## *Tesla Bot: The Ten Essential Components (each worth a point)*

| *Component* | *What needs to be done…* | *Comments* | *Grading template* |
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| Cost of equity | 1. Compute the unlevered beta for robotics business and lever using Tesla's debt to equity ratio.<br>2. Use an equity risk premium that reflects where the project generates revenues (not where Tesla generates revenues) | • The bottom-up beta did vary depending upon how the debt-to-equity ratio for comparable firms was computed. (If you used the simple average of the D/E ratio, you got a lower beta. You will get a different beta, if you use a subset of the auto companies. That is fine.)<br>• You cannot use Tesla's beta or its ERP to evaluate this project. | 1a. Used beta for company instead of beta for project (-1 point)<br>1b. Errors in mechanics of computing unlevered betas (-0.5 to -1 point)<br>1c. Did not adjust ERP for global exposure (-0.5 point)<br>1d.<br>Other:_____ |
| Debt Ratio | Count all interest-bearing debt and lease debt as debt, and use the current market capitalization of equity as the market value of equity, in computing a debt ratio. | • Counted all liabilities as debt, instead of just focusing on interest-bearing debt.<br>• Ignored lease debt<br>• Used book value of equity instead of market value of equity | 2a. Miscounted debt (-0.5 point)<br>2b. Used book equity (-0.5 point)<br>2c. Subtracted interest and other financing expenses to get to cash flow (-1/2 point)<br>2d. Other (-0.5 point) |
| Capacity Investment | By investing in this project, you find yourself running out of capacity in year 4 instead of year 9 (give or take a year). The opportunity cost is therefore the present value of spending in year 3 (or year 4) versus year 8 (or year 9). | If you do not show the savings in year 8, you are considering the incremental cost but not the incremental benefit. (You can also show the present value difference today, instead of the total investment) | 3a. Did not show savings from not having to invest in year 8 (-0.5 point)<br>3b. Allocated the investment in year 3 to project (-0.5 point)<br>3c. Other (-0.5 point) |
| Sunk Costs | The money that has already been spent is not only a sunk cost, but | I know that I added back sunk costs to get to initial investment in the | 4a. Counted sunk cost in cash flows, either directly or as a tax benefit (-0.5 |

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| | it should not be part of capital invested, since it was expensed before you did the analysis. | Disney case but that is because I treated sunk costs as part of my initial investment. If you did not consider sunk costs as part of your investment, don't net it out of the initial investment. | point)<br>4b. Counted tax savings from depreciation on existing stores (-0.5 points) |
| Allocated G&A | The allocated G&A is different from than the incremental G&A. You need to adjust for the difference, in after-tax terms. | Adding back allocated G&A makes sense only if subtracted it out to get to operating income in the first place. If you used only incremental G&A to get to operating income, don't add back the allocated G&A. | 5. Did not neutralize non-incremental or fixed G&A costs (-0.5 point) |
| Non-cash Working Capital | The non-cash working capital investment is the change in working capital each year. It begins right now (year 0) and affects cash flows each year, as it increases with revenues. At the end of the project lifetime (only in the finite life case), don't forget to get it back. | Non-cash working capital = Accounts Receivable plus Inventory minus Accounts Payable. It is only the change that should affect your cash flow, not the total working capital. | 6a. Change in working capital computed incorrectly (-0.5 point)<br>6b. Considered total working capital, not change in working capital (-0.5 point) |
| Taxes | The cash flows should be after taxes. | Only operating expenses can be deducted for tax purposes. That includes cost of goods sold, marketing costs, G&A and depreciation. | 7a. Deducted capital expenses for tax calculations (-1/2 point)<br>7b. Deducted change in working capital for tax calculations (-1/2 point)<br>7c. Other |

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| Salvage value in finite life case & Terminal value in infinite life case | 1. This should include the book value of the fixed assets that have not been depreciated by year 10 plus the working capital salvage.<br>2. The terminal value should be estimated using the inflation rate as the growth rate. It should also reflect reasonable assumptions about capital maintenance in perpetuity. (The longer life does not require a perpetuity assumption. It can just be for another ten or twenty years) | 1. If you don't salvage working capital and recover book value of assets, you should at least show the tax benefits from having a capital loss.<br>2. You cannot keep a project going without investing in it. In fact, here is a very simple test. If you look at your cashflow in year 10, it includes a cash inflow from depreciation. If you assume that this cashflow will grow in perpetuity, and you have no capital investment, you will run out of capital to depreciation very soon. In other words, that cashflow cannot be sustained.<br>3. If you set your terminal growth rate > 2%, you will need new capacity to meet the additional real demand.. | 8a. Did not salvage working capital or book assets in finite life case (-0.5 point)<br>8b. Salvaged working capital and book assets in perpetual life case (-0.5 point)<br>8c. Set growth rate > inflation rate, without adding to capacity (-0.5 point)<br>8d. Other (-0.5 point) |
| Capital Maintenance | Consistency and common sense demand that there should be more capital maintenance (even over the next 10 years and not just after), if you are trying to run this as an infinite life business. What is a reasonable cap ex? If depreciation represents depletion in the assets, capital maintenance should make | If you just extend the life of the project without allowing for capital maintenance, projects will always look better with longer lives than shorter ones. The key, though, is to match the capital maintenance assumptions to assumptions about project life. With the finite life scenario, it makes little sense to pump huge amounts into capital | 9a. Capital maintenance assumptions same for finite and infinite life (-1 point).<br>9b. Inadequate capital maintenance (-1 point) in terminal value. You are depreciating more than you cap ex in perpetuity. (-0.5 point)<br>9c. Included capital maintenance only in terminal value in perpetual life case. Too little, too late! (-0.5 point) |

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| | it up, at least in later years, and since there is inflation, it will cost you more. | maintenance, especially as you wind the project down. | |
| Side Effects on Software business | The increase in revenues for software has to be converted into after-tax operating income & cash flow. They must be discounted back at the cost of capital for Tesla software. | You should generally not use the same cost of capital that you did for the Tesla Bot cashflows | 10a. Did not count the lost sales or the synergy benefits in NPV (-1/2 point)<br>10b. Used the robotics business cost of capital to value synergy (No points off) |