and provides a clear picture on the main issues the company has faced. As mentioned earlier in this paper, the availability of certain materials caused big issues for consumer goods companies and consequently raised prices which are still affecting these companies today. Procurement teams throughout the industry have been working hard to offset these costs through innovation and continuous improvement. By leveraging new opportunities companies like Kraft Heinz can try to improve their market position and get ahead of their top competitors.

5.3. SWOT Analysis

Assessing Kraft Heinz's post Covid competitive position through a SWOT analysis helps understand, not only the impact of the pandemic on the company, but also what can be done to reduce this impact and leverage on the opportunities that may arise from the situation. All the factors discussed so far in this paper, as well as the cost analysis and interviews done can help build a clear picture of the current state of The Kraft Heinz Company in the market.

Figure 27 is Kraft Heinz' SWOT analysis. As any analysis of this type, it is split into four quadrants – Strengths, Weaknesses, Opportunities and Threats.

Figure 27. Kraft Hein SWOT Analysis 2022

Kraft Heinz has powerful Strengths, which make it a tough competitor in its most relevant markets. It has a strong and diverse team, not only in Procurement, but also across all other functions. The diversion and the strength allow the team to thrive by sharing new ideas and collaborating to make these happen. Furthermore, the ketch up company is known for its good service level, measured by its on-time deliveries, product conditions and other KPIs agreed with customers. It has good partnerships with global logistics suppliers with strong networks. On top of that, its partnerships with suppliers allow the company to stay competitive through innovative solutions.

As any other company, Heinz also has some Weaknesses. Since, it is a huge multinational, with thousands of different roles across the zones, the job rotation occurs fast. Although this is positive for its employees' carriers and to bring new ideas to the table, it can generate a lack of knowledge in critical positions, which can hurt the company. Additionally, despite the collaboration within each function being exceptional, the cross-functional one is not as strong. This can generate de-alignments between the goals of each function, which can lead to some critical problems. An example easy to understand is when the commercial teams do not cooperate with the procurement teams. If this happens, the procurement team is not able to make the right purchase to deliver the results the commercial team requires to bring value to their customers. Lastly, like any big company, Kraft Heinz incurs a lot of extra costs not predicted. Having a good visibility of the reasons behind these costs is crucial to avoid them in the future, which is an area where the company needs improvement.

As mentioned earlier in this paper, critical situations like the one consumer goods companies are living now create opportunities. The huge impacts material availability and prices caused by the lockdowns, and later the war, brought to the surface different ways to get ahead of the competition. The simplest of these Opportunities is the major need for new ideas, which consequently drives companies like Heinz to be bolder and give a shot to ideas previously considered risky. Another massive opportunity was described sharply by Stuart Alldridge in the first interview done in this research. As Stuart mentioned, critical market situations can bring old project ideas back to life. Projects that were not interesting when

specific costs were low can become extremely interesting once these costs go up. For example, railway deliveries become much more interesting if the fuel cost is very high. Additionally, not only old ideas can become more interesting, but also new ideas can arise from extreme circumstances. New problems require new solutions, and the first to discover these new solutions will benefit the most. As times of war bring people together, critical market situations bring the different players in the supply chain closer as well. Customers and suppliers closely to thrive together, which shines light on the partnerships and gives birth the further collaboration. Furthermore, the last couple of years have pushed the world to give more and more importance to sustainability. Sustainable solutions are still a recent subject on companies' to-do lists. Therefore, as they have not been explored for long, they are full of new opportunities. As consumers turn to more sustainable options, Kraft Heinz can leverage on this thirst and be the first to offer some of these options and be able to claim them through strong marketing strategies. Lastly, the lockdowns of the past years have pushed the world into a fast-paced digitalization. This means consumers are looking for new ways to buy. Achieving the easiest, fastest and most interactive solutions for consumer needs can further increase or even bring new revenue to the company.

