THE IMPACT OF CORONAVIRUS ON THE GLOBAL FLEXO PRINT & PACKAGING INDUSTRY

How to respond to the new trends in the flexographic industry

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The emergence of COVID-19 will have ramifications in every industry in the way we conduct business. For the packaging industry however, we are uniquely position to rebound faster than other industries due the demand of FMCG products through production improvements.

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PREFACE

AV Flexologic is an industry-leading manufacturer of flexographic mounting machines for the printing industry. We are part of the Color Control Group which consists of AV Flexologic, Tech Sleeves, Leapfrog 3D Printers and AllFlexo.

We have been always driven by innovation and the need to find better ways of solving the challenges for our valued customers.

This report has been written to answer some key questions regarding the striking challenges that we as an industry and the world face with the emergence of COVID-19.

The information that has been compiled here has the purpose of informing fellow industry stakeholders on how we as an industry have faired in other historic calamities such as the September 11th and the Recession of 2008 following a financial crisis and what can be expected with our current situation

We shall look at the key metrics that highlighted the previous years and how by adopting new approaches, we can weather and thrive during these challenging times.

OUR VISION

To continuously innovate by creating cutting edge technology.

Flexographic printing

The flexo industry is the fastest growing printing method with a projected 2.3% annual growth through 2023 (Smithers). Using the flexographic method it is possible to print on plastics, metallic films, cellophane, paper, and on corrugated surfaces.

The main 6 applications of flexographic printing are:

1) Food packaging

Flexographic printing uses quick drying and non-toxic inks, which is not harmful to food. For these reasons it is suitable for printing of food packaging. The main flexo packaging applications are: beverage containers, food containers, milk cartons, as well as disposable cups and containers.

2) Medical packaging

Since flexography is a safe food printing and packaging method, it can also be used to print packaging for medicines and other medical supplies. Flexographic printing can be used on foil wrappers, plastic and hygienic bags.

3) Flexible packaging

Flexographic printers can be used in printing flexible and non-rigid materials such as plastic and polythene, which is an advantage towards the digital or traditional printers. For that reason, it is the best choice for industrial converters that print on plastic and paper bags.

4) Brown corrugated boxes

Corrugated boxes are widely used in shipping and storage businesses. Flexo printing gives the possibility to print on various substrates and surfaces, therefore it is ideal for brown corrugated boxes.

5) Self-adhesive labels

Flexographic printing allows for the relatively quick printing of medium or large print jobs of self-adhesive labels that are used for retail products and can be applied manually or by a machine.

6) Newspaper and other print media

Flexographic printing is used for quick and large print jobs such as the production of newspapers, flyers, posters, books, magazines etc. Additionally, it is used also for printing envelops, wallpapers, and containers, and print envelopes can also be done with the use of flexographic printers.

INTRODUCTION

An outline of our current situation and what is occurring in the packaging industry.

We are living through a historic moment in the world and the packaging industry. The spread of COVID-19 has markets in constant flux, and the news reports highlight the increasing figures of the afflicted and countries are suspending travel and closing borders.

COVID-19 is an unprecedented moment in our time and industries everywhere have had to change the way they do business. A recession has been predicted and the prevailing message is hard times are ahead.

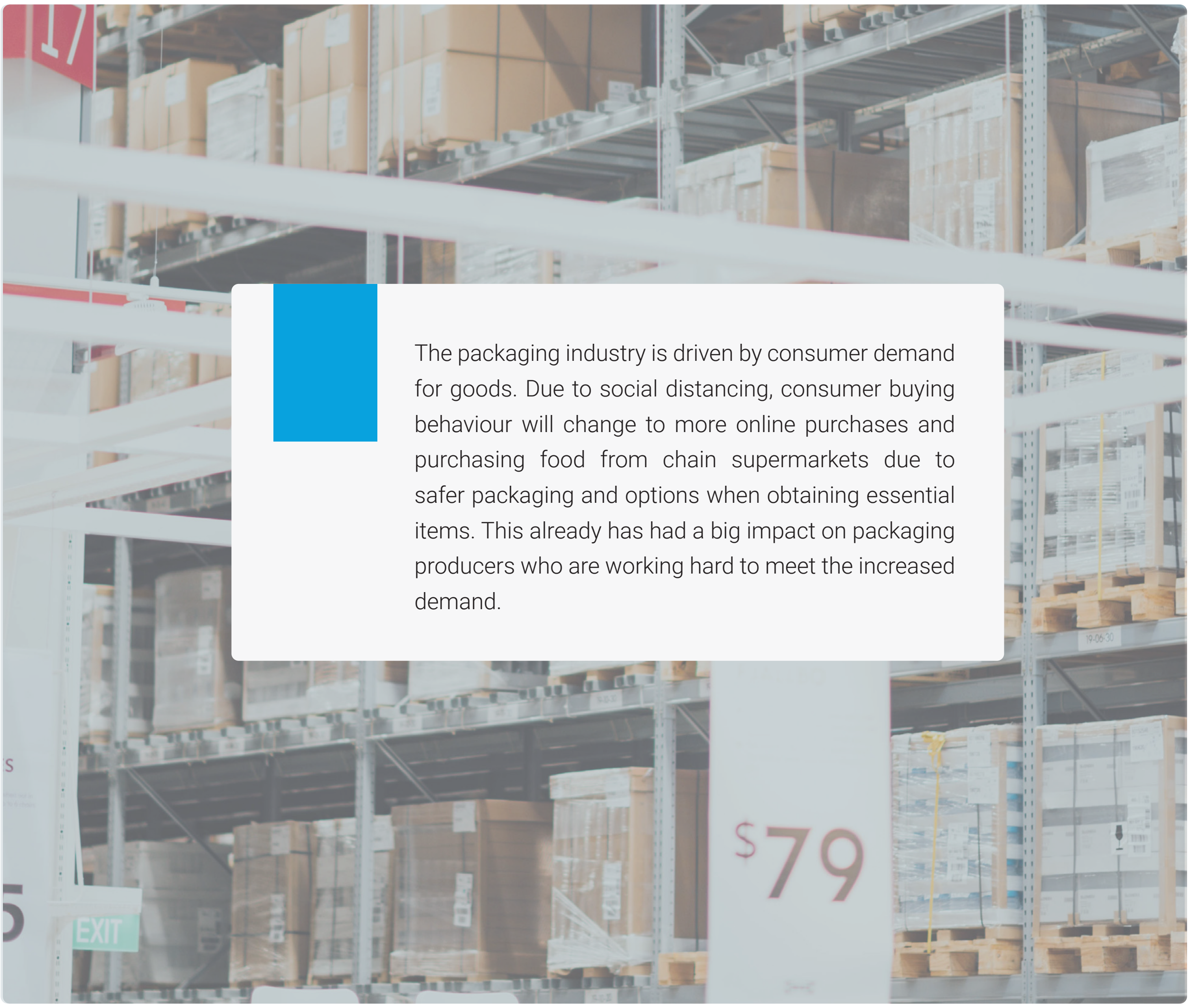
So what about us in the packaging industry. How will this impact our industry? In this research, we shall aim to answer that question. This is uncharted territory. The only source of insight can be gleaned by looking at how we as an industry handled the previous Recession of 2008 and factor in what is different today. In looking at what happened then, we can chart a path of what is likely to come.

