

# Value/EBITDA Multiple

- The Classic Definition

$$\frac{\text{Value}}{\text{EBITDA}} = \frac{\text{Market Value of Equity} + \text{Market Value of Debt}}{\text{Earnings before Interest, Taxes and Depreciation}}$$

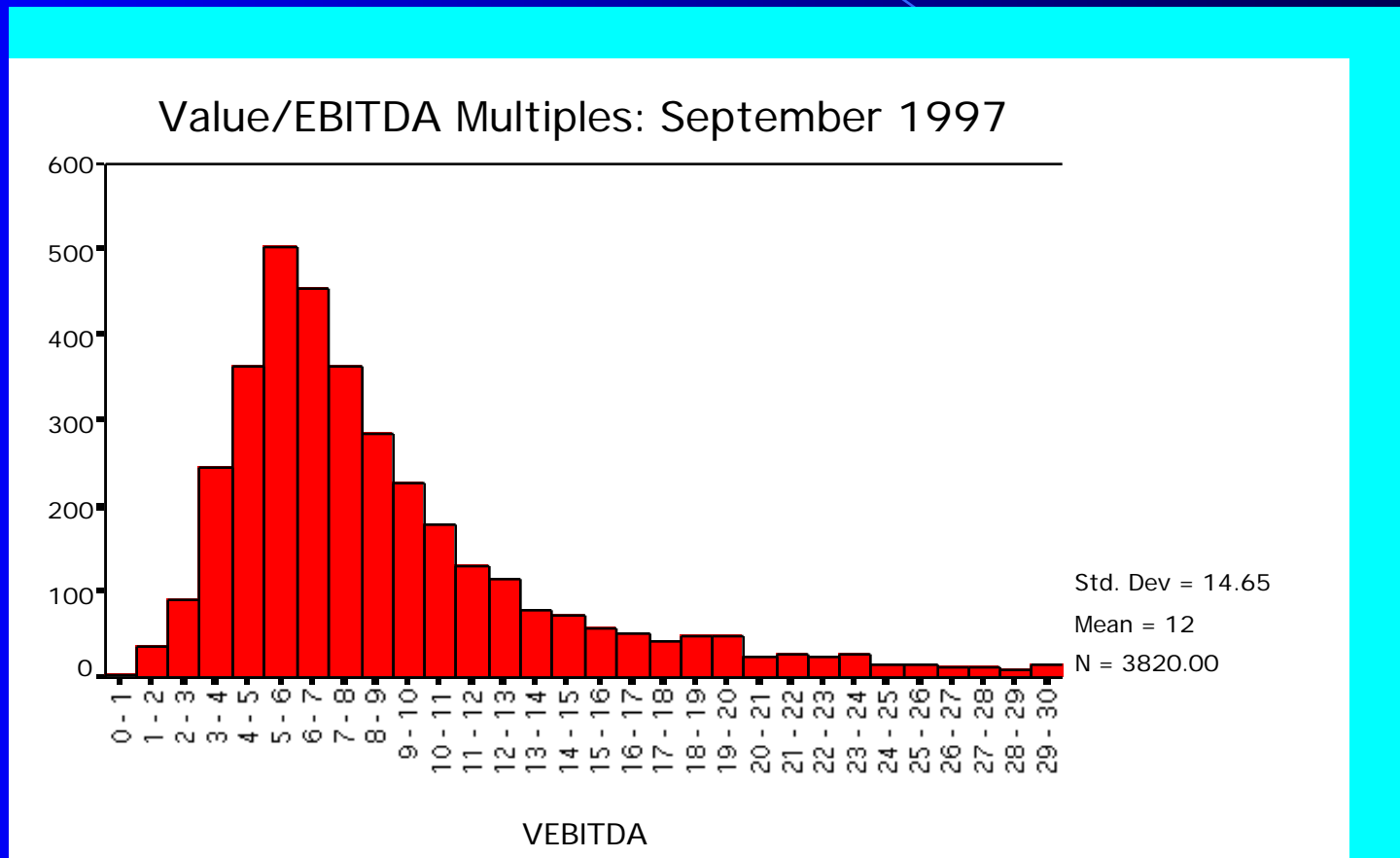
- The No-Cash Version

$$\frac{\text{Value}}{\text{EBITDA}} = \frac{\text{Market Value of Equity} + \text{Market Value of Debt} - \text{Cash}}{\text{Earnings before Interest, Taxes and Depreciation} - \text{Interest Income}}$$

