Buy now, pay later: Is it a supply chain thing?

Buy now/pay later is one of the hottest trends in marketing, creating new sales for organizations. It's also creating headaches for supply chain professionals from procurement to operations.

BY TAN MILLER

Let's say that you're the manager of logistics for a major retailer. Led by the sales and marketing groups, your firm has recently implemented the latest rage in e-commerce and retail purchasing practices, "buy now, pay later," or what we'll call BNPL. The program allows consumers to make a purchase and receive the merchandise today while making payments over time. Of course, these programs have been around for years. Backed by finance companies, they've typically been offered by companies and services providers with expensive products that people used to spend years saving up for, everyone from your local dentist to finance expensive dental procedures like crowns and veneers to furniture retailers. Today, these programs have gone mainstream: Use your Paypal account to buy a $60 pair of shoes online, and Paypal is likely to give you the option of paying for the purchase over four payments to six payments.

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100%
BUY NOW,
PAY LATER!
ADD TO CART

It's easy to see why sales, marketing and finance might love these programs because they potentially open up a new sales channel and increase revenue. But what about supply chain? Perhaps it's not as simple as it seems on the surface and creates a new set of logistics costs and headaches.

Over the years, you, the supply chain manager, have made the accommodations necessary to facilitate a lay-a-way purchase. When a customer purchases via lay-a-way, you put the item aside in your warehouse or the back room of a store, and then ship the item to the customer, or they pick it up in the store, after the final payment is made. You have to create additional storage space and perhaps a carry cost to hang on to the item. But, if they customer fails to make the final payment, the item can still be resold as new.

The BNPL is similar, but different. Now, when the customer clicks the purchase option after agreeing to make payments, they take immediate possession of the item, either picking it up in a store, or after you ship it out to them. That sounds simple enough. But, one of the things you noticed is that not infrequently, the customer changes their mind, cancels the BNPL contract, and returns the item to your distribution network, just like they'd return any other product. Sometimes, the returns don't come back for weeks, or even months, after they've been used by the customer for some period of time in their homes. What's more, as the volume of e-commerce orders has picked up, so has the volume of returns, including those purchased using BNPL.

These returns come back in various used states. In some cases, the products can no longer be sold again, even on a discounted, used basis. As a logistics manager, you find yourself wondering whether the BNPL purchase option is actually helping or hurting your firm's financial success, if you take into consideration all of the costs associated with handling, returning and potentially disposing of the product.

As the use of BNPL escalates rapidly, logistics professionals may rightly be concerned as to the potential ramifications of their firm's adoption of BNPL on logistics operating costs, and ultimately on their firm's profitability. Further, as the pandemic has intensified the attention paid to the critical impact of the supply chain on the daily lives of consumers, logistics and supply chain is playing an elevated role at your firm. You and your supply chain team leaders now report directly to the COO or CEO. In that role, you have to decide whether now is the time to insert supply chain and logistics considerations into your firm's debate over the merits of BNPL, along with your colleagues from sales, marketing and finance. And specifically, you intend to influence your firm to adopt well-known logistics principles such as "total cost of ownership" into the BNPL decision-making process.

That's a big step. To make it, you want to be armed with facts about the true cost associated with the BNPL option to your firm. In this paper, we present a small, straightforward model to quantify the benefits and costs of BNPL. We envision this BNPL model as a tool that logistics managers can utilize both for their own analysis of BNPL, and importantly as a vehicle to facilitate discussions with colleagues in sales, marketing and other departments in their firm.

Specifically, this model integrates logistics costs into the overall analysis of how BNPL affects a firm financially. It provides a straightforward, easy-to-implement tool to evaluate the impact of BNPL with logistics-related costs taken into consideration. Finally, we note that while the model described here is intentionally simple, it can readily be expanded to incorporate additional logistics factors, as well as more advanced analytical methods such as the utilization of probability analysis in sales forecasts. (Readers interested in using a more advanced version of this model can contact the author directly.)

What is buy now, pay later?

BNPL plans were pioneered in the early 2000s by start-up firms such as Klarna, Affirm and Afterpay. Payment period durations can range from weeks to months to even years, depending upon the type of product and the terms offered by the merchant. Additionally, other financial terms for the consumer such as the interest rates, penalty fees, missed payment rules and so on can vary widely. For example, many BNPL purchase options have no interest fees, while others may impose substantial fees.