One thing however that needs to be understood is that this oncoming recession will be very different from the previous one. In the previous recession, we did not have the cessation of movement of people, we did not have whole countries enforcing travel bans. We also did not have people self-isolating at home.

However, we also did not have the interconnectivity of our markets that conduct business online. The saturation of online market places was not as prevalent as today. We also did not have the same advancements in technology as we do now which can further optimize our work processes to reduce costs and increase productivity.

We must not forget that a recession is in truth, driven by fear. Fear of the markets, fear of uncertainty, fear that creates less confidence in markets.

People will still need FMCG and this is one of the key factors that make our industry different, both as a challenge to optimise our operational expenses and an opportunity to reach newer markets. Although some products will be in lower demand as consumers change buying behaviour, other segments like hygiene are sky-rocketing and packaging is one thing that all products require.



The packaging industry is driven by consumer demand for goods. Due to social distancing, consumer buying behaviour will change to more online purchases and purchasing food from chain supermarkets due to safer packaging and options when obtaining essential items. This already has had a big impact on packaging producers who are working hard to meet the increased demand.

WHAT OCCURRED BEFORE

An outline of our current situation and how we handled and faced previous challenges in the flexible packaging industry.

North America

The definition of a recession is two consecutive quarters of decreasing GDP. The sentiment that we are experiencing now seems very similar but more intense than in previous years. In 2008 when major investment banks started to close and terminations in every sector grew, the packaging industry had similar fears.

When we look at the data (figure 1) we can see that the recession did have an impact in 2009 where the effects of the recession finally manifested. This was a reduction of around 12.8% in the North American market. After 2009 however, it steadily rose again until 2011 where it almost reached 2008 levels.

When we add more context especially with the terrible events that occurred in September 2001 in the US (Figure 2), we see that the effect it had on the flexible industry was not impactful. The tragedy occurred at the end of the year but revenue still grew in 2002.

If we look at the output in North America (Figure 3) we see despite the recession, growth in output was achieved steadily. The industry did receive an initial hit, but considering that flexible packaging is driven by FMCG as a demand factor, this was expected. Consumer sentiment during recessions is negative but the consumption of essential goods and services will remain at stable levels.

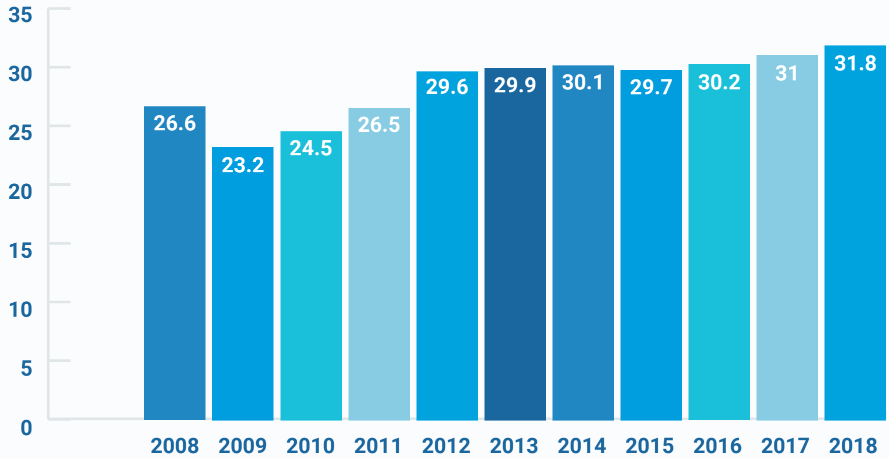
Europe

This trend was also observed in the Western European flexible packaging industry in terms of output as well (Figure 4). PCI Films Packaging report in 2009 had recorded sales declining by 3% from 2008. The reason why the packaging industry pulled through

The growth has been particularly strong in single-serving/away-from-home meals, single-dosage medicine, pet food, aseptic packaging applications, and pouches.
Packaging, William Blair Investment Banking Report, 2016

FIGURE 1

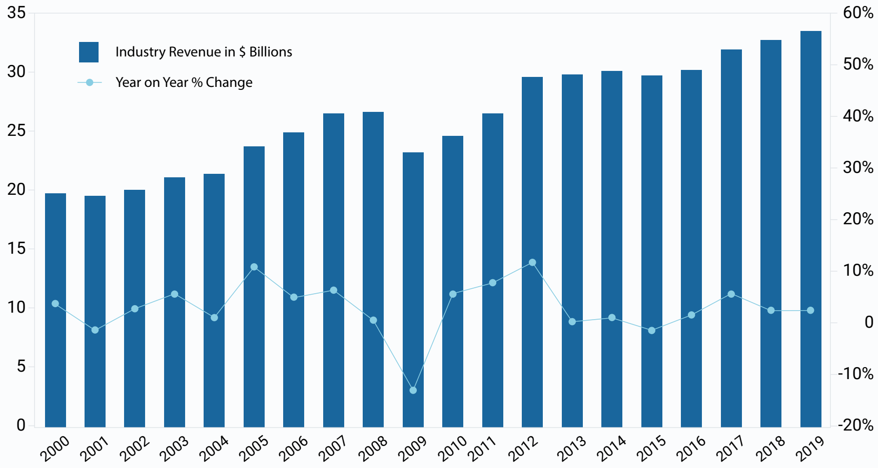
NORTH AMERICAN GROWTH IN SALES FOR FLEXIBLE PACKAGING INDUSTRY 2008-2018 (IN BILLIONS)



Source: State of the industry report, Flexible Packaging Association (FPA) (Corrugated and Flexible packaging), 2019

FIGURE 2

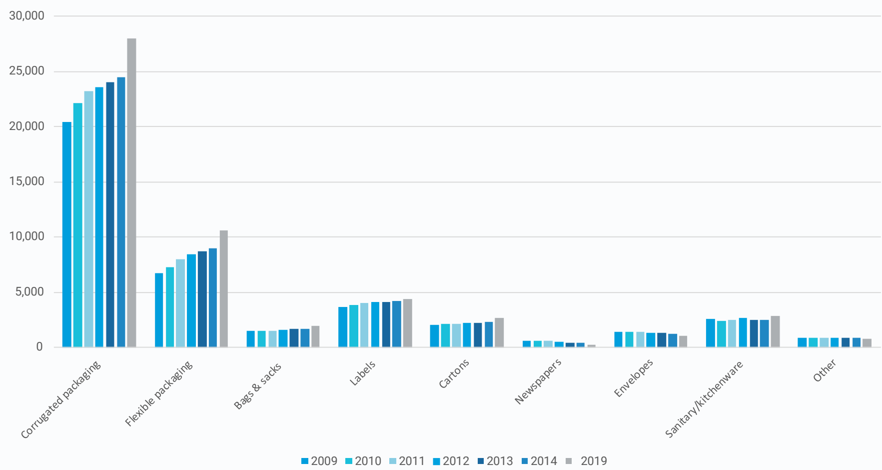
2000-2019 U.S FLEXIBLE PACKAGING REVENUE (BILLIONS, % CHANGE)