## Reasons for Increased Use

1. The multiple can be computed even for firms that are reporting net losses, since earnings before interest, taxes and depreciation are usually positive.
2. For firms in certain industries, such as cellular, which require a substantial investment in infrastructure and long gestation periods, this multiple seems to be more appropriate than the price/earnings ratio.
3. In leveraged buyouts, where the key factor is cash generated by the firm prior to all discretionary expenditures, the EBITDA is the measure of cash flows from operations that can be used to support debt payment at least in the short term.
4. By looking at cashflows prior to capital expenditures, it may provide a better estimate of “optimal value”, especially if the capital expenditures are unwise or earn substandard returns.
5. By looking at the value of the firm and cashflows to the firm it allows for comparisons across firms with different financial leverage.

# Value/EBITDA Multiples: September 1997



# The Determinants of Value/EBITDA Multiples: Linkage to DCF Valuation

- Firm value can be written as:

$$V_0 = \frac{FCFF_1}{WACC - g}$$

- The numerator can be written as follows:

$$\begin{aligned} FCFF &= EBIT (1-t) - (Cex - Depr) - \text{Working Capital} \\ &= (EBITDA - Depr) (1-t) - (Cex - Depr) - \text{Working Capital} \\ &= EBITDA (1-t) + Depr (t) - Cex - \text{Working Capital} \end{aligned}$$

## From Firm Value to EBITDA Multiples

- Now the Value of the firm can be rewritten as,

$$\text{Value} = \frac{\text{EBITDA} (1-t) + \text{Depr} (t) - \text{Cex} - \text{Working Capital}}{\text{WACC} - g}$$

- Dividing both sides of the equation by EBITDA,

$$\frac{\text{Value}}{\text{EBITDA}} = \frac{(1-t)}{\text{WACC} - g} + \frac{\text{Depr} (t)/\text{EBITDA}}{\text{WACC} - g} - \frac{\text{CEx}/\text{EBITDA}}{\text{WACC} - g} - \frac{\text{Working Capital}/\text{EBITDA}}{\text{WACC} - g}$$

## A Simple Example

- Consider a firm with the following characteristics:
  - Tax Rate = 36%
  - Capital Expenditures/EBITDA = 30%
  - Depreciation/EBITDA = 20%
  - Cost of Capital = 10%
  - The firm has no working capital requirements
  - The firm is in stable growth and is expected to grow 5% a year forever.
  - Note that the return on capital implied in this growth rate can be calculated as follows:

$$\begin{aligned}g &= \text{ROC} * \text{Reinvestment Rate} \\ .05 &= \text{ROC} * \text{Net Cap Ex/EBIT} (1-t) \\ &= \text{ROC} * (.30-.20)/[(1-.2)(1-.36)]\end{aligned}$$