Without question, BNPL is big business. As BNPL has gained an increasingly strong foothold in recent years among retailers, and in particular their younger consumers, heavyweight financial firms such as American Express, Paypal and others have joined the

ranks of BNPL providers. This promises to accelerate the growth of the BNPL market, which CNBC estimates has already reached about $100 billion in 2021.

The *Wall Street Journal* puts the number even higher, which earlier this year reported that investment firms like Brigade Capital Management made double-digit returns in 2021 funding "more than $500 million of 'buy now, pay later' consumer loans." According to the *WSJ*, such direct-to-consumer loans amount to more than $1 trillion loaned each year by private capital. Whichever number is correct, it's obviously large, and growing quickly as the investment community looks for higher returns in an otherwise low interest environment.

As previously noted, BNPL differs from traditional layaway programs because the consumer acquires the product immediately, before paying in full for the product, compared to layaway, where the consumer receives the product only after the completion of all payments. Further, third-party financial providers typically charge merchants a BNPL service fee of 5% to 6% rather than the typical 2% to 3% fees assessed for traditional credit card services. This all adds up to BNPL representing both a potential sales (revenue) enhancement opportunity for retailers, but also a potential source of additional costs and risks, including logistics-related costs. Thus, it creates the need to evaluate the potential impact of BNPL on a firm from all financial and operational aspects, including logistics related costs.

BNPL, simplified

Table 1 displays a simple Excel-based cost-benefit model that evaluates the changes in both revenues and costs for a firm before and after it offers the BNPL purchase option to its customers. A firm that has already implemented BNPL will have before and after data, while a firm that has not yet offered BNPL to its customers must develop forecasts. We will discuss later why firms in either situation may benefit from employing alternative forecasts of revenues and costs under BNPL.

A quick review of Table 1 illuminates the simple premise of this model; namely, we compare sales revenues and logistics related costs pre and post BNPL. This facilitates calculating the incremental changes in revenues and logistics costs, as well as the incremental change in total profit contribution (CTPC) after logistics

TABLE 1

A simple "buy now, pay later" cost-benefit model

Annual revenue or cost component [1]	Projected total revenue or cost $ (000)	Incremental change from offering BNPL $ (000)
Sales revenue [2]	$11,000 / $10,000	
Revenue from cancellation fee charge on returns	$2	
TOTAL REVENUE	$11,662 / $10,450	
Service fee to 3rd party financial firm [3]	$660 / $200	
Logistics handling costs of returns	$11 / $5	
TOTAL COSTS	$1,773 / $705	
Change in total profit contribution after logistics and sales related costs of offering BNPL	$9,889 / $9,745	

With BNPL option

[1] The costs shown are only those logistics and service fee costs directly associated with BNPL which may vary depending upon whether BNPL is or is not offered to customers (i.e., these are not "total logistics costs" so costs such as transportation costs are not included)

[2] This represents total sales revenue (i.e., it is not just sales purchased with the BNPL financial option)

[3] It is assumed the 3rd party firms are BNPL financial providers, or in the case of "without BNPL", the third party financial providers are credit card firms

Source: Authors

and related costs from offering BNPL.

CTPC is defined as the difference between total revenues—total logistics related costs, both after and before a firm makes BNPL available to its customers.[1] For example, the fictitious illustration in Table 1 indicates that under the scenario modeled, the firm's CTPC would increase by $144,000 annually by offering BNPL. This gain in CTPC would result because total revenues with BNPL offered rise by $1,212,000, while total logistics related costs increase by $1,068,000. The difference of $144,000 between the incremental changes in revenue and logistics related costs represents the annual incremental change in CTPC that BNPL generates for the firm.

The results of the analysis displayed in Table 1 obviously depend on the actual or assumed data underlying this model. In many cases, firms will not have before and after BNPL data, and will need to make forecast assumptions, such as firms that either have not yet implemented BNPL or have just recently begun to offer this financial option. However, even firms that have actual BNPL experience and data may benefit from exploring different what-if future scenarios. Tables 2 and 3 review the data assumptions underlying the analysis shown in Table 1, and set the stage for the what-if simulation we will illustrate in Table 4.