Source: State of the industry report, Flexible Packaging Association (FPA), 2019

FIGURE 3

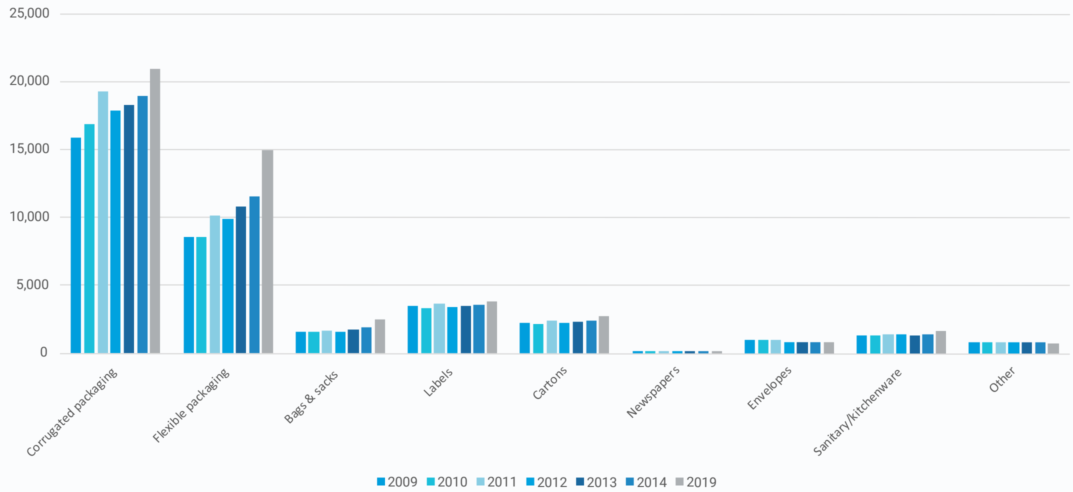
NORTH AMERICAN FLEXOGRAPHIC PRINTING OUTPUT BY PRODUCT IN MILLIONS



Source: The Future of Flexographic Printing in a Digital World, Smithers Pira, 2019

FIGURE 4

WESTERN EUROPE FLEXOGRAPHIC PRINTING OUTPUT BY PRODUCT IN MILLIONS



Source: The Future of Flexographic Printing in a Digital World, Smithers Pira, 2019

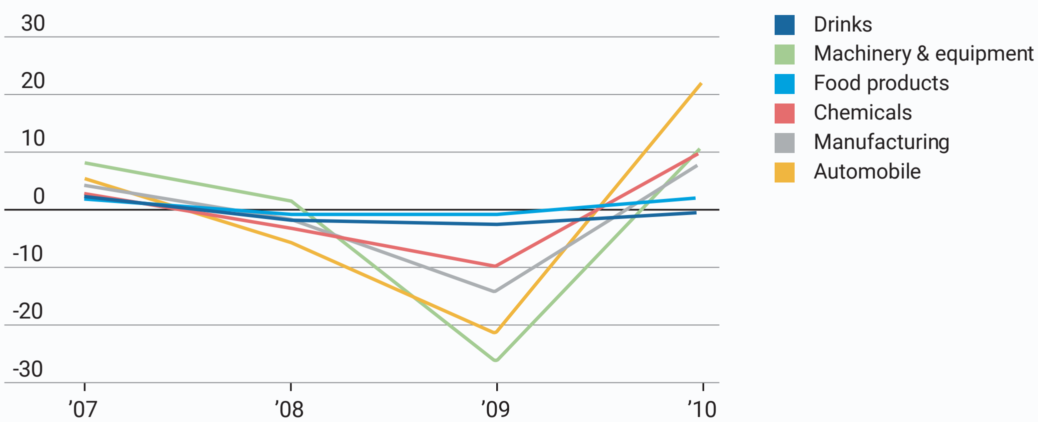
relatively well was due to a new focus by producers on reducing costs through producing lighter packs and a focus on the attractiveness for consumer buying choices.

Consumers became more cautious during the financial crisis. Impulse purchases decreased but food and drink are considered essential and they were relatively unaffected.

The trend to reduce the weight of packs and lighter packs became a standard as a means to reduce costs while meeting consumer demands and revenue for the producers. This is the reason why multi-packs became more prominent in the last few years. Consumers in Europe and North America could not justify the purchase of larger single portions which would go to waste. An example of this is when Campbell changed the baked beans 64-ounce pack to a two 32 pack bundle.

FIGURE 5

EU: EVOLUTION OF OUTPUT GROWTH IN THE MANUFACTURING INDUSTRY, 2007-2010 (%)

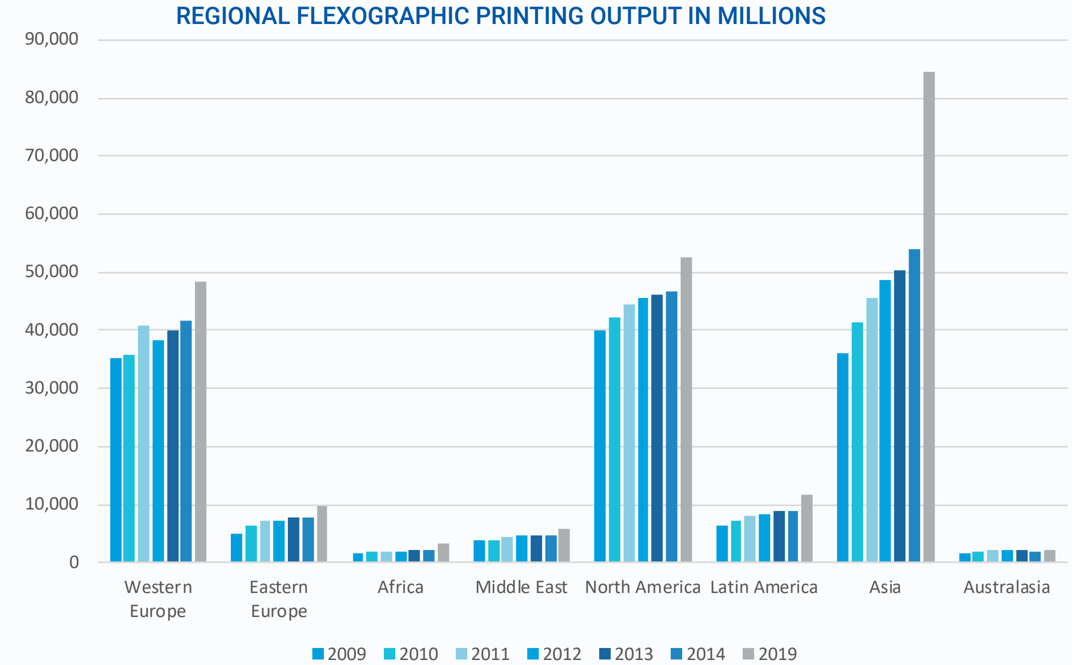


Source: Data & Trends of the European Food and Drink Industry, Food Drink Europe, 2011

Another trend that grew from the financial crisis was tied into streamlining supply chains with retailers adopting private labels to attract more price conscience consumers.

An increase in private labels has allowed for supermarkets to target the segment of consumers that were impacted in some way by the recession and this has also reduced the production costs through packaging producers being able to streamline their production process via more standardisation.

FIGURE 6



Source: The Future of Flexographic Printing in a Digital World, Smithers Pira,2019

The emerging market was a massive driver in growth

One of the biggest drivers for the flexible packaging industry has been the Asian market (Figure 6). From the time of the recession, we saw the market grow by 133%. This trend was key in offsetting a lot of the effects of the recession. As we look at 2019 it has become the biggest market for flexible printing. This is only expected to grow especially now with a newer focus on hygienic safe packaging to mitigate any further challenges faced with the advent of COVID-19.