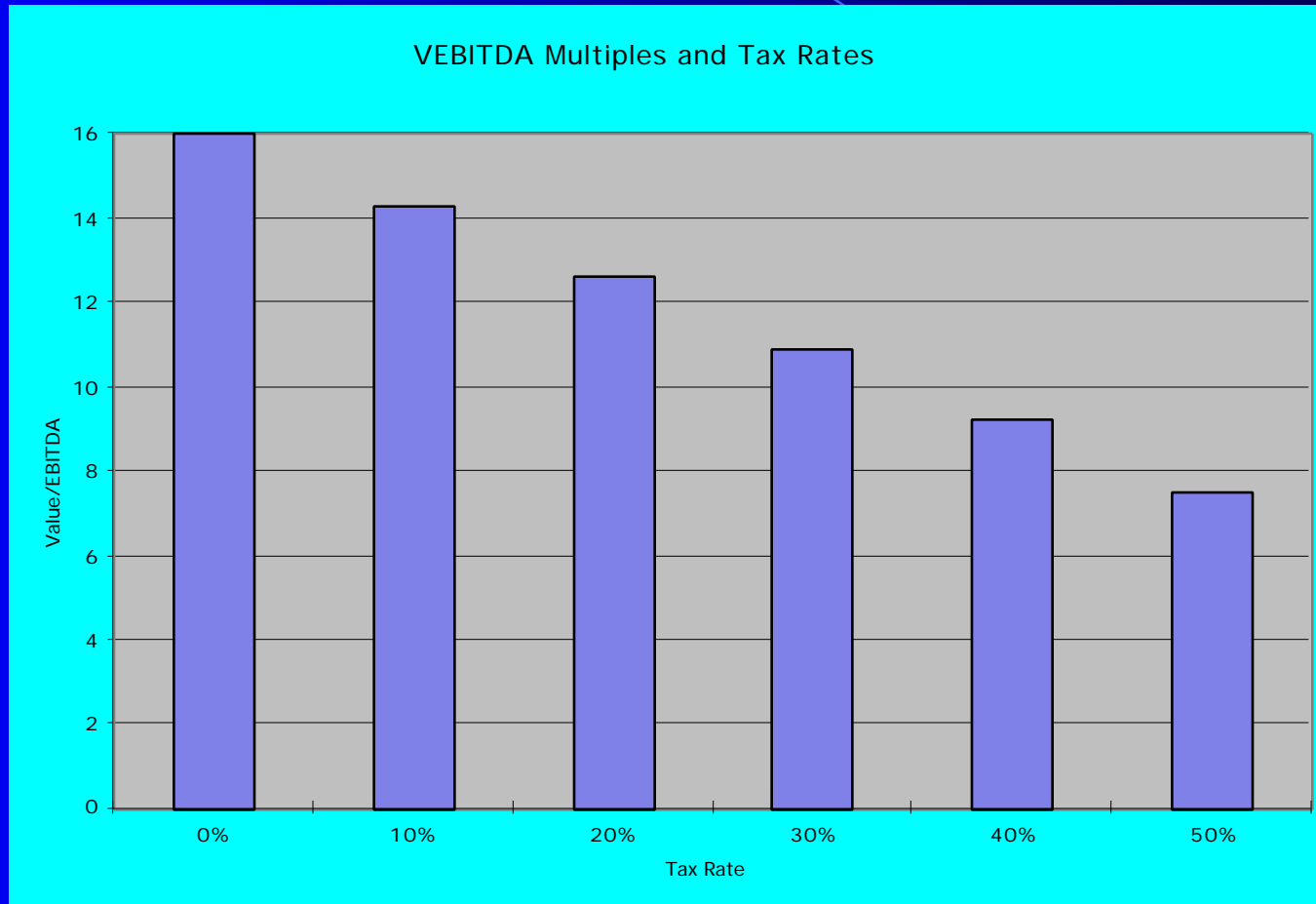
Solving for ROC,  $\text{ROC} = 25.60\%$

## Calculating Value/EBITDA Multiple

- In this case, the Value/EBITDA multiple for this firm can be estimated as follows:

