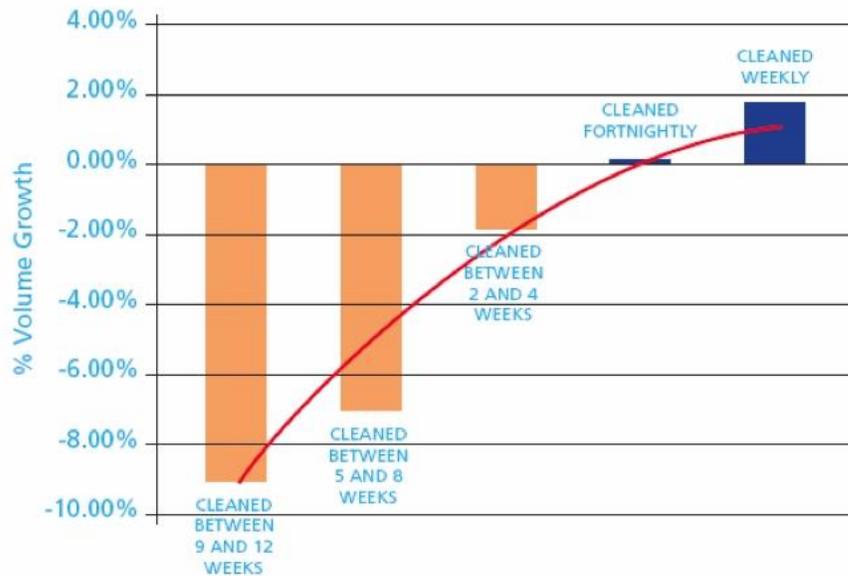


The Economic Benefits of Line Cleaning

Draught Beer Quality Subcommittee

Recently, David Quain, using data from a UK Pub company, highlighted the economic benefits of draught line cleaning. The main affect was increasing draught volume growth from increased cleanings; lines cleaned between 9 and 12 weeks had negative volume growth (around -9%), whereas accounts that were cleaned weekly had volume growth of around 2%.



Source: A UK Pub Company, as seen in D. Quain’s “Draught Beer Quality: Challenges and Opportunities”

Although these findings may be intuitive, they have yet to be tested systematically in the United States. Consequently, this report uses a natural experiment, the purchase of a line-cleaning business by a wholesaler, to test the relationship between line cleaning and volume growth in the U.S. marketplace. Similarly to Quain’s findings, it finds that line cleaning increases the volume growth of draught sales, potentially by as much as 4% a year.

Background:

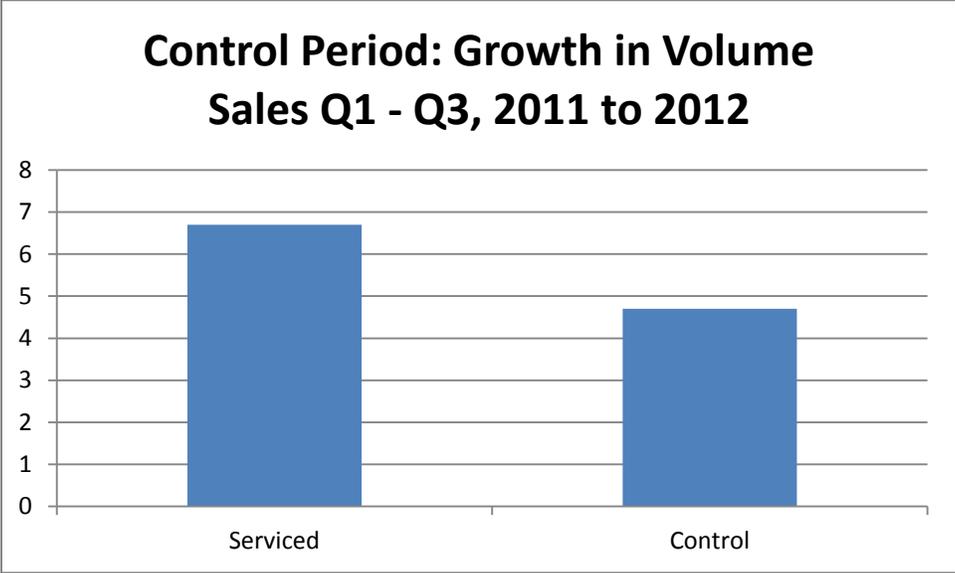
In September of 2012, a U.S. wholesaler purchased a local draught line-cleaning business. As a result, this provided an opportunity to analyze the performance of this wholesaler’s accounts broken into two groups: those taking advantage of the line-cleaning service offered by the wholesaler, and those that do not. Although this does not prove that those accounts using the line-cleaning business necessarily clean more than those that do not, it is highly suggestive of that fact.

