

Greenwich Residential Housing Valuation Study Executive Summary

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Executive Summary

The Greenwich Board of Realtors engaged Ray Kehrhahn to facilitate a 20-year historical study that examined and produced a trend/valuation growth analysis of residential housing values based on the sale price of residentially zoned single family real estate in Greenwich Connecticut. The valuation analysis included all market transactions of Single Family and Residential Condominiums and produced an index which trends year over year the valuation of residential real estate with in the town of Greenwich by Zip-Code.

Further, the study examined the relationship of the created residential housing valuation equity return index, to other widely know financial indexes, such as the Dow Jones Industrial Average, The Russell 2000, and the Standard & Poor's Index.

A Microsoft access/excel database was created that recorded all residential single family home and condominium transactions from 1956 – 2006. Information collected:

- Physical property's street address,
- Owners address,
- Month & year of sale,
- Sale price,
- Lot size,
- Number of rooms,
- Number of bedrooms,
- Number of bathrooms,

- Mortgage amount at time of purchase,
- Year home was built,
- Census tract id,
- Zip-code

The study required utilization of all market transactions associated with the transfer of ownership for residential real estate. the data aggregated in this study was collected by a team of University Of Connecticut Graduate Students from land sales records available through the town of Greenwich for the years 1956 – 2006. Note that the MLS data did not contain all sales of all residential properties in all years, so it was not used.

Results Summary

Greenwich Real Estate as an Equity Investment has fared very well over the 20-year period studied.

DATE	All ERI	DJ30C	SP500C	RS2INX
December-87	0.00%	0.00%	0.00%	0.00%
December-88	16.90%	11.85%	12.40%	22.36%
December-89	52.76%	42.00%	43.03%	39.76%
December-90	59.12%	35.84%	33.65%	9.77%
December-91	14.13%	63.44%	68.81%	57.72%
December-92	59.22%	70.26%	76.34%	83.53%
December-93	15.71%	93.63%	88.79%	114.71%
December-94	34.50%	97.77%	85.88%	107.89%
December-95	57.82%	163.93%	149.28%	162.37%
December-96	72.25%	232.59%	199.80%	201.10%
December-97	161.10%	307.89%	292.76%	262.88%
December-98	176.95%	373.56%	397.50%	250.38%
December-99	178.46%	492.99%	494.65%	319.12%
December-00	280.06%	456.36%	434.35%	301.50%
December-01	302.78%	416.88%	364.66%	305.63%
December-02	348.49%	330.24%	256.09%	218.10%
December-03	357.41%	439.19%	350.02%	362.43%
December-04	529.15%	456.16%	390.50%	441.04%
December-05	568.08%	452.78%	405.22%	459.01%
December-06	615.38%	542.82%	474.02%	554.04%

Correlation	
DJ	0.851514739
Correlation	
S&P	0.795722156
Correlation	
R2k	0.924705133

Methodology

The Dow Jones Industrial Average, S&P 500, and the Russell 2000 were all selected as a base for the comparison of housing price Equity Return Index.

The Greenwich Housing market was segmented by zip code and an index created that tracked the housing sales values by year.

Each zip code market index was set with a base of 100 points at the end of 1987, as was the data associated with each financial index, the change in the close prices from quarter to quarter and year to year were used to inflate or deflate this number and reflect the change.

To create an index for each zip code, similar measures were taken. First an average of the sales prices for each period was taken using the sale price for all houses in that period. Next, the average prices in 1987 was set as the base of 100 points, then all subsequent years were calculated by multiplying the previous index value by the change in the average price.

$$Index_t = Index_{t-1} \left(\frac{Avg_Sale_t}{Avg_Sale_{t-1}} \right)$$

Using this equation, each zip code's index value was calculated for the data, then a second index calculated for the adjusted data with houses containing four or more bedrooms.

