

J.M. Smucker--Building a Financial Model

Chapter 7

PURPOSE OF MODEL:

BUILD FINANCIAL MODEL FOR SMUCKER
IN ORDER TO:

Predict future FCFs

Value firm as a whole

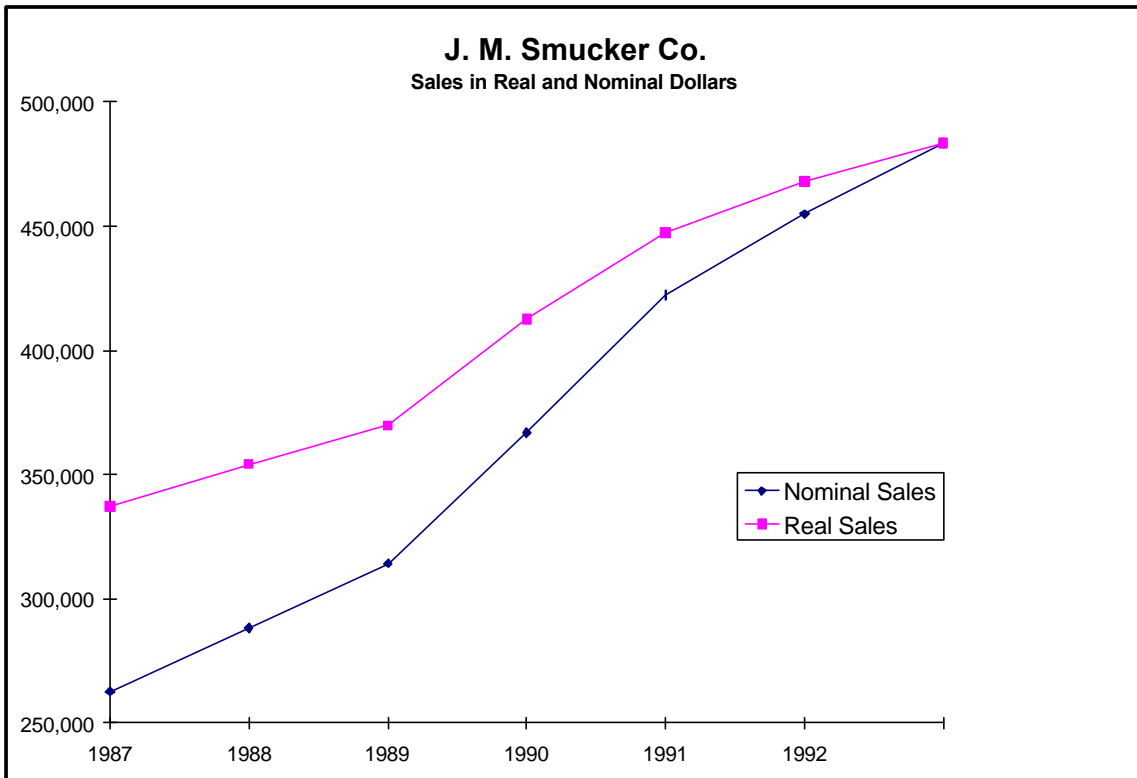
Value component securities

(Note that this is a "top down" valuation")

