



**Atrato** Capital

**WATERSHED MOMENT AS ONLINE TURNS  
PROFITABLE FOR UK GROCERS**

**CAN GROCERS NOW BE TRULY  
CHANNEL AGNOSTIC?**

**APRIL 2021**

## OMNICHANNEL SUPERMARKETS THE FUTURE OF UK GROCERY

WHAT



PERCENTAGE  
INCREASE IN  
ONLINE GROCERY  
DEMAND

180%

HOW



80%

PERCENTAGE OF ALL UK  
ONLINE ORDERS  
FULFILLED VIA  
OMNICHANNEL STORES

OUTCOME

COSTS TO BE  
RECOVERABLE FROM  
CHARGES - ONLINE  
MARGINS NOW AT  
NEAR PARITY WITH  
INSTORE SALES



100%

WHY

30  
MINS

AVERAGE DRIVE TIME  
TO CUSTOMERS  
-KEY TO LOWERING  
FULFILLMENT COSTS



The Covid-19 pandemic has driven five years of growth in online grocery in five months. This increased online penetration has transformed the profitability of omnichannel grocery fulfilment. With in-store and online profit margins now at near parity<sup>1</sup>, omnichannel stores provide operators the benefit of achieving a seamless integration of customer experience across all channels. We believe this underpins the importance of having the right stores in the right location to be successful in the future model of grocery.

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### KEY FINDINGS

- **Omnichannel supermarkets have emerged as the last mile grocery winners with locations adjacent to large catchments and minimal delivery drive times.**
- **Delivery cost is the dominant factor in online grocery fulfilment cost. Picking and packing productivity results in marginal gains.**
- **The near doubling in online grocery penetration has halved delivery costs from omnichannel stores<sup>2</sup>.**
- **Grocery home delivery fulfilled from omnichannel supermarkets achieves materially better delivery density metrics when compared to centralised fulfilment centres (“CFCs”).**
- **Online grocery is now profitable for supermarkets with total fulfilment costs reduced to levels recoverable from customer charges.**
- **Store pick fulfilment productivity per labour hour is approaching equivalence to CFCs, but with a much lower capital cost.**
- **Adding online fulfilment operations to a supermarket creates a much better in-store experience with greater numbers of staff on the shop floor, increased product turnover leading to a fresher product on the shelves and availability of click and collect.**
- **Two of the major operators have abandoned their CFCs in favour of increased omnichannel store pick. CFCs will persist, but we believe only for operators with capacity constraints or in the premium price segment.**

<sup>1</sup> Source: Atrato Capital research

<sup>2</sup> Source: Atrato Capital research, Kantar online grocery data.

## 1. OVERVIEW

The online grocery sales channel is logistically highly complex for operators. Every day, hundreds of thousands of customer baskets need to be fulfilled with a different combination of tens of thousands of individual products. The number of possible combinations and permutations could reach billions.

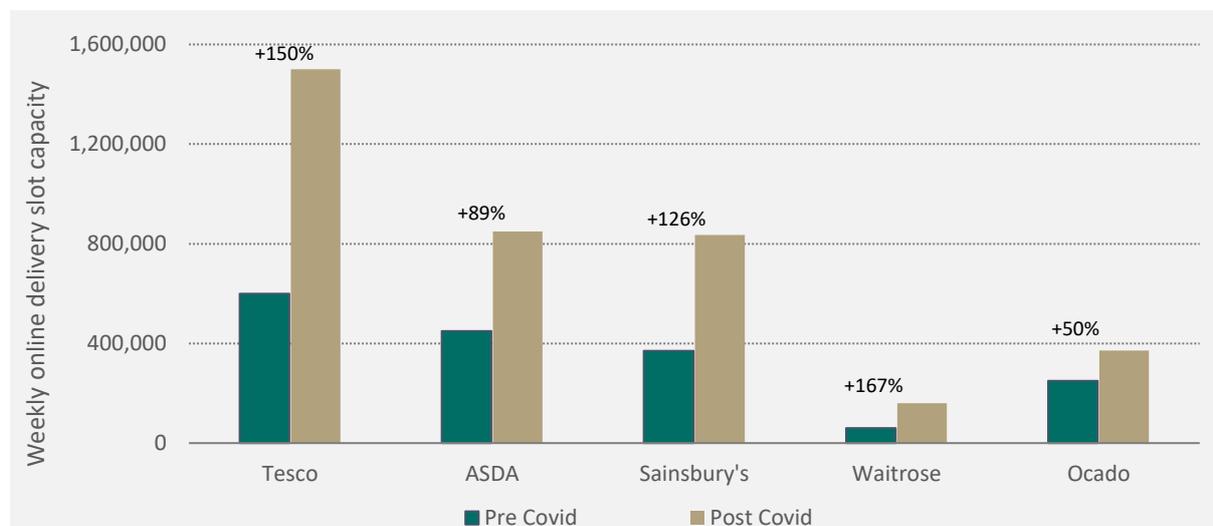
In addition, the fulfilment logistics for home delivery are incredibly complicated. Products have different shapes, sizes, weights and need to be delivered simultaneously, at a specific time and with multiple temperature requirements.