FIGURE 7

FLEXOGRAPHIC PRINTING OUTPUT BY REGION 2019(%)

Equipment sales in previous years

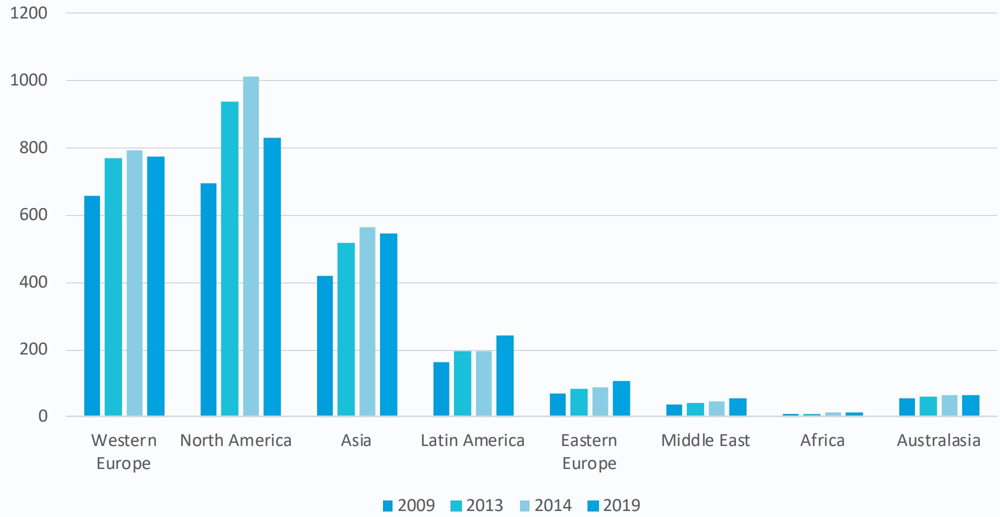
The state of equipment sales for the flexible packaging industry has been different depending on the geographic region. The biggest decline in new equipment sales can be found in North America with the Compound Annual Growth Rate (CARG) declining by -3.9% from the period 2014-2019. This decline was also observed in Western Europe(-0.5%) and Asia(-0.7%). The loss can be attributed to several reasons.

According to Roland Berger (Consultancy) manufacturers are facing newer regulations concerning sustainability and the previous decade has led to a saturation in these markets where competition is high. This has led to fewer investments. Manufacturers have then been forced to focus on efficiency and productivity, while also cutting costs considerably.

The other regions, however, showed an increase with the biggest growth happening in Latin America and Eastern Europe.

FIGURE 8

NEW FLEXOGRAPHIC PRINTING EQUIPMENT SALES BY GEOGRAPHIC MARKET, 2009–19 ($ MILLIONS)



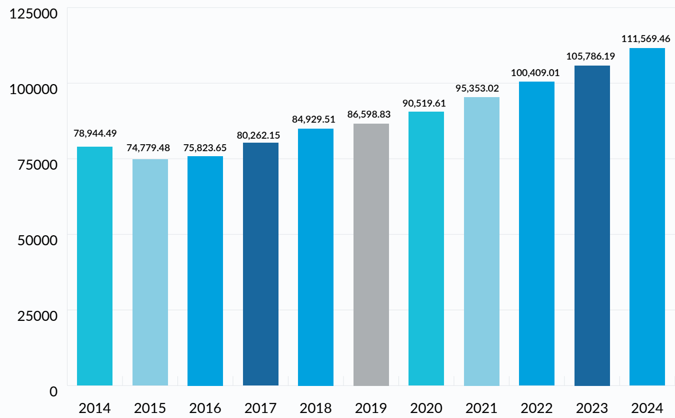
Source: Smithers Pira,2018

HARDEST HIT INDUSTRIES

What impact does the coronavirus have on the global Economy?

FIGURE 9

GDP FROM 2014-2024 COMPARED TO PREVIOUS YEARS



Source: GDP Statisa,2020

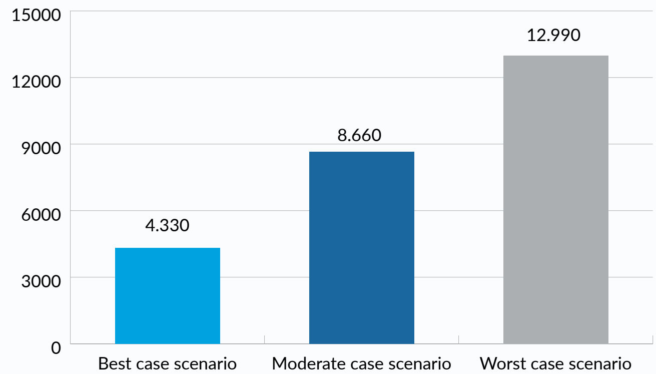
Before the coronavirus pandemic appeared, the forecast of the global GDP growth for the upcoming years was showing a 0.4% increase for 2020 with further increases in the subsequent years. The global GDP for 2019 was $86.6 trillion and it was expected to reach $90.52 trillion in 2020.

After the coronavirus outbreak, these numbers have been deemed unachievable due to many countries facing lock-downs which will impact their national economies. The only businesses that remain fully operational are deemed essential. These are the food and medical supplies, shipping and delivery industries.

In a recent study conducted by the London Business School, three scenarios were formulated regarding the economical impact globally due to the duration of widespread lock-downs.

FIGURE 10

FORECASTED MONETARY GDP LOSS AS A RESULT OF COVID-19 2020 (Billions)



Source: GDP Statisa,2020

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In the best-case scenario in 2020, which is defined as a two-month duration of travel bans and a sharp decline in domestic demand, the monetary loss of global Gross Domestic Product (GDP) is expected to lose about $4.3 trillion U.S. dollars due to the coronavirus (COVID-19) outbreak. In a worst-case scenario, defined as a six-month duration of travel bans, the global GDP is predicted to lose about $12.99 trillion U.S. dollars. It is worth mentioning that for 2019, the GDP of the United States was $21.44 trillion while China's GDP was even higher at $27.31 trillion. These two economies are the ones that are taking the biggest hit from the COVID-19 pandemic.

The industries that are impacted the most from the COVID-19 outbreak are:

Airlines, Hotels and Tourism, Transportation, Movie Theatres and film productions, live sports, shipping, construction, automakers, oil and gas, Tech companies, food-service and restaurants, and retail companies.