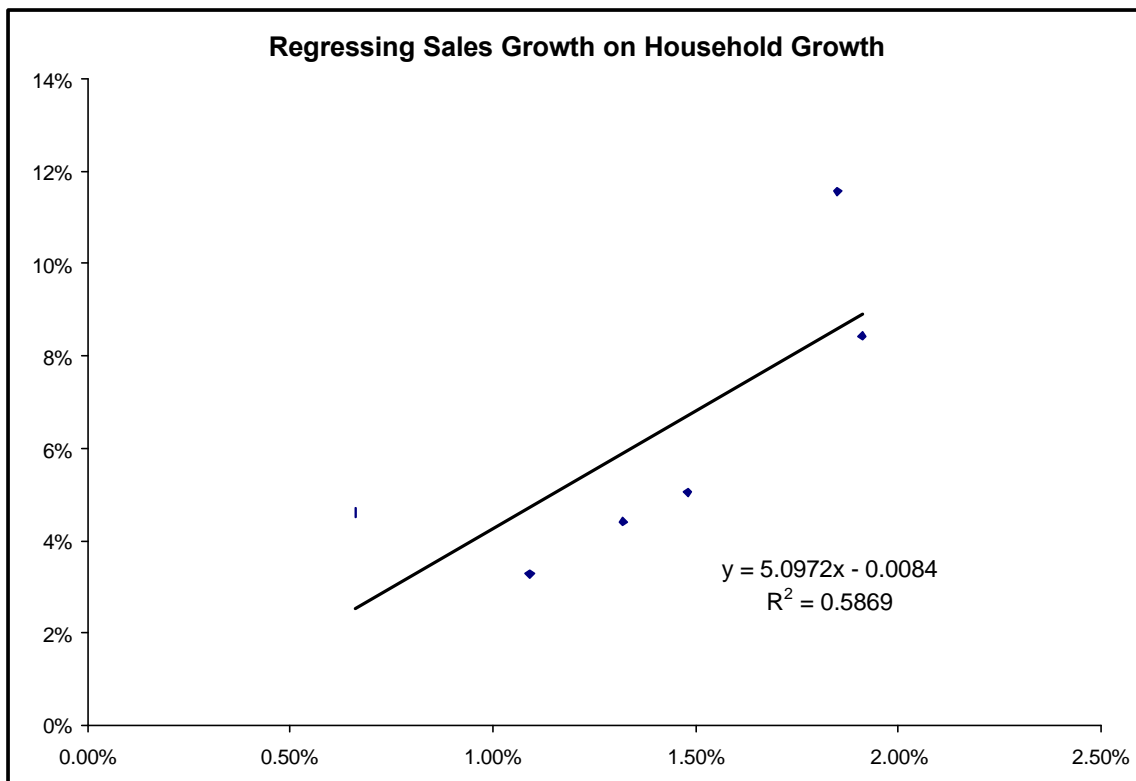
ANALYZING SMUCKER SALES

J.M. Smucker Co.			
Adjusting Sales for Inflation			
Financial Year Ending April 30	Sales (\$M)	Average CPI	Constant Dollar Sales
1986	262.80	108.57	333.07
1987	288.26	110.62	358.57
1988	314.25	115.18	375.41
1989	366.86	120.25	419.79
1990	422.36	126.12	460.80
1991	454.98	132.97	470.82
1992	483.47	137.60	483.47

Note: Smucker's financial year ends April 30. The CPI in each row of the table is the average monthly CPI for the year ending April 30.



Building a sales regression model:



$$\% \text{ change in real sales} = -0.00875 + 5.12852 * \% \text{ change in households}$$
$$R^2 = 58.65\%$$

Sales model (NOTE that base year is 1992)

Domestic *real* sales

Based on household growth--1.4% per year

In short run: $5 * 1.4\% = 7\%$ (as in regression)

In long run: $1.4\% =$ household growth

International *real* sales:

10% in 1993 & 1994

1.4% after 1997

Interpolated in 1995 & 1996

J.M. Smucker Co.
Sales Projections, 1993-1997

year	1992	1993	1994	1995	1996	1997
	(base)					
real growth rate of U.S. sales		7%	7%	4%	1.4%	1.4%
U.S. Sales (\$millions)	\$442.88	\$473.88	\$507.05	\$527.34	\$534.72	\$542.20
International real growth rate		10%	10%	10%	6%	1.4%
International sales	\$40.59	\$44.65	\$49.11	\$54.03	\$57.27	\$58.07
Constant-dollar sales	483.47	518.53	556.17	581.36	591.98	600.27
Annual inflation rate		3%	4%	4%	4%	4%
Cumulative adjustment factor		1.0300	1.0712	1.1140	1.1586	1.2050
Current-dollar (nominal) sales	483.47	534.09	595.77	647.66	685.88	723.30
Projected nominal sales growth		10.47%	11.55%	8.71%	5.90%	5.46%

Nominal sales = real sales * (1 + inflation projections).