The threats posed by the severe market changes of the last few years have been vastly described multiple times throughout this paper. Cristina Pedroso, in the second interview done in this research has given good examples of the negative effects to the company caused by the lack of labor in the market and availability of certain materials. This is currently still a threat Heinz is dealing with on a daily basis, which is putting huge pressure on the procurement teams across the world. As described earlier in this paper, the short supply of materials is causing massive inflationary pressures and driving prices through the roof. Among these are energy and fuel prices, drastically worsened by the sanctions put on Russia after its invasion of Ukraine. Additionally, as mentioned before, the world is giving a huge importance to climate impact. Environmental regulations imposed by governments are not only taxing manufacturers, but also causing decreases in production output. Although these threats are serious and can cause damage to Kraft Heinz and other consumer goods companies, these are also the reason the opportunities described in the previous paragraph exist. Markets are unstable, but companies can use this to their own benefit by grabbing opportunities quicker than others.

Conclusions

To wrap up, we will list the conclusions that can be taken from the application of the methodologies used in this study to the main problem – The impact of supply chain disruptions caused by the COVID-19 pandemic and the Ukraine war on inflation and its effect on consumer goods companies. Furthermore, answers to the critical questions presented in the objectives of the study (Chapter 1) will be given.

In the past two and a half years, the world has been experiencing extreme changes. In 2020, the government-imposed lockdowns to prevent the spread of the Covid-19 pandemic completely changed the consumer market. Despite the already ongoing change in consumer behavior, the lockdowns shifted consumers even more towards online purchases. People started investing in home improvements and increased massively their supermarket spend. On top of that, the lockdowns destroyed global logistics networks, due to closures in ports, lack of labor and changes in demand of certain sectors. In 2021, when the world started to open up, the demand increased massively, and the supply could not keep up. Consequently, the prices of raw materials suffered huge increases. In Europe, particularly in the UK, due to Brexit, the lack of heavy goods vehicle drivers was another critical factor, which combined with the increased demand, had a huge impact on companies. Driver salaries went up as high as 30% and still there weren't enough drivers. Consumer goods companies like The Kraft Heinz Company had a huge impact not only on their costs, but also on their service. Service level agreements with customers were not being met, which put at risk the name of the brand and even shelf space. Throughout 2021, prices continued to go up putting Procurement teams across the world on the spotlight. Although financial experts, as the ones in the European Central Bank, initially predicted inflation to fall during 2022, this could not have been further from reality. In 2022, prices kept going up and a new crisis arose in Europe. The sanctions imposed by European governments on the reduction of the purchase of gas, oil and coal from Russia after its invasion of Ukraine drove energy and fuel prices to all-time highs. Increased logistics cost increases were already an issue in 2021 and became even more critical in 2022. Manufacturing costs across different industries were highly impacted, as electricity prices went through the roof. Procurement teams in multinational consumer goods companies like Kraft Heinz are facing these issues head on and trying to come up with new initiatives to offset the impact of the inflation crisis. They can use analytics to get a better insight of the impact of inflation and come up with strategies to mitigate risks

As mentioned, several times during this study, the main cause of the present inflation and supply crisis were the lockdowns to fight the Covid-19 pandemic. They were the source of the supply chain disruptions, which led prices to escalate. There were also some natural causes, as bad crops, which contributed to the supply shortage of certain raw materials. This shortage coupled with the increased demand after the world opened in 2021 caused the prices of these materials to increase massively. Furthermore, there were certain local events, like Brexit in the UK, which aggravated the crisis further. Lastly, the sanctions imposed on Russia during the war in Ukraine by European governments gave birth to the energy and fuel crisis we are living today. All these factors together have put the world in an inflationary crisis never seen before.

As discussed in depth throughout this study, in the past two and a half years the logistics sector was one of the most impacted sectors, mostly due to labor shortages and the fuel crisis. The energy sector had already suffered in 2021, but reached new levels in 2022, with a high focus in Europe. The impact of these two sectors combined with price increases of certain commodities led the retail sector to suffer a huge impact as well.