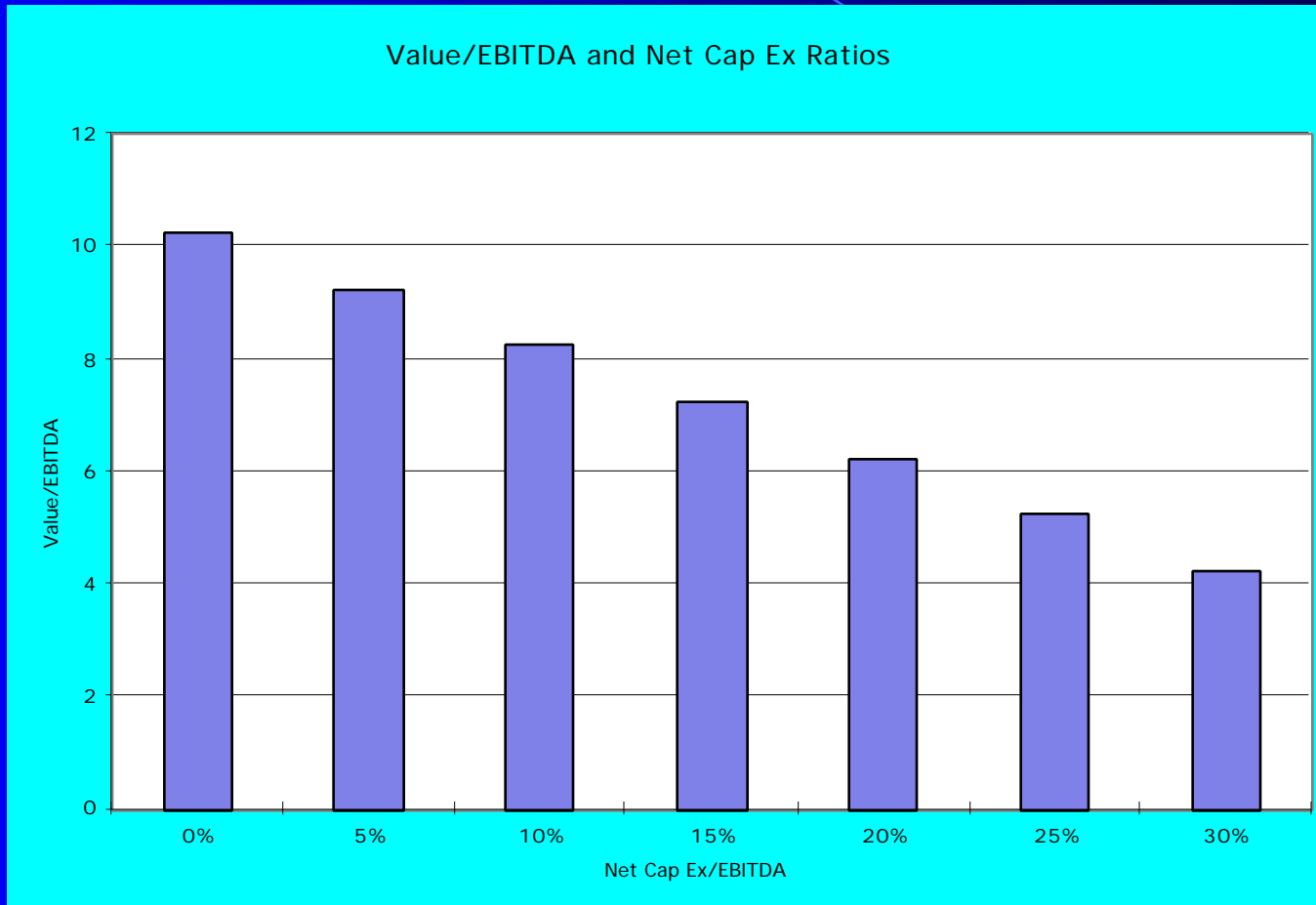
$$\frac{\text{Value}}{\text{EBITDA}} = \frac{(1-.36)}{.10-.05} + \frac{(0.2)(1-.36)}{.10-.05} - \frac{0.3}{.10-.05} - \frac{0}{.10-.05} = 8.24$$