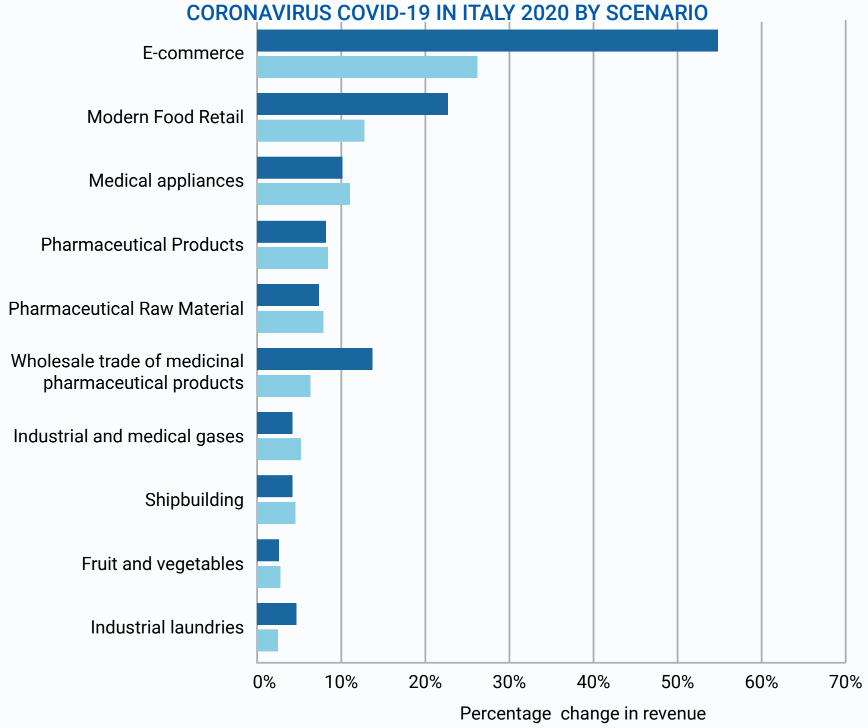
Small sized companies are at risk since they have limited cash-flows due to the lock-downs while their investments and spending in rent and mortgages are pushing their cash flows to non-viable levels.

Industries Comparison

Taking as an example the case of Italy, which has the highest number of COVID-19 cases after China and the United States, it is expected to lead to a drop in Italy's industrial production and GDP. Nevertheless, some industries might experience an increase in terms of revenue. Among others, the revenue generated by e-commerce, food retail, and medical products and supplies are expected to experience the largest growth.

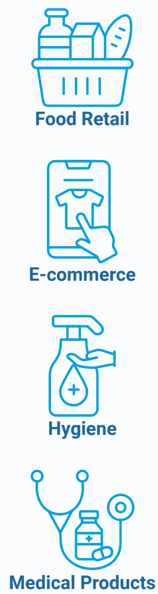
FIGURE 11

INDUSTRIES EXPERIENCING AN INCREASE IN REVENUES DUE TO THE IMPACT OF CORONAVIRUS COVID-19 IN ITALY 2020 BY SCENARIO



Source: GDP Statisa,2020

BEST PERFORMING INDUSTRIES DURING COVID-19 OUTBREAK



The McKinsey company researched the impact of coronavirus on the 6 main sectors of the economy and the estimated period of recovering. The tourism and hospitality sector took the biggest hit and it is expected to start recovering in the fourth quarter of the year, while consumer products and electronics will have the fastest comeback in the second quarter.

All sectors are impacted, with several seeing severe consequences
Preliminary views based on base case - Subject to change as the COVID-19 outbreak evolves

	Tourism and hospitality	Aviation / airlines	Oil and gas	Automotive	Consumer products	Consumer electronics, semi-conductors
Estimated degree of impact, in terms of duration	Longest					
Estimated global restart (Global slowdown scenario)	Q4	Late Q3 / early Q4	Q3	Late Q2 / Q3	Q2	Q2
	Severe ripple effects (e.g., closures in Paris, tourism down 50% in Vietnam, despite lack of local transmission) Delayed **recovery until winter season**, when disease might surge again Potential of more **localized** impact, containing negative demand hit	**Sustained headwinds**, with global travel acutely impacted; summer season missed – **forward bookings** for Mar-April down significantly; reports of over 40% in certain airlines Pace of recovery faster for **domestic travel** (~2 quarters); slower pace of recovery for **long-haul and/or international travel** (up to ~3-4 quarters)	**Oil price decline** driven by both longer-term demand impact and short-term supply overhang Rebound expected with resumption of consumer demand, but **long-term impact likely** if situation persists and depresses prices beyond a year	**Existing vulnerabilities** (e.g., trade tensions, declining sales) amplified by acute decline in Chinese demand, continued supply chain and production disruption (in China, rest of Asia, now EU) Headwinds to persist into Q3 given **tight inventories** (<6 weeks), **supply chain complexity** (therefore, minimal ability to shift)	**Overall moderate decline** in private consumption and exports of services Demand for **certain product segments** (e.g., food, produce) resilient; significant **online** growth (though hampered by labor shortage) Potential of **localized** impact, containing negative demand hit	**Market structure shifts accelerated** (e.g., strategic moves to diversify supply chain) **Downstream impact** due to supply chain challenges in China, rest of Asia (esp. South Korea), causing delays in 5G, product development Pace of recovery to **differ by sub-sector** (e.g., semiconductor likely faster)

Source: IHS Market; McKinsey Global Institute Analysis; Subject matter experts; Press reports

McKinsey & Company 11

Source: McKinsey Global report (9th March 2020)

How is the coronavirus currently affecting the demand for printing and packaging?

The coronavirus pandemic has changed the landscape of everyday life for everybody and has created new trends in the printing and packaging industry such as the increased demand for packaged foods, safe packaging and distribution, and an enormous increase in e-commerce.

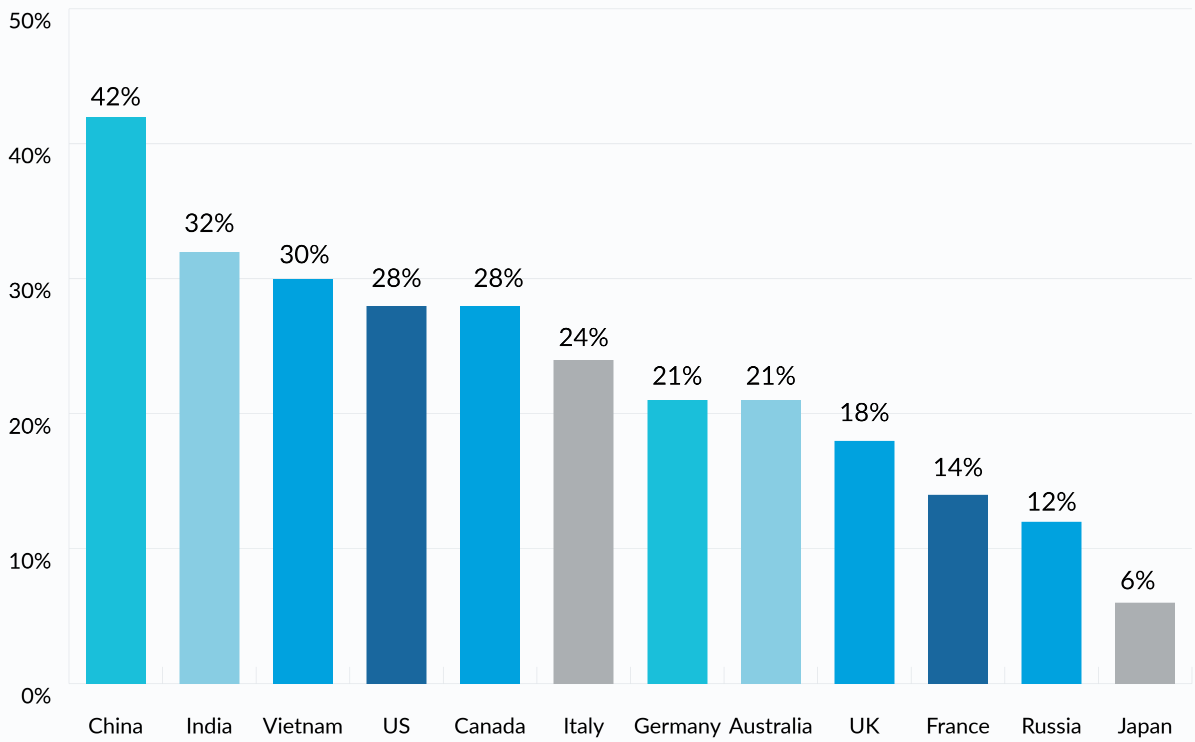
Demand vs Supply

To begin with, people's response to COVID-19 is controlled by fear and panic. The reason behind it is a "mix of miscalibrated emotion and limited knowledge," argues psychologist David DeSteno in an editorial for The New York Times.

