

Lehmann, Christian; Bidmon, Christina

## Article

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# On the Back of A Beer Coaster – Simple Estimates for Costs and Revenues in Business Modelling

Christian Lehmann<sup>1</sup>  
Christina M. Bidmon<sup>2</sup>

*1 Department of Economics and Informatics, Hanover University of Applied Sciences, Hanover, Germany, christian.lehmann@hs-hannover.de*

*2 Copernicus Institute of Sustainable Development, Utrecht University, c.m.bidmon@uu.nl*

## Abstract

Validating the profit formula of a business idea is a difficult task for students and entrepreneurs alike. With the “Business Coaster” we present a simple and playful tool that helps students to get in touch with numbers and design the value capture side of a business model.

*“A few measures that are directly related to the basic business model are better than a plethora of measures that produce a lack of focus and confusion about what is important and what is not” (Pfeffer and Sutton, 1999: 260).*

## Introduction

How a firm monetises the value it creates is one of the essential questions a business model needs to answer (Baden-Fuller and Mangematin, 2013: 419). Yet questions

about the “profit formula” (Johnson et al., 2008: 62) behind a business idea are often the hardest to answer for students and entrepreneurs alike.

Alongside value creation and value delivery, value capture constitutes a key element in most business model definitions (e.g., Teece, 2010: 173; Baden-Fuller and Mangematin, 2013: 421). Accordingly, frameworks and canvases that aim at depicting the underlying value architecture of a business model often require information on costs and revenues (Trimi and

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Berbegal-Mirabent, 2012). For example, in the widely used Business Model Canvas (BMC) “cost structure” and “revenue streams” are two of the nine building blocks (Osterwalder and Pigneur, 2009: 14). Yet when teaching business models, the focus often lies on ideating the value proposition or brainstorming about potential customer groups, not on financial planning. In our classes, we have found that students can find the transition from the “upper part” of the BMC to the “bottom part” with costs and revenues quite challenging. Bound to the semantic structures of the canvas, they struggle with the switch from qualitative to quantitative blocks. Often, they fill in a few words on revenue and cost items, but hesitate to quantify them. If they put numbers, these numbers differ substantially in their quality, address different units, or refer to different points in time. Thus, the financial viability of the new or improved business model often remains unclear.

Whereas tools such as the BMC or the Lean Canvas arguably do not aim to develop fully-fledged business cases, a neglect of the financial part of teaching business models is problematic for several reasons. First, the profit formula is one of the central elements of validating any business idea. Alongside desirability (customer pain point) and feasibility (technology-market-fit), the validation of the financial viability is essential and of primary concern to stakeholders. Second, students taking a class on business modelling often expect that they will not only learn how to develop new business ideas, but also how to commercialise and monetise them. In fact, any student leaving the classroom without an idea of how to take the next steps to assess the financial viability of a business model is at risk of judging business modelling to be a “tiger without teeth”, i.e. a helpful tool for the ideation stage only.

For teachers, the dilemma lies in finding a compromise between a meaningful, fast introduction to the financial part of a business model and integrating a comprehensive lecture on entrepreneurial finance. Existing tools such as the BMC, or extensions of the BMC with a financial focus (for an example based on 15 KPIs cf. Jackson et al., 2015) mainly offer templates to quickly establish the major costs and revenues underlying a business model. At the other end of the spectrum are comprehensive tools for running calculations such as profit-loss-statements (P&L), cash-flow analyses,

and business plans. What is missing is something in between: A tool with the same level of abstraction and playfulness as the BMC that still allows some basic estimates of major cost and revenue drivers to be carried out. To fill this gap, we developed a simplified profit and loss estimation, the *Business Coaster*. It can literally be put on the back of a beer coaster (hence the name) and constitutes an easy, engaging way for students to validate the financial viability of their business idea. In the following, we explain the pedagogic rationale behind the Business Coaster, illustrate its application, and give some practical advice for teachers on how to use it.