Both accounts are relatively large. The accounts utilizing the line-cleaning business total annual sales of more than 40,000 barrels annually, while the accounts not utilizing the line-cleaning option total more than 120,000 barrels annually. They are distributed across the same geographic area (all within a single state) and other than the utilization of the line-cleaning service, no known differences exist between the two groups.

The Comparison:

This report uses a time series design to measure the effect of the line-cleaning business on draught sales in the two accounts. It looks at sales in the two groups for three quarters before and after the purchase of the business. It finds that the difference between the growth in volume sales widened between the accounts using the cleaning service (the “serviced” accounts) and those that did not (the “control” accounts).

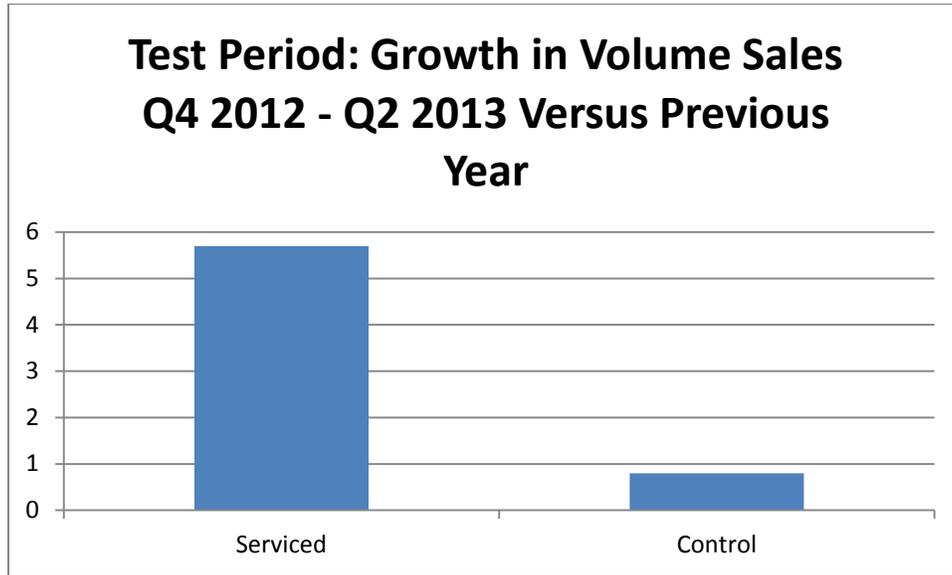
For the before period, we can look at growth in the three quarters prior to the purchase of the cleaning business, comparing Q’s 1-3 2011, versus the same period in 2012. Both accounts saw year-on-year growth in this control period, with the sales of the serviced accounts growing 2 percentage points faster than the control accounts.



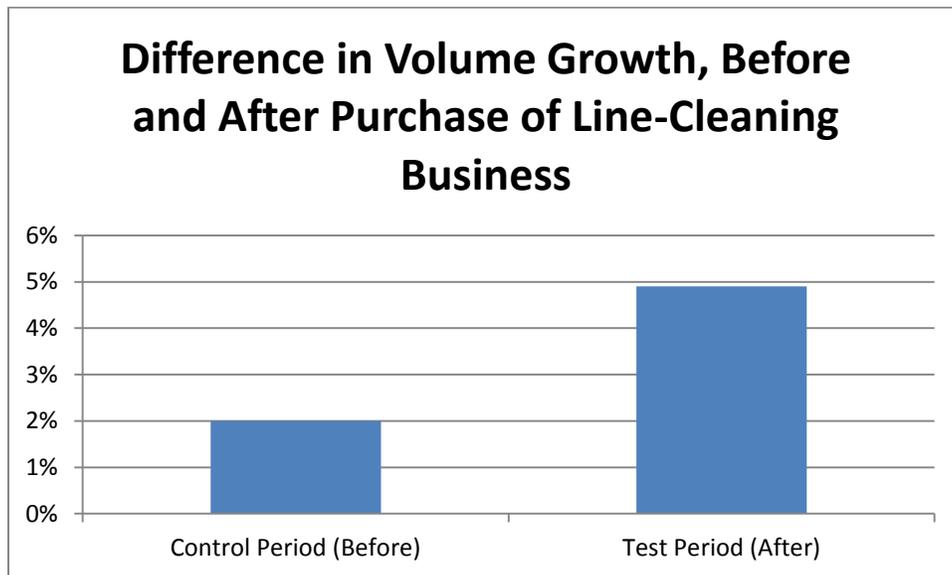
This comparison gives a baseline between the two sets of accounts. In general, regardless of their cleaning schedule, it suggests that the serviced accounts should be expected to grow 2% faster than the control accounts, even if growth rates vary due to economic conditions or consumer preferences.