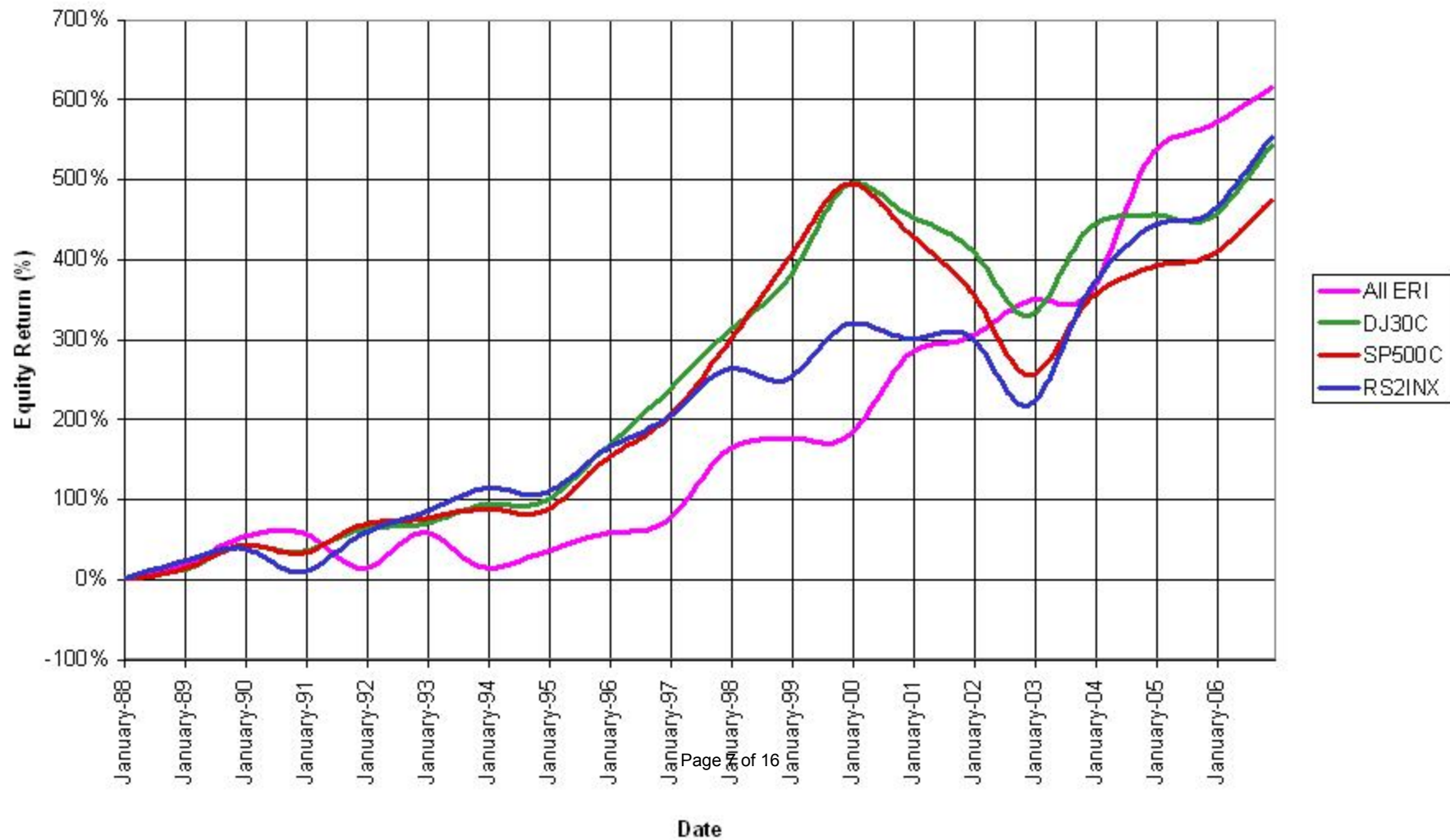
With the index values set, the Equity Return Index was created to give an alternate interpretation of the housing prices. Using the index for all data, and assuming that for each house, approximately 35% of the sales price was put into the purchase initially as a down payment, the ERI was calculated by subtracting the original index price and dividing by the equity portion.