Since the launch of the UK's first online grocery offering in 1996, the channel has achieved a slow average annual growth rate of 0.3% and reached a total of 8% UK grocery market share prior to the COVID-19 pandemic<sup>3</sup>.

### 1.1 STEP CHANGE IN DEMAND, CAPACITY, AND PROFITABILITY

The COVID-19 pandemic has dramatically changed the online grocery landscape by turbocharging demand throughout the UK and propelling online sales to 15% of the market<sup>4</sup>. Operators have responded impressively in increasing home delivery capacity from 1.8 million deliveries per week to 3.7 million deliveries per week<sup>5</sup> in just a few months.

**Figure 1: Published online grocery weekly delivery slot change March 2020 to March 2021<sup>6</sup>**



Larger supermarkets with in-store pick capacity were well positioned to respond quickly to the pandemic. Most of the capacity growth generated during the pandemic, as illustrated in Figure 1 above, has come from store pick fulfilment. Over 80% of online grocery sales are estimated to now be fulfilled from stores<sup>7</sup>.

At the extreme, our research has shown that the turnover of some individual omnichannel grocery stores is now 50% online and 50% physical shopping and a 25%:75% split is not uncommon. Any

<sup>3</sup> Source: Institute of Grocery Distribution (IGD)

<sup>4</sup> Kantar, Sainsbury's and Tesco 2020 Q3 trading statements - January 2021

<sup>5</sup> Top 5 online grocery slot capacity -operator websites and Atrato estimates.

<sup>6</sup> Source: Atrato estimates and operator websites

<sup>7</sup> Atrato capital research

foreseeable growth in online market share can be fulfilled through the omnichannel store-pick model, but some question how this impacts the in-store customer experience and operator profitability.

For the customer, the store-pick model creates a virtuous circle because an omnichannel store needs to carry a bigger and better range with the increased turnover from online leading to a much fresher product on the shelves. Customers also appreciate the additional staff members available on the shop floor. Thus, adding online fulfilment to a store can create a much better in-store experience for the customer and usually increases physical sales as a result.

**Figure 2: Symbiotic relationship between in-store and online sales**



## 1.2 THE OMNICHANNEL VIRTUOUS CIRCLE

The omnichannel virtuous circle has long been appreciated by the operators, however pre-Covid, online sales were considered to be costly and structurally less profitable than physical in-store sales.

The near doubling in online grocery penetration has materially improved delivery densities which has, in turn, nearly halved delivery costs from omnichannel stores<sup>8</sup>. Given the dominant driver of grocery home delivery fulfilment costs is the delivery piece, this newfound efficiency gain has transformed online profitability to the point whereby online sales are close to profit margin parity with physical in-store transactions.

With near equivalence between in-store and online profit margins, omnichannel stores now achieve a seamless integration for the operator between online and offline channels. This new normal underpins the importance of having the right stores in the right location to be successful in the future model of grocery.

The seamless integration between online and offline is a very significant development within the grocery industry as it empowers the operator to be truly blind to channel. Future grocery strategy can therefore be focussed purely on the customer and be agnostic to where the sale takes place – in store, online with delivery or click and collect.

In a post Covid era, the most profitable customer will demand its grocer to provide both online and physical channels.

<sup>8</sup> Source: Atrato Capital research, Kantar online grocery data.

### 1.3 METHODS OF FULFILMENT

Firstly, a summary the different types of fulfilment methods available to the operators:

#### *Automated centralised fulfilment centres*

Automated centralised fulfilment centres (“CFCs”) are large c.0.5m to 1m sq.ft. warehouses equipped with sophisticated automation and capacity to fulfil c.200,000 grocery orders per week. CFCs can take up to 24 months to design and build with estimated costs of over £100m<sup>9</sup>.

Centralised fulfilment is designed around a “hub and spoke” model in which customer orders are fulfilled in an automated CFC (the “Hub”) and transported or ‘trunked’ to smaller warehouses (the spokes). The spoke operates as a transshipment point designed to minimise the distance that the final delivery truck must drive to the customer (the “stem mileage”). In the UK, Ocado currently operates 4 CFCs and 17 spokes for their online only grocery business also providing fulfilment services for M&S food and Morrisons.

#### *Dark store / partially automated centralised fulfilment centres*

These facilities have partial automation and are designed to fulfil online orders only (i.e., no in store sales). They come with an unappealing mix of additional capital costs (i.e., new location) and comparatively high operating costs (i.e., low volumes and no in store sales) and are a back-stop solution for locations with limited supermarket space (i.e., London). Recently some operators have closed their dark stores in favour of omnichannel store pick fulfilment. Accordingly, we have not considered this solution further.

