IN BRIEF

We propose 3 strategies luxury auto makers can use to reduce waste and improve profitability, all while helping conserve the environment.

As a mature, high-cost industry, luxury auto makers stand to enjoy considerable gains from these strategies.

RETHINKING THE LUXURY AUTO BUSINESS MODEL

Strategies for a Circular Economy

Rethinking the Luxury Auto Business Model by Mark Esposito, Jonathan Xu

Executive summary

The automotive industry can benefit from a radically different business model, one that involves less waste, higher customer loyalty, and significantly improved profits. In this report, we propose strategies luxury automobile makers can implement that can revolutionize their business. Instead of selling cars for a one-time profit, manufacturers should switch to a service-based long-term lease business model. Instead of losing touch with customers after the initial sale, manufacturers should collect back used vehicles years later to be remanufactured into new vehicles. These are examples of Circular Economy strategies (explained in the next section), whereby manufacturers efficiently recycle and remanufacture their products without sacrificing quality. Ultimately, this leads to a more sustainable business model and environment. Circular Economy strategies could help firms dramatically increase profits while conserving environmental resources.

What is a Circular Economy?

A circular economy is an economic system where companies keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life. This means that firms design and manufacture their products in a way that is recyclable and remanufacturable into new products. For example, instead of discarding a smartphone after four years of use, it is returned to the manufacturer, disassembled, and made into a new model. According to the World Economic Forum, a smartphone made this way could enjoy

A circular economy enables the decoupling of growth from resource constraints

In the illustrative case of Mercedes Benz, implementing these strategies could increase profits by up to nine times within five years.

Significantly increased profits with the new business model

Implementing a Circular Economy Strategy: Final Considerations

Conclusions

Appendix
50% lower production costs per device. A circular economy enables the decoupling of growth from resource constraints, partly by insulating firms’ cost structures from volatile commodity prices.

Businesses can follow three approaches to implement a Circular Economy strategy:

1. **Practice more closed-loop recycling.** This means adopting self-sufficient recycling processes and using recyclable materials that maintain their quality throughout recycling processes. Closed-loop recycling is more preferable because it allows a product to be recycled back into itself. In contrast, open-loop recycling indicates that it can be recycled into other types of products, and is commonly referred to as downcycling. Whenever economically feasible, closed-loop recycling is always more preferable to open-loop recycling.

2. **Rent, instead of sell, products.** This means that business charge customers a fee to use their products and services. In return, customers enjoy greater peace of mind and convenience, while businesses reap improved profit margins. Such an arrangement significantly reduces unnecessary consumer waste, and promotes product longevity.

3. **Offer ways to lengthen and widen the use of products.** For example, manufacturers can establish product recycling, refurbishment, and replacement programs which engage with customers directly. By increasing the points of customer contact, firms have more opportunities to improve customer engagement, brand loyalty, and the profit margins.

If manufacturers promote excessive longevity of their products, does this always entail a reduction in profits over the long-run? Not necessarily: by implementing the “rent instead of sell” business model, manufacturers can mitigate reduced product turnover with increased customer loyalty and higher per-unit profit margins. This revenue model increases per-unit profits while reducing the need for firms to continually increase manufacturing and sales force capacities.

**Current state of the luxury auto industry**

The global luxury auto industry generates approximately US$200 billion a year in annual sales, and is often characterized by four brands, namely Mercedes Benz, BMW, Audi, and Lexus. Collectively, these brands account for more than half of luxury vehicle production and sales, producing approximately 5 million vehicles per year for combined sales of almost US$160 billion. Traditionally, the industry has focused its efforts on quality manufacturing and prestige marketing, two effective levers that have helped justify the higher retail prices that these vehicles command. However, as the industry continues to be challenged by rising raw material prices, net profit margins have been eroded under difficult operating conditions.

According to the New York Times, the estimated average lifespan of a car is 13 years. Drivers, however, keep a new car on average for only 6 years, according to Autotrader, the largest online marketplace for US car transactions.

Among BMW, Mercedes, and Audi cars listed on Autotrader, only 30% of them were 6 years or older. This potentially suggests that older luxury vehicles are either not being resold frequently or are being prematurely retired by their drivers.

