

# Forecasting Sales

## F305 Intermediate Corporate Finance

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Slide Set B1 – Forecasting Sales

# Overview

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Forecasting Income Statements and ultimately cash flows will be how some of you spend the first part of your careers.

It is neither Rocket Surgery nor Brain Science.



# Sales Forecasting:

## The 1<sup>st</sup> Step in Valuation

- Everything we've done so far and will do in this course starts with forecasting cash flows
- Forecasting cash flows starts with sales
- Sales are generally the biggest driver of forecasts
  - Income statement is affected because variable costs depend on sales
  - Balance sheet is affected because fixed assets and some NWC items triggered from sales forecasts (e.g., Days Receivables, Days in Inventory)

# How to Start

What do we do with this?

Is there a trend?

Are there macroeconomic factors to consider?

- Effect of Recessions?
- Correlation to GDP?



# Correlation of Sales & GDP

How closely does the firm's revenue track GDP?

## Four Examples

*Johnson & Johnson*

HealthCare

Medical Supplies &  
Pharma

Revenues: \$85BN 60%  
US Sales

*General Dynamics*

Defense/Aerospace

Planes/Tanks/Ships/Tech

Revenues: \$42.3BN 72%  
of Sales to US Govt

*Kroger*

Consumer Staples

Grocery Stores

Revenues: \$150BN

*Illinois Tool Works*

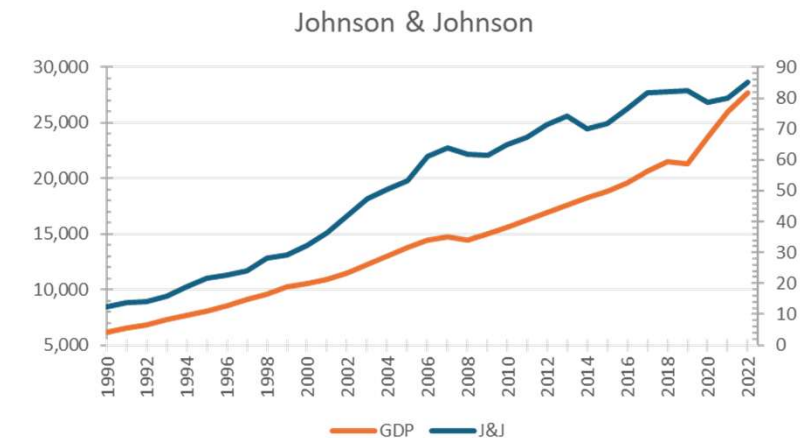
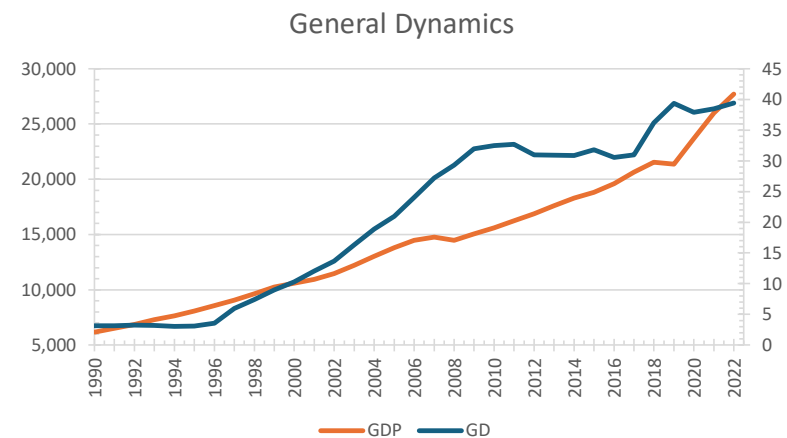
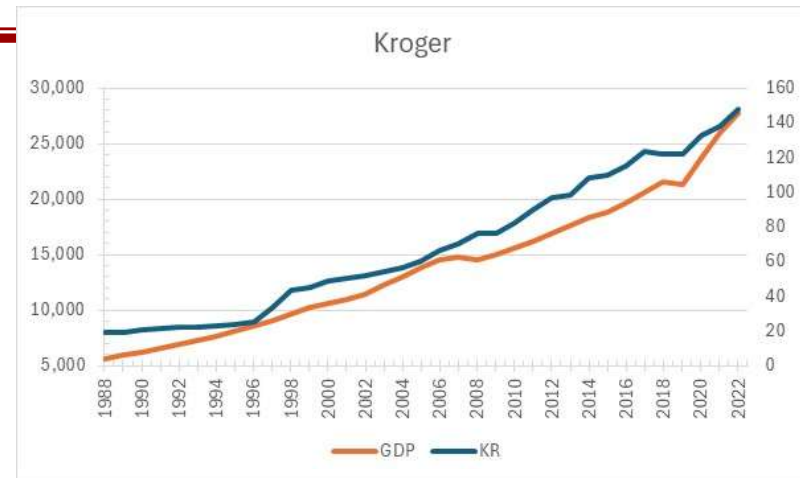
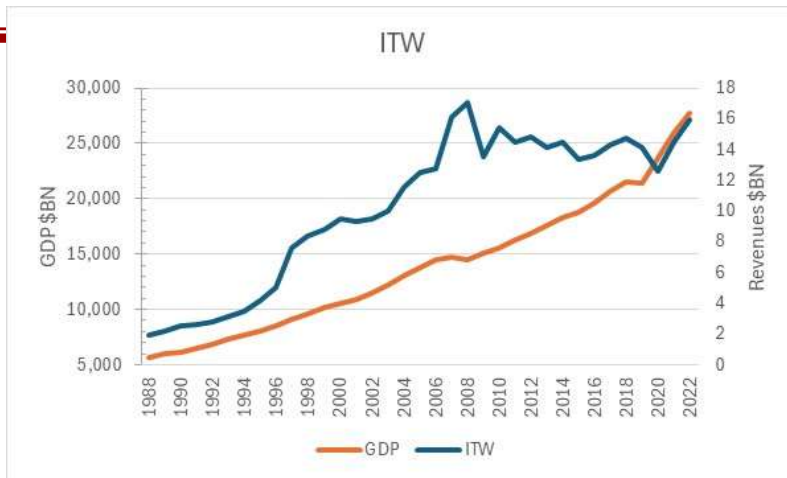
Industrial