Assume 3% inflation in 1993

Assume 4% inflation/year afterwards

Operating cost analysis

$$\text{COGS} = 65\% * \text{Sales}$$

$$\text{SG\&A} = 22\% * \text{Sales}$$

J.M. Smucker Co.							
Operating Cost Percentages							
FYE ending April 30	1986	1987	1988	1989	1990	1991	1992
COGS as % of Sales	66.9%	66.7%	65.6%	65.5%	66.6%	65.0%	65.0%
SG&A as % of Sales	22.1%	21.5%	22.4%	22.9%	21.8%	23.7%	23.8%

$$\text{A/R} = \text{Sales}/12$$

$$\text{A/P} = 13.7\% * \text{Sales}$$

$$\text{Inventory} = 87 \text{ days} = 0.238 * \text{Sales}$$

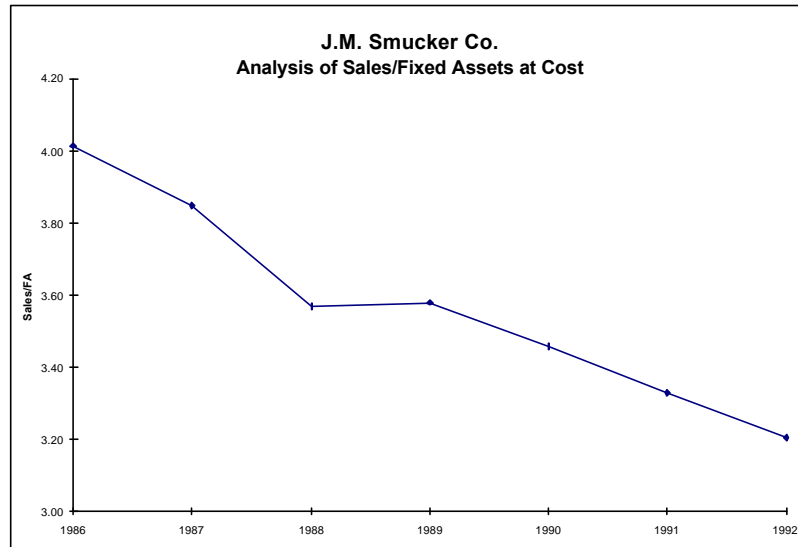
$$87/365 = 0.238$$

J.M. Smucker Co.							
Analysis of Net Working Capital							
	1986	1987	1988	1989	1990	1991	
Average collection period (days)	33.16	28.80	29.49	30.76	33.96	31.38	
Average payable period (days)	53.47	50.92	51.38	45.93	48.57	49.66	
Inventory days--raw materials	49.75	43.91	45.03	46.16	52.25	48.30	
Inventory days--finished goods	24.92	31.67	30.17	29.54	34.31	40.21	
Inventory days	74.67	75.58	75.20	75.69	86.56	88.50	

FIXED ASSET ACCOUNTS

FA at Cost is assumed to be a function of Sales

Does Smucker have excess production capacity?



Does this imply excess capacity?

J.M. Smucker Co.					
Analysis of Depreciation Charges, 1987-91					
	1988	1989	1990	1991	1992
Annual depreciation charges	8,018	9,679	10,452	10,772	11,309
Depreciable fixed assets	82,846	95,389	112,693	126,249	138,894
Total fixed assets	88,036	102,484	122,168	136,722	150,879
Depreciable vs. total fixed assets	94.1%	93.1%	92.2%	92.3%	92.1%
Annual depreciation rate	9.7%	10.1%	9.3%	8.5%	8.1%

- On the basis of this table we assume that:
 - Land = 8% of fixed assets
 - Reported depreciation = 8% of FA; i.e, average depreciable life = 12 years
- Assume that asset retirement (in 1991 = 3,148) grows at nominal rate of sales growth

This gives the following table:

	1992	1993	1994	1995	1996
Land	11,985	13,240	14,769	16,055	17,003
PP&E					
net depreciable assets	138,894	153,435	171,155	186,065	197,043
Accumulated depreciation					
This year's depreciation		(11,693)	(12,984)	(14,289)	(15,324)
Retirement of assets	3,148	3,478	3,879	4,217	4,466
Total depreciation	(62,556)	(70,772)	(79,876)	(89,948)	(100,806)
Net PP&E	76,338	82,664	91,279	96,117	96,237

Smucker's financial policy: No new debt

Smucker's dividend policy: Payout ratio = 1/3

==> Cash & Cash Equivalents is B/S plug.