People are panicking because of the fear of the unknown and sensational media both mainstream and social platforms play an important role in aggregating this fear. Mixed messages and inaccurate information are spreading even faster than the coronavirus while consumers are panic-buying a month's worth of supplies creating a danger in shortages. The graph below illustrates the share of consumers that stockpiled goods due to coronavirus per country:

FIGURE 12

SHARE OF CONSUMERS THAT STOCKPILED FOOD BECAUSE OF CORONAVIRUS WORLDWIDE IN MARCH 2020, PER COUNTRY



Source: GDP Statisa,2020

Safe packaging

The coronavirus outbreak has created a change in consumer behaviour. Given the fact that COVID-19 is considered to have started spreading through the wholesale seafood and meat market in Wuhan, this animal-borne virus demands the full attention in meat handling and distribution methods. Flexible packaging provides bigger safety and sterilization comparing to wholesale fresh meat markets. For that reason not only in China but also in the rest of the world, the demand for flexible food packaging has been increasing as people are getting more health and safety conscious and governments are expected to force restrictions to secure food safety.

The level of the increase in demand for packaged goods because of COVID-19 is related to the financial state and cultural habits of each country. For example in Canada, restaurant deliveries have increased by 21% following a 20% increase in grocery delivery for March.

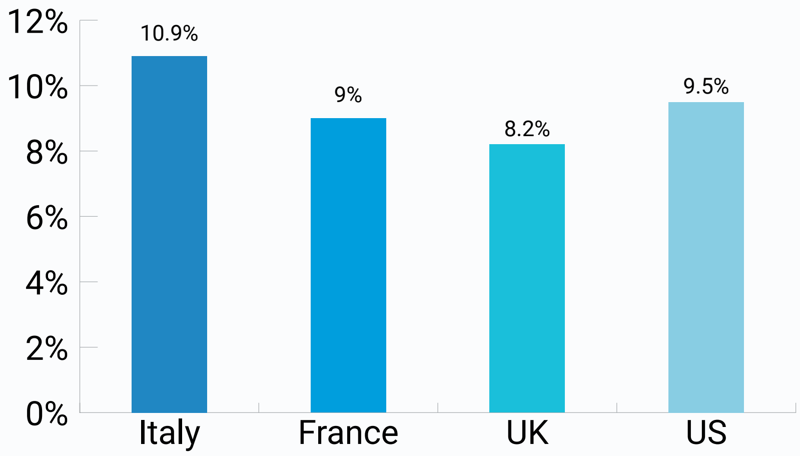
However, this is not the case for other countries with lower economic growth. Taking as example Argentina, even during the first weeks of the COVID-19 lock-down, there was only a 62% increase in the consumption of goods such as rice, pasta and cleaning products. Also, in Colombia, there was an 82% increase in OTC (over-the-counter-drugs) and a 44% increase in demand for wet wipes, while canned food demand has only increased by 19%.

Comparing these numbers with Germany's packaged food consumption, the difference is enormous. The sales revenue change for bread mix increased by 350% in Germany, white flour, rice and pasta increased by more than 170% each. A similar increase in demand for FMCG products was noticed in Russia and Poland, while in countries like South Korea and China the demand for canned food was even higher reaching 268% for March following a 116% rise in bottled water sales.

The graphs below show the general increase in demand for packaged goods in the selected countries. More specifically, Italy experienced a 10,9% increase in packaged goods with France, the UK and the US to have an average increase of 9%.
In the case of the US, the products with the highest demand are packaged food, frozen food, alcohol, medical supplies, beverages, and tobacco.

FIGURE 13

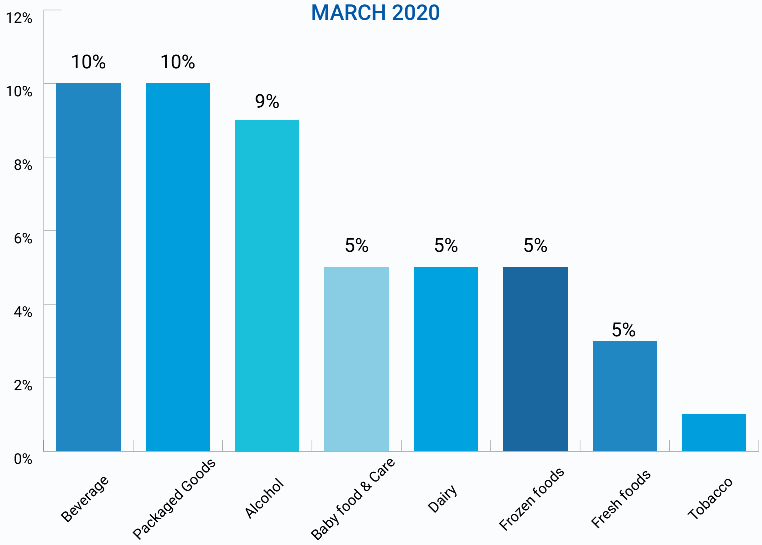
GLOBAL CHANGE IN CONSUMER PACKAGED GOOD SALES DUE TO COVID19 MARCH 2020



Source: GDP Statista,2020

FIGURE 14

U.S CHANGE IN SALES OF EDIBLE GROCERIES DUR TO COVID19 MARCH 2020



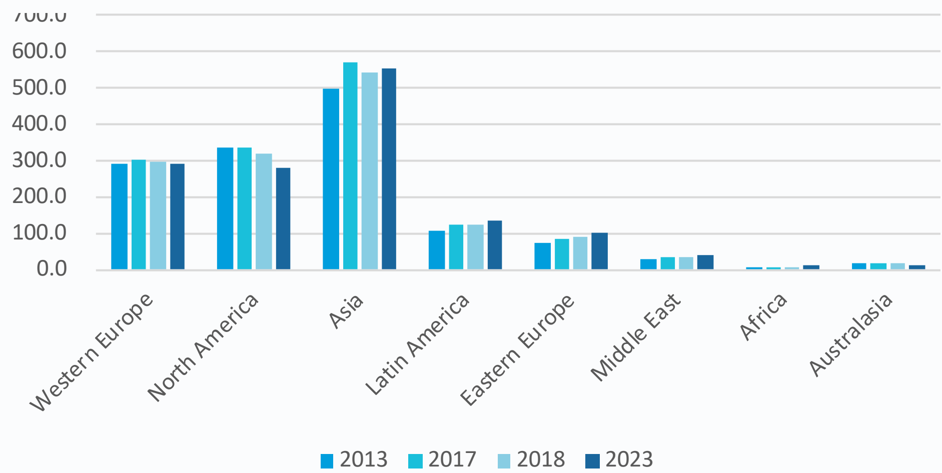
Source: GDP Statista,2020

Impact on Flexographic printing equipment sales

In a report from Smithers Pira that was written before the COVID-19 pandemic, the stated outlook for sales for flexographic equipment is expected to reach $1.43 billion by 2023 where we shall see a slight decline in sales from 2018 where sales were at $1.44 billion. When we look into regional data, the majority of the decline will be observed in North America, Australasia and slightly in Western Europe.