## Introducing the Business Coaster

### Pedagogic rationale

The idea of the Business Coaster emerged from three, interrelated challenges we observed while teaching business modelling and entrepreneurship to undergraduates in engineering and economics for more than five years. First, students lack orientation on how to start generating estimates on costs and revenues. Usually, they have no prior experience in setting prices, negotiating commissions, or employing people. Loose guiding questions such as “*What are the major cost drivers of the business?*” provided by frameworks such as the BMC are of only limited help and do not provide an explicit link between revenues and costs that allows their interaction to be assessed (Jackson et al., 2015: 103). As a result, even students with some background in entrepreneurial finance can have a hard time figuring out how to start validating the financial viability of their idea. Second, the switch to numbers can lead to anxiety and stress in students. Being asked to form hypotheses and make assumptions can create the sensation of having to make choices in spite of the many uncertainties about other variables in the business model. Such decisional conflict can be uncomfortable, especially when facing time constraints, (e.g. Pratt and Huettel, 2008). In our classes, we often observed defensive avoidance (“*I cannot fill that in.*”) or procrastination (“*I cannot fill that in - yet*”) when students were tasked to start working on the bottom part of the BMC.

Third, we observed that it is hard for students to grasp what level of detail is necessary for initial calculations.

Often, they lack pragmatism and do not dare to make a few informed assumptions on core variables. Obviously, it is an overwhelming task to generate forecasts on future financing and cash flow requirements, long-term profit prospects, demands of operating lead times, marketing expenses, and pricing. But to come up with a very first validation of a business case most of this is not needed. A few point estimates are sufficient to get an initial feeling for the financial viability of an idea.

The pedagogic rationale behind developing the Business Coaster was to counteract this triple challenge of working with numbers, and find a simple and even engaging way to validate the profit formula of a business model. Specifically, the tool was developed to provide students with (i) a simple starting point for how to proceed with validating costs and revenues, (ii) a playful, non-threatening way to work with numbers, and (iii) orientation on the essential first estimates to be included. In the following, we introduce the Business Coaster's structure and illustrate its application with an example.

### The Business Coaster

Financially, every business idea has to answer two questions. The first is about profitability: *"Is this idea worth pursuing?"* A new idea should only be realised if the supposed revenues exceed the planned costs. A *profit formula* (Johnson et al., 2008: 62) contains a revenue model including pricing, the cost structure of the business, and the margin. The second question is: *"Can I afford to realise the idea?"* This question addresses the issue of investment needs and liquidity. An idea might be profitable but one might run out of cash before enjoying its profits due to high upfront investments or running costs before break-even. Profitability clearly is a necessary condition for a start-up, liquidity is a sufficient condition. Therefore, initial calculations on the viability of an idea should focus on profitability.

The most well-established instrument to illustrate profitability is a profit-loss statement (or P&L). A P&L presents the revenues and costs incurred during a specific period. We reduced the traditional P&L to 11 lines representing the core values of a business. To display this reduced P&L, we wanted to find a simple and playful format that fostered creativity and facilitated

POSITION	MONTH*	COMMENTS
11 MINIMUM SALES		
10 COST OF SALES		
9 GROSS MARGIN		
8 OTHERS		
7 OVERHEAD:		
6 OVERHEAD:		
5 OVERHEAD:		
4 INTEREST		
3 DEPRECIATION		
2 TAXES		
1 NEEDED PROFIT		

\*EVERYTHING NET.




Figure 1: The Business Coaster

"leaving the comfort of the usual" (Van der Meij et al., 2017: 58). We also wanted to avoid the impression that initial calculations require a lot of effort and extensive Excel spreadsheets. Ultimately, we decided to put the reduced P&L on a beer coaster, indicating that first calculations can literally be run on the back of a coaster. The "Business Coaster" is depicted in Figure 1.

The simplified P&L includes eleven items, ranging from minimum sales (#11) at the top to profits (#1) at the bottom. It asks students to provide numbers on a monthly basis and includes a column for comments, in which they are encouraged to note down the assumptions that underlie their estimates. The three icons at the very bottom represent the average price of a product, the number of customers needed, and the necessary amount of working time. They allow an initial and intuitive judgement of a business case's financial viability to be made.

Calculations on the Business Coaster can be approached either top-down, working from sales to profits, or bottom-up, working from profits to sales. In class, we experienced that students were often overwhelmed when starting a P&L from the top by estimating sales. Reverse planning proved to be more effective. The Business Coaster works best as discovery-driven planning: *"Instead of starting with estimates of revenues*

and working down the income statement to derive profits, you start at the bottom line with profits [...]. You then work your plan up to what the necessary revenues are" (McGrath and MacMillan, 1999: 5).