FMCGs and other consumer goods companies across the world had to understand the main cost drivers impacting their portfolios. By doing this, Buyers can use fact-based studies to start conversations about certain areas of increase, with justification for a price rise required. Taking the example of the analysis done to the Kraft Heinz's Drinks & Brunch External Manufacturing portfolio, we could see the impact of the different commodities had on the total portfolio spend. Carton, corrugated, and injection molding materials suffered the biggest price increases among packaging materials. In the same line, fruits, oil and sweeteners had the biggest price increases from all ingredients in the portfolio.

As Stuart Alldridge mentioned in his interview, adverse situations bring new opportunities. Since the market has completely shifted, companies can leverage on these new opportunities not only by coming up with new ideas, but also by brining back old project ideas which did not make sense before. Projects that were not feasible when certain costs were low, can now be extremely interesting when the same costs are high. Intermodal solutions, for instance, are much more attractive with higher fuel prices, as their prices get more competitive. Furthermore, as times of war bring people together, critical market situations can bring the different players of a supply chain together as well. If the customer is successful, the supplier will be successful by extent. Therefore, collaboration with suppliers through strategic alignment, continuous improvement and innovation is a great example of how to leverage opportunities generated by the current crisis. In the past 2 and a half years, the world has moved towards sustainable solutions at a fast pace. There are hundreds of new sustainability initiatives in the market. Companies can leverage these solutions to get ahead of competition, as well as meet CO2 emission targets imposed by governments across the world.

As the current market is still highly unstable, companies need to prepare themselves for the future. Offsetting the impact of inflation through savings projects is a great way to prepare. However, although cutting costs during a crisis is beneficial, companies need to keep a long-term view, if they want to come out on top once the dust settles. Investments are still required to leverage opportunities like the ones mentioned in the paragraph above. Another great way to prepare for the future, is to try to lock prices for critical materials. As Cristina Pires Pedroso mentioned in her interview, the External Manufacturing had an easier time than other Procurement teams at Kraft Heinz because they booked ingredients and packaging stock in advance. This means that if the market price goes down the company loses possible profit, but if there is a lack of that same material in the market and the price goes up the company is not only safe from the hit, but also guarantees the delivery of that stock on time. In unstable markets like the one we have now, this is a great way to mitigate risks. A variety of sourcing and contracting strategies can be used by businesses to limit their exposure to additional expenses. Other strategies also include pass-through pricing and financial hedging.

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Annex

Interview Transcript

Stuart Alldridge (Strategic Project Manager Logistics)

Background and role at Kraft Heinz

“I have been with Kraft Heinz for 25 years. I have alternated between Operations and Projects. Currently, I am the Strategic Project Manager for Logistics Northern Europe. But have in the past been Head of Physical Distribution, Transition Manager for the NDC and have been involved in procuring transportation and warehousing contracts, before we created the center of excellence in the Hub in Amsterdam to do so. So yeah, I have got a reasonable understanding in terms of how the NDC operates and, how internal and external shocks, such as demand or supply, can give ourselves some interesting moments.”

Stuart’s point of view on how the pandemic restrictions affected Kraft Heinz operations