Typically vehicles in North America are composed of approximately 20% post-consumer recycled material by weight. Everything from old carpet to blue jeans may end up in a new vehicle. Auto recyclers remove parts such as engines, transmissions, doors and bumpers for reuse in other vehicles. Other parts that can also be remanufactured include starters, alternators and water pumps. Batteries, catalytic converters, tires and some plastics are removed and their materials are recycled into new products.

In Europe, governments have typically been highly supportive of environmental protection laws. In 2015, the legally required recycling rate for end-of-life vehicles, components and materials was raised to 95% overall recovery (85% reuse and recycling of materials).
Current business models

The luxury automotive industry is a mature industry that has traditionally focused on high quality design and manufacturing, as well as prestige marketing. Its above-average Cost of Sales component (on average, 80% of revenue) indicates lucrative cost-saving opportunities. Net profit margins in this century-old industry have also been gradually compressed, and currently average at less than 7%. The industry’s high material and labor costs represent a high potential for gross margin improvements via a Circular Economy strategy.

Among the used cars sold, as many as 98% are vehicles <5 years of age.

Luxury automakers, like all car manufacturers, purchase parts from suppliers, manufacture vehicle components, assemble them into vehicles and sell them, via dealers, to retail customers. The luxury automakers own some of these dealers (i.e. corporate stores), while others are independent. Currently, luxury dealers are mostly focused on selling new vehicles: an estimated 80% of vehicle sales are new cars and only 20% are used cars. Among the used cars sold in the US, as many as 98% are vehicles <5 years of age. Note that the average vehicle lifespan is actually 13 years.

Therefore, it is evident that luxury auto manufacturers generate most of their income from new vehicle sales. However, there are numerous constraints to this business model: new vehicles are expensive to manufacture, and net margins are low (averaging at less than 7%). Selling new vehicles once also establishes a low ceiling on the profitability of each car. Constantly supplying large numbers of new vehicles also requires sustaining high labor, material, and overhead costs to support large manufacturing capacities and employee headcounts. In an age of volatile commodity prices, the business will be highly susceptible to fluctuations in material costs, while not necessarily being able to pass on those costs to consumers.

22. The key raw materials used in luxury automobiles are metals (~75%) and plastics (~10%). Both of these material types are highly recyclable, with metals at 95%, and plastics at 80%. 23. Remanufacturing key vehicle component is an important step in both cost savings and sustainability. In remanufacturing a component, it no longer needs to be recreated from scratch, but instead is created from an existing old component. 24. Most luxury automakers are currently developing their remanufacturing capabilities. Leading the way in this field is Daimler, which is already able to remanufacture many key components of its Mercedes Benz vehicles. This includes parts of the engine, transmission, and steering unit. Remanufacturing saves energy and production costs, but requires careful planning during initial design. Daimler states that all Mercedes-Benz models are 85% recyclable and 95% recoverable. This includes the major components such as engines, transmissions, and axle housings, as well as mechanical components such as turbochargers, brake parts, and steering units. The firm has 350 specialists for replacement engines (in Germany). Globally, it employs 2,100 workers involved in remanufacturing activities. 25. However, Daimler notes that certain limitations do still exist when it comes to remanufacturing. Notably, it is still unable to entirely remanufacture or recycle its engines, due to difficulties with removing magnets from old engines, as well as challenges with repairing electric motors within the engine. In addition, its reliance on open-loop recycling allows for only generic recycling processes. In contrast, with closed-loop recycling, the materials of an old product are almost fully reused to manufacture a new product. Closed-loop recycling does not imply a degradation of product quality. In fact, if design and manufacturing processes were initially devised with remanufacturing in mind, parts should be easily disassembled and reconstructed without material downgrades to quality. The end user, after all, is not willing to compromise on the quality of the product that they are receiving.

BMW is in a similar position when it comes to incorporating circular strategies into their production and recycling processes. Most of BMW’s recycling is in the form of open-loop recycling. BMW has established recovery systems in over 30 countries for end-of-life vehicles to be recycled, presumably by third parties. Currently, most BMW vehicle components are recycled as raw materials as opposed to remanufactured. However, improving vehicle component re-manufacturability has been identified as one of the firm’s long-term goals in enhancing sustainability.