Diversified Equip Mfgr

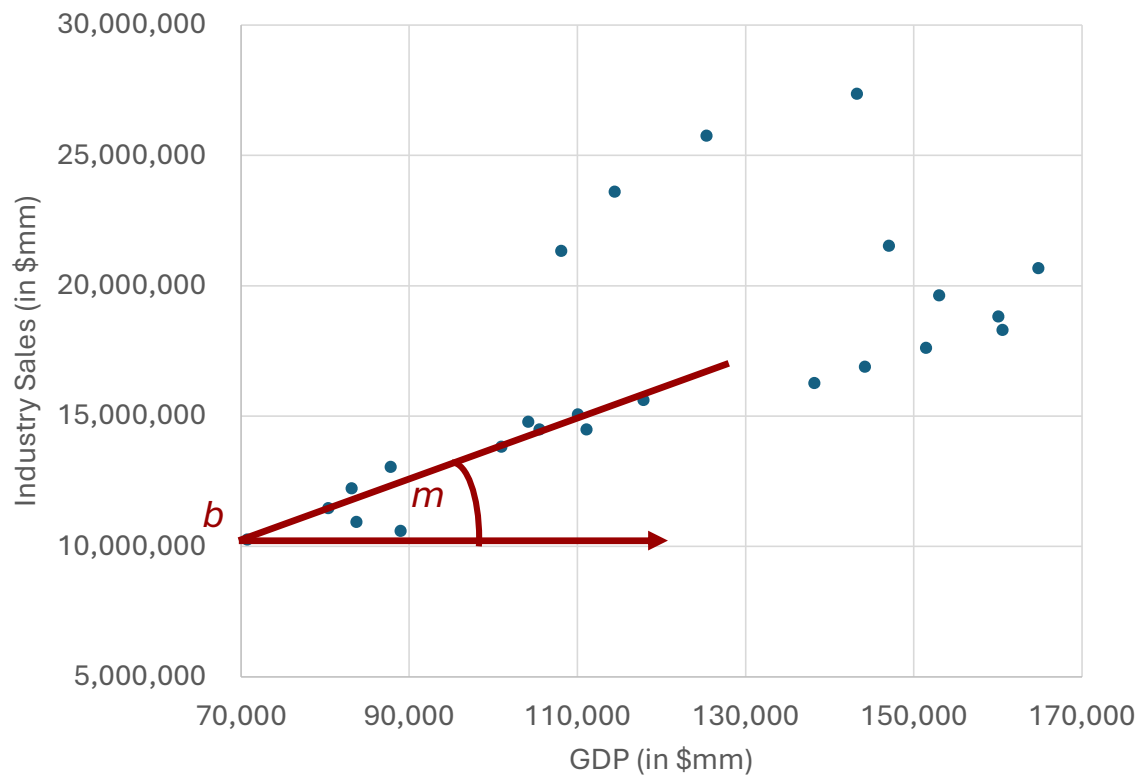
Revenues: \$16BN

Which do you think will have the highest and lowest correlations with the overall economy?

