

FIN 580

Entrepreneurial Finance

Intellectual Asset Valuation

Prof. Seungjoon Oh
Peking University HSBC Business School

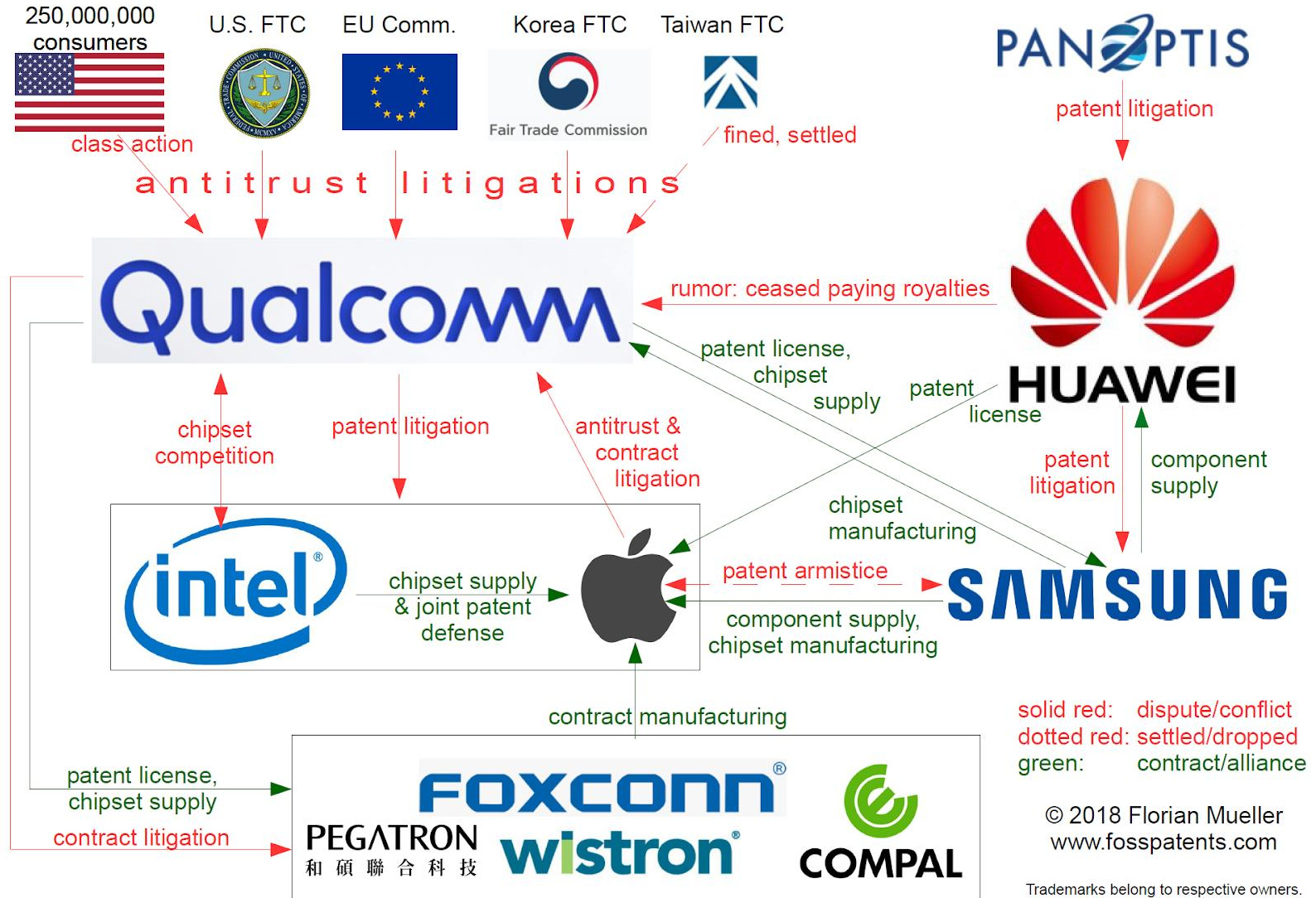
The Importance of Intellectual Assets

- Intellectual assets are key inputs for producing goods and essential in defining product market boundaries.
- Intangible assets currently account for 90% of the S&P 500's total assets.