Audi’s progress on these fronts closely approaches those of Mercedes and BMW. It currently recycles based on a partially closed-loop model, with parts of its metals production being closed-loop. Some of Audi’s vehicle components are designed with circular design in mind, which facilitates efficient material recycling. Audi, however, has not yet invested heavily in the area of component remanufacturability. It has instead focused its efforts more on moving towards a close-loop recycling model.

A notably lacking feature among all luxury automakers is the ‘rent instead of sell’ revenue model. A notably lacking feature among all luxury automakers is the ‘rent instead of sell’ revenue model. The ‘rent instead of sell’ approach is a true hallmark of a Circular Economy strategy. Not only is it sustainable, it can boost per-unit profits and net margins significantly. In such a model, the luxury automakers rent their cars instead of selling them outright. Currently, among almost all luxury car makers, the closest available form is the vehicle leasing option. This does not exactly constitute a ‘rent instead of sell’ revenue model, because the vehicle is ultimately sold to another consumer after the initial lease period ends. However, the demonstrated popularity of leasing is an indication of the potential profitability that a ‘rent instead of sell’ model could bring to luxury automakers.
Opportunities for a Circular Economy Strategy

If the auto industry has already achieved a 95% recycling and recovery rate, what more can be done? In fact, probably quite a lot. By today’s standards, the major luxury automakers are already well-positioned in terms of sustainability. Yet much can still be done to fully adopt a Circular Economy strategy. Not only is this good for the environment it is also equally good for business. More recently, BMW, Audi, and Mercedes have all started their own versions of short-term (by the minute/day) car rental programs. While these pilot programs are commendable steps towards efficient resource allocation, they are still distant from an ideal ‘rent instead of sell’ business model.

As is applicable to almost all industries, luxury automakers should:

1. Engage in more closed-loop recycling
2. Move to a ‘rent instead of sell’ business model
3. Lengthen product usability

Strategy 1: Engage in more closed-loop recycling

Luxury automakers can establish programs that more proactively collect end-of-life vehicles directly from end users. Although such programs do exist today (eg. BMW’s), the onus is usually on the customer to contact and locate the collection center, thereby creating customer inconvenience. Ideally, firms should establish greater incentives for customers to return the their end-of-life vehicles to them directly so that materials eligible for closed-loop recycling can be directly extracted and remanufactured into new vehicle components.

Examples:
The steel, aluminum, upholstery, and glass from an old Audi A4 vehicle can be recycled for use in a new Audi A4 vehicle.

Strategic Benefits:

This type of recycling reduces energy use by as much as 75%, according to the World Economic Forum 32. This translates into cost savings in manufacturing processes. It also ensures that automakers do not lose track of most of these vehicles after the initial sale, and captures the full potential value of these vehicles since their useful life is on average 13 years. Today, although 95% of a car’s materials are recyclable, there are still many “gaps” in the circular loop. As the firms move closer to a closed-loop recycling system, purer inputs (i.e. uncontaminated material) are obtained as a result of this collection and redistribution efficiency. This enables the efficient refurbishment and remanufacturing processes that can generate a cost advantage for automakers that leverage such methods.

Strategy 2: ‘Rent instead of sell’ business model

A core tenet of a Circular Economy strategy is that firms sell their products as ongoing services, as opposed to solitary products. Consider Spotify’s successful model of selling music as a service for a regular monthly fee, and Netflix’s model of selling movies as a monthly subscription. It was not long ago that music was sold as CDs and movies, as DVDs. These industries have already successfully transformed to a ‘rent instead of sell’ model. Both firms and consumers win in this model – firms receive more predictable revenue streams, and consumers receive ongoing support and updates while paying less upfront costs. Typically, the more complex the product, and the more ongoing maintenance it needs, the greater the potential for selling it as a service.

In the luxury auto industry’s case, instead of just selling cars to customers, they should establish a Long-term Lease program. This program will be different from a traditional vehicle leasing arrangement.

In a traditional leasing arrangement, the dealer leases a vehicle to a customer for a fixed period (typically several years) at the end of which the vehicle is returned and resold to another customer as a used vehicle. Thereafter, the automaker has almost no obligation (and revenue opportunity) with respect to this vehicle.