#### *Omnichannel supermarkets - store pick fulfilment*

The store pick fulfilment model utilises an existing network of supermarkets as last mile fulfilment centres (known as omnichannel stores). Store employees pick and pack online orders from the supermarket aisles using handheld scanning equipment to optimises the pick walks. Online orders are then delivered to the customer via vans operating from distribution docks located at the back of stores or made ready for click and collect.

Omnichannel supermarkets have typical fulfilment capacity of c.2,000 orders per week<sup>10</sup> and are re-supplied daily from centralised distribution centres. Converting a supermarket to operate as a last mile fulfilment centre requires minimal capital expenditure estimated at less than c.£1m. Our research suggests that over 80% of all online orders in the UK are fulfilled from omnichannel supermarkets.

**Figure 3:** Summary of fulfilment options – Over 80% of all UK online orders are fulfilled using omnichannel stores<sup>11</sup>.

	Omnichannel		Dark store	Centralised fulfilment centre
	manual	automated		
Potential volume (orders per wk)	2,000 - 3000	6,000-7,000	15,000 - 20,000	100,000 -200,000
Capital expenditure (£ms)	£0.5-£1	£3-£5	£20-£25	£150 -£250
Est. development time	<1 month	3-6 months	Up to 12 months	Up to 24 months
Est. delivery radius	25-45min	25-45min	Up to 60 min	Up to 120 min
Typical delivery fleet size	8-30 vans	20-50 vans	50-100 vans	Over 100 vans
Customer proposition	Home delivery Click and Collect Same day & next day	Home deliver Click and Collect Same day & next day	Home delivery Same day & next day	Home delivery Next day

<sup>9</sup> Source: Atrato research

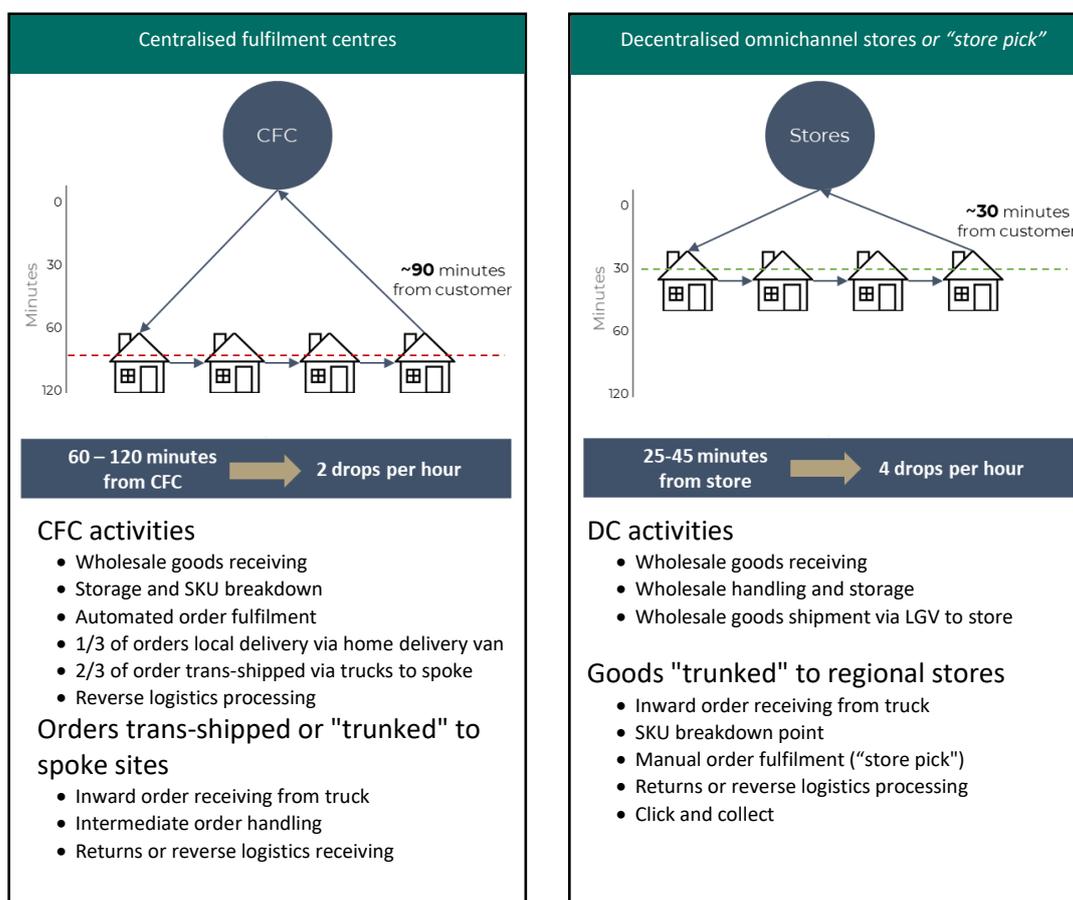
<sup>10</sup> Source: Atrato Capital research

<sup>11</sup> Based on Atrato Capital research and operator websites.