# Revenue to GDP (nominal)



# Statistical Way to Measure



Regression: Better than Eyeballing

Assume there's a linear relationship between  $x$  and  $y$

- $y = b + mx$
- $b$  = intercept
- $m$  = slope

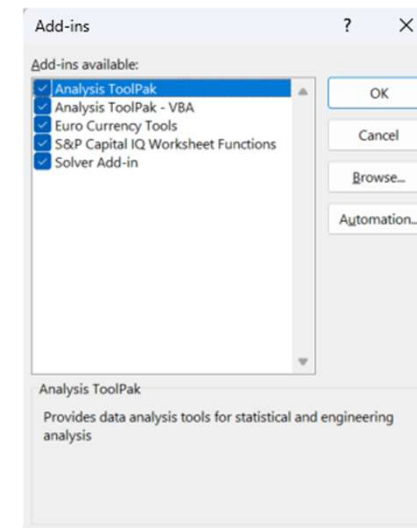
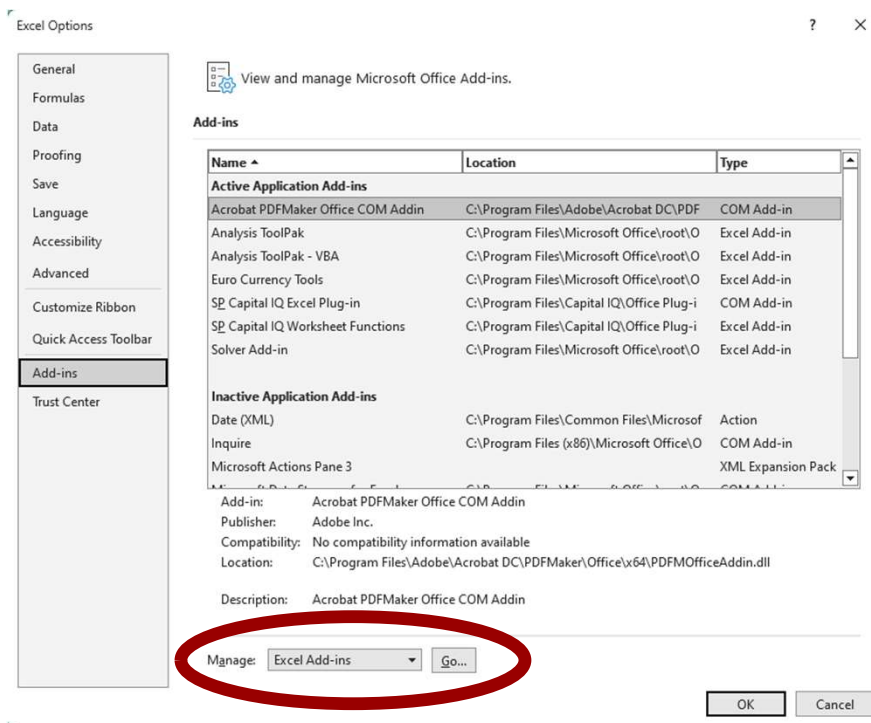
Use regression to estimate  $m$  and  $b$

Validate how reliable your estimates are

# Data Analysis Tool Pak

## In Excel: Data Analysis | Regression

Office Button | Excel Options | Add-Ins | Manage Excel Add-ins Go | check the box for Analysis ToolPak | OK





# Regression Results – Excel Data Analysis

Which have the highest and lowest correlations with the overall economy?

ITW

<i>Regression Statistics</i>	
Multiple R	0.842933
R Square	0.710537
Adjusted R Square	0.701765
Standard Error	2.673472
Observations	35

GENERAL DYNAMICS

<i>Regression Statistics</i>	
Multiple R	0.938477
R Square	0.88074
Adjusted R Square	0.876893
Standard Error	4.663917
Observations	33

KROGER

<i>Regression Statistics</i>	
Multiple R	0.989441
R Square	0.978994
Adjusted R Square	0.978358
Standard Error	5.939629
Observations	35

JOHNSON & JOHNSON

<i>Regression Statistics</i>	
Multiple R	0.947235
R Square	0.897255
Adjusted R Square	0.89394
Standard Error	8.059359
Observations	33

