

Economic insight into the baby disposable diaper industry



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The disposable diaper, an invention that revolutionized the baby care industry exists today as a practical solution to the problem of dirty, smelly, wet baby bottoms throughout the world.

The need for diapers has always existed. There are several documents from the past that refer to the use of milkweed leaf wraps, animal skins and other creative natural resources to serve the need, a far cry from today's disposable diapers [citation]. Proctor & Gamble commercialized the disposable diaper business by introducing 'Pampers' in the year 1961 [citation]. Since then, the industry has witnessed remarkable magnitude of development and one of the reasons disposable diapers are enjoying overwhelming popularity is due to the rising number of working mothers in the society [citation]. The volume of growth is also closely co-related to the level of birth-rate, and owing to its rising trend there lay great potential in the coming years [citation].

The baby disposable diaper industry is poised to take advantage of this growth and thereby to realise its potential this paper will try to highlight some of the key propositions for a keen investor so as to assist him/her gain a comprehensive overview of the market from the logistics perspective. To provide one with factual insights, the report has sketched a detailed schematic for the city of Dunedin (New Zealand) and tries to serve details of the current market scenario, potential and other practical considerations. However the report holds high level of generalisability and similar settings can later be applied to other regional markets. Please note that the estimations made are based on calculative judgements and are not totally accurate.

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Target Market

The duration for which children may rely on diapers depends on how fast they pass their potty training. There is a high level of diversity across the globe, where Americans take the longest to learn, around 34 months [citation]. Babies in China and Russia probably are the best examples who learn in less than 20 months [citation]. The rest of the world is somewhere in the middle. A good estimate should be around 30 months, i. e. 2. 5 years. Therefore, children within the age bracket 0-2. 5 form the end consumers. However the purchase decisions are undertaken by the parents who form the target consumers.

Market Potential

The market potential of the disposable diaper market relies on the estimation of absolute demand. The first step towards this estimation is to calculate number for children lying within the age bracket of 0-2. 5 years. The next census figures for New Zealand will be released in 2011, and using statistical data for the year 2006 would prove obsolete. However NZ Stats does provide with real time figures for the entire country. To derive recent figures for the required age group, proportionate increase in total population of New Zealand from the year 2006 to 2010 was calculated, which stood around 8. 7% [citation]. This increase was then added to the 2006 census for Dunedin. From the total population of the city, number of children within the age of 2. 5 years was 2. 5% of the total population [citation]. This gave us a final figure of 3, 225. The second step was to calculate the diaper consumption for each life stage and arriving to an average number of diapers used during the entire life of the child. As per Absormex data index,

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a new born infant consumers around 6. 82 diapers per day, whereas two year olds use 3. 74 per day [citation]. Therefore at an average a baby consumes around 5. 2 diapers per day. Thus the daily consumption is derived by multiplying the total number of babies with the average daily consumption. As consumption can be equated to the market demand, the absolute maximum demand for the city approximately stands around 16, 770 diapers per day.

The market potential is the maximum demand for the market, which assumes if all babies use disposable diapers. But this is certainly not the case. Thus one has to consider the market penetration to arrive to the actual demand potential. As per Richer Investment consultants, diaper purchase triggers at around \$3, 500 USD of Purchasing Power Parity (PPP) per year which equates to around \$ 4, 700 NZD [citation]. In Dunedin, 83% of the population earn an annual income of more than \$ 5000 [citation]. Thus this gives us a demand potential of around 14, 000 disposable diapers per day.

Inventory Planning and Warehousing

Owing to a long shelf life and high volume, inventory planning for disposable diapers can turn into a perplexing job. This is because both the characteristics contradict each other to arrive to an optimum stock.

Technically, disposable diapers do not have an expiry date [citation]. But they do turn pale after the duration of eighteen months [citation].

Nonetheless, they still possess a comparatively longer shelf life than most of the FMCG products. Thereby the seller can gain an opportunity of lowering the cost by stocking large quantity of goods. However disposable diapers,

owing to their fluffiness take up larger shelf space and stocking large inventory could be quite expensive.

To answer this dilemma, one has to take into consideration the low value of the product and quicker technological innovations. In the inventory cost, the cost of storage remains flat regardless of the type of the product. In the case of diapers, a pack of forty four in New Zealand costs around \$ 28, giving us a per unit price of 60 cents, which is quite high in comparison to the shelf space it takes up. Moreover, observing the technological trend in the diaper industry, a new innovation is introduced every three months. Therefore, storing goods more than three months would lead to stock obsolescence. Therefore one needs to carefully plan out the inventory considering all the above mentioned factors.