In the Long-term Lease program, the automaker charges customers a monthly fee for driving the vehicle. Instead of actually selling the vehicle outright, the automaker retains ownership of it, and provides it with a lifetime warranty. During the vehicle’s lifetime (eg. 13 years), the automaker covers all warranty-eligible repairs at no extra charge. In exchange the customer pays a fixed monthly fee for the entire duration.

The automaker can even offer periodic upgrades to the engine, transmission, and vehicle cosmetics at an extra charge if the customer desires a car that can be continually updated.

At the end of the Long-term Lease period, the vehicle has also reached the end of its life. The automaker collects the vehicle and recycles/remanufactures its major components into a brand new car.

Potential Circular Economy Strategies For Luxury Auto Manufacturers

<table>
<thead>
<tr>
<th>Circular Economy Best Practices</th>
<th>Current State of Industry</th>
<th>Industry Opportunities</th>
</tr>
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<tbody>
<tr>
<td>Closed Loop Recycling</td>
<td>Closed Loop Recycling</td>
<td>Engage in more closed-loop recycling</td>
</tr>
<tr>
<td>Rent instead of sell</td>
<td>Rent-instead-of-sell</td>
<td>Rent instead of sell</td>
</tr>
<tr>
<td>Lengthen and widen use of products (eg. remanufacturing)</td>
<td>Lengthen and widen use of products (eg. remanufacturing)</td>
<td>Lengthen product usability</td>
</tr>
</tbody>
</table>

Legend: ✔ Achieved ✔ Partially Achieved ❓ Not Yet Achieved ★ Optimal State
The customer pays the automaker a flat monthly fee during this Long-term Lease period, in exchange for an entirely-taken-care-of driving experience.

A 13 year-old Mercedes Benz C-class vehicle (2003 model). This vehicle continues to drive well.

An example of ‘rent instead of sell’:

Using a tangible example, consider a customer signing up for a Long-term Lease for a new 2016 Mercedes C-class sedan. From this customer’s perspective, it is as if he has leased the vehicle indefinitely, with all extraordinary expenses covered.

The customer pays US$450 per month throughout the life of the vehicle (estimated at 13 years). In comparison, a traditional 3-year lease currently costs US$580 a month, and a 5-year finance purchase costs US$754.

In return, Mercedes covers all non-accident-related repairs for the entire duration.

The customer returns the vehicle at the end of vehicle life, but also has the option to return it prior to that, at a time-weighted penalty. The penalty will be significant enough to deter most customers from returning it. However, the customer can transfer the Long-term Lease obligation to another person for a nominal administrative fee.

How customers benefit from this program:

Customers will enjoy unlimited driving mileages and very few restrictions, as if they own the vehicle. They no longer need to worry about expensive out-of-warranty repairs after 4 years (when traditional warranties expire). Customers anticipate that this will save him/her money, time, and trouble in the long run.

Monthly payments under the Long-term Lease are stable and predictable, and lower than any other financing method (traditional lease, or financing). Long-term Lease monthly payments are also tax-deductible (as a business expense).

Customers avoid having to unnecessarily switch cars every 3 or 4 years because their lease term has ‘expired’. Many customers are perfectly satisfied with the car they have been driving. They also no longer need to worry about “selling” the vehicle when it is out of warranty and in need of repairs. The automaker will repair the vehicle for free, and recycle it when it reaches the end of its useful life. Moreover, regular maintenance and upgrades to the vehicle help prolong its useful life. Customers are also free to make non-warranty nullifying modifications to the vehicle, or incur minor cosmetic damages to the vehicle without being fined. This is in contrast to traditional leasing programs which impose heavy penalties on customers for even minor scratches or damages.

The customer pays US$450 per month for the life of the vehicle. In comparison, a traditional 3-year lease currently costs US$550 a month, and a 5-year finance purchase costs US$754.