# Illinois Tool Works

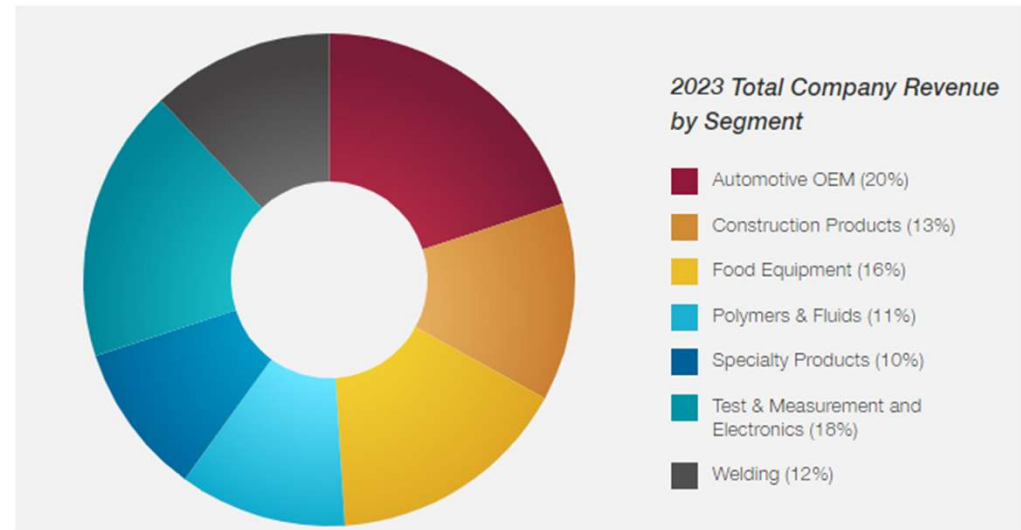
Broad exposure to many industries

*Illinois Tool Works*

Industrial

***Diversified*** Equipment Mfgr

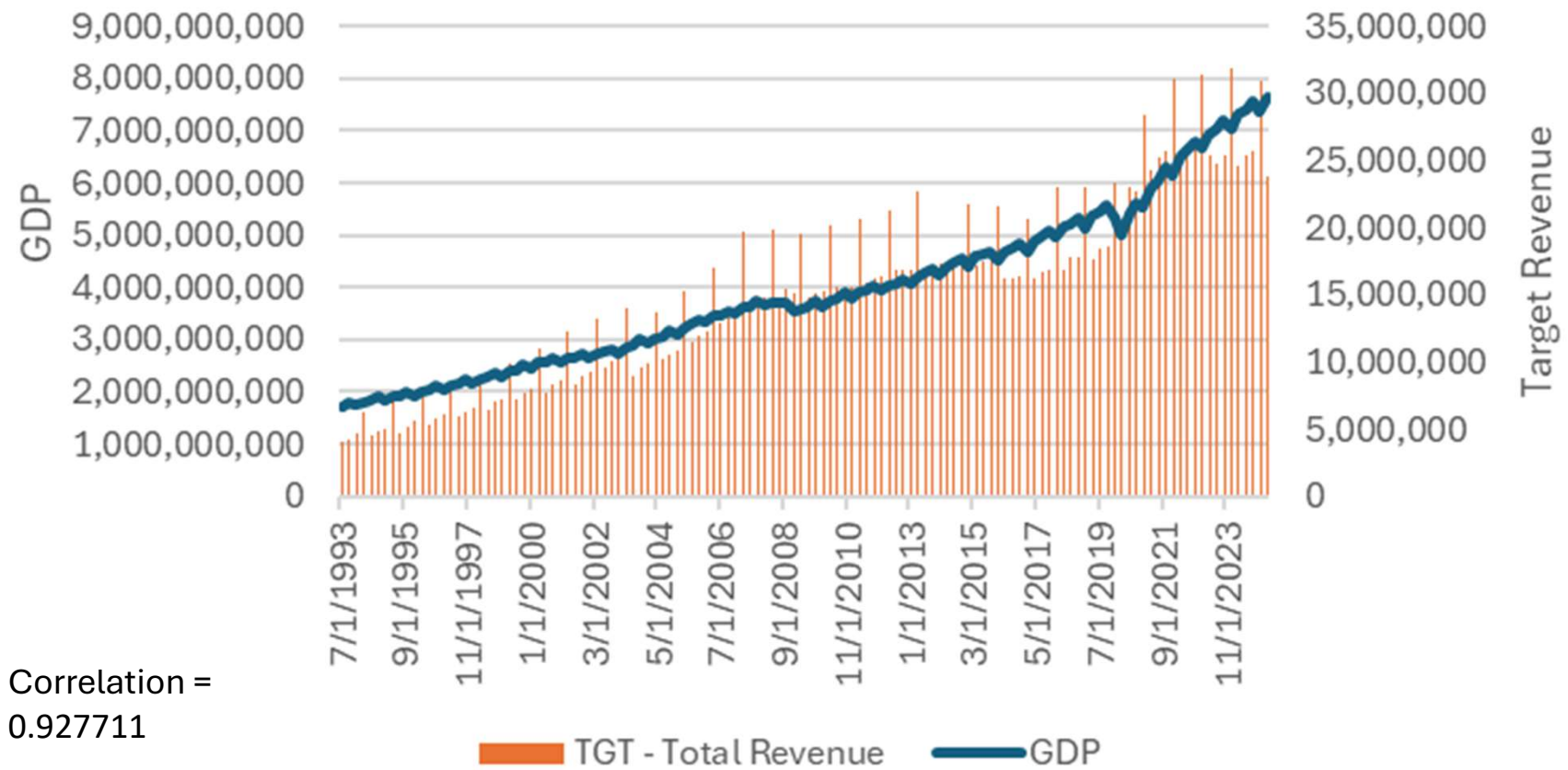