Table 2 reveals the revenue and sales related variables evaluated by the BNPL model. A glance at the first column shows that before and after sales revenue, lost revenue, salvage revenue, cancellation fees revenue and fees for financial services (costs) are included in this version of our model.[2]

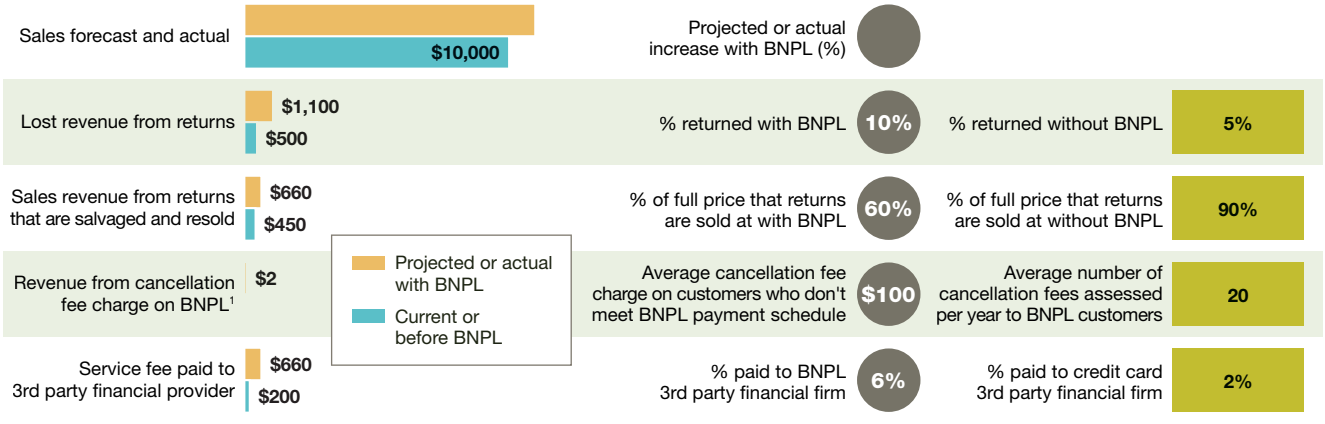
Columns 3 and 2 display the before and after values for each of the variables. Columns 4 and 5 allow the model user to enter either actual data or alternatively to make assumptions (projections) on the impact of implementing BNPL on a model variable. Thus, the data points entered in columns 4 and 5 affect the values shown in column 2.

For example, in the scenario displayed here, the projected or actual increase in sales resulting from the implementation of BNPL is 10%. This scenario also assumes that the firm charges a cancellation fee to customers who don't make their BNPL payments (e.g., $100), and it projects the average number of cancellation fees enforced per year (e.g., 20).

We can observe all of the variables considered in this scenario, and can also envision how any other variables pertinent to a particular firm could be incorporated into the analysis to customize this model.

TABLE 2

Revenue actuals and forecasts and sales related fees

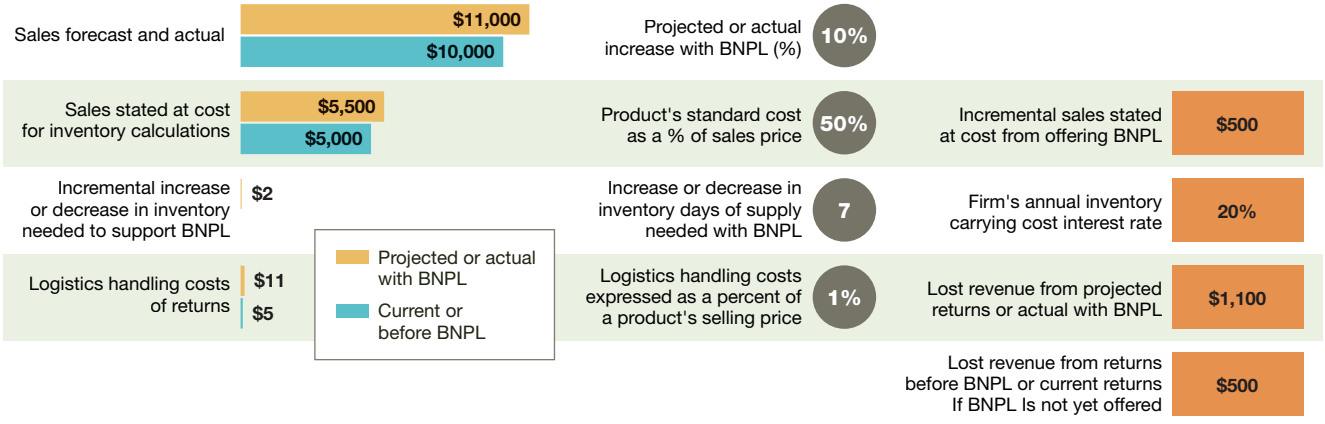


[1] For firms that charge a cancellation fee on product purchased via BNPL and which is either returned, and/or the customer does not meet the payment schedule and the product is re-possessed by the firm - this row captures the revenue obtained from the cancellation charges

Source: Authors

TABLE 3

Logistics costs and variables



Source: Authors

Table 3 focuses on the logistics related costs and variables potentially affected by the implementation of BNPL. For clarity, sales before and after BNPL are restated from Table 2, and then are calculated at cost to facilitate inventory calculations. Next, the model evaluates the incremental change in inventory required to support BNPL. To facilitate this calculation, the user must input the change in inventory days of supply required with BNPL and the firm's annual inventory carrying cost interest rate.