However, looking at the second period, we find that the gap between the two accounts actually grew after the purchase of the line-cleaning business by the wholesaler. The initial quarter post-purchase was the most dramatic, with the serviced accounts growing 11.1% in draught volume

(4Q 2012 vs. 4Q2011), whereas the control accounts actually shrank in volume, down -2.4%. Looking over a similar three quarter timeframe as the control period, we see that that serviced accounts grew 5.7% from 4Q 2012-2Q 2013 versus the similar period a year before, whereas the control accounts grew by a much lower 0.8%. This difference of 4.9% was almost three percentage points higher than would be expected given the control period.



In all, this suggests that the effect of the line-cleaning business was worth almost 3% of the total volume sales growth in the serviced accounts over three quarters (almost 4% annualized). Put differently, without the cleanings, based on the growth in the other accounts, we would have expected the serviced accounts to have grown by just under 3% in the three quarters examined. In reality, they grew by almost 6%.



Although this before-after comparison does not have the explanatory power of a more rigorous true experiment on the effects of line cleaning, in replicating Quain's findings in the US context, it provides persuasive evidence as to the power of line cleaning on draught sales.

Note: Some retailers might complain that the 4% growth is simply the result of beer lost *during* line cleaning, rather than real growth because of line cleaning. Although the return from line cleaning, even including the cost of lost beer, will be detailed below, it is worth noting that the beer from line cleaning is likely *at most* 1% point of that 4% growth. Assuming one keg a week, a retailer would lose 40 oz. of beer in cleaning (see more below), which is 1% of the two kegs per cleaning cycle. If kegs turn over at a faster rate (for instance, some popular kegs can turn over 4 times a week), this drops significantly. At four kegs/week, this loss would be only 0.25% of the beer in that keg, which is a negligible portion of the expected growth of 4%.

Return On Investment (ROI)

Perhaps the most important implication of this finding is that it allows retailers to calculate a potential return on investment from line cleaning. Before beginning these calculations, it's worth stating a blunt summary:

Under even the most extremely conservative assumptions, frequent line cleaning generates positive returns. With more reasonable assumptions, it may be a large source of new profit for retailers.

Again, the observed difference of 2.9% between the account groups over three quarters annualizes to 3.9%. That means if we assume 132 servings in a keg (at ~15 oz. per serving in a standard 1984 oz. keg), this volume growth is worth around 5 additional pints per keg per year.¹ Across the serviced accounts that represents over 450,000 pints/year, and for the control accounts, it represents almost 1.3 million pints a year in foregone growth (almost 5,000 barrels in lost growth across accounts that are more than 125,000 barrels).

The cost of line cleaning will vary significantly based on the keg in question, the frequency of cleaning, and the cost of cleaning (in terms of labor and materials). In beer costs, for a high end beer (priced at \$135 keg), this could run as high as \$70 a line/year in beer alone. For a lower priced beer (many domestics for instance are \$88 a keg), these costs will be lower.

The labor cost will depend on a variety of factors (who cleans, number of lines cleaned, etc.). Line cleaning services typically charge \$5-8 a line, whereas in-house labor may take up to 3 hours for a single line. As seen below, no matter the variables used, line-cleaning makes economic sense for retailers.

¹ Estimates of the number of pints in a keg vary. A strict calculation gives 124 pints/keg, but any retailer knows that typical pours, including foam, range closer to 14.5-15 oz. Accounting for realistic pours, foam, and spillage typically generates estimates in the low 130s range.