Revenues: \$16BN



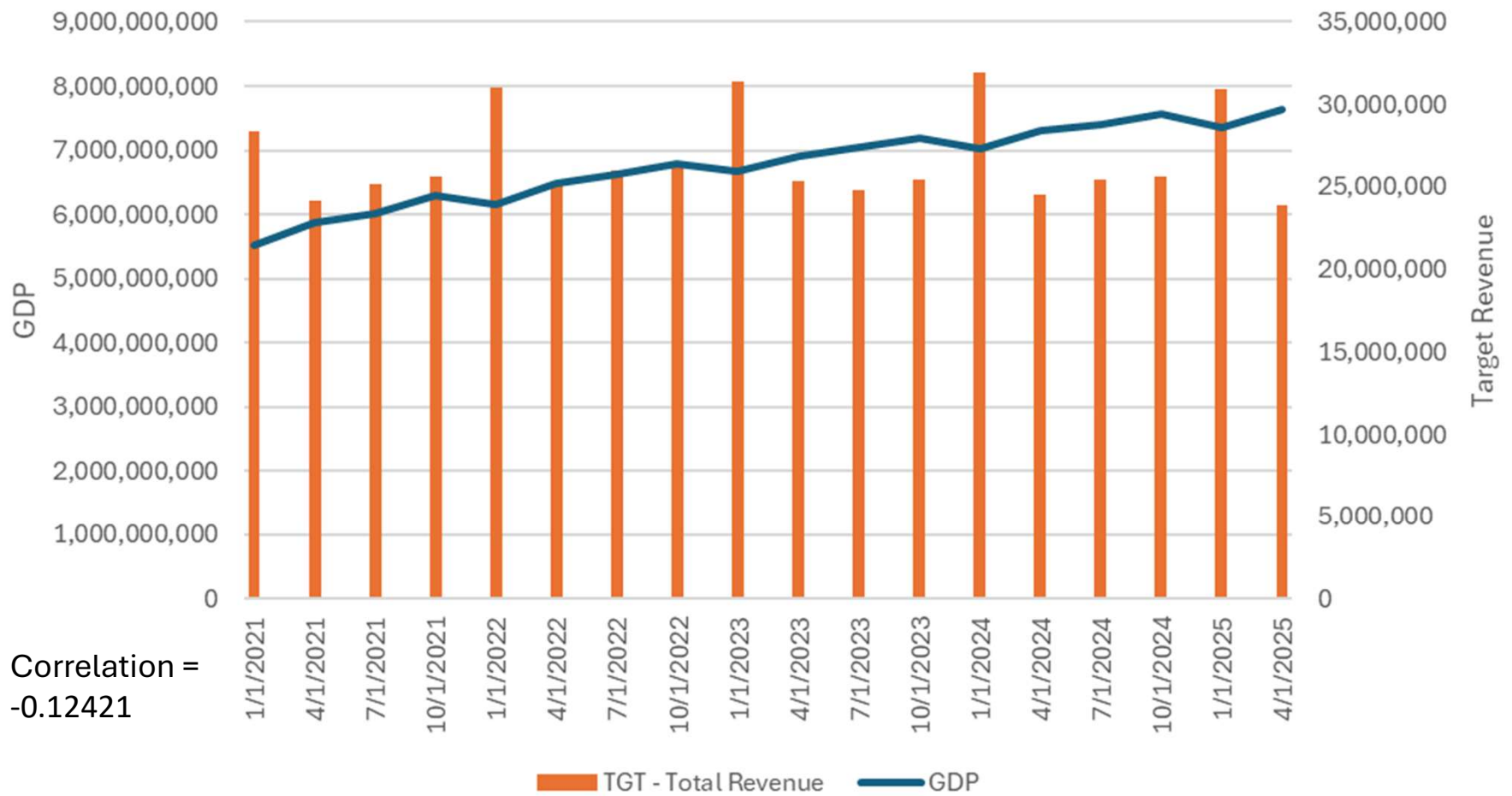
This lack of correlation to the overall economy is why CONGLOMERATES are formed.

It's effectively a portfolio diversification strategy.