The omnichannel store solution also allows operators to install automated fulfilment solutions (urban micro fulfilment centres) within stores to enhance capacity and productivity. These consist of automated picking technology in the back of the brick-and-mortar store with a footprint of approximately 10,000 to 15,000 sqft). This is detailed further in Section 4 below.

The question then becomes, which strategy is best for a given operation to fulfil consumer demand efficiently, generate profitability and become a key driver of investment in the future. The answer depends on a wide range of factors but we focus on what we believe to be the key cost drivers (delivery and picking & packing) and strategic drivers (margins and click and collect).

**Figure 4: Features of the different Types of fulfilment methods<sup>12</sup>**



## 2 DELIVERY

Clever robotics and warehouse automation systems can assist in lowering the cost of picking and packing each online order. However, picking and packing is not the dominant driver of the total online fulfilment cost. Delivery represents the cost with the largest potential for variability. If delivery costs can be optimised, total online grocery fulfilment costs can be reduced to a level which is substantively recovered via a delivery charge to the customer. By comparison, picking and packing productivity has scope only to deliver marginal gains.

<sup>12</sup> Source: Atrato Capital research, for illustrative purposes.

## 2.1 DELIVERY PERFORMANCE – STORE PICK VS CENTRALISED FULFILMENT

One of the primary advantages of using supermarkets as fulfilment centres is lower stem times, i.e., the distance between the fulfilment centre and the customer. We can illustrate this by examining the relative delivery performance between centralised fulfilment and store pick fulfilment using delivery performance data from Ocado’s CFC’s and from Tesco and Sainsbury’s store pick operation.

Using geographical drive time and demographic mapping software, we determine that 90% of the UK population can be reached within a 25-45 minute stem time radius for the Sainsbury’s store network vs 60-120 minutes for Ocado’s CFC and Spoke network.<sup>13</sup>

One of the main benefits of lower stem times is that it can enable the operators to achieve greater utilisation and productivity from its delivery fleet. Ocado achieved up to 1.7 deliveries per van per hour (“DPH”) in 2019.<sup>14</sup> In contrast, Tesco achieved circa 2.5 DPH.<sup>15</sup> This difference in productivity is primarily due to lower stem times associated with using a well located store as the last mile fulfilment centre.

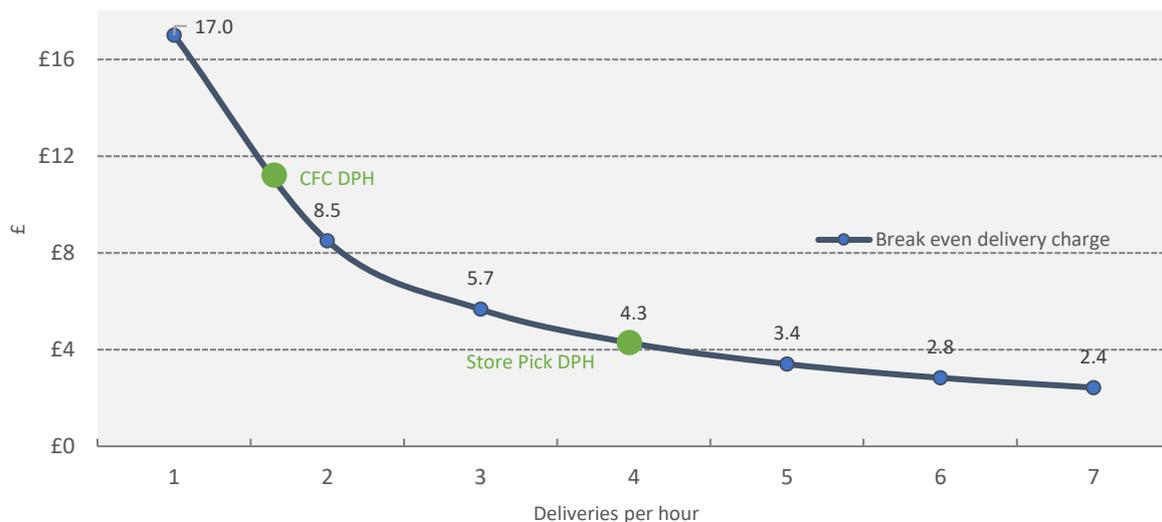
## 2.2 STEM TIME DELIVERY ECONOMICS

The cost of operating a delivery van per hour is between c.£17-£20 consisting of the driver salary cost (85%), van depreciation (5%) and diesel cost (10%). Each van operates productively for around 16 hours per day with a maximum capacity of c.20 grocery orders per van.<sup>16</sup>

In the short term, delivery cost per hour is substantially a fixed cost for the operator since each van’s driver and depreciation cost is fixed. Diesel cost for extra mileage is only a small variable.

As such, there is an inverse relationship between the number of deliveries per hour and the cost per delivery as illustrated below.

**Figure 5: Average delivery cost assuming different deliveries per hour (DPH)**



Source: Atrato Capital research based on drive time cost analysis based on above cost assumptions.

<sup>13</sup> Drive time estimates using StorePointGeo

<sup>14</sup> Ocado 1H20 Results - 192 DPV per week converted to hourly assuming standard 16-hour operational day.