### Case Study: compare the profitability of selling a new compact luxury vehicle in the US

<table>
<thead>
<tr>
<th>2016 Mercedes Benz C300</th>
<th>Retail Price: US$42,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finance Interest Rate: 2.9%</td>
<td>Lease Interest Rate: 3.9%</td>
</tr>
<tr>
<td><strong>Existing Business Model</strong></td>
<td><strong>New Model</strong></td>
</tr>
<tr>
<td><strong>Lease Purchase</strong></td>
<td><strong>Finance Purchase</strong></td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
</tr>
<tr>
<td>Customer’s monthly payment</td>
<td>580</td>
</tr>
<tr>
<td>Length of payment period</td>
<td>3 years</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>48,279</td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
</tr>
<tr>
<td>COGS + SG&amp;A expenses**</td>
<td>44,163</td>
</tr>
<tr>
<td>Additional warranty expenses</td>
<td>n/a</td>
</tr>
<tr>
<td>Earnings before income tax</td>
<td>4,116</td>
</tr>
<tr>
<td>Income Tax</td>
<td>1,303</td>
</tr>
<tr>
<td><strong>Net Income</strong></td>
<td>2,814</td>
</tr>
<tr>
<td><strong>EBIT margin</strong></td>
<td>8.5%</td>
</tr>
<tr>
<td><strong>Net income margin</strong></td>
<td>5.8%</td>
</tr>
</tbody>
</table>

* According to FASB, vehicle’s “selling price” under the sales-type lease = present value of the lease payments
** Based on Daimler’s EBIT margin in its 2015 annual report
*** Estimated based on Mercedes Benz’s published extended warranty premiums for every 3 additional years
+ Comparable BMW and Audi vehicles are: BMW 328 sDrive: $41,345; Audi A4 Premium Plus: $43,200.
All payment options assume $0 down payment.
Why will this business model attract more customers?

According to Edmunds, a top automobile review resource, 4 of the top 6 reasons for not buying a used luxury vehicle have to do with the manufacturer providing no warranty or support for the car. Car buyers desire luxury cars for their prestige, design, and driving dynamics; yet they fear the unpredictable repair costs and maintenance hassles once the standard 4-year basic warranty period elapses. This is one of the main reasons why almost half of BMW and Mercedes Benz customers lease their vehicles in the United States. Car review websites and forums often warn car buyers about the risks associated with buying a used luxury car after the standard warranty period has run out. Horror stories with regards to $5000 electronics repairs and $3000 parts replacements abound.

The all-encompassing monthly payment appeals to customers who desire the prestige of ownership, but not its unpredictable troubles.

Yet, because few people truly know the probability and costs associated with these potentially expensive repairs (and not many are willing to be guinea pigs to find out), there is a general revulsion among consumers when it comes to buying a second-hand luxury vehicle.

A consumer in the market for a used vehicle is much more likely to buy a used Toyota or Honda (which are considered more reliable over the long run), as opposed to a Mercedes, BMW, or Audi. As a result, most used luxury vehicles beyond the 6-year mark are typically not actively bought, sold, or maintained. There is not much of an active market for these vehicles, and some of them are destroyed due to “early retirement”. In most cases, these vehicles, if properly maintained, would have a much longer lifespan (probably equal to or greater than the average lifespan of 13 years). Unfortunately, they are frequently prematurely abandoned due to their expensive servicing costs and the lack of sufficient resale interest. Moreover, when they are abandoned, they are rarely returned to the original manufacturer, but instead sent to junk yards where they are crushed and not fully recycled or remanufactured. These activities result in a product and material waste in the economy. The stability and predictability of the all-embracing monthly payment will attract new customers who desire the prestige of ownership, but not its unpredictable troubles. By servicing and engaging the customer over a much longer horizon (eg. 13 years), stronger customer relationships can be built, and customer loyalty will be improved. By collecting the end-of-life vehicles, the automaker will be able to manufacture new vehicles much more efficiently and cost-effectively via the recycling or remanufacturing of key parts. By manufacturing fewer new vehicles and augmenting the profitability of existing ones, cost savings can be rapidly achieved due to lower inventories, less raw materials, and reduced direct labor expenses.

Overall, this revenue model will enable the firm to increase brand recognition, and be recognized as an innovative, sustainable, and environment-friendly company. The long-term benefits in terms of brand loyalty and customer satisfaction are undeniable.