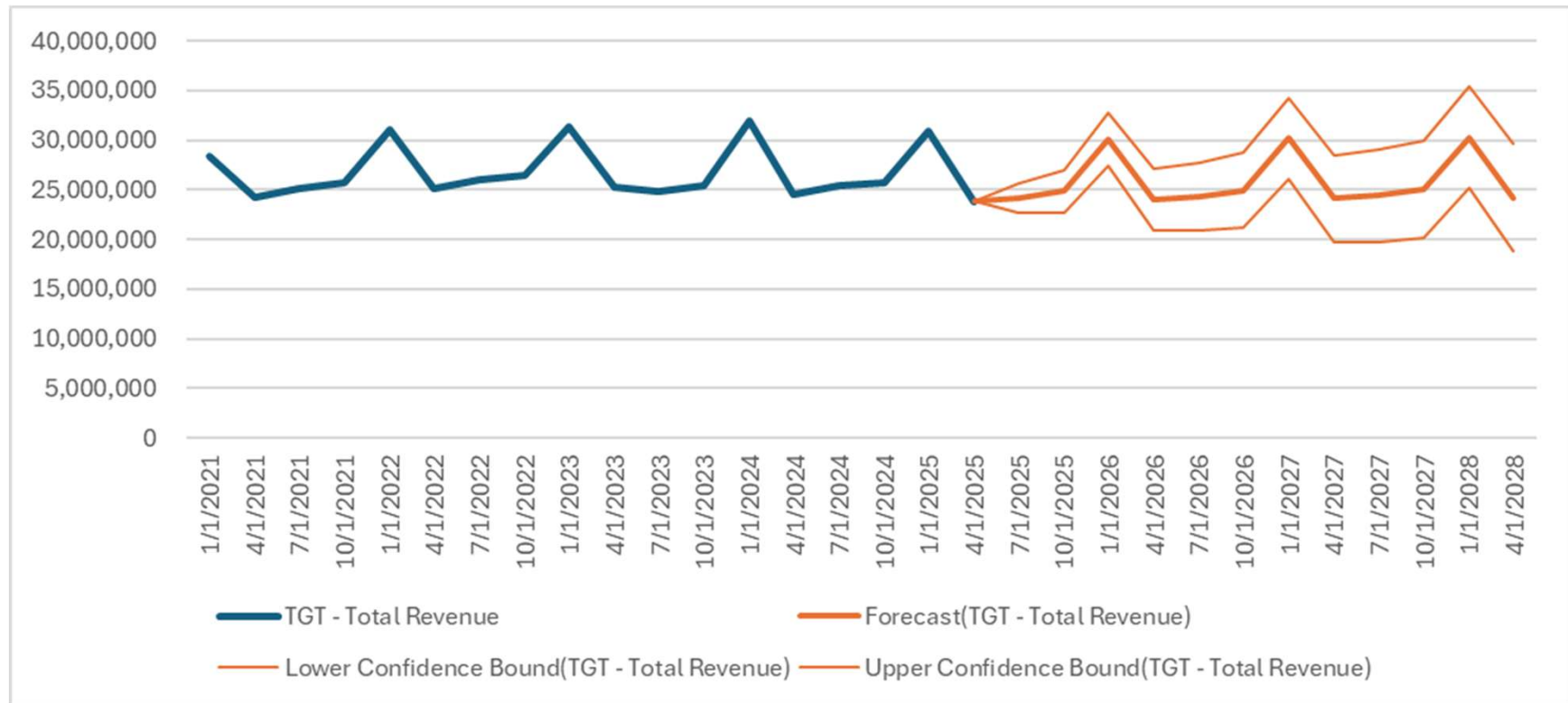
## TGT Revenue vs. GDP Since 1973



# TGT Revenue vs. GDP Since 2021



# Excel's Forecast Sheet Tool



# How to Project Sales

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- Absent a change in strategy or a dramatic change in situation, HISTORY is a good guide
- Understand the macroeconomic factors affecting the industry and the company
- Analyze the competitive landscape and the strategies being used by others

# Understanding the History

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- Were there Acquisitions/Divestitures in the recent past?
  - Could throw off the trend
- How much is inflation affecting the sales/revenue number?
  - Are they SELLING MORE UNITS (Really growing)?
  - Are they just raising prices along with (or more than) inflation?
- Has the firm's marketing strategy changed recently?

# How to Project Sales

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## In the short-term...

- Macroeconomic conditions tend to be more important than industry dynamics
  - Competitive positions of companies are unlikely to change much in the short run
- GDP forecast is reliable
  - Use REAL GDP forecasts
  - Use history and industry outlook to project firm's short-term sales

## In the long-term...

- GDP forecast is NOT infallible
  - Economists have correctly predicted 15 of the last 3 recessions
- Firms' competitive positions likely to change
  - Use time-series analysis to project firm's long-term sales



# How to Project Sales

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## **Short-term sales forecast (out 2-3 years)**

- Look at the industry
  - What's the overall outlook?
  - Linkage to the macro economy
- Look at the market shares and material movements

## **Long-term sales forecast (Beyond 3 years)**

- Fast or slow?
- Stable or non-stable (product life cycle) growth?
- Analyze the trend of sales growth

# Forecasting The Short-Term

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## Aggregate level of macroeconomic activity

- GDP and GNP
- Orders for plant and equipment, stock prices, money supply...

## Index of leading economic indicators

- Produced monthly by Bureau of Economic Analysis of the Department of Commerce
- Leads by about ½ a year
- Consecutive changes (trend) more informative

## Predictions of economists for future economic trends

- Published monthly by **Blue Chip Economic Indicators**
- Project growth in GDP over 2 years
- Project inflation rate

## Other sources:

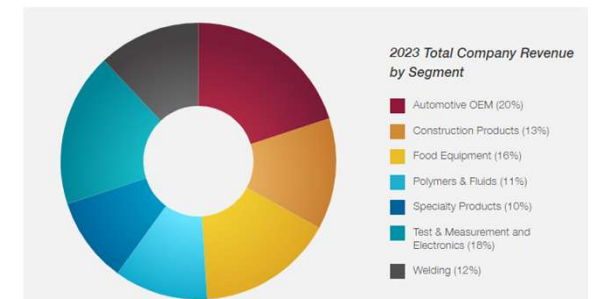
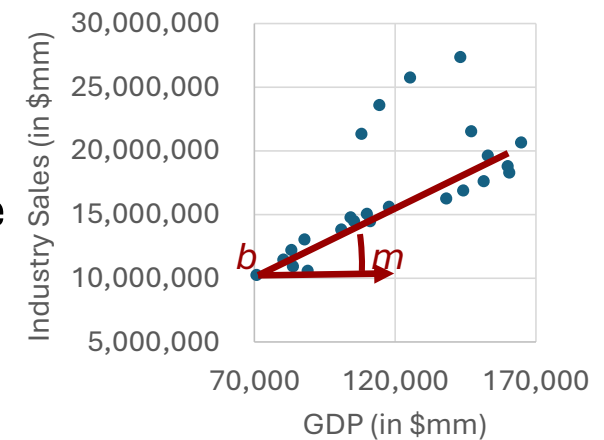
- FRB St. Louis (<http://www.stls.frb.org/fred>)

# IF You Have Market Share Data (unlikely)

$$Sales_{t+1} = Market\ Share_{t+1} * Industry\ Sales_{t+1}$$

## Industry sales driven by macro conditions

- If you've got that, you can do a regression vs. GDP and use that to forecast
- Determining Market Share is a challenge if you're looking at a **DIVERSIFIED BUSINESS**
  - Can you break the business down and do market shares for each unit?