We urge students to start their calculation with an *average month in the second business year*. A monthly base is chosen instead of an annual perspective because it is closer to real life and corresponds with estimates that students perform in their personal life. The application of an average month further helps to reduce seasonality effects. The second year is chosen, because high expenditures to manage market entry and lower initial income may blur the financials of the first year. In the following, we explain the Business Coaster with the help of a one-product start-up.

### Application example: The Colibry case

Cristina, an Italian beauty expert, invented the Colibry, a small and hand-driven hair-removal device. It uses the ancient technique of threading and makes it applicable for everybody through a safe and ergonomic design. When accurately applied, threading is far more effective than other techniques and causes only little harm to the skin. A typical customer for the Colibry is a woman in her mid-twenties, who cares about both her appearance and health. Cristina, who works as aesthetician, will get help from two friends, Nadja (BA in economics) and Peter (experienced mechanic).

Cristina found a producer nearby. She assumes to purchase an initial set of 1 000 pieces. Cristina and her friends will assemble the final product in their studio by adding threads and packaging it nicely. Cristina forecasts that the purchasing costs for the Colibry, the threads, a lovely bag, and a printed manual will be 20.00 Euros (net) per unit. This is half of the selling price of 48.00 Euros (40.00 Euros net with VAT of 20 percent). Cristina also assumes that the easiest way to start a business is to sell directly to customers via an own website (colibry.it). Customers pay upfront. Cristina does the invoicing and organises the logistics. For each order, 30 minutes will be required for assembling and order processing. To start the business, a website is needed, a trademark has to be registered, and a designer will have to provide a prototype and a CAD file for the producer. Overall, Cristina plans an investment of 24 000 Euros prior to starting the business. She also

assumes that the average working life of the investment is four years. The money comes from Cristina and her grandmother. External funding is not needed.

Cristina applies the Business Coaster to calculate the needed minimum sales assuming regular running expenses and a profit sufficient to cover her living costs. Because she calculates as an entrepreneur, every number is stated net, without VAT. Figure 2 depicts a possible calculation for the Colibry case.

Starting with line #1 Cristina takes a profit of zero (break-even point). Eventually, she adds her own costs of living (2 000 Euros) and the expected expenses for social security (1 000 Euros). The resulting 3 000 Euros in line #1 represents the (needed) profit after taxes. To calculate taxes in line #2, the assumed tax ratio of 33% is added to the profit after taxes, resulting in income taxes of 1 500 Euros. The value for the depreciation (or amortisation in case of intangible goods) in line #3 is calculated by dividing the upfront investments of 24 000 Euros by their average working life of four years (48 months). Cristina does not pay any interest (line #4).

The three most important overheads (personnel, marketing, and rent) are added in lines #5, #6, and #7. Cristina plans to rent a small studio (rent and service charges of 2 000 Euros per month). Marketing expenditures are about 2 500 Euros per month, mainly for online advertising. As Nadja and Peter will be employed full-time, Cristina has negotiated a wage of 2 500 Euros for each of them, adding the employer's cost of

POSITION	MONTH*	COMMENTS
11 MINIMUM SALES	42 000	sales to reach needed profit
10 COST OF SALES (50%)	21 000	parts, packaging, logistics
9 GROSS MARGIN	21 000	sum of everything below
8 OTHERS	4 000	33% of (5+6+7)
7 OVERHEAD: personnel	7 500	wages and social security (2 pers.)
6 OVERHEAD: marketing	2 500	ads, social media
5 OVERHEAD: rent	2 000	studio, office, stock
4 INTEREST	0	savings
3 DEPRECIATION	500	investments/Ø working life
2 TAXES	1 500	tax ratio of 33%
1 NEEDED PROFIT	3 000	living expenses and social security <small>*EVERYTHING NET.</small>
40.00 (net)    42/day    21h/day		

Figure 2: Solution for the Colibry case



social security of 50%. All other overheads (line #8) are stated as a percentage of the three most important fixed costs (e.g. communication or insurance). Cristina assumes this to be 33 percent. Eventually, this allows for calculating the gross margin in line #9. It comes to 21 000 Euros per month (net).