Today, 4 of the 6 main reasons for not buying a used luxury car have to do with lack of manufacturer support

Strategic benefits of this strategy:

This proposed strategy represents a major shift towards a ‘rent instead of sell’ business model as opposed to a manufacturing one. As a service-based business model, it typically benefits from higher margins, greater differentiation potential, as well as improved customer loyalty. Service-based revenues are also more stable and predictable. This leads to less earnings volatility and improved corporate valuations (hence a higher stock price). The automaker can reduce vehicle production costs while retaining market share and increasing profitability per vehicle (because vehicles are no longer unnecessarily abandoned by customers).
Strategy 3: Lengthen product usability

This strategy focuses on designing vehicle components to be recyclable, reusable, and remanufacturable from the outset. Integrating these concepts into product design and initial manufacturing is critical to reducing remanufacturing costs later on in the product cycle. Although it does require additional R&D investment today, it will reap benefits in the future in the form of lower production costs. Lengthening product usability after a ‘rent instead of sell’ model has been implemented will serve to improve firm profitability even further – as vehicle repair expenses decrease in the face of constant recurring revenue streams paid by customers.

Remanufacturing as a part is preferable to recycling because it builds upon an already-manufactured component, as opposed to re-creating it from raw materials. Remanufacturing components avoids the need to repurchase raw materials from suppliers (thereby reducing incremental costs).

Although certain luxury automakers, such as Daimler, are already able to remanufacture many of its vehicles’ components, there is still room for improvement.

Opportunities for improving material usability include:

- Ensuring that the materials used are adequately suitable for a closed-loop manufacturing system (avoid materials that degrade significantly post-recycling)
- Investing in R&D to further improve on the recyclability of engines, including the removal of magnets from the old engines, repairing of electric motors, and the recycling of magnet materials and rare earth metals
- Leveraging new 3D printing technologies when producing smaller-batch niche components that benefit from additive manufacturing. This could save up to 90% of raw materials, according to successes that firms like Boeing have already had.

Significantly increased profits with the ‘rent instead of sell’ business model

To demonstrate the tangible improvement to profitability under the ‘rent instead of sell’ model, we can study a representative example – the Mercedes Benz C-class, a compact luxury sedan. Consider the profitability of a selling this vehicle in the US market. There are three potential revenue models: the traditional leasing program, the traditional financing program, as well as the new Long-term Lease program.

The first thing to notice is that the customer’s monthly payment under the Long-term Lease model is actually 40% lower than it would be in a traditional Finance purchase, given today’s interest rate environment. Lower monthly payments are attractive for cash flow conscious customers, which tend to be the younger clientele. Incidentally, recent studies have shown that an increasing number of younger-aged drivers are leaning towards purchasing Mercedes and BMW cars.

In the Long-term Lease program, although the payment term is much longer, customers enjoy a hassle-free driving experience throughout the duration. They are likely aware that, on an aggregate basis, they will be paying more in the Long-term Lease program, but many customers may come to terms with this if they value peace-of-mind and certainty more than pure cost-savings. After all, driving a luxury car in itself is not a frugal activity.

Under this new business model, Mercedes Benz’s net income per vehicle is actually 217% of what it was under the traditional finance purchase. This means that “selling” one car under this new business model is equivalent to selling 2.17 cars under the old model.

Net income margin has also increased significantly by 72% over what it would be with a traditional finance purchase.

Naturally, automakers will sell less vehicles under the new Long-term Lease program, but the profit per unit would increase dramatically in a way that mitigates the reduced sales volume. With lower sales volumes, luxury automakers can focus their resources on service quality and customer satisfaction, as opposed to volume manufacturing.

Based on these scenarios, it becomes possible to estimate the consolidated financial impact that the aforementioned Circular Economy strategies could have on luxury automakers.

When applied to the example of Daimler, the following financial impacts are forecasted:

<table>
<thead>
<tr>
<th>The ‘rent instead of sell’ revenue model is backed by strong economics</th>
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<tbody>
<tr>
<td><strong>Sample firm: Daimler</strong></td>
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<tr>
<td><strong>Income</strong></td>
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<tr>
<td>Net income</td>
</tr>
<tr>
<td>Revenue</td>
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<tr>
<td><strong>Profit Margins</strong></td>
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<tr>
<td>Net profit margin</td>
</tr>
<tr>
<td>Gross profit margin</td>
</tr>
<tr>
<td><strong>Stock Price</strong></td>
</tr>
<tr>
<td>Earnings per share</td>
</tr>
<tr>
<td>Stock price</td>
</tr>
</tbody>
</table>
Implementing a Circular Economy Strategy: Final Considerations

In adopting a Circular Economy strategy, the following factors should likely be considered. They will affect both the feasibility and results of strategy implementation.