Finally, the model considers the logistics costs of handling returns before and after BNPL. For this calculation, the user must provide the firm's handling costs expressed as a percent of the product's selling price, and lost revenue before and after BNPL is also utilized.[3]

A breakeven modeling illustration

Table 4 posits an illustration of how we envision a manager employing this model to evaluate and facilitate a discussion of the potential impact of BNPL on a firm's profitability. For a firm either considering a BNPL implementation, or in the early stages of an actual implementation, developing the after results (i.e., the after data) may not be clear or settled yet.

In any of these situations, sensitivity or what-if analysis represents a powerful tool to provide perspective on an uncertain, difficult to forecast outcome. Specifically, by utilizing sensitivity analysis, managers can obtain an order of magnitude, directional view on the potential impact of BNPL. Table 4 presents a what-if sensitivity analysis that illustrates the insights this tool generates. Now, let's briefly review the example in Table 4 and discuss its analytic value.

Table 4 displays the results of seven illustrative scenarios where the assumed or forecast increase in sales resulting from the implementation of BNPL ranges from 0% to 30%. Column 3 shows that depending upon the increase in sales generated by offering BNPL, our fictional firm could lose as much as $753 thousand in profit (if sales remain unchanged) or gain as much as $1.9 million in profit (if sales increase by 30%). Further, this table reveals that the breakeven point where incremental sales from BNPL begin to generate a positive contribution to profit lies somewhere between 5% and 10%.

The value of this analysis lies not in a specific projection of where the profit contribution turns positive, it is just over 8% according to the results in Table 4[4]; but rather in the general range it suggests. In this case, from Table 4, we observe that if BNPL stimulates sales increases of about 15% or more, we can be confident that the overall impact on profits will be positive, while if sales increase by much below 10%, BNPL may have only a marginally positive—or even negative—effect on profitability.

This range and perspective enhances a firm's decision-making process by enabling managers to more confidentially asses the potential or actual value of BNPL for their operation. For example, while managers may have great uncertainty regarding a specific sales forecast increase,

they may have a much higher degree of confidence that BNPL will generate increased sales of more than X% or less than Y%. Sensitivity analysis, as illustrated in Table 4, can often provide sufficient order of magnitude guidance to allow managers to reach a conclusion or make a decision confidentially.

The bottom half of Table 4 lists the other assumptions (forecasts) made to generate this analysis. This offers a concise view of all the variables and projections underlying the what-if sensitivity results. This perspective is important as the values assumed for some of these variables, such as the percent of purchases returned under the BNPL option, may represent best guesses. At the same time, other variables such as logistics costs expressed as a percent of a product's selling price may be known data points. By reviewing all of these variables, along with the alternative sales increase projections under BNPL, a manager can more confidently assess the results.

Extensions to Table 4 and the model

The analytic results and model displayed in Table 4 can easily be expanded and customized for an individual firm. Briefly, the following highlights a few of the extensions users can implement.

TABLE 4

Buy now, pay later: What-if sensitivity analysis

Scenario #	Projected increase in sales with BNPL (%)	Change in total profit contribution after logistics and sales related costs of offering BNPL: [rev - logistics related costs] $ (000) annual	Total sales revenue $ (000) annual	Total logistics and other BNPL sales related costs and fees $ (000) annual
1	0%	-$753	$10,000 $10,000	$8,992 $9,745
2	5%	-$304	$10,500 $10,000	$9,441 $9,745
3	10%	$144	$11,000 $10,000	$9,889 $9,745
4	15%	$593	$11,500 $10,000	$10,338 $9,745
5	20%	$1,041	$12,000 $10,000	$10,786 $9,745
6	25%	$1,490	$12,500 $10,000	$11,235 $9,745
7	30%	$1,938	$13,000 $10,000	$11,683 $9,745

With BNPL option Without BNPL option

Other scenario assumptions in addition to the assumed increase in sales resulting from offering BNPL