End of year: Taxes payable = 25% of annual tax expenses

SMUCKER (J.M.) CO.			
BALANCE SHEET		Initial	
	FYE ending	Balances	new
ASSETS	April 92	for	name
	pro forma		
Cash and cash equivalents	36,268	36,268	Cash & S.T. investments
Trade receivables, net	41,565	41,565	Accounts receivable
Finished products	34,604	77,777	Inventories--sum of Finished Products & Raw materials, etc.
Raw materials, containers and supplies	43,173		
Other current assets	5,961	5,961	
Land and land improvements	11,985	11,985	Land
Buildings and fixtures	47,191	138,894	Net depreciable assets
Machinery and equipment	88,781		
Construction in progress	2,922		
Accumulated depreciation	(62,556)	(62,556)	Accumulated depreciation
Intangible assets	20,961	27,874	Other non-current assets--sum of Intangible assets & other assets
Amounts due from ESOP	11,103		eliminated
Other assets	6,913		
Total assets	288,871	277,768	
LIABILITIES			
Accounts payable	28,363	42,741	Accounts payable--sum of A/P, Salaries, and Accrued
Salaries, wages and additional compensation	7,934		Marketing
Accrued marketing and merchandise	6,444		
Income taxes	2,249	2,249	Income taxes payable
Dividends payable	3,101	3,101	Dividends payable
Current portion of long-term debt	0		
Other current liabilities	5,469	5,469	Other current liabilities
Long-term debt	3,827	3,827	Long-term debt
Deferred federal income taxes	6,692	6,692	Deferred income taxes
Other liabilities	1,474	1,474	Other liabilities
Class A common	3,692	7,384	Common stock
Class B common	3,692		
Additional capital	7,034	7,034	Additional capital
Retained income	209,586	209,586	Retained income
Less: deferred compensation	(947)	(11,789)	Miscellaneous adjustments--sum of Deferred compensation and
Currency translation adjustment	261		Currency translation, minus ESOP loans
Total liabilities and shareholder equity	288,871	277,768	

J.M. SMUCKER CO., Financial Statement Model, Parameters

Parameter estimates for Pro Forma	1992	1993	1994	1995	1996	1997	1998+
Sales growth		10.47%	11.55%	8.71%	5.90%	5.46%	5.46%
(COGS+SG&A - Depreciation) to Sales		86.50%	86.50%	86.50%	86.50%	86.50%	86.50%
Accounts Receivable to Sales		8.60%	8.33%	8.33%	8.33%	8.33%	8.33%
Accounts Payable to Sales		9.00%	9.00%	9.00%	9.00%	9.00%	9.00%
Inventory to Sales		16.00%	15.50%	15.00%	15.00%	15.00%	15.00%
Fixed asset growth before asset retirement		10.47%	11.55%	8.71%	5.90%	5.46%	5.46%
Return on financial investments		5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Interest on debt		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Dividend payout		33.00%	33.00%	33.00%	33.00%	33.00%	33.00%
Income tax payable to income taxes		25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
Dividends payable to dividends		25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
Effective tax rate		40.00%	42.00%	42.00%	42.00%	42.00%	42.00%
Depreciable Fixed Assets as % of Total Fixed Assets		92.00%	92.00%	92.00%	92.00%	92.00%	92.00%
Depreciation rate		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Asset retirement (\$K)	3,148	3,478	3,879	4,217	4,466	4,710	5,56%
Debt retirement		440	440	430	430	27	20.00%

“Income tax payable to income tax” and “Dividends payable to dividends” represent the percentage of income tax and dividends (respectively) not paid by the end of the reporting year, which appear on the balance sheet of Smucker.

