# Paper Outline

1. Introduction
   1. Motivation:
      1. Royal Dutch Shell is an international company and highly subject to the macroeconomy. As numerous macroeconomic indicators are highly correlated with revenues, such as the price of a barrel of oil, the net financial impact is exposed to these uncontrollable variables. By understanding the impacts, measures can be taken to mitigate the impact of changes to the macroeconomy.
   2. Objectives:
      1. This report will cover the major macroeconomic indicators and how they impact Royal Dutch Shell. An analysis of specific measures to mitigate this risk will be compared with the goal of maximizing revenues.
   3. Organizational overview of paper:
      1. Theoretical and empirical review among outstanding literature of fundamentals of oil/natural gas industry.
      2. Apply concepts to Royal Shell Dutch.
      3. Determine sensitivity of revenue to certain macroeconomic indicators.
      4. Establish model based on empirical evidence.
      5. Use model to manipulate endogenous variables to maximize revenue.
      6. Provide alternatives beyond scope of model.
2. Literature Review
   1. Determinants of price of oil and natural gas.
   2. Correlation with price of oil/natural gas to other macroeconomic indicators.
   3. Limiting exchange rate risk of international firms.
   4. Microeconomics of Oil/Gas Industry to maximize revenues.
3. Analysis Approach
   1. Scope: Determine which macroeconomic variables and economies foster the greatest revenue variability and how to mitigate this risk to maximize revenues.
   2. Evaluate a log-log model with revenues as the dependent variable and the macroeconomic variables of the largest markets to determine the revenue elasticity of a given variable.
   3. Using the evaluated elasticities, create a theoretical model for annual revenues. Include inputs for that Royal Dutch Shell can manipulate to hedge the risk of the most impactful macroeconomic variables.
      1. Potential inputs to be determined from literature review but could include hedging price risk with the forward market, return on upstream/midstream/downstream investments, allocation of resources to differing economies, return on investment of lobbying, size of reserves, etc.
   4. Optimize theoretical model to determine ideal inputs to maximize revenues.
   5. Analyze economic value-added of differing operations and value of diversified operations.
4. Results & Discussion
   1. Breakdown of log-log model to understand revenue sensitivity to macroeconomy.
   2. Basis of theoretical model and how it can be applied going forward.
   3. Discussion of ideal inputs, how they can be applied, and reasoning behind inputs.
   4. Discussion of whether the benefits of a diverse operations “portfolio” are greater than the allocation of resources to the revenue-maximizing operations.
      1. Diverse portfolio should reduce variability of annual revenues whereas an allocation to only the revenue-maximizing operations would result in higher highs but lower lows.
5. Conclusions
   1. Summary of options available to Royal Dutch Shell to mitigate risk and optimize revenues and which variables impact revenues greatest.
   2. How Royal Dutch Shell would be able to maximize revenues given current macroeconomic conditions.
   3. Discussion of variability outside of scope of model.

# Macroeconomic Indicators

* Shell publicly releases revenues by four geographical areas: Europe, Asia/Oceania/Africa, USA, and Other Americas.
  + Data will be considered for each of the macroeconomic indicators of these regions.
  + Where a single number cannot be sourced or determined (such as with the exchange rate), the largest national economy of each geographical area will be used.
    - This is because this economy would most likely drive most of the revenues and be highly correlated with the other regional economies in the area.
    - Those countries would be Germany, China, USA, and Brazil, respectively.
* Indicators to be analyzed:
  + Real GDP Growth
    - Because oil/natural gas are used as inputs for many processes, it would be reasoned that a growth in the output would increase sales of oil/gas.
  + Inflation Rate
    - Since refined oil has a shelf life, Shell would be subject to the current price level which would in turn affect revenues.
  + Unemployment Rate
    - Fluctuations in employment should cause demand of oil to fluctuate as more or less people would be commuting to work.
  + Nominal Interest Rate
  + Trade-Weighted Real Exchange Rate
    - Interactions between countries all over the world call for the need to be mindful of exchange rates.
  + Industrial Production
    - Many industrial facilities use natural gas directly or implicitly through generated electricity, an increase in energy demand for production should cause an increase in sales.
  + Consumer Spending
    - Sales of good and services would reflect the behavior of the populace. Increased spending should reflect an increase in travel and other activities that would increase demand for oil.
  + Oil/Natural Gas Price
    - Trivially, the wholesale oil/gas price level would affect annual revenues.