The Natural of Intellectual Assets

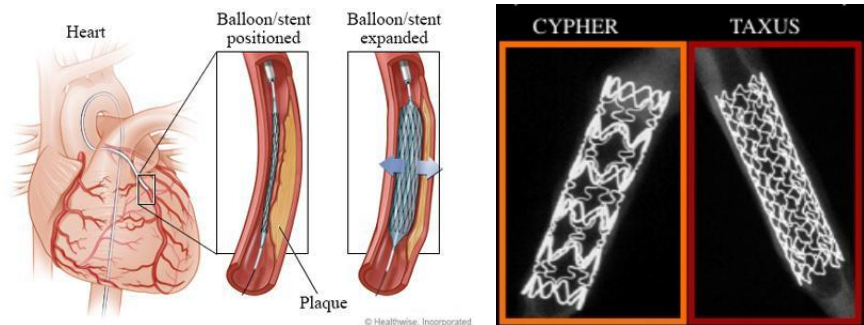
- 5 Types of Intellectual property
 - ▶ Patents
protect inventions
 - ▶ Trademarks
protect words, names, symbols, design
 - ▶ Industrial design
protect aesthetic appearance of a product
 - ▶ Confidential information/trade secret
protect concepts, ideas, and factual information
 - ▶ Copyright
protect expression of an idea

Smartphone Patents Battleground



Vascular Stents Market

- Johnson & Johnson vs. Boston Scientific
 - ▶ Competing in coronary artery stents (\$6.5B market)
 - ▶ Pioneered by J&J but Boston Scientific became a major rival
 - ▶ A series of courtroom battles and J&J's predation strategy using deep pockets
 - ▶ Since 2003, Boston Scientific settled 17 lawsuits with J&J and paid \$1.7B.
 - ▶ Boston Scientific announced layoff plans during the same month.



China's IP Reform

- China's passage of National Intellectual Property Strategy (NIPS) reform in 2008
 - ▶ In 2008, China released NIPS outlining reforms on the laws, regulations, and enforcement of IP. (National Bureau of Asian Research (2011))
 - ▶ the number of patenting and copyright application has experienced an explosive growth
 - ▶ expansion of specialized IP courts and enhancement of human resources notable increase in the number of IP litigation (40% increase between 2009-2010)

China's IP Reform

- China's payments for the use of the U.S. intellectual property grew more than 11-fold from \$755 million in 1999 to \$8.3 billion in 2017 (Santacreu, Ana and Peake, Makenzie (2019))

B. China's Payments for the Use of U.S. Intellectual Property and China's GDP

Normalized to 1, Year = 1999



SOURCE: World Bank and OECD.

Intellectual Asset Transfer

- Difficulty of measuring and valuing innovation
 - ▶ Particularly apparent when a company wants to acquire the company or the rights to use its IP
- IP rights can be licensed or sold outright
- License contract for royalty rate or license fee
- Licenses have relied on “rules of thumb” rather than quantitative analysis.
 - ▶ E.g., 5% of sales revenues or 25% of operating profit margin
- Contribution to profit of intellectual property and intellectual assets (CPIPIA) is important

Approaches to Intellectual Asset Valuation

- Cost Approach
 - ▶ Quantifying the investment that would be required to replace the future service capability of the technology (e.g., replacement cost)
 - ▶ The cost approach yields a lower estimated value

Approaches to Intellectual Asset Valuation

- Market Approach
 - ▶ It measures the present value of future benefits by obtaining a consensus from the marketplace
 - ▶ Requisites: 1) active public market, 2) exchange of comparable properties
- The Emerging Global Marketplace for Intellectual Property (IP)



Approaches to Intellectual Asset Valuation

- Income Approach
 - ▶ It measures the present value of the anticipated stream of economic benefits
 - 1) What sort of income stream will be generated by the intellectual asset over time?
 - 2) How long will that income stream persist?
 - 3) How likely is the forecasted income stream to materialize?