Feasibility of technological improvements

Improving remanufacturability requires technological improvements and/or redesigning of certain components. This may prove to be capital intensive in the short run with financial benefits only visible after 3 to 7 years. Firms need to have a long-term perspective before investing in such capabilities. Not all components can be economically remanufactured immediately. For example, if remanufacturing a part is 20% more expensive than manufacturing from scratch, few firms would choose the former. Thus investing in closed-loop design and production processes is a necessary precursor to a feasible to remanufacturing plan.

Long term revenue streams

Adopting the ‘rent instead of sell’ model requires companies to forgo large cash flows in the short-run (i.e. vehicle sales) in exchange for steady revenue streams in the long-run (i.e. fee income). Firms must be ready for such a long-term view. If a publicly-traded company is singularly focused on the next quarter’s earnings, it may be disappointed when a long-term strategy fails to reap financial rewards right away. An effective and profitable ‘rent instead of sell’ revenue model requires companies to focus more on customer service as opposed to just quality manufacturing. Customer loyalty stems directly from him/her having received stellar service in every interaction. Traditional manufacturing-focused firms need to pay special attention to customers’ needs and desires to succeed in this environment.

Competitive Pressures

The first mover has an advantage if adopting circular strategies early. As competitors gradually all enter the space, margins will collectively shrink. This alone should present an incentive for luxury automakers to begin adopting circular economy strategies as soon as possible.

Circular strategies tend to extend and promote longevity of the firm’s products. However, excessive longevity may hurt annual sales. Therefore, firms will need to find a balance between immediate and future revenue streams. One way to do this is to focus on the “rent instead of buy” business model whereby regular fees are paid for product usage. This reduces the need to constantly increase production, and instead focuses on increasing per-unit profit margins.
Conclusions

To conclude, there are a couple of key takeaways from this report:

The luxury auto industry stands to greatly profit from Circular Economy strategies

Although luxury automakers have already made steady progress in the area of sustainability, they can do more. Specifically, they can:

(i) Engage in more closed-loop recycling
(ii) Move to a ‘rent instead of sell’ model
(iii) Lengthen product usability

Doing so will result in significant margin improvements and stock price increases.

There is a compelling business case for adopting these Circular Economy strategies

Full adoption of the circular strategy not only conserves resources, but in doing so helps raise businesses’ net profit margins and earnings dramatically, as demonstrated in this case study. In an industry as mature as the luxury auto industry, business model innovation becomes even more important in fostering continued growth and development. When earnings and sustainability can be achieved simultaneously, all stakeholders are happy.

Quick Refreshers

“

A circular economy enables the decoupling of growth from resource constraints

Closed-loop recycling does not imply a degradation of product quality.

On average, a car lasts 13 years. Drivers, however, keep a new car for only 6 years.

Among the used cars sold, as many as 98% are vehicles <5 years of age. Note that the average vehicle lifespan is actually 13 years.

A notably lacking feature among all luxury automakers is the ‘rent instead of sell’ revenue model.

As is applicable to almost all industries, luxury automakers should:

1. Engage in more closed-loop recycling
2. ‘Rent instead of sell’, and
3. Lengthen product usability

Under the ‘rent instead of sell’ model, the all-encompassing monthly payment will attract new customers who desire the prestige of ownership, but not its unpredictable troubles.

The customer pays US$450 per month for the life of the vehicle. In comparison, a traditional 3-year lease currently costs US$550 a month, and a 5-year finance purchase costs US$754.