# Value/EBITDA Multiples and Taxes

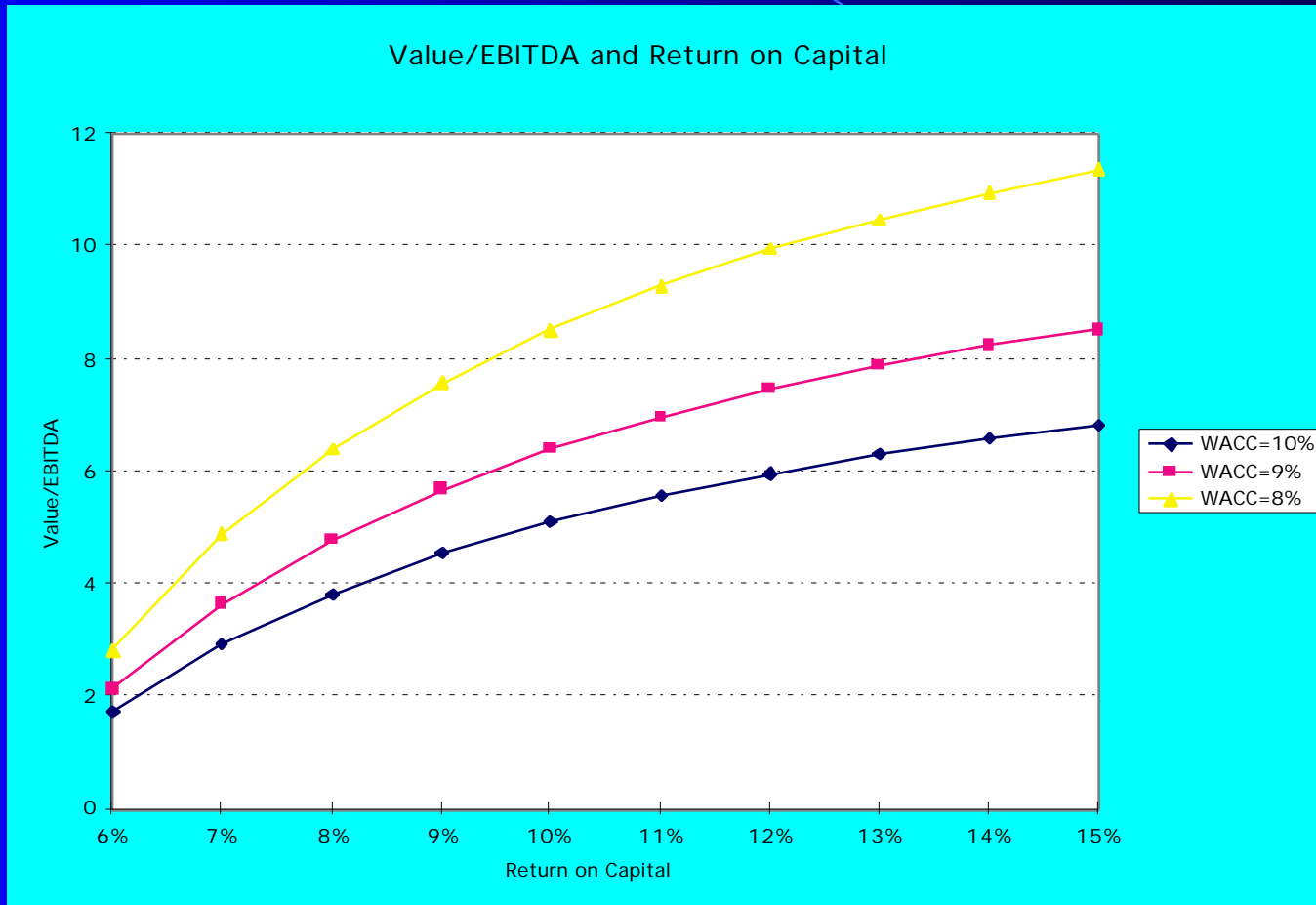




# Value/EBITDA and Net Cap Ex



# Value/EBITDA Multiples and Return on Capital



# Value/EBITDA Multiple: Trucking Companies

Company Name	Value	EBITDA	Value/EBITDA
KLLM Trans. Svcs.	\$ 114.32	\$ 48.81	2.34
Ryder System	\$ 5,158.04	\$ 1,838.26	2.81
Rollins Truck Leasing	\$ 1,368.35	\$ 447.67	3.06
Cannon Express Inc.	\$ 83.57	\$ 27.05	3.09
Hunt (J.B.)	\$ 982.67	\$ 310.22	3.17
Yellow Corp.	\$ 931.47	\$ 292.82	3.18
Roadway Express	\$ 554.96	\$ 169.38	3.28
Marten Transport Ltd.	\$ 116.93	\$ 35.62	3.28
Kenan Transport Co.	\$ 67.66	\$ 19.44	3.48
M.S. Carriers	\$ 344.93	\$ 97.85	3.53
Old Dominion Freight	\$ 170.42	\$ 45.13	3.78
Trimac Ltd	\$ 661.18	\$ 174.28	3.79
Mattack Systems	\$ 112.42	\$ 28.94	3.88
XTRA Corp.	\$ 1,708.57	\$ 427.30	4.00
Covenant Transport Inc	\$ 259.16	\$ 64.35	4.03
Builders Transport	\$ 221.09	\$ 51.44	4.30
Werner Enterprises	\$ 844.39	\$ 196.15	4.30
Landstar Sys.	\$ 422.79	\$ 95.20	4.44
AMERCO	\$ 1,632.30	\$ 345.78	4.72
USA Truck	\$ 141.77	\$ 29.93	4.74
Frozen Food Express	\$ 164.17	\$ 34.10	4.81
Arnold Inds.	\$ 472.27	\$ 96.88	4.87
Greyhound Lines Inc.	\$ 437.71	\$ 89.61	4.88
USFreightways	\$ 983.86	\$ 198.91	4.95
Golden Eagle Group Inc.	\$ 12.50	\$ 2.33	5.37
Arkansas Best	\$ 578.78	\$ 107.15	5.40
Airlease Ltd.	\$ 73.64	\$ 13.48	5.46
Celadon Group	\$ 182.30	\$ 32.72	5.57
Amer. Freightways	\$ 716.15	\$ 120.94	5.92
Transfinancial Holdings	\$ 56.92	\$ 8.79	6.47
Vitran Corp. 'A'	\$ 140.68	\$ 21.51	6.54
Interpool Inc.	\$ 1,002.20	\$ 151.18	6.63
Intrenet Inc.	\$ 70.23	\$ 10.38	6.77
Swift Transportation	\$ 835.58	\$ 121.34	6.89
Landair Services	\$ 212.95	\$ 30.38	7.01
CNF Transportation	\$ 2,700.69	\$ 366.99	7.36
Budget Group Inc	\$ 1,247.30	\$ 166.71	7.48
Caliber System	\$ 2,514.99	\$ 333.13	7.55
Knight Transportation Inc.	\$ 269.01	\$ 28.20	9.54
Heartland Express	\$ 727.50	\$ 64.62	11.26
Greyhound CDA Transn Corp	\$ 83.25	\$ 6.99	11.91