<sup>15</sup> According to our discussions with consultants and Tesco delivery drivers

<sup>16</sup> Source: Atrato Research, Assumes 2 shifts per day based on an 8 hours per shift pattern.

Based on these calculations, the equilibrium point for an average delivery cost of c.£4 is between 4-5 DPH requiring c.64 deliveries per van per day, and with typical van capacity of 20 orders, this is likely to require a total of c.3 reloading trips per day to the fulfilment centre.

The store pick model is the only framework that could realistically allow an operator to achieve c.4 DPH. We estimate that c.20% - 25% market share for home delivered grocery could provide sufficient local demand to allow delivery densities to reach this level.

### 2.3 DELIVERY CONCLUSION

Delivering grocery from a well located omnichannel supermarket achieves a game changing saving in the cost of online fulfilment over CFCs. The average delivery charge to customers now substantively offsets the reduced cost of delivery and cost to pick and pack (as to which see below). This means that in-store vs online is broadly margin neutral to the grocer.

What's more, the store fulfilment model has the potential to add capacity quickly to satisfy an increased level of online demand without substantial increase in investment cost. Meanwhile, the delivery stem time associated with CFCs places the model at a structural cost disadvantage.

## 3 PICKING AND PACKING

Automated CFCs rely on various degrees of technology to bring goods to pickers to pack baskets. At the extreme, is Ocado's incredible system which orchestrates robotics or "bots" across a "hive" which houses up to 50,000 separate grocery product types (known as "Stock Keeping Units" or "SKU's") stored in pallets or "totes"<sup>17</sup>. Each tote is collected by bots and delivered to a picking and packing station where ordered SKU's are then picked by hand by a stationary employee in to shopping bags for delivery.

Store pick relies on individuals picking ordered SKU's from traditional store aisles into pick trolleys. Pick trolleys are designed to fulfil up to 8 orders at any one time<sup>18</sup>. Pickers use handheld scanning equipment with a graphical interface that tells them what SKUs to collect and optimises their pick walks enabling them to identify products more efficiently. Pickers create synergies with shelf stacking logistics as they can immediately report low shelf stock levels for speedy replenishment.

Store pick supermarkets tend to score higher in customer satisfaction surveys as physical customers appreciate the increase in staff members to help on the shop floor.

Store pick supermarkets also need to carry a bigger and better range of goods, and these goods have a higher velocity of turnover leading to fresher produce and longer best before dates. This in turn drives an increase in physical store sales.

### 3.1. PICK PERFORMANCE AND PRODUCTIVITY

The standard industry measure for picking performance is 'items picked per labour hour' (IPH). This determines how quickly a typical order basket of 45 items can be fulfilled.

There is very little productivity differential between IPH rates from highly automated centralised fulfilment centres and a modern store pick fulfilment system.

<sup>17</sup> Source: Ocado Annual report 2020.

<sup>18</sup> Source: Atrato Capital research

Highly automated centres still require a lot of human labour. For example, Ocado’s largest CFC in Erith utilises circa 1,050 human pickers & 1,800 robots<sup>19</sup>.

We can examine the IPH performance between a centralised fulfilment model and store fulfilment model using data from Ocado and Sainsbury’s.

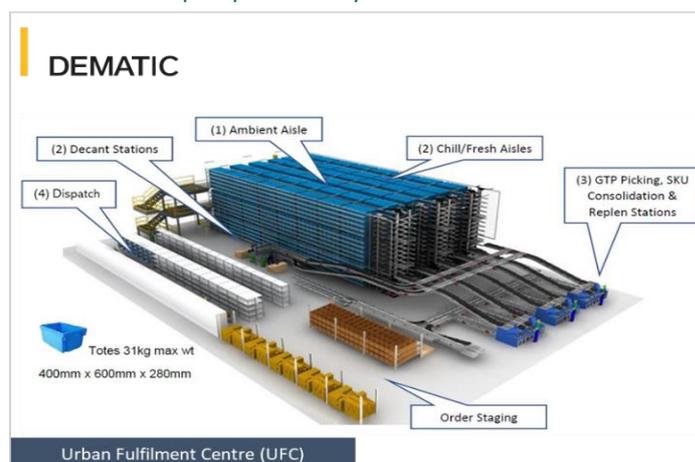
Ocado’s current IPH is 170<sup>20</sup>. In contrast one major store pick fulfilment operator has improved store pick IPH from 116 to 160 according to IGD and staff at another store pick fulfilment operator tell us some stores can reach 180 IPH. This this means c.4 typical basket sizes can be fulfilled within one hour and spreads the marginal picking cost over 3 to 4 baskets. Whilst not all store pick fulfilment systems may hit the same IPH productivity levels achieved by our example, it does illustrate how store pick can become as productive as automated systems.