Diapers are available in different sizes, and one has to also consider the proportions of different sizes to be held in the right quantity. Disposable diapers are available in 6 sizes, from 1 to 6. Small infant consumer size 1-2 and two year olds use size 5-6. The level of consumption for different sizes is indirectly correlated to the age of the children, i. e. small infants consume higher quantity of smaller sized diapers as compared to the bigger sized diapers consumed by two year olds. To estimate the proportion of different sizes to be stocked, we can make use of the Absormex consumption figures aforementioned. For medium sized diapers (size 3-4), we would assume that its consumption is equal to the average of the small and large sizes, i. e. 5.20 per day. Thus, the total inventory would be composed of 43%, 33% and 24% of sizes 1-2, 3-4, and 5-6 respectively.

Distribution Channels

Supermarkets and pharmacy shops are the two primary retail distribution channels for disposable diaper. Hospitals with maternity wards do serve as a secondary channel for catering the diaper needs for new born infants.

Supermarkets Chains:

Supermarkets are the most generic channel to reach the customers. As per Timmon's survey, almost 41% of the total stock flows through supermarkets [citation]. In Dunedin there are 18 major supermarkets [citation]. Major concentration of these stores is observed around Dunedin Central and mainly across Roslyn, Saint Clair, Caversham, Port Chalmers and Mornington.

Pharmacy Shops:

Pharmaceutical outlets also serve as a channel for retail distribution, though not as important as supermarkets, owing to the lower frequency of customer visits and lower foot traffic. As per Timmon's survey they contribute around 18% of the total sales [citation]. However, the clustering of pharmacy shops is identical to that observed for supermarkets as well.

Hospitals:

Hospitals act as a tertiary distribution channel which caters the needs of the new born infants after their immediate birth. In Dunedin, there are 16 main hospitals, out of which 11 have maternity wards [citation]. However as they only cater the needs of infants hence would only require small sizes of 1-2.

To estimate the number of diapers required by the hospitals, one has all the

required figures. As per breathingearth. net, a baby is born every 8.9 minutes in New Zealand, which gives us a national figure of 162 births per day. The proportional birth rate for Dunedin comes to around 5 babies per day. These babies are held in the hospital for two days where they required 6.82 diaper changes per day. Thus a baby needs a diaper change every every 3.5 hours. Thus gives us a total consumption for hospital of around 35 diapers per day. Therefore the requirement is marginal as compared to the aforementioned distribution channels.

Alternative Channels of Distribution

A distribution channel can be feasible if is able to suffice the benefits with its costs. In the case of disposable diapers, the product holds absolute sense if one proposes to avail it via online channels. On the first place, the popularity of diapers is purely driven by the level of convenience it avails to the working parents for whom time is of essential value. Therefore, home delivery would enhance its level of convenience. Moreover, it is a functional product which does not require personal inspection before every purchase. However the channel would only be justified if it is able to provide the product at least in par with retail prices or lower. These could be justified by the savings created after cut shorting the profits of the retailer along with other related costs for availing the product on retail shelves. Thus higher savings would enable feasibility of the channel from seller's perspective as well.

Procurement and Distribution

Globally centralised manufacturing centres serve benefits of reduction in costs through economies of scale, given that the high logistics and

transportation costs are sufficed with the profit margins of the goods. In the case of disposable diapers, it is highly unlikely to support the structure for a centralised manufacturing plant owing to the low value and high volume of the product. Therefore diaper manufacturers maintain regional manufacturing units. For the region of Oceania, prominent enterprises such as Kimberley Clark and Proctor & Gamble have their diaper manufacturing facilities primarily located in Australia, whereby the national distribution centres for New Zealand are situated in Auckland and Christchurch.

Procurement from Christchurch via railway would prove feasible cost wise, unless if the national distributors agree to cover the road transportation costs, which is less likely. Proximity would lead to shorter transit duration, which in this case would be approximately 11 hours, eventually lowering the lead time.

The losses related to out of stock situation for diaper brands are is reasonably high. It is highly likely that the consumer would pick up the competitors product due to the product high level of substitution. Moreover, the functionality of the product remains flat across different brands.

Therefore in the case of several out of stock situation; the customer might eventually switch brands. The ultimate solution to this problem is to reduce the lead time by holding stock as close as possible to the retail channels.

This would require holding distribution centres at district level.

In Dunedin, majority of the retail outlets including hospitals are clustered around the Octagon, Great King St. North, St. Clair, and Mornington, which are situated in the Central, North, South and East portion of the city

respectively. West portion of the city is scarcely populated, hence not taken into consideration. Taking into account the rent for holding a centralised distribution facility near the railway station, which falls into Dunedin CBD, it would be rather cheaper to hold three smaller centres across the north, south and east portions of the city. Northern and Central portions of the city hold approximately 40% of the total population [citation], whereas the rest of the population is more or less distributed equally around the Southern and Western portions of the city [citation]. As consumption is directly related to the volume of population, a comparatively larger the distribution centre can be held in North Dunedin (Great King St. North). As this centre would be closest to the Central portions of the city, it would suffice the needs for this portion as well. The other two centres can be held in Western and Southern zones of the district. Therefore proximity to remote distribution centres from the retail locations would serve cheaper transportation costs, shorter delivery and lead time.