J.M. SMUCKER CO., financial statement model

Income statement						
	1992	1993	1994	1995	1996	1997
Sales	483,472	534,089	595,769	647,666	685,882	723,304
COGS + SG&A (excluding depreciation)		(461,987)	(515,340)	(560,231)	(593,288)	(625,658)
Gross profit		72,102	80,429	87,435	92,594	97,646
Depreciation expense		(11,693)	(12,984)	(14,289)	(15,324)	(16,193)
Operating income		60,409	67,445	73,146	77,270	81,453
Interest income		1,813	2,516	3,158	4,134	5,403
Interest expense		(306)	(271)	(236)	(201)	(167)
Income before taxes		61,916	69,691	76,069	81,203	86,688
Income taxes		(24,766)	(29,270)	(31,949)	(34,105)	(36,409)
Net income		37,150	40,421	44,120	47,098	50,279
Dividend		(12,259)	(13,339)	(14,560)	(15,542)	(16,592)
Increase in retained earnings		24,890	27,082	29,560	31,555	33,687
Earnings per share		1.26	1.37	1.50	1.60	1.70
Balance Sheet						
Assets	1992	1993	1994	1995	1996	1997
Cash & short term investments	36,268	50,327	63,166	82,687	108,052	136,992
Accounts receivable	41,565	45,932	49,647	53,972	57,157	60,275
Inventories	77,777	85,454	92,344	97,150	102,882	108,496
Other current assets	5,961	5,961	5,961	5,961	5,961	5,961
Land	11,985	13,240	14,769	16,055	17,003	17,930
PP&F						
net depreciable assets	138,894	153,435	171,155	186,065	197,043	207,794
Accumulated depreciation						
This year's depreciation		(11,693)	(12,984)	(14,289)	(15,324)	(16,193)
Retirement of assets	3,148	3,478	3,879	4,217	4,466	4,710
Total depreciation	(62,556)	(70,772)	(79,876)	(89,948)	(100,806)	(112,290)
Net PP&F	76,338	82,664	91,279	96,117	96,237	95,504
Other non-current assets	27,874	27,874	27,874	27,874	27,874	27,874
Total Assets	277,768	311,452	345,040	379,816	415,166	453,032
Liabilities and Equity	1992	1993	1994	1995	1996	1997
Accounts payable	42,741	48,068	53,619	58,290	61,729	65,097
Income taxes payable	2,249	6,192	7,318	7,987	8,526	9,102
Dividends payable	3,101	3,065	3,335	3,640	3,886	4,148
Other current liabilities	5,469	5,469	5,469	5,469	5,469	5,469
Long-term debt	3,827	3,387	2,947	2,517	2,087	2,060
Deferred income taxes	6,692	6,692	6,692	6,692	6,692	6,692
Other long-term liabilities	1,474	1,474	1,474	1,474	1,474	1,474
Common stock	7,384	7,384	7,384	7,384	7,384	7,384
Additional capital	7,034	7,034	7,034	7,034	7,034	7,034
Retained income	209,586	234,476	261,558	291,118	322,674	356,361
Misc. adjustments	(11,789)	(11,789)	(11,789)	(11,789)	(11,789)	(11,789)
Total Liabilities and Equity	277,768	311,452	345,040	379,816	415,166	453,032

J.M. SMUCKER CO., financial statement model, Pro Forma Cash Flow Statement

Cash-flow statement	1992	1993	1994	1995	1996	1997
Operating activities						
Net income		37,150	40,421	44,120	47,098	50,279
Depreciation		11,693	12,984	14,289	15,324	16,193
Changes in Accounts Receivable		(4,367)	(3,716)	(4,325)	(3,185)	(3,118)
Changes in Inventories		(7,677)	(6,890)	(4,806)	(5,732)	(5,613)
Changes in Accounts Payable		5,327	5,551	4,671	3,439	3,368
Changes in taxes payable		3,943	1,126	670	539	576
Cash Flow from Operations (CEO)		46,069	49,476	54,619	57,483	61,685
Investing activities						
Land		(1,255)	(1,529)	(1,287)	(947)	(928)
PP&E		(18,019)	(21,599)	(19,127)	(15,445)	(15,460)
Net cash from investment activity		(19,274)	(23,128)	(20,413)	(16,392)	(16,388)
Financing activities						
Increase in debt		(440)	(440)	(430)	(430)	(27)
Dividends paid		(12,296)	(13,069)	(14,254)	(15,297)	(16,330)
Net cash from financing activity		(12,736)	(13,509)	(14,684)	(15,727)	(16,357)
Net increase in cash		14,059	12,839	19,521	25,365	28,940
Cash at beginning of year		36,268	50,327	63,166	82,687	108,052
Cash at end of year		50,327	63,166	82,687	108,052	136,992
Free cash flow						
Net cash from operations		46,069	49,476	54,619	57,483	61,685
Net cash from investing activity		(19,274)	(23,128)	(20,413)	(16,392)	(16,388)
After-tax interest expense		184	157	137	117	97
After-tax interest income		(1,088)	(1,459)	(1,832)	(2,398)	(3,134)
Free cash flow		25,890	25,045	32,510	38,810	42,260