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## Appendix:

**Sample firm (Daimler) | Financial performance forecast with implementation of Circular Economy Strategy**

### Common Size (as % of Revenue)

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</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>117,982</td>
<td>129,872</td>
<td>149,467</td>
<td>167,904</td>
<td>189,731</td>
<td>216,294</td>
<td>248,738</td>
<td>288,536</td>
</tr>
<tr>
<td><strong>Cost of sales</strong></td>
<td>-92,855</td>
<td>-101,688</td>
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<td>-11,050</td>
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<tr>
<td><strong>R&amp;D costs</strong></td>
<td>-4,205</td>
<td>-4,532</td>
<td>-4,760</td>
<td>-5,541</td>
<td>-6,450</td>
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</tr>
<tr>
<td><strong>Other operating income</strong></td>
<td>-1,530</td>
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<tr>
<td><strong>Other operating expense</strong></td>
<td>-399</td>
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<td>-566</td>
<td>-577</td>
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<tr>
<td><strong>Profit/loss on equity method investments, net</strong></td>
<td>3,345</td>
<td>897</td>
<td>464</td>
<td>464</td>
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<td>458</td>
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<td><strong>Interest income</strong></td>
<td>212</td>
<td>145</td>
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<td><strong>Net profit</strong></td>
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### R&D Costs

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Annual Growth Rates</th>
<th>Rationale</th>
</tr>
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<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>12% 13% 14% 15% 16%</td>
<td>Revenue grew by 12% per year over the past 2 years. Assuming circular strategies are adopted, revenue can be expected to grow by 16% in 2020</td>
</tr>
<tr>
<td><strong>Cost of Sales</strong></td>
<td>12% 9% 6% 6% 6%</td>
<td>Cost of Sales traditionally grew in line with revenue growth rates. However, by adopting a closed-loop circular strategy, Daimler can likely curtail the growth in Cost of Sales. This is anticipated to materialize by 2018, following heavy R&amp;D investments that bring about stronger remanufacturing capabilities</td>
</tr>
<tr>
<td><strong>Selling expenses</strong></td>
<td>10% 5% 5% 5% 5%</td>
<td>Selling expenses will increase in the short-run (in 2016) as additional bonuses will be used to motivate the salesforce to push the new “business model”. However, once customers accept and adjust to the new model, sales incentives can be normalized again</td>
</tr>
<tr>
<td><strong>General administrative expenses</strong></td>
<td>6% 9% 10% 11% 12%</td>
<td>As cost of sales decrease, general administrative expenses will increase. This reflects the additional resources needed to administer the large number of long-term-lease vehicles now under Daimler’s management and warranty</td>
</tr>
<tr>
<td><strong>R&amp;D Costs</strong></td>
<td>16% 16% 16% 16% 16%</td>
<td>Daimler is expected to invest significantly in R&amp;D, to improve component remanufacturability and recyclability. Such investments will start paying off in the medium term</td>
</tr>
</tbody>
</table>

### Revenue and Income Forecast (Euro, millions)

<table>
<thead>
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<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>117,982</td>
<td>129,872</td>
<td>149,467</td>
<td>167,904</td>
<td>189,731</td>
<td>216,294</td>
<td>248,738</td>
<td>288,536</td>
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<td><strong>Cost of sales</strong></td>
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### EPS Basic

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### Stock Price (yearly average)

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<tbody>
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<td><strong>Stock Price (yearly average)</strong></td>
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<td>65</td>
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### P/E ratio

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<td><strong>P/E ratio</strong></td>
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<td>10.0</td>
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References

1 The Waste and Resources Action Programme, June 2016. WRAP and the circular economy

2 World Economic Forum, January 2014. Towards the Circular Economy: Accelerating the scale-up across global supply chains


6 Refer to section “Significantly increased profits with the new business model” of this article.

7 Based on research of Daimler, BMW, and Audi company data, VFACTS, and Scotiabank Global Banking and Markets research.

8 Statistica data, 2016.

9 Based on research of Daimler, BMW, and Audi company data

10 New York Times, March 2012. As Cars Are Kept Longer, 200,000 Is New 100,000

11 Autotrader, May 2016. Buying a Car: How Long Can You Expect a Car to Last?

12 Based on research conducted via filtered search of used US-based vehicles on Autotrader.com, conducted May 2016.


19 Based on research of Daimler, BMW, and Audi company data

20 Based on primary research of Mercedes and BMW dealers in various major cities across North America
Based on research conducted via filtered search of used US-based vehicles on Autotrader.com, conducted May 2016.

World Economic Forum, January 2014. *Towards the Circular Economy: Accelerating the scale-up across global supply chains*


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Based on an estimate that premature abandonment is equal to approximately 10% of the value of global annual new luxury vehicle sales.

World Economic Forum, January 2014. *Towards the Circular Economy: Accelerating the scale-up across global supply chains*