Typical Scenario: Let's start with what might be an average set of assumptions: a retailer with 4 lines, who is moving from once every two months to a two-week cycle. There are three costs: lost beer, labor, and materials.

The first cost is lost beer. This a relatively small cost. The total cost for four lines of moving from a two-month to two-week cycle is only \$217.76 annually. Assuming one keg per line per week, this is less than 1% of total beer costs on those four lines for the year (0.8% at 1 keg/week, 0.4% at 2 kegs/week).

Cost of lost beer (two-week) = (40 ounces of beer [80 feet x .5 oz per foot] x ~.07 per oz [\$135 a keg/1984 ounces a keg] * 26 cleanings) = \$70.77

Cost of lost beer (two-month) = (40 ounces of beer [80 feet x .5 oz per foot] x ~.07 per oz [\$135 a keg/1984 ounces a keg] * 6 cleanings) = \$16.33

Net annual cost of lost beer for each line moving from two-month to two-week cycle = \$54.44

Total cost for 4 lines = \$217.76

Total cost of all beer purchased during the year on four lines = \$135/keg x 1 keg/week/line x 52 weeks/per x 4 lines = \$28,080

So lost beer equals less than 1% of total beer costs!

As for the labor costs, we will assume that a worker can clean four lines in four hours.² In most cases, labor costs per line will decrease as lines increase. Cleaning one line may take three hours, whereas 4 lines may only take four hours (and 8 lines may only take 5 hours). In addition, line cleaning services will likely be a cheaper alternative in many cases.

In this case, the labor costs are:

Costs for two-week cycle = 4 x \$10 an hour x 26 cleanings = \$1040

Costs for two-month cycle = 4 x \$10 an hour x 6 cleanings = \$240

Net annual labor cost of moving from two-month to two-week cycle = \$800

This cost assumption may be higher than necessary. If we assume an \$8 charge/line for a service, this cost is only $(4 \times 8 \times 26) - (4 \times 8 \times 6) = \640 .

The last portion of costs are the cleaning materials. A competitively priced liquid cleaning currently retails for \$11.70 for a 68 oz. bottle (and is likely cheaper in bulk). With 9 oz. needed per gallon of cleaning liquid, and if we assume 3 gallons of cleaning solution per line (though

² This is another assumption that is likely overly conservative. An experienced line cleaner may only take two hours for a similar job.

this will decrease as lines increase as the needed reservoir can be shared), that works out to \$4.65 in materials a line clean (\$11.70 bottle / ~2.5 cleans a bottle [68 oz./bottle x 1 gallon solution/9 oz. cleaner x 1 clean/3 gallons required]).

Costs for two-week cycle = \$4.65 x 26 cleanings x 4 lines = \$483.14

Costs for two-month cycle = \$4.65 x 6 cleanings x 4 lines = \$111.49

Net cost of moving from a two-month to two-week cycle (4 lines) = \$371.65

So what's the total net cost of moving from a two-month to two-week cleaning cycle?

Total Net Cost = \$217.69+\$800+\$371.65 = \$1,389.34

So in this scenario, costs go up by \$1389.34 a year for the four lines. This is a per line cost of \$347.34.

However, new expected profits go up by \$3546.40, or \$886.60 a line! If a pint of beer costs \$4.50³, and a retailer makes \$3.41 in profit on that beer, that means that with five additional pints/keg in growth from cleaning (4% growth in volume), a retailer is making \$17.05 per keg/year profit from cleaning. Assuming even the very conservative rate of one keg a week on a line, that works out to \$886.60 a year in new beer profits per line, for a total of over \$3500 in new profits with four lines.

5 pints/keg x \$3.41 profit/pint x 52 kegs/year/line = \$886.60 profit/year/line

x 4 lines =

= \$3,546.40 in new profit

This makes total net expected profits increase up to \$2,279.04 for the four lines, or a total of \$569.76 a line! And, this is assuming that the retailer is cleaning the line. With a wholesaler cleaning the line (or the line service costs outlined above), the profits will only increase.

4-Line Scenario (moving from once every two months to two-week cycle)

Total Net Costs = \$1,389.34 (\$347.34 a line)

Total New Profits = \$3,546.40 (\$886.60 a line)

Total Net Profit = \$2,157.06 (\$539.26 a line)

³ This is a conservative estimate. GuestMetrics found that in 2012, the average pint of craft beer (which is the likely beverage in a \$135 keg) in a tavern/bar averaged \$5.39.