FIGURE 15

FLEXOGRAPHIC EQUIPMENT SALES($ Millions)



Source: Smithers Pira,2018

The Asian, Latin America and Eastern European markets were forecasted to be the most stable. This trend can be attributed to the more focus that printing houses have on productivity. Automation and cutting operational costs is a major focus for many equipment manufacturers. (FTA,2018)

When we factor in, however, the effects of COVID-19, the assumption is that equipment sales will rise as manufacturers focus on improving supply chains, reducing the need for more labour and the adoption of more automation. If we look at the previous data, output as a whole has been increasing despite sales declining. This highlights the global trend for many industries aiming to improve productivity through technology adoption. This is only expected to increase now with the coming of COVID-19. Equipment makers globally will aim to improve work-flows to mitigate the effects of COVID-19 with the consideration that treatments are still in development.

E-commerce

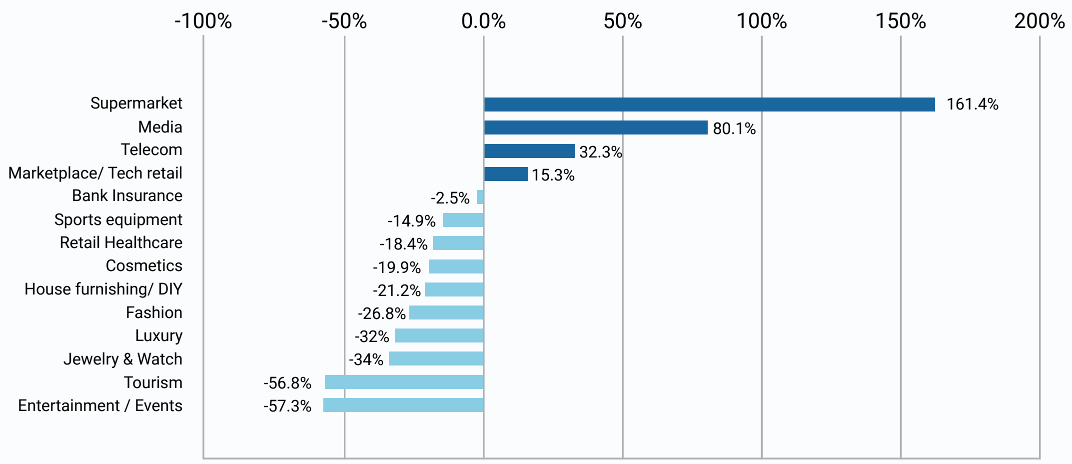
Part of the new trends in the packaging industry is the consumer's shift to e-commerce amidst the pandemic lock-downs. Online orders and delivery of goods and services are rising as people are spending more time at home due to the fear of the coronavirus spreading. The graph below shows that supermarkets, media, telecom and tech companies experienced an enormous increase in their online traffic.

This trend is only expected to increase as new habits are adopted. The COVID-19 outbreak will last for the foreseeable future and consumers with hygiene and social distancing in mind will aim to reduce interactions by adopting online services more so when possible.

Retailers around the world will also take notice and the increasing proliferation of online groceries stores such as Picnic in Europe, Walmart and Amazon in the USA already have services that cater to grocery deliveries to their customers. This trend will only grow both as a means for customers to purchase their essential items, but also for retailers as a means to reduce down costs.

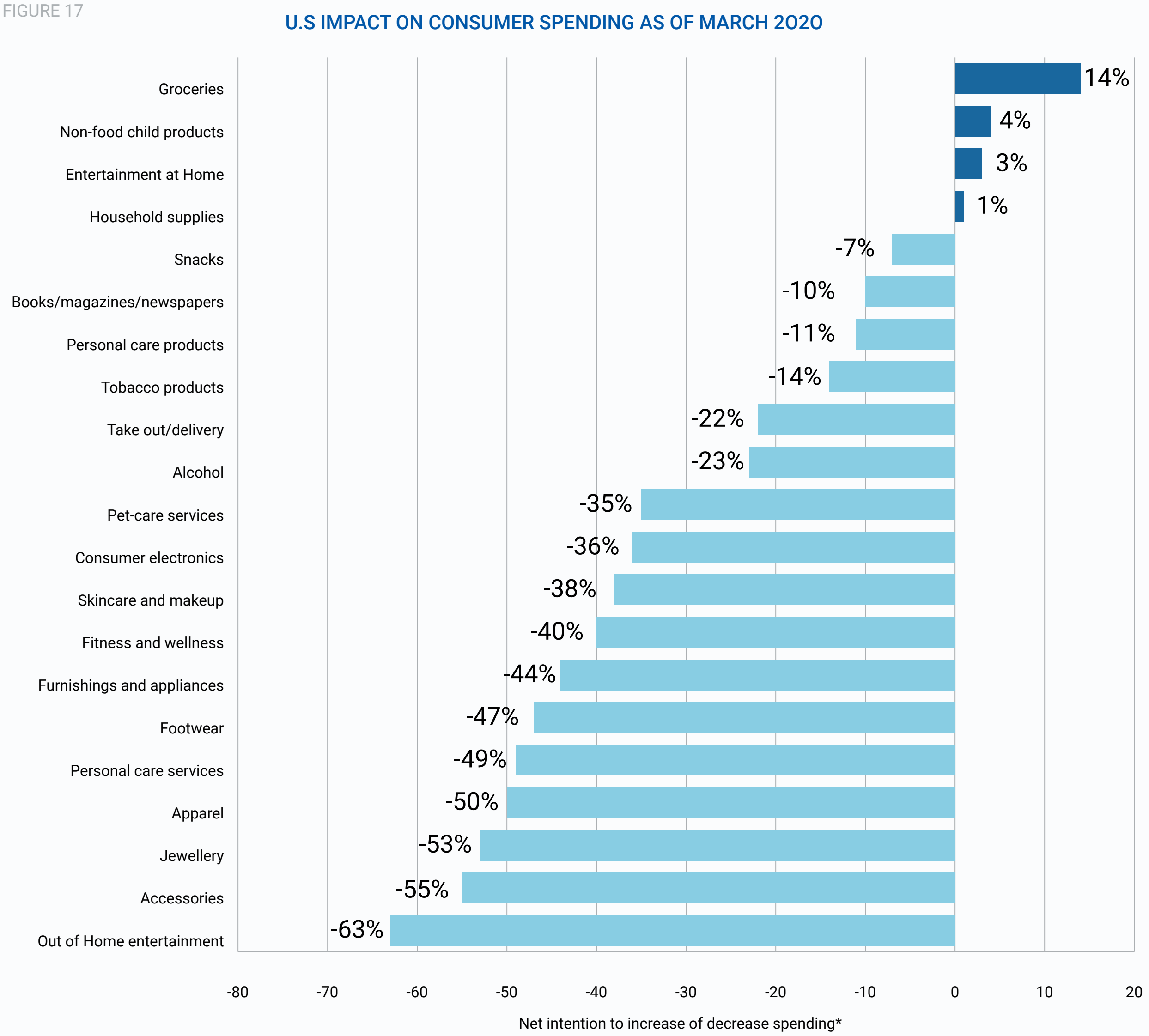
FIGURE 16

IMPACT OF CORONAVIRUS ON ONLINE TRAFFIC ON SELECT INDUSTRIES MARCH 2020



Source: GDP Statista,2020

FIGURE 17



Source: GDP Statista,2020

What impact will the coronavirus have on the flexo market in the long term?