“I will give you the first 4 weeks, because I think it was absolutely critical in terms of what it did, how it tested immediately what we were doing, from a physical operations perspective, and then how it sort of set up some morning shots that we had in the future. Covid in the UK, and my experiences are in the UK, so I will talk about that. So, Covid in the UK really started to hit the public attention probably about late February 2020, leading to a full-scale lockdown on March 24th, 2020. So, I would say we had about a 4-to-5-week period where we had the “what’s gonna happen?”, “what are we gonna do?”, “what is the government gonna do?”, etc. And then we had a serious of stable products which were very difficult to get the demand for, and to understand what the supply effect would be and how we would deliver. So, for baked beans and various things like that the sales tripled. We were looking for 300% supply and we had the capability of probably doing about 150% to 170%. So, in the first stages we immediately had to try and get as many cans out of the building as we could, on an urgent basis. And that was trying to get as much manpower as we could, trying to maximize the working week, trying to turn pick pallets into full, and trying to get as much traffic transportation as we could. There were some elements of “name your price” in terms of procuring the transport providers as well for that. We did establish some record weeks in terms of pallet dispatches. I think we did very close to record weeks 4 weeks in a row, right at the start of the pandemic. Then, as the pandemic kicked in and people started catching it, etc. Our sick rate went from the usual 2% to 3% percent up to about 6% to 8%, and even 10% in the worse weeks, and that was across both the factory and the distribution center. So, we were trying to produce some contingency plans to say, for example “if we lost 10 people, this what we do”, “if we lost 20 people, this is what we do”, etc. And we kept going through the whole of the pandemic trying to put the best hygiene regime in place. You know plastic screens, single tables in cantines, handwash everywhere, temperature monitoring when you walked into buildings and things like that, and strict policies if you weren’t feeling well, etc. So, we did whatever we could to keep the place going both in the factory and in the NDC. So, in the early days, I think it created a demand

effect first of all. We then had to really work with our partners to get as much supply as we could, and that then started to become more and more finite. And that takes to end of the first phase which would be about 50% extra volume in March, 33% extra volume in April, and then sort of settled back towards budgetary position in May/June 2020."

In this first phase you were already seeing the huge in demand, but not yet the consequences on prices of not only gas, but also truck drivers, etc. Correct?

"That came later. So, we had a general macro-economic dampening of other demand. So, for instance, the building sector – finished. The restaurant and catering leisure sector – stopped. So, drivers who were probably filling Weather Spring pubs and David Lloyd gym centers, and whatever, were available. So, we didn't at that stage face any real pressure in terms of picking up the resources we needed on a temporary basis. That started to kick in I would say late 2020/early 2021."

Was there any specific strategy applied on this first stage?

"It was probably the first time in my career where we failed to meet the demand. So, the demand was 300% and we did 156%. And it was sort of an acceptance that in certain sectors doing the best you could and getting the most volume as you could out was a noble attempt and was appreciated. So, we worked very closely with the retailers, Tesco, Asda, Morrison's and Sainsburys in particular, to create as many loading outbound slots as we could, and to sustain as much of that demand as we could. We did things like SKU rationalization in a very large scale, so what we would do is instead of exchanging the production line so many times in the week, we would just make a big, long run of, for instance, beans and if someone wanted baked beans, they would order that EPN. We hardly did any re-pack, both from a label shortage perspective, because that was heavily manual, but also from a complexity perspective. So, we were doing those sorts of things to try and do the core very well with the least interventions as possible, and then really sort of reduce down the complex stuff."

Great! Let's then move on to the second stage of the pandemic effect.

"In the UK, right around the end of 2020 we had the exit from the European Union, and for our industry in particular it was most noticeable in the shortage of heavy goods vehicle drivers. So, we were looking somewhere between 90,000 and 100,000 drivers short, as an industry, in the UK. The Brexit situation contributed for about a third of that, about 25,000 to 30,000 European drivers went back to eastern Europe particularly. That coupled with lockdowns and Covid crisis started to then apply pressure in the heavy goods vehicle market. As lockdowns were removed and the economic activity started to increase, the demand for moving consumer goods around increased, and the supply just wasn't there. This started to really be noticeable June/July 2021. We got to a stage where we were struggling to meet 80% customer service for a number of months through the summer of 2021. And that just wasn't Kraft Heinz. We really struggled with the lack of drivers. Also, Wincanton, our LSP, had a contract that said, "you do this lane for this price any day of the week", and they couldn't do it. And it was mixture of environmental material change, so the drivers weren't there, it looked like force majeure type of thing in their minds. And if you're leaving half a million to a million dollars a day behind in your warehouse and causing no end of disruption and operational duress, then we came to the

conclusion very quickly that we had to pay what it takes to get out the door. And we were paying in Tier 2 Transportation about 75% uplift for a number of months. It settled back in early 2022 to 30/35%, but in September, October, November, December of 2021 our Tier 2 budgets were 175%. And then since Christmas, January the market got better a little bit. There are more drivers coming through in the UK, there is more training going on, held by probably a 30% increase in lori driver's wages. But it is still pretty tight.