TERMINAL VALUE PROJECTION

From Gordon Model:

$$\text{Terminal Value} = \frac{\text{Last Projected FCF} * (1 + \text{terminal Sales growth})}{WACC - \text{growth}}$$

Projecting FCFs (5.46% is the long-run nominal growth):

$$\text{Terminal Value} = \frac{42,260 * (1 + 5.46\%)}{WACC - 5.46\%} = \frac{44,567}{WACC - 5.46\%}$$

From CAPM:

$$WACC = r_f + \mathbf{b}_{asset} [E(r_m) - r_f]$$

In Chapter 8 we will see that r_f should be $(1 - t_c) * r_{f_{debt}}$.

This gives:

	A	B	C	D	E	F	G
132	Value--discounting FCF + terminal value						
133	Beta	0.9					
134	$R_f*(1-t_c)$	0.03					
135	$E(R_m)$	0.12					
136	RADR for FCF	11.10%	$\leftarrow =B134+B133*(B135-B134)$				
137							
138	FCF growth, after year 5	5.46%					
139	Terminal FCF	42,260					
140	Terminal value, Gordon Model	789,616	$\leftarrow =B139*(1+B138)/(B136-B138)$				
141							
142	Valuation based on FCF discounting and terminal value						
143			1993	1994	1995	1996	1997
144	FCF		25,890	25,045	32,510	38,810	42,260
145	terminal value						789,616
146	TOTAL		25,890	25,045	32,510	38,810	831,876
147	Value (full-year)	584,236	$\leftarrow =NPV(B136,C146:G146)$				
148	Value (half-year)	615,808	$\leftarrow =B147*(1+B136)^{0.5}$				
149	Add back initial cash	36,268					
150	Value	652,076					

VALUING SMUCKER'S SECURITIES

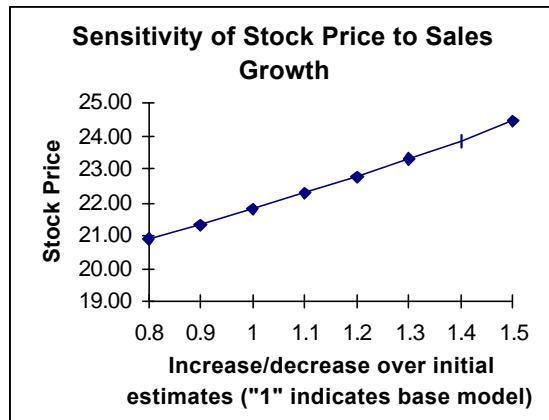
- Debt value = Book value = \$3.8 million. This leaves value of remaining securities (warrants plus shares) = \$648.276 million.
- Valuing Smucker's options:
 - Smucker has 1,000,000 warrants with average exercise price of \$16
 - Simple warrant value model:
$$W = S - 16,$$

where S = share price.
 - This means:
$$\$648,276,000 = 29,500,000 * S + 1,000,000 * (S - 16)$$

$$\Rightarrow S = \$21.78$$

$$W = \$5.78$$

SENSITIVITY ANALYSIS



	B	C	D	E	F	G	H	I	
191			Stock Price as Function of Terminal Growth Rate and WACC						
192			WACC						
193			8%	9%	10%	11%	12%	13%	
194	Terminal	0%	18.22	16.31	14.79	13.54	12.51	11.64	
195	Growth	1%	20.11	17.73	15.89	14.42	13.21	12.21	
196	Rate -->	2%	22.63	19.56	17.27	15.49	14.06	12.90	
197		3%	26.16	22.00	19.04	16.82	15.10	13.72	
198		4%	31.45	25.42	21.40	18.54	16.39	14.72	
199		5%	40.27	30.54	24.71	20.83	18.06	15.98	
200		6%	57.91	39.08	29.68	24.03	20.27	17.59	
201		7%	110.83	56.16	37.95	28.84	23.38	19.74	
202		8%	nmf	107.40	54.49	36.86	28.04	22.75	
203		9%	nmf	nmf	104.12	52.88	35.81	27.27	
204		10%	nmf	nmf	nmf	100.96	51.34	34.80	