Mark VII	\$ 160.45	\$ 12.96	12.38
Coach USA Inc	\$ 678.38	\$ 51.76	13.11
US 1 Inds Inc.	\$ 5.60	\$ (0.17)	NA
Average			5.61

## A Test on EBITDA

- Ryder System looks very cheap on a Value/EBITDA multiple basis, relative to the rest of the sector. What explanation (other than misvaluation) might there be for this difference?

## Analyzing the Value/EBITDA Multiple

- While low value/EBITDA multiples may be a symptom of undervaluation, a few questions need to be answered:
  - Is the operating income next year expected to be significantly lower than the EBITDA for the most recent period? (Price may have dropped)
  - Does the firm have significant capital expenditures coming up? (In the trucking business, the life of the trucking fleet would be a good indicator)
  - Does the firm have a much higher cost of capital than other firms in the sector?
  - Does the firm face a much higher tax rate than other firms in the sector?

## Value/EBITDA Multiples: Market

- The multiple of value to EBITDA varies widely across firms in the market, depending upon:
  - how capital intensive the firm is (high capital intensity firms will tend to have lower value/EBITDA ratios), and how much reinvestment is needed to keep the business going and create growth
  - how high or low the cost of capital is (higher costs of capital will lead to lower Value/EBITDA multiples)
  - how high or low expected growth is in the sector (high growth sectors will tend to have higher Value/EBITDA multiples)

# U.S. Market: Value/EBITDA Regression

Multiple R .47968  
 R Square .23009  
 Adjusted R Square .22890  
 Standard Error 499.11191

## Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	95890904.61967	47945452.30984
Residual	1288	320857161.28121	249112.70286

F = 192.46490      Signif F = .0000

## ----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
REINV	-.970608	.547679	-.043341	-1.772	.0766
PROJGR	41.6294	2.1266	.478746	19.576	.0000
(Constant)	4.949412	.383466		12.907	.0000