Stock Allocation and Replenishment

Two aspects are to be considered for stock allocation, one is distributing to different channels and the second is geographical allocation. Both the aspects are dependent on the frequency of purchase. This again directly correlates to the level of population. Considering the population of Dunedin, around 40% are concentrated in the Central and Northern portions of the city where as the rest is equally concentrated in the Western and Southern portions of the city. The Eastern portion of the city is not considered due to habitat scarcity. Therefore the stock would be allocated keeping into

consideration the same proportion of the population residing at the different parts of the city.

It is observed that parents of smaller infants are less price sensitive as compared to those of grown up babies [citation]. Therefore marking smaller size diapers at a slightly higher price won't bring would only affect the demand in a comparatively smaller correlation. Moreover a higher demand of the smaller size as compared to the larger one can further benefit the suppliers to buy in bulk and sell to the retailers. Therefore would serve cost benefits from purchase as well as sale.

[Replenishment]

Overcoming Demand Fluctuation

The supply chain for disposable diapers can be a victim of the bullwhip effect, which can be caused by minimal information sharing between the channel members where irregular purchase patterns exist. Considering the actual market scenario; parents who buy disposable diapers already anticipate that their baby would require diapers in the coming weeks. Therefore they do not buy in single packs, but in multiples to save on large quantities. However, this can lead to apparent delay in subsequent purchase occasions. This is because they do not possess accurate consumption estimates and can lead to fluctuations in purchase patterns, eventually leading to increase in demand volatility. The supermarkets stores at which they buy these products order by the pallet size or even truck load, and again at varying frequencies. Moreover the wholesalers will also be ordering according to their own re-order level policies. The combined effect of all this

could create volatile picture of demand by the time this distorted picture is received at the diaper factory.

To overcome these inefficiencies the one has to make sure to ensure transparency between the retail channels and can strongly count on efficient consumer response. Instead of having to anticipate requirements on the basis of personal forecasts, it should be demand driven. For which the supplier has to rely on retailer's sales figures rather than his own personal forecasts to place orders to the national suppliers. It can be made sure that one own figures also get passed on to the channel members closer to the manufacturers. This is to give out a clear demand picture to the manufacturer who can further utilize this for making efficient use of resources. Manufacturer's efficiency highly impacts the profit margins, sales figures, and above all the very existence of channel members. Thus with the achievement of better use of production and transportation capacity, all the members in the supply chain can respond efficiently to demand fluctuations along with saving on working capital.

Technological Considerations

RFID (Radio Frequency Identification) has been a technological breakthrough in the field of logistics. It serves the seller with an array of information which him gain deep insights, far beyond the conventional bar code technology.

The question is whether the diaper industry can make use of this technology to reap greater benefits. Considering the costs, a single tag costs around 10-15 cents (USD), which converts to around 20 cents in New Zealand Currency [citation]. Incorporating the technology does not support the cost and profit

structure in case of disposable diapers. Moreover the cost of the tag is just <https://assignbuster.com/economic-insight-into-the-baby-disposable-diaper-industry/>

around 65% of the total cost, whereas the rest is comprised of infrastructure to support the technology in the supply chain. Therefore would add up to a total cost of approximately 30 cents per unit which remains constant across all the packing sizes. Operating in thin profits, 30 cents would not support the profit margins nor would serve the benefits in the scarcely populated country of New Zealand.

Conclusion

Diapers were introduced in the 1960, since then they have undergone tremendous number of innovations. It might look simple, but it's an technological achievement, where a single diaper of today has over 200 patents. On top of this, it keeps getting modified with superficial upgradations such as fasteners, size of the pads, colour patterns, and even liner material. But the core appeal of diapers is still its convenience. This is of utmost importance to today's working mothers. Made from non-degradable plastic, disposable diapers reduce the task of washing cloth diapers.

Plastic is by far the most expensive component of disposable diapers. The higher shelf life is highly responsible for the durability of this plastic used in diapers, which is resistant to heat, weather and other environmental concerns. This is where the problem lies, they cannot be broken down by sunlight nor natural deterioration works for them, eventually turning it into a non-degradable waste. In today's highly environmental sensitive society, the unfriendliness of diapers towards the environment is creating a big issue towards its preference and sale. The whole structure might fall apart if this issue is taken seriously. However, major efforts have been undertaken to introduce molecular structures in the plastic paper used in diapers to cause <https://assignbuster.com/economic-insight-into-the-baby-disposable-diaper-industry/>

it to disintegrate upon extended environmental elements. This development highly potent in changing the perception towards disposable diapers and how it is viewed by the consumers.