Did you see this happening in the whole UK market?

"Yes, so the Wincanton model is a part core model with Wincanton employed drivers, and a semi-subcontract model where they are using Wincanton drivers from other networks, and about 40% to 50% will then be contracted subcontractors taking specific lanes."

How did the war in Ukraine influence logistics costs?

"Let's take vehicle fuel first. So, in the Wincanton contract, all their prices were based on the liter fuel costing 115 pence per liter, and, more often than not, we got a slight credit back. So, the price would be 108 or 112, something like that. Now, right about the time when the Ukraine war started, there has been an upward pressure, slow at first, and then probably April/ May it hit about 140 pence, and it is now approximately 148 pence, it is the last I have seen. So, that is something around 35% increase in fuel, something like that. So, instead of getting a 1 or 2% credit we are getting an 8 or 9% charge in our cost based on fuel, and I can't see it going down any time soon. Because the barrel is around 120 dollars, and it has held high for a very long time. In Covid times it was 20 and is now 120 dollars a barrel. The same is happening with energy. Wincanton operates the NDC, so whatever price they pay for gas and electricity they will then pass on to ourselves. I am not quite sure of the timeframe, but I know we have had increasing provisions in our account for energy. So, we are looking again at 30/40% increases in energy, particularly gas."

Did the war change the company's strategy aligned previously to fight inflation and the supply chain disruptions cause by Covid restrictions?

"Going from Covid, through Brexit, through the Ukraine war, etc., we have had very little gaps in between. We have been in a mindset to get service first. And then, once you have got the service in place and you have got the resources in place, try and structure the contracts that you have. So, for our new carrier 3T, we did a new auction with them, in March, and we now have got new rates for a certain period going forward. So, this is turning back into the traditional buying model rather than a help model. But every time we try and settle, the next thing happens, so we haven't been back to the buying model we were pre-covid."

In your opinion, is there anything we could have done better to tackle the situation?

"Yes, I think we could have done better. I think Wincanton certainly could have done better. We took the view that this was Britain's second or third largest logistics company, and if they didn't have any gravity and weight in the market than who would. But we still found out, probably too late, that the crisis was more difficult and deeper than we would ever imagine, particularly last summer. We were

paying double rates for certain lanes and still were not turning up. And the other thing that effect has had is we would assemble in an automated warehouse the load. The vehicle should have turned up at 10 o'clock in the morning – it didn't – what do you do with that load? An automated warehouse is very good at pushing the goods out and it is designed for less than 1% to come back. I was part of the design in 1998, haha that's how old it was. So, for every 100 out, you would get 0.5% coming back, for whatever reason. We were getting returns of 7 to 10%. So, we had to say: look, if the demand says we need to do 120, but our driver resource says we can only load 100, lets only have a plan for 100 and not for 105 or 110, because the only thing we will be doing is putting it back. Because what you need to do is make sure the warehouse doesn't then cause an ongoing transport problem, and then the transport doesn't cause an ongoing warehouse problem, into a vicious circle. So, we took the decision to cap the transportation, which gave the warehouse 2 weeks to recover, which it did. Ever since mid to late august the warehouse has outperformed the transport in terms of assembly and commitment and hitting the numbers."

Did this situation create opportunities to get ahead of competition, and how do you see our current market position?

"I would say that you always have projects in your cupped. Projects that maybe would not work if fuel were at 115 pence or less, but that might work if fuel were over 130, 140, 150 pence. You might be looking at some network designs – remodeling the network. You might be looking at factory directs. You might be looking at collaboration with other people. So, some of the ideas that we parked because we run a very efficient automated warehouse with 85% of our vehicles being full loads and going to one place. We were relatively efficient in the marketplace. Now that that cost base has gone up, we can start looking at things like railway, southern warehouses, Dutch warehouses, factory directs, etc. It changes the potential root to market, and it changes the footprint. And that is something we are working through now, to try and reset in the medium term some of these inflationary pressures.