Recent technology evolution has meant that smaller automated micro fulfilment systems, or urban fulfilment centres (“UFCs”), can now be housed within supermarket back of house areas. These smaller systems house 20,000 SKU’s and only automate the picking of dry goods that require minimal management within the storage system. Picking of fresh and frozen items that are difficult and expensive to automate is done in store via store pick. In addition, the picking of fresh items from the supermarket shelves has such a positive impact on the freshness and range of the in-store offering that operators have a strong preference to continue to pick these items from the store.

Many technology companies have now emerged supplying pick technology. One example of a manufacturer of these smaller supermarket-based systems can achieve an IPH of up to 200 per hour using this hybrid approach.

Amazon is working with Dematic to build UFCs into its US stores<sup>21</sup> and Tesco is working on a 3-year plan to install 25 similar systems into its UK supermarkets. Ken Murphy’s update to the market in January confirmed that Tesco’s first UFC in West Bromwich performed strongly, delivering on all the productivity metrics they hoped it would and that a second UFC is to open in Lakeside very soon and will have an even higher pick rate than West Bromwich.

**Figure 6: Micro fulfilment technology example – According to IGD, urban fulfilment centres are part of strategy to increase capacity and overall store pick productivity<sup>22</sup>.**



Source: Dematic Website.

<sup>19</sup> The Guardian, November 2020

<sup>20</sup> Ocado 1H20 Results Presentation

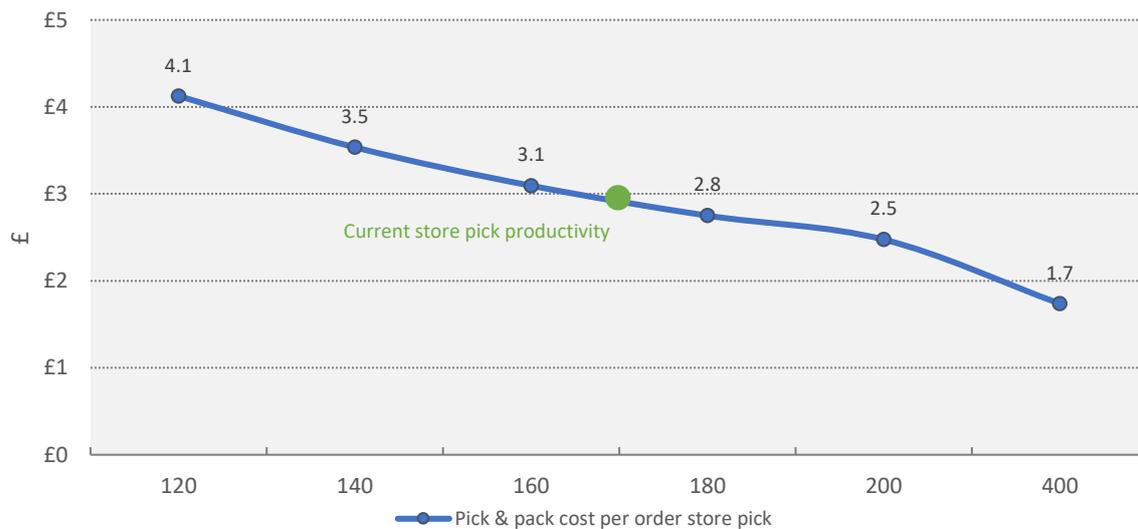
<sup>21</sup> Source: The Grocer, March 2020

<sup>22</sup> Source: Dematic Website

### 3.2 PICKING AND PACKING ECONOMICS

In the case of store pick, the direct cost is represented by the hourly cost of the labour to pick and pack each order which we estimate is £12.00 per hour. Based on different IPH we can see the marginal cost impact for each standard basket of 45 items.

**Figure 7:** Average pick and packing cost per order (IPH) using omnichannel store pick method – an IPH of over 200 items will require investment in micro fulfilment automation.



Source: Atrato Capital research based on assumed average cost and basket size as listed above

The current manual picking cost is c.£3 per basket. In the case of a fully automated centralised system, the cost is represented by the labour cost, capital depreciation of the equipment and the maintenance cost of the system. We estimate this to be around £7 per basket (£5 direct CFC labour and maintenance cost<sup>23</sup> and £2 capital depreciation<sup>24</sup>).

### 3.3 PICKING AND PACKING CONCLUSION

We believe the manual store pick model allows an operator to recover the full marginal cost of the picking operation from charges to customers. A pick cost of £3 per order is likely to allow store pick operators to substantially recover this cost through delivery charges whilst investment in hybrid systems offers the opportunity to lower this cost further.

In contrast, a fully automated centralised warehouse system is unlikely to recover the marginal labour and capital depreciation cost from customer charges due to the high capital cost of automation and the labour required to operate such systems.

<sup>23</sup> Based on Ocado CFC labour cost % of sales H120 Results Presentation.

<sup>24</sup> Estimated based on £130m Hatfield CFC estimated total cost depreciated assuming 20-year useful life with 70k order capacity per week capacity.