The flexographic industry is one of the few industries that must remain active and continue to deliver its services to the end customer. The world is shifting to e-commerce and even after controlling the COVID-19 pandemic, people will still need to adapt to a new way of life. Printers and converters are dealing with an enormous increase in the demand for specific products and they face difficulties in their supply chain and logistics, while in some cases they are operating with less capacity.

Supply chain

There is an enormous increase in the demand for sanitizers, medical and pharmaceutical products as a response to COVID-19. Ethanol and n-propanol are among the materials which are essential for printers and converters to produce food packaging. Printing ink manufacturers across Europe are reporting reduced availability of these materials since they are used for the production of hand sanitizers.

Tom Bowtell, CEO of the British Coatings Federation states: “In the past few days, BCF members have reported that prices for ethanol and n-propanol have risen by up to 350% since last week, adding thousands of pounds a week in additional material costs. There are great concerns that supplies will dry up completely in future.”

Moreover, the FTA and Intergraf associations are urgently calling on European and national authorities to secure the supply of ethyl alcohol for the continuous production of food packaging.

Additionally, many companies in the printing industry rely on the Chinese production of chemicals used in the printing process, such as inks and solvents. Phil Mango (Smithers) states that China has resumed production in most regions already, therefore basic raw materials such as polyester and rayon should not be severely affected. But already melt-blown nonwovens are seeing increased pricing in some regions and disinfecting materials for wipes may see increased pricing short term.

As a result of the high demand and the limited supply, prices on raw materials and solvents are expected to rise. The supply chain of printing companies is taking a big hit that is expected to last also in the second quarter of the year. In the long term, without the intervention of the government, there is a serious concern for shortages. As for the shipping and transport of raw materials and solvents, the problem is less severe since there is still commercial activity between countries even though they are amidst lock-down. In the long run, there should not be any serious concerns for long-delayed orders.

Production

As explained before, the demand for packaged goods has increased substantially with some products facing higher demand than others. Below are the different product packaging categories that have seen a significant change in demand.

Corrugated market

According to a Smithers report : “Demand for corrugated packaging material has grown steadily since 2018, rising by more than 3.5% annually, and will likely show slightly better growth over the medium term. Through 2025, we can expect the market to increase by more than 4% per annum to reach nearly 200 million tones.” – Smithers, March 2020.

This research was conducted before the coronavirus outbreak. In the long-term, it is expected for demand for corrugated boxes to increase since it is highly correlated with shipping and delivering goods.

Flexible packaging

COVID-19 has changed consumer shopping habits and the focus is leaning towards e-commerce. Flexible packaging is highly correlated with food packaging and the rise in demand for packaged products has created the need for more printers and converters to speed up production.

Eleftherios Kassianidis, sales director, UK & Ireland at A. Hatzopoulos, stated: "*We observed a month-on-month increase of 6% in incoming orders in February, relative to January, and anticipate an increase of a further 11% in March. Our current projection, based on the latest forecasts by large retailer/distributor, engendering ca. 70% of our turnover in the UK, indicates an increase of 21% in incoming orders at the end of April, again relative to the end of January*."

FFP is also experiencing high volumes of orders, despite working mainly with fresh food packaging, Helen Clements, Commercial Director said: "*It has been crazy, we've seen such a high number of orders come through, with one retailer we work with saying that demand is high as it is at Christmas*."

In the long term, even after the termination of the national lock-downs, for at least until the end of 2020, the need for packaged goods will continue to be high, therefore printers and converters need to be prepared for the continuation of this increased demand that they are called to fulfil.

Labels and narrow-web

As mentioned before, the pandemic outbreak triggered a huge demand for sterilization and other protective label products, with many label converters running to fulfil these orders. Consumers are paying more attention to products that help to improve their immune systems and the purchases of healthy foods has increased. These trends have created many opportunities for label producers. Furthermore, there has also been an increase in demand for self-adhesive label printing for food, beverages, self-care and cleaning products.

RECOMMENDATIONS

Wide web and Narrow-web printers are struggling to respond to the high demand, facing troubles with material supplies and delays in delivery. The situation is expected to be mitigated in the second quarter of the year. Printers and converters will need to adapt fast to the new reality.

With regards to consumers' new habits and behaviour, the handing and distribution of packaged goods need to meet the highest standards of safety regulations. Additional safety measures need to be taken to ensure product sterilization as consumers demands are heading towards safe packaging solutions.

When it comes to the supply chain and production, printers and converters are advised to implement the principles of Lean Manufacturing. By tracking and monitoring their manufacturing system, they will be able to recognize and eliminate waste in every step of the supply, production and distribution process. By eliminating waste in inventory, waiting for time, transportation that creates unnecessary motion and delays, they can boost their efficiency and optimize the use of their valuable resources. Furthermore, by implementing the Kanban System, a streamlined work-flow will be created which enables a just-in-time (JIT) production. Problems with delayed raw materials can be solved on time with the proper planning and implementation of the Kanban System.

* Waste is eliminated through **continuous improvements**

Last but not least, printers and converters must utilize the latest innovations in the flexographic industry to be able to increase capacity and speed-up production. The automation of the printing and packaging process can lead to better quality results with less costs and effort. The fourth industrial revolution in manufacturing (Industry 4.0) provides solutions that enhance productivity using automation, tracking and monitoring. The latest innovations in flexo printing and packaging include:

Other departments	Press department
Contact-less mounting - A fully automatic taping and mounting solution using Robot technology	Automatic impression setting and control (through learning)
Automatic Sleeve Storage Systems for safe storage of sleeves and adapters	Automatic register setting and control
TIR Measurement System for scanning the 3D landscape of sleeves and making a report of their condition	Automatic ink viscosity control
RFID chips and magnets for tracking sleeves	RFID chips and magnets for tracking sleeves
End-to-end digital workflows	End-to-end digital workflows
Automatic zero position on sleeves	Automatic cleaning and wash-up
	Automatic diagnosis of hardware and software
	Automatic material splicing and transferring
	Automatic web guiding
	Print job recall and sharing between several presses
	Automatic defect detection and culling
	Automatic web tension control
	Automatic process adjustments through production speed changes
	Robotic folding and packaging

Conclusion

In a recent report from Deutsche Bank, it was stated that the there will be a sharp decline in global GDP in the second quarter of the year, but a resurgence will be expected in the third.

When we look closer to different industries, historically FMCG and household product companies have always outperformed other industries. This is through disasters and also recessions. This is due to a few key reasons. Despite the markets, consumers will still need to provide for their families, eat, clean their homes and participate in the economy. The essential services are also in need of supplies as they aim to reduce the effects of COVID-19. Global Governments have already made major policy changes to implement stronger monetary policies to help the economy.

Although costs are expected to increase because of the limited supply in the supply chain, in reality, the flexo industry now more than ever needs to focus more on costs control by eliminating waste and enhancing production efficiency through digitization and automation.

The challenges faced are still prominent and they will continue to be until the end of the year. Printing and packaging are vital to peoples lives and with the right management, the printing industry can adapt and serve the needs of end customers.

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