I go to bed at night with a source of pride of what we did in Covid. We were a company that had a demand increase. There were companies that had demand decreases. We recorded some very impressive NSV delivery numbers. We beat the market expectations for 2 years running. We had a bad summer. The industry had a bad summer. I think we got out with the warehousing prices quicker than others. I think we are probably middle of the range in terms of transportation, and we still have some progress to make in procuring transportation and trying to get the cost base down over the next couple of quarters. So, I would say that for warehousing I am very proud in terms of what we did from an outbound perspective. There have been challenges all the way through, but I think we are in control. In transportation I think there is still a bit more work to do."

Cristina Pires Pedroso (External Manufacturing Lead Better Meals)

Background and role at Kraft Heinz

"Currently I am leading the category called Better Meals, which represents around $100Mio, around 20 to 30 External manufacturers, with over 1000 products. I am responsible for Procurement end to end, which means that all the supplier relationship management related to those EMs are under my

scope, negotiations as well. Also, project management of projects we have with them for Value Engineering purpose or innovation purpose. We have ESG projects going on. So, overall, all the contractual basis plus projects that we must do to keep the business moving forward."

How do you see Covid related lockdowns have affected prices, particularly last year while we were working together, and consequently Kraft Heinz?

"There are two things. One is what really impacts the external manufacturer, that is the conversion cost. We had a huge increase in energy, as you know. We started lacking labor in the market. So, for the direct effect for the cost of the external manufacturers those were the two main factors. Most of our agreements for ingredients and packaging are based on open books, which means that we pay according to the market price. So, my suppliers do not suffer in case the cost of ingredients or packaging goes up, because the full cost comes to Kraft Heinz. So, that is why I do not call that a direct effect to the EM, but direct to Kraft Heinz. For me more than the cost, the main issue was the availability in the market. For example, we started lacking oil, and it was not even a matter of how much oil is costing, but if we have oil. In my portfolio specifically, on my biggest EM, which represents 50% of the portfolio, I had more than 10% cost increase this year on ingredients and packaging, mainly driven by food additives. So, in terms of costs yes, we had a big hit.

I think we did quite a good job, because when we compare the work that we have done versus the market, I really believe that we managed to offset much more than many of our competitors, but from the availability perspective we are still suffering. On my biggest supplier, I am suffering on service since February this year. We are not recovering the service, purely because we don't have people to go to work and there are also many delays on the delivery of the ingredients."

You actually already kind of covered a part of my next question, which is what strategies we have used to fight this issue and what opportunities does that generate?

"I think we were lucky in some situations, because when it comes to external manufacturing we book stock in advance. For example, for peanuts I have the full next year covered. Of course, if the prices of peanuts go down, I will suffer, because I am booked with x price, but I am at least covering myself and guaranteeing that I am going to have stock for next year. In external manufacturing we had a lot of stock booked, so we didn't feel the availability of materials much less than the Direct Procurement team."

Did you feel like Russia's invasion of Ukraine and the war aggravated the situation?

"Not that much. The biggest impact we saw was on labor, because there are some people that are from there and want to me close to family, etc. But no, most of our ingredients and packaging don't come from Ukraine nor Russia."

Lastly, how do you think Kraft Heinz performed overall during this period and what could we have done better?

“I think we did a very good job as a team. In the beginning, the Business was quite tough on us because they thought it was something coming from Procurement, all this inflation. I think we passed that phase explaining that it was not coming from Procurement, but that it was a market situation. I think we managed it very well with our suppliers. Many suppliers I was expecting to come and ask for a cost increase did not do it. My biggest supplier, for example, did not ask for a cent on conversion cost, even though, as you said, energy costs are super high, gas is high, etc. I think we have a lot of good people fighting here and we did a good job.”