Licensing Intellectual Assets

- Determining the Asking Rate
 - ▶ Industry average contribution to profit from intellectual property and intellectual assets (CPIPIA)

$$WACC = \frac{V_m}{V_{bev}} R_m + \frac{V_t}{V_{bev}} R_t + \frac{V_i}{V_{bev}} R_i$$

Return on monetary assets: R_m

Return on tangible assets: R_t

Return on intangible assets: R_i

$$R_i = \frac{WACC - \frac{V_m}{V_{bev}} R_m - \frac{V_t}{V_{bev}} R_t}{\frac{V_i}{V_{bev}}}$$

V_m , V_t , and V_i are the fair market values of the monetary, tangible, and intangible assets,

Licensing Intellectual Assets

- Determining the Asking Rate
 - ▶ $CPIA = IPIA + CP$ of other intangible asset
 - ▶ We can calculate industry average CPIPIA
By Subtracting an industry average for CPIA for companies without IPIA from the CPIA value for a company with an IPIA portfolio.

Licensing Intellectual Assets

- Determining the Licensee's Acceptable Range
 - ▶ 1) Financial projection for the company without the new product: benchmark
 - ▶ 2) Financial projection for the company with the new product
 - ▶ $2) - 1)$ is the maximum rate that could be paid

Licensing Intellectual Assets

Exhibit 7 Company X

Constant Sales Growth	5%	(In thousands)				
		Year 1	Year 2	Year 3	Year 4	Year 5
Commodity Product Sales		113,491	119,165	125,124	131,380	137,949
Cost of Commodity Sales	65%	73,769	77,457	81,330	85,397	89,667
Depreciation Expense		<u>2,270</u>	<u>2,383</u>	<u>2,502</u>	<u>2,628</u>	<u>2,759</u>
Gross Profits		37,452	39,325	41,291	43,355	45,523
SG&A	21%	<u>23,833</u>	<u>25,025</u>	<u>26,276</u>	<u>27,590</u>	<u>28,969</u>
Operating Income		13,619	14,300	15,015	15,766	16,554
Taxes	40%	<u>5,448</u>	<u>5,720</u>	<u>6,006</u>	<u>6,306</u>	<u>6,622</u>
Net Income		8,171	8,580	9,009	9,459	9,932
Add Back Depreciation		<u>2,270</u>	<u>2,383</u>	<u>2,502</u>	<u>2,628</u>	<u>2,759</u>
Gross Cash Flow		10,441	10,963	11,511	12,087	12,691
Less						
Additions to Working Capital		1,000	1,000	1,050	1,103	1,158
Capital Expenditures		<u>2,632</u>	<u>2,632</u>	<u>2,383</u>	<u>2,502</u>	<u>2,628</u>
Net Cash Flow		6,809	7,331	8,078	8,482	8,906
Discount Rate and Factors	12%	<u>0.89</u>	<u>0.80</u>	<u>0.71</u>	<u>0.64</u>	<u>8.11</u>
Present Value		6,080	5,844	5,750	5,390	72,193
Total Net Present Value		95,258				

Licensing Intellectual Assets

Exhibit 8 Company X with New Product (without Royalty Calculation)

		(in thousands)				
		Year 1	Year 2	Year 3	Year 4	Year 5
Commodity Product Sales		113,491	119,165	125,124	131,380	137,949
New Product Sales		5,000	10,000	20,000	40,000	70,000
Total Sales		118,491	129,165	145,124	171,380	207,949
Cost of Commodity Sales		65%	73,769	77,457	81,330	85,397
Cost of New Product Sales		37%	1,850	3,700	7,400	14,800
Total Cost of Sales			75,619	81,157	88,730	100,197
Depreciation Expense			2,370	2,583	2,902	3,428
Gross Profits			40,502	45,425	53,491	67,755
SG&A		21%	24,883	27,125	30,476	35,990
Operating Income			15,619	18,300	23,015	31,766
Taxes		40%	6,248	7,320	9,206	12,706
Net Income			9,371	10,980	13,809	19,059
Add Back Depreciation			2,370	2,583	2,902	3,428
Gross Cash Flow			11,741	13,563	16,711	22,487
Less						
Additions to Working Capital			1,200	1,800	4,050	6,103
Capital Expenditures			2,632	3,632	4,763	7,901
Net Cash Flow			7,909	8,131	7,898	8,483
Discount Rate and Factors		15%	0.87	0.76	0.66	0.57
Present Value			6,878	6,148	5,193	4,850
Total Net Present Value			130,893			
+/- Relative to Baseline			35,636			