Next, Cristina needs to calculate her variable costs in line #10. These might be external costs of production and/or cost of sales. As the Colibry is sold directly via her own website, there are no sales commissions but costs of production are assumed to be 20.00 Euros for each Colibry (device, threads, bag, and manual). To obtain the gross margin (in percent), the variable costs are divided by the net selling price. With a gross profit margin of 50 percent and the gross margin of 21 000 Euros in line #9 Cristina eventually calculates her minimum sales (line #11). A monthly turnover of 42 000 Euros (net) is needed to cover all operational costs and to yield a profit to finance Cristina's living expenses.

With average sales of 42 000 Euros per month (net), Cristina gets an initial indication of the financial viability of her idea. She can now take this viability check further. Assuming 25 working days per month, she will have to sell 42 Colibries per working day. To sell those 42 pieces, Cristina and her friends have a workload of 21 hours or 7h per person and working day. Assuming that order processing realistically only accounts for one part of the entire workload and the team also has to spend time on marketing and administration, Cristina and her friends would probably have to work far more than eight hours per day.

The Business Coaster ultimately does not judge the financial viability of the Colibry case, but it helps Cristina to get initial insights about it and pose questions to verify her assumptions such as (1) *"Is it realistic to sell 42 Colibries per day in the nearer future?"*, or (2) *"Is it feasible to spend significantly more than eight hours every working day?"* If Cristina responds positively to those questions, she might proceed.

## Key Insights and Discussion

We see the core benefit of the Business Coaster in the fact that students get a better and more realistic idea of the financial viability of a business model.

The simplified P&L statement helps students to make implicit assumptions explicit, and to assess their consequences. In class, we experienced that even novices in entrepreneurship instantly became curious and were not afraid to perform initial calculations on daily sales and the workload needed. Of course, there are also limitations to the Business Coaster. In the following, we reflect on when to use it and how to deal with some pitfalls and challenges inherent in business modelling.

### When to use the Business Coaster

Business modelling proceeds in various stages. Canvases are instruments for the first iterations, business plans evolve prior to market engagement. As we judge the Business Coaster to be a good companion of a canvas, it serves best for the first or early iterations of a business model. At that stage, it makes most sense to apply it in its simplest form: no profit (break-even), no taxes and no investment. In other words, the lines on taxes, depreciation and interest (#2-4) may be ignored at first. Lines #5-11 keep the focus on the operational profitability (or earnings before interest, taxes, depreciation, and amortisation, short: EBITDA). They yield the numbers that are essential for initial presentations of the business model to outside parties.

### How to deal with iterations and changing assumptions

The development of a business model is an iterative trial-and-error process (Chesbrough, 2010; Sosna et al., 2010). Cristina may figure out that the variable costs increase when she sells via Amazon. She will get a better access to the market, but she has to pay for it (for example, as of 2019, Amazon charges 15 percent per sale in Western Europe). Insights on customers' willingness to pay may lead to changes in the sales price of the Colibry. Or Cristina might decide to outsource the assembly of the Colibry to the producer, paying more whilst being relieved from time-consuming and low-skilled work. In short, there are many scenarios that would change the initial calculation on the Business Coaster. Rather than a drawback, we consider it an enormous advantage that students can use the Business Coaster to ascertain the financial consequences of different assumptions based on an initial calculation. In class, we urge students to document the most critical assumptions they make. Mostly, those are (1) prices related to minimum sales, (2) variable costs,

Line	Variable	Value	Rule of thumb
10	Cost of sales	0%-5% 15% 50%	Take up to 5% for digital products you sell by yourself. Take 15 % as sales commission if a third party brings you a client. Take 50% for products when you do not know yet how much production will cost. Also take 50% when you sell in another party's store.
8	Others (overhead)	33%	Take 33% of additional overheads (e.g. insurance, maintenance, communication).
4	Interest	10%	Start-ups are risky, so plan for a 10% interest rate.
2	Taxes	33%	Calculate 33% of your profit for income taxes.

**Table 1: Rules of thumb for different variables on the Business Coaster**

notably purchase prices and sales commissions; and (3) wages or marketing costs. Students should then verify their assumptions and adjust them, if need be. Table 1 depicts some rules of thumb we developed during our practice with the Business Coaster, which might be helpful for teachers and facilitators.