# Projecting the Firm's Sales When You Know Market Share

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Company sales will depend on

- The overall industry sales
- The Company's market share

Projected Firm Sales = Projected Industry Sales \* Projected Market Share

$$\begin{aligned} & (1 + \text{Industry Sales Growth Rate}) \\ * & \text{ (1 + \% Change in Market Share)} \\ = & (1 + \text{Firm Sales Growth Rate}) \end{aligned}$$

# Example

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Projected Firm Sales = Projected Industry Sales \* Projected Market Share

Suppose industry sales are expected to grow at 20%. However, the market share of the firm that you are evaluating is expected to drop from 20% to 15%. What is the growth rate of firm's sales?

# Example (cont.)

$$(1 + \text{Industry Sales Growth Rate}) * (1 + \% \text{ Change in Market Share}) = (1 + \text{Firm Sales Growth Rate})$$

$$(1 + 20\%) \times \left(1 + \frac{-5\%}{20\%}\right) - 1 = -10\%$$

	Was	Is		Was	Is
Industry Sales	100	120	Industry Sales	100	120
Market Share	20%	15%	Market Share	20%	15%
			Firm Sales	20	18
					-10.00%

## A word about Market Share

Projecting market shares can be tricky

Some imperfect solutions...

- Has the firm's growth rate historically been higher or lower than industry growth rate?
  - That should tell you whether it has been gaining or losing market share
- Look at marketing expenditures of firm relative to industry marketing expenditure
  - Change in marketing expenditures higher than the industry should correlate to higher market share
  - Except when it doesn't

# Forecasting Long-Term Sales Growth

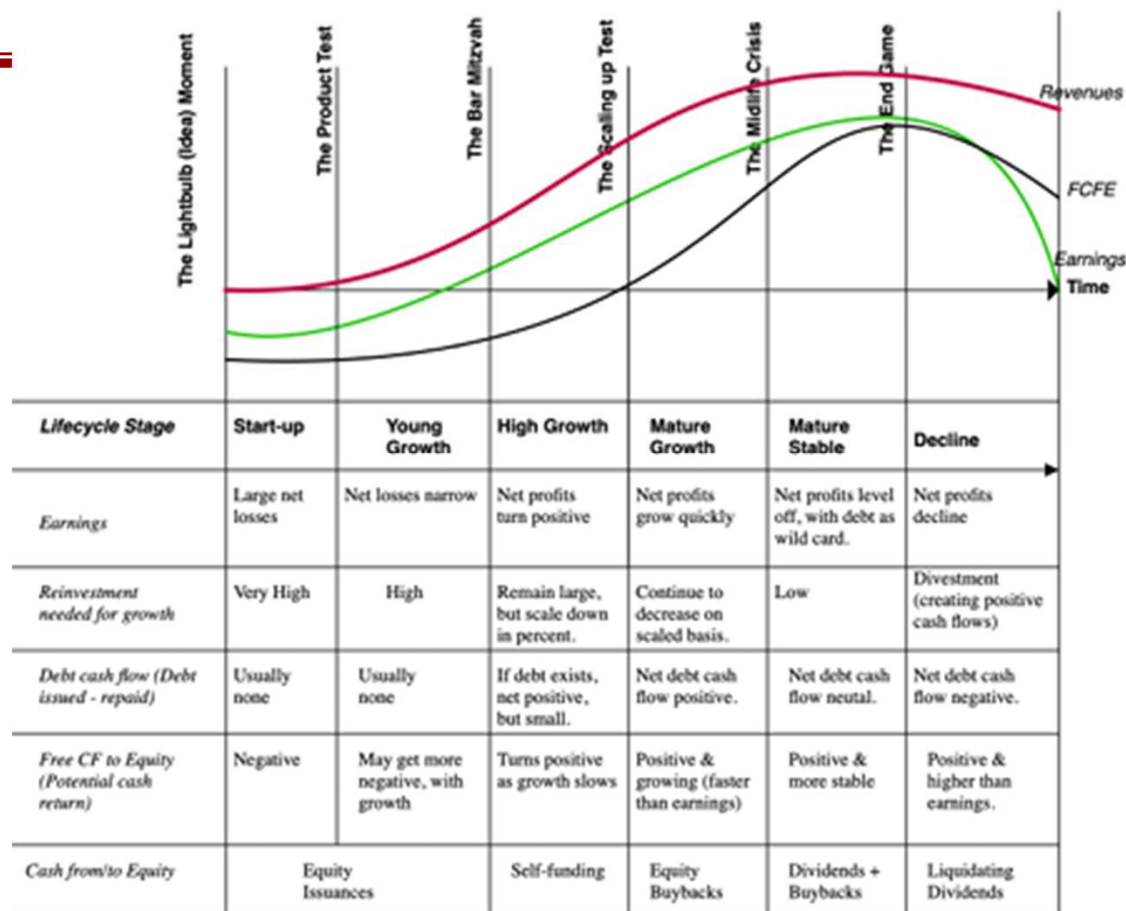
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## Analyzing sales growth patterns:

- Stable growth
  - Large established firms/ industries grow at steady rate forever
  - Often close to GNP growth rate
  - Characteristics: Average risk and average-to-low reinvestment rate
- Two-stage growth
  - Smaller firms/ industries grow at a high rate initially, then settle down to a stable growth rate
  - Characteristics: Moderate to high risk and moderate-to-high reinvestment rate



# Lifecycle of the Firm



Source: Aswath Damodaran

<https://people.stern.nyu.edu/adamodar/pdfiles/eqnotes/valpacket1spr24.pdf>

# Adjusting for Inflation

- Sales analysis should be done on real sales (i.e., sales expressed in constant dollars with respect to a **base year**)

$$\text{Sales}_{\text{Old}} * \frac{\text{CPI}_{\text{Base}}}{\text{CPI}_{\text{Old}}} = \text{Sales}_{\text{Base}}$$

- **NOTE:** Translate all past sales to real sales first, **before** doing sales analysis

*Example: Sales in 2012 were \$16,410, the CPI was 139.6 in 2012 and 162.6 in 2018. What is the real value of 2012's sales in 2018 dollars?*

# Solution

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	<u>2012</u>	<u>2018</u>
Sales	16,410	
CPI	139.60	162.60

$$\text{Sales} * \frac{\text{CPI}_{2018}}{\text{CPI}_{2012}} = 19,113.65$$

# The Gift of Working with Public Companies

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When dealing with publicly-traded firms, we have “perfect information”

- Past financial statements
  - Give us the ability to calculate past growth, always a good starting point
- Analyst Estimates
  - Professionals who cover these companies have a good handle on the near-term
  - No one has a good handle on
  - the long-term

# Capital IQ

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## My Favorite Resource

SEC Filings

Transcripts / Company Presentations

Downloadable Data

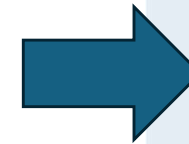
- Financials
- Ratios / Multiples
- Comparable Companies
- Capital Structure / Security Info

**My Capital IQ Companies**

- My Links**
  - Securities Summary
  - Capital Structure Details
  - SEC Filings
  - Quick Comps
  - Tearsheet
  - Transcripts
- Most Used**
  - Ratios
  - Cash Flow
  - Multiples
  - Cash Flow
  - Chart Builder
- RatingsDirect®**
  - S&P Entity Summary
  - Credit Research
- CreditStats Direct®**
  - Select Stats & Ratios
  - Income Statement
  - Balance Sheet
  - Cash Flow
  - Capital Structure
  - Supplemental
- Company Summary**
  - Tearsheet**
  - Corporate Timeline
  - Long Business Description
  - Products
  - Competitors
  - Industry Classifications
  - Offices
  - Analyst Coverage
  - Corporate Governance
- People**
  - Professionals
  - Board Members
  - Committees
  - Compensation



- Financials/Valuation**
  - Key Stats
  - Income Statement
  - Balance Sheet
  - Cash Flow
  - Multiples
  - Capitalization
  - Capital Structure Summary
  - Capital Structure Details
  - Ratios
  - Supplemental
  - Pension/OPEB
  - Segments
- Proprietary Data**
- Estimates**
  - CIQ Estimates
  - Guidance
- Peer Analysis**
  - Quick Comps
  - Comparable M&A Transactions
  - Credit Health Panel
- Charting**
  - Chart Builder
  - Annotated Stock Chart
- Fixed Income**
  - Summary
  - Credit Ratings
  - Securities Summary
  - Credit Default Swaps
- Short Interest**
- Equity Listings**
- Transactions**
  - M&A/Private Placements
  - Public Offerings
  - Takeover Defenses
  - Transaction Advisors
- Business Relationships**
  - Customers
  - Suppliers
  - Strategic Alliances
  - Auditors
- Investors**
  - Private Ownership
  - Public Ownership
  - Investor Activism



- News, Events & Filings**
  - News
  - Events Calendar
  - Transcripts
  - SEC Filings
  - Filings & Annual Reports
  - Key Documents
  - Key Developments
- Research**
  - Investment Research
- Investments**
  - Direct Investments
  - Co-Investors
  - Corporate Tree
  - Investment Criteria
  - Public Holdings
- Other Functions**
  - Add to List / Comp Set
  - Find Similar Companies
  - Find Buyers
- Report Builder**
- Relationship Management**
  - Activity Logs / Add
  - Tasks / Add
  - CRM Overview
  - Relationship Paths
  - Document Management
  - Audit History
  - Projects Summary

# The Most Important Thing

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Is what we HAVE NOT discussed:

- How will the Company's stated strategy affect its short- and long-term results?
- What are they saying about their future?
- Do you agree with it? Do you think it will work?
- Will it change their cost structure? (Better or worse?)
- What happens if it doesn't work?
- What happens if there's a recession? Or an economic boom?

These are the things that really drive the analysis

Do your best to THINK ABOUT IT and draw conclusions



# Conclusion

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- Sales is the first and most critical step in building proformas: It drives other predictions
- Historical growth, economic analysis and industry analysis can help to project sales growth rate for a particular company

# Up Next

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Ratio Analysis

Sustainable Growth Rate

Internal Growth Rate

The DuPont Identity

Please sign up for a Capital IQ account  
(and install the Excel plug-in, if you  
wish)