	With BNPL option	Without BNPL option
Percent of purchases returned	10%	5%
Percent of full price that returns are re-sold at	60%	90%
Percent paid to BNPL 3rd party and to credit card 3rd party provider	6%	2%
Logistics handling costs expressed as a percent of a product's selling price	1%	1%
Product's standard cost as a % of sales price	50%	50%
Firm's annual inventory carrying cost interest rate	20%	20%
Cancellation fee on customers who don't meet BNPL payment schedule	$100	NA
Average number of cancellations fees asessed per year to BNPL customers	20	NA
Increase or decrease in inventory days of supply needed with BNPL	7	NA

Source: Authors

1. A range of what-if scenario values for any variable (e.g., percent of purchases returned under BNPL) can be evaluated. Table 4 only illustrates a what-if on the percent increase in sales with BNPL, and holds constant all other variables' assumed values. However, this what-if can be done for any other variable also.

2. One can define a larger set of scenarios where alternative values for two or more variables are utilized, such as the projected increase in sales and the percent of purchases returned. Obviously, the number of combinations and scenarios would increase, but one can feasibly do this.

3. User friendly software such as Microsoft Access, Python or even Excel Macros can be employed to create automated versions of this model. For example, a program can be constructed where the user simply inputs before and after BNPL data for each variable, and then the program automatically runs each scenario and generates an output report similar to Table 4.

Modeling considerations

The example presented in Table 4 represents just one concise illustration of the customized BNPL models a firm can create to evaluate the potential benefits and costs of implementing BNPL, taking logistics related implementation factors into consideration.

Obviously numerous other business, marketing and sales considerations weigh heavily in an evaluation of BNPL, and may even hold a higher priority and influence on any decisions. Nevertheless, this model can assure that logistics factors receive appropriate consideration in a firm's assessment of BNPL, and that decisions on BNPL are guided by the "true total costs" of this financial payment option.

To conclude, we offer the following bullet list of factors to consider when analyzing BNPL. Some apply more specifically to logistics related modeling factors, while others would more generally apply to a BNPL implementation strategy.

1. A firm that offers consumers hundreds or thousands of products may find it neither feasible nor insightful to explicitly analyze the potential BNPL costs and benefits for each individual product. Alternatively, a strategy of evaluating families or groups (e.g., brands) of products represents an efficient analytic approach.[5]

2. Further, certain general product categories may represent good candidates for BNPL, while others may not. For example, retailers such as Walmart, Target, Home Depot, Lowes and others offer an extensive variety of products to consumers, and their prices range from under five dollars to hundreds and thousands of dollars. Clearly below some dollar threshold, a BNPL purchase option does not make sense. Similarly, while BNPL may work for consumer durable products, it generally does not for consumer perishable items.

3. Firms such as retailers utilizing an omni-channel sales and logistics strategy may have to do their analyses by location, or at least by categories of locations. Large retailers often provide their customers many different ways to buy products including:

- purchase from a store location and check out;
- purchase online from a store location and drive to a pickup location outside of the four walls of the store itself (e.g., drive-thru);
- purchase online and receive home delivery from a store location;
- purchase online and receive home delivery from a distribution facility; and
- purchase online and receive home delivery with expedited delivery.

The logistics costs of alternative purchase options in an omni-channel environment can vary significantly. Hence, the need to develop analyses (and models) by location category may be necessary to account for these differences.

The growth of BNPL

The use of BNPL purchase options by retailers continues to grow at a rapid pace both in the United States and elsewhere. Further, more long-established financial institutions have begun to enter the BNPL third-party provider landscape, joining upstart firms that initiated this financial option.

This will enhance the growth of BNPL as a purchase option that more and more retailers will implement.

As BNPL becomes more entrenched, it is important that firms understand the logistics implications and total costs for their operations of offering BNPL. Straightforward analytic models, such as those presented in this article, facilitate this needed evaluation of the logistics impacts of BNPL.

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1 Note that logistics and related costs include lost revenue from returns as well as third party financial fees.

2 Other variables pertinent to a particular firm can easily be added to those shown. One simply has to provide "before" and "after" data for any additional variable to be included.

3 Lost revenue before and after BNPL is originally input into Table 2 and shown again in Table 3 for clarity.

4 The actual breakeven point in this example where incremental sales become positive occurs if sales increase by 8.4% or more.

5 Although it is beyond the scope of this article, in general, a family or selected group approach for actual implementation purposes often represents a fruitful strategy. Similarly, firms may wish to pilot or prioritize an actual implementation, and a family or small group initial implementation can facilitate a pilot.