If the curriculum allows it, the introduction of the Business Coaster can also be coupled to some more explanations on how to generate estimates. For example, we found it helpful to introduce students to top-down and bottom-up ways of estimating (from a population to a sample, or vice versa), combining different estimates via weighted averages, or creating simple rating systems that allow qualitative information to be transferred into quantitative information (e.g., “strong increase”=50%, and so on).

### How to deal with complex business models

The Colibry case is an example for a “simple” business model since it is a one-product business with direct sales and the product is not very complex. Other business models might be more sophisticated. For example, Cristina might sell a slightly different product for men. She might also begin to generate revenues from ads on her website or start to sell via wholesalers. Complex business models with different revenue streams

are harder to map out on the Business Coaster. To consider a second product or a second sales channel, students might use the second column, normally reserved for comments. Generally, we recommend students to initially focus on the *central mechanism to capture value*. The first version of the Business Coaster should depict the core profit formula. Subsequently, one or two extensions such as a second revenue stream, another sales channel, or different product categories can be considered. For businesses with a wider range of products such as stores or restaurants, prices might be aggregated and stated as average expenditure per customer or as customer value (per month). Customer value may also replace the price for consumables or repurchased goods. In a business to business-context with much higher volumes per customer and order (e.g. 1, 000 Colibries per drugstore) the average price per order should be stated. For platform businesses, one may state the different streams of income (e.g. subscription fees and advertising revenues) in different columns.

### Limits of applying the Business Coaster

The Business Coaster helps to answer the first question about a business model's profitability: “*Is my idea worth pursuing?*” But a profitable business idea is not necessarily a good one. If upfront investments demand high funding, an idea may be too costly to be realised. The issue of liquidity clearly is the second major point in assessing a venture's financial viability. The coaster is not suited to do this; it only provides insights about profitability.

The Business Coaster also does not replace a complete P&L statement or a more comprehensive calculation of expenses and costs such as claims or liabilities. Furthermore, the monthly view as a point in time calculation does not allow the mapping of changes over time, such as the development of stocks or seasonal effects. To encounter all expenditures and their changes over time, a more complex spreadsheet is needed.

It may also be misleading to apply the coaster to businesses seeking to become standard in their niche. Those businesses (e. g. Amazon for online shopping or Uber for individual transportation) are not profitable in the short- and mid-term, but aim to increase their customer base and market share in the long run.

## Conclusion

We conceive entrepreneurship to be the ability to turn financially viable ideas into action. The business model is at the heart of this process. It describes the process of value creation, delivery, and capture. Canvases provide immense help in early stages of the business modelling process, but they have a structural problem with numbers due to their descriptive rather than analytical nature (Knott, 2006). Integrating simplified elements of financial planning, such as the Business Coaster, in business model teaching enables students to check the financial viability of their idea. Combined with discovery-driven planning (or bottom-up planning) the simplified P&L statement focuses on a few, but meaningful numbers (e.g. sales per day). In a playful manner, a tool like the Business Coaster helps students to better understand the profit formula and the financial mechanisms behind a business model. Easily combined with common frameworks such as the BMC, the Business Coaster is a powerful tool to facilitate the switch from words to numbers. It provides data for early pitch decks and helps students to take the first steps in the direction of a more comprehensive business plan.

Overall, we found that the Business Coaster is very useful to calculate operating profits for business model ideas at different points in time (or development stages). Its shape and symbolic simplicity demonstrably help students in entrepreneurship classes to get an initial sense of the financial viability of their ideas. Furthermore, the process of generating estimates for the eleven items on the Business Coaster sensitises them to the critical assumptions and potential scenarios of capturing value from a business model.



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## About the Authors

**Christian Lehmann** is associate professor for entrepreneurship at Hanover University of Applied Sciences. He also manages NEXSTER, the entrepreneurship centre of his university. After graduating from Free University of Berlin he worked in some start-ups and as consultant. He holds a PhD from the University of Bayreuth. Christian's research interests are business model innovation, teaching entrepreneurship, and social businesses.



**Christina M. Bidmon** is a postdoctoral researcher at Católica Lisbon School of Business and Economics, where she works in the Business Model Design Lab. Her research interests include the emergence of novelty in incumbent organizations, sustainability-driven innovation, and business modelling. Christina holds a PhD from Aarhus School of Business and Social Sciences, Denmark.