Even the assumptions in this scenario may still be fairly conservative, as they assumes lines are only turning over once a week and that a retailer is doing line-cleaning themselves, rather than using a service. With more frequent turnover, or lower labor costs, potential returns from line cleaning only increase.

But what happens under the most extreme assumptions? Even then, more-frequent line cleaning is likely profitable.

The Highest Cost Scenario: For the purposes of this exercise, let's start by assuming the highest cost scenario, moving from *very* infrequent cleanings (once every three months) to a two-week cleaning cycle for a single line that is running beer priced at \$135 a keg in a state where the retailer is required to carry out their own cleanings (i.e. bear the labor costs of cleaning). Using the same method outlined above, this works out to an annual cost of \$70.77 in lost beer for the line + the cost of labor/materials (which again, may or may not be borne by the retailer) and a net cost of \$59.88:

$\text{Cost of lost beer (two-week)} = (40 \text{ ounces of beer [80 feet x .5 oz per foot]} \times \sim.07 \text{ per oz [\$135 a keg/1984 ounces a keg]} \times 26 \text{ cleanings}) = \70.77 $\text{Cost of lost beer (three-month)} = (40 \text{ ounces of beer [80 feet x .5 oz per foot]} \times \sim.07 \text{ per oz [\$135 a keg/1984 ounces a keg]} \times 4 \text{ cleanings}) = \10.89 $\text{Net cost of lost beer from moving from once a quarter to two-week cycle} = \59.88
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As for the labor costs, we will again assume the highest cost scenario, one in which a worker is cleaning a single line, taking three hours. In most cases, however, labor costs per line will decrease as lines increase. Cleaning one line may take three hours, but 4 lines may only take four hours.

In this case, the labor costs are:

$\text{Costs for two-week cycle} = 3 \times \$10 \text{ an hour} \times 26 \text{ cleanings} = \780 $\text{Costs for three-month cycle} = 3 \times \$10 \text{ an hour} \times 4 \text{ cleanings} = \120 $\text{Net labor cost of moving from once a quarter to two-week cycle} = \660

The last portion of costs are materials. A competitively priced liquid cleaning currently retails for \$11.70 for a 68 oz. bottle (and is likely cheaper in bulk). With 9 oz. needed per gallon of cleaning liquid, and if we assume 3 gallons of cleaning solution per line (though this will decrease as lines increase as the needed reservoir can be shared), that works out to \$4.65 in materials a line clean (\$11.70 bottle / ~2.5 cleans a bottle [68 oz./bottle x 1 gallon solution/9 oz. cleaner x 1 clean/3 gallons required]).

Costs for two-week cycle = $\$4.65 \times 26 \text{ cleanings} = \120.90

Costs for three-month cycle = $\$4.65 \times 4 \text{ cleanings} = \18.60

Net cost of moving from once a quarter to two-week cycle = $\$102.30$

So what's the total net cost?

Total Net Cost = $\$59.88 + \$660 + \$102.30 = \822.18

Now \$822.18 sounds like a lot of cost for a single line, but when balanced against the return from volume growth, it still makes sense. Keep in mind, this was in the most extreme scenario, with a single line (and so no economies of scale), with an expensive beer, with previously very infrequent cleanings, and so on.

On the benefits side, if a pint of beer costs $\$4.50^4$, and a retailer makes \$3.41 in profit on that beer, that means that with five additional pints in growth from cleaning, a retailer is making \$17.05 per keg/year profit from cleaning. Assuming even the very conservative rate of one keg a week on a line, that works out to \$886.60 a year in new beer profits, for a total return of \$64.42.

$5 \text{ pints/keg} \times \$3.41 \text{ profit/pint} \times 52 \text{ kegs/year} = \$886.60 \text{ profit/year}$

- $\$822.18 \text{ (costs)}$

= $\$64.42 \text{ in new profit per line}$

Again, even with the most extreme set of assumptions, retailers will reap new profits from frequent line cleaning.

⁴ This is a conservative estimate. GuestMetrics found that in 2012, the average pint of craft beer (which is the likely beverage in a \$135 keg) in a tavern/bar averaged \$5.39.