#### 4. GROSS MARGINS

Many industry observers believe the centralised fulfilment model to be more profitable than the store fulfilment model. We believe this is largely due to the 4.5% EBITDA profit advertised by Ocado Retail which is considered a measure for the profitability of automated centralised fulfilment systems<sup>25</sup>.

This profitability is generated from gross margins of 35% which are exceptionally high for a grocer. It is worth noting that Ocado Retail can achieve these margins by targeting a premium segment of the UK grocery market by selling premium brands on its platform such as M&S and previously Waitrose to an affluent London and Home Counties based market. This degree of market segmentation means Ocado's share of the total £200bn UK grocery market is a very small 1.9%<sup>26</sup>. Hence Ocado's impressive net margins are a function of its ability to charge its customers higher prices rather than a lower cost of fulfilment.

Price orientated mainstream grocers, such as Tesco, Sainsbury's, Morrisons and Asda need to operate on gross margins of c.25% to maintain their much larger market shares.

These mainstream grocers may need to employ CFC solutions where they are capacity constrained and where the cost to build store based fulfilment is simply too high. A good example of this is Tesco's CFC based model for fulfilling Central London home deliveries.

However, outside this limited application, omnichannel supermarket operators can achieve online profit margins comparable to traditional in-store supermarket sales with average home delivery charges of around £7 per order and click and collect charges of £3.

#### 5. CLICK AND COLLECT

Click and collect services lowers the fulfilment cost to the operator by some 80% when compared to home delivery, as consumers collect picked and packed online grocery orders from an omnichannel store as part of a commute to work or other travel mission. For many consumers, this is an very convenient way to shop.

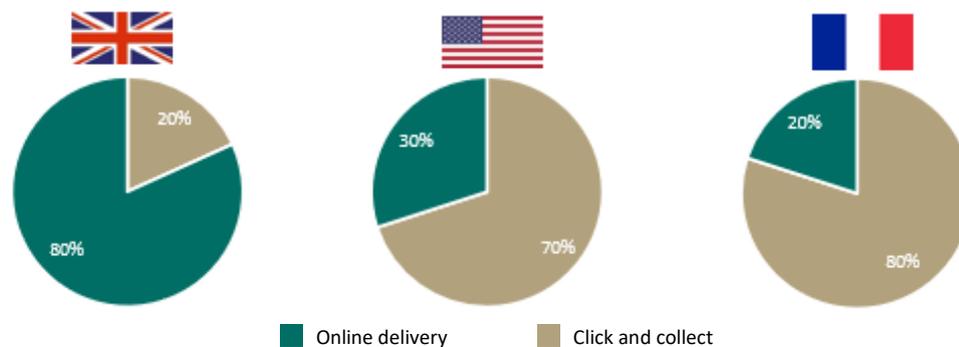
This model has proven exceptionally popular in France and the USA, where up to 90% of all online orders are click and collect. There is no doubt that the consumer convenience aspect is a factor in this popularity. However, it is also due to prohibitively expensive home delivery charges caused by lower urban density and higher stem times. This highlights the price elasticity of demand for home delivery. For example, click and collect has increased from c.10% to as much as 20-25% of online sales for two of the big 4.<sup>27</sup>

<sup>25</sup> Ocado H120 Results Presentation

<sup>26</sup> Kantar Worldpanel, March 2021

<sup>27</sup> Based on Tesco and Sainsbury's Q3 trading updates January 2021

**Figure 8:** Online grocery market by online channel – UK click and collect has grown from 10% to 20% as grocers improve the customer experience.<sup>28</sup>



Source: Atrato Capital research

In addition to removing the cost of home delivery, click and collect can also benefit the operator by driving footfall to the store. Evidence from France and the USA shows that c.40% of click and collect customers also do a top up shop in the store when collecting online orders, improving the total basket margin from online sales<sup>29</sup>.

A network of physical omnichannel stores providing low-cost fulfilment capacity and localised collection points is integral to capitalising on the increased popularity of click and collect. These omnichannel stores also provide last mile fulfilment capacity that can efficiently cater for shifts in demand between home delivery and click and collect and we believe there may be an increase in promotion and investment in improving click and collect services due to the profit margins incentive.

## OVERALL CONCLUSION

Our research illustrates how omnichannel stores are driving value creation within the grocery operators business models as they adapt and change to a multi-channel offering in which online has a more substantial market share.

We believe this online demand surge will be sustained even after the pandemic ends and lockdown measures and restrictions are relaxed. Tesco’s CEO Ken Murphy agrees with us “online grocery has just become an institutional part of customers shopping habits, because as they’ve gotten into the rhythm of it, they’ve got comfortable with it and they find it very convenient”.

The global theme of the consumer demanding more choice, more quality, faster fulfilment and all at lower prices, results in large omnichannel supermarkets being ideally placed to serve these desires whether online or physical.

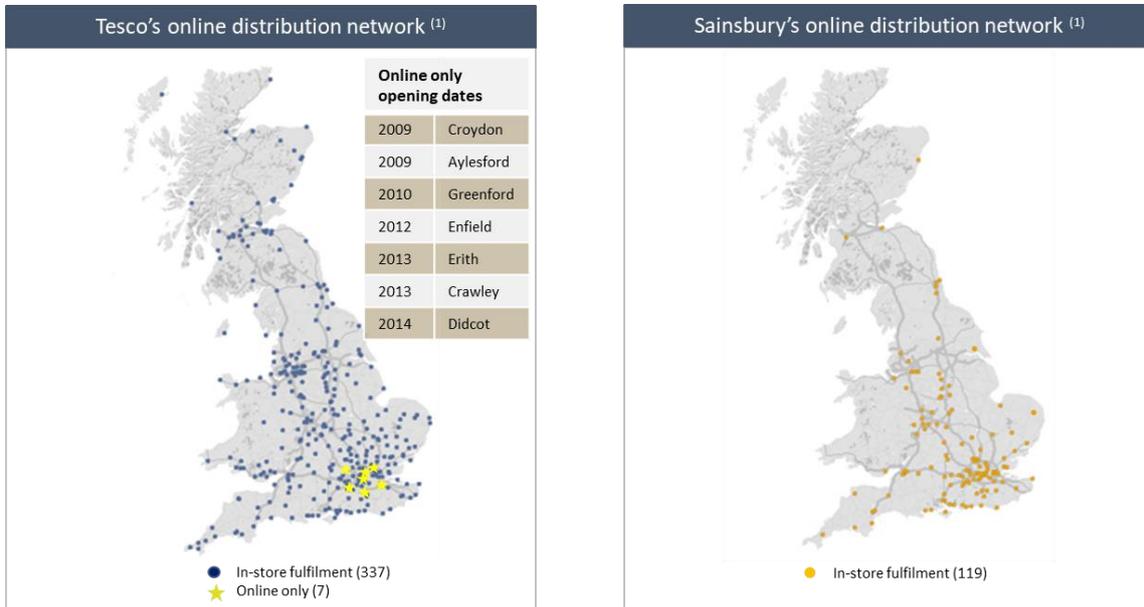
In a post Covid era, the most profitable customer will demand the seamless integration between online and offline with the option to shop in store, click and collect and shop in person.

**With the cost of online fulfilment recovered from delivery charges, the grocers can be focused purely on the customer and be agnostic to the sales channel.**

<sup>28</sup> Source: Atrato Capital research

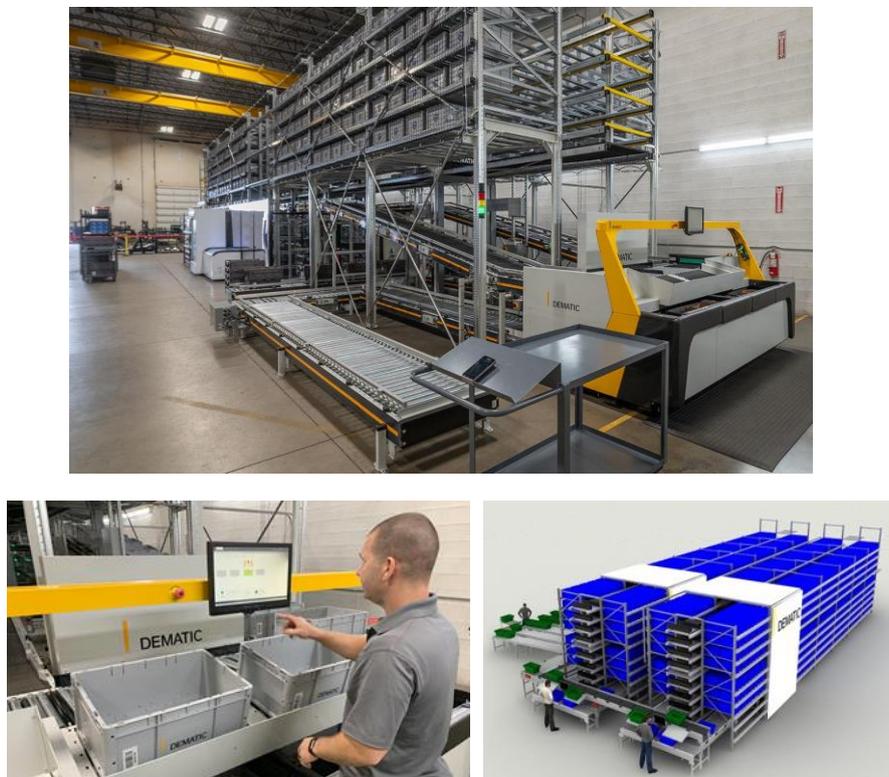
<sup>29</sup> CNBC May 2020, based on Forrester research

### ILLUSTRATION 1: TESCO AND SAINSBURY'S ONLINE DISTRIBUTION NETWORK<sup>30</sup>



### ILLUSTRATION 2: URBAN FULFILMENT CENTRE

Example of the latest inn store urban fulfilment centre developed by Dematic.



Source: Dematic website

<sup>30</sup> Source: Atrato research, operator websites and Atrato estimates

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