$$ERI = \frac{(Index_t - Index_0)}{Equity}$$

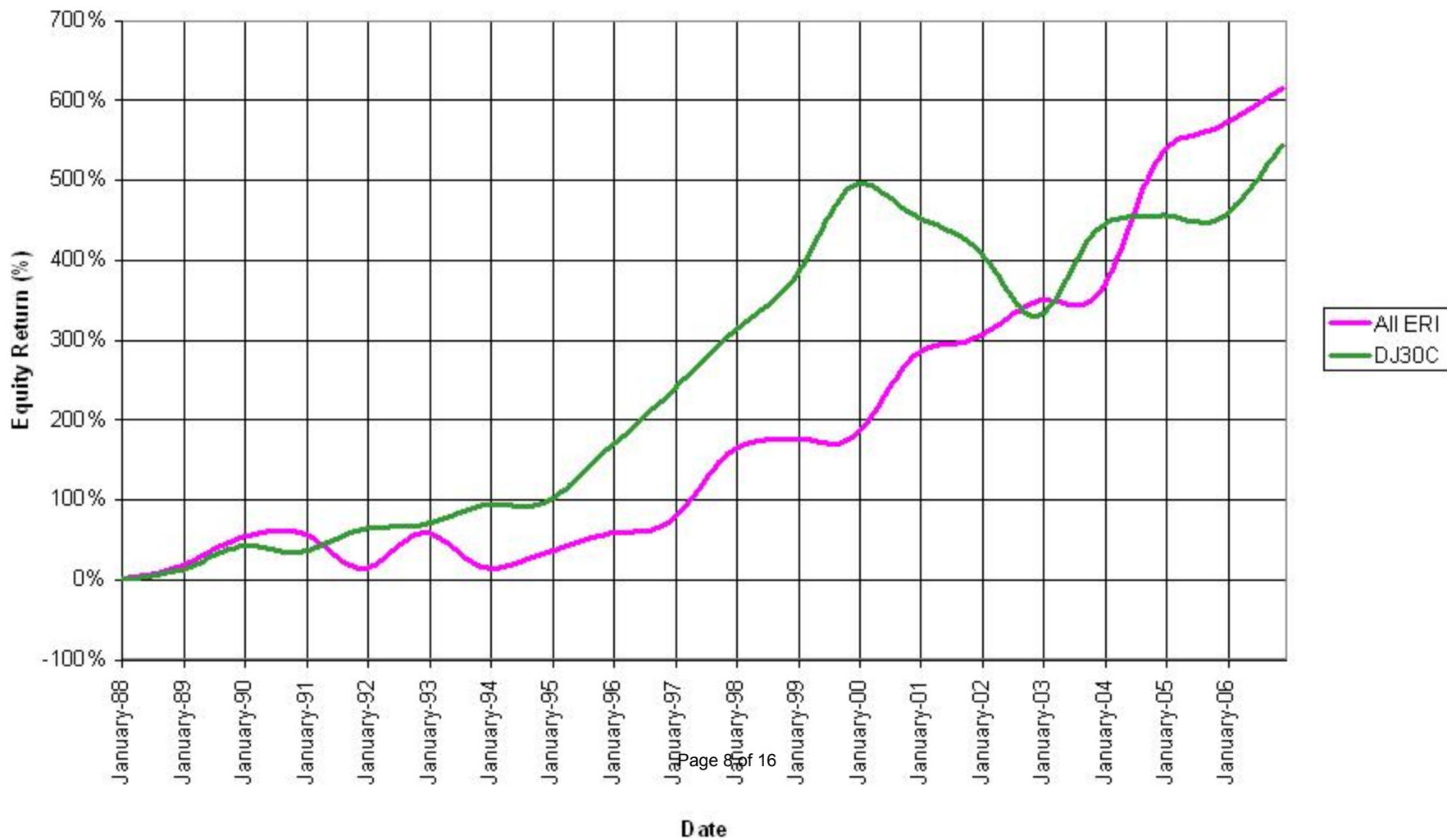
This was then graphed against a similar permutation of the market indices where the % change in the index versus the base period value was calculated. A weighted average of sales by zip code provided the input for EGI for all housing sales in the town of Greenwich.

Greenwich Residential real estate returned on average 615% to equity invested, significantly outperforming the financial indexes choosed for comparison and outperforming Connecticut, New England and the United States as a whole.

Greenwich Equity Return Index All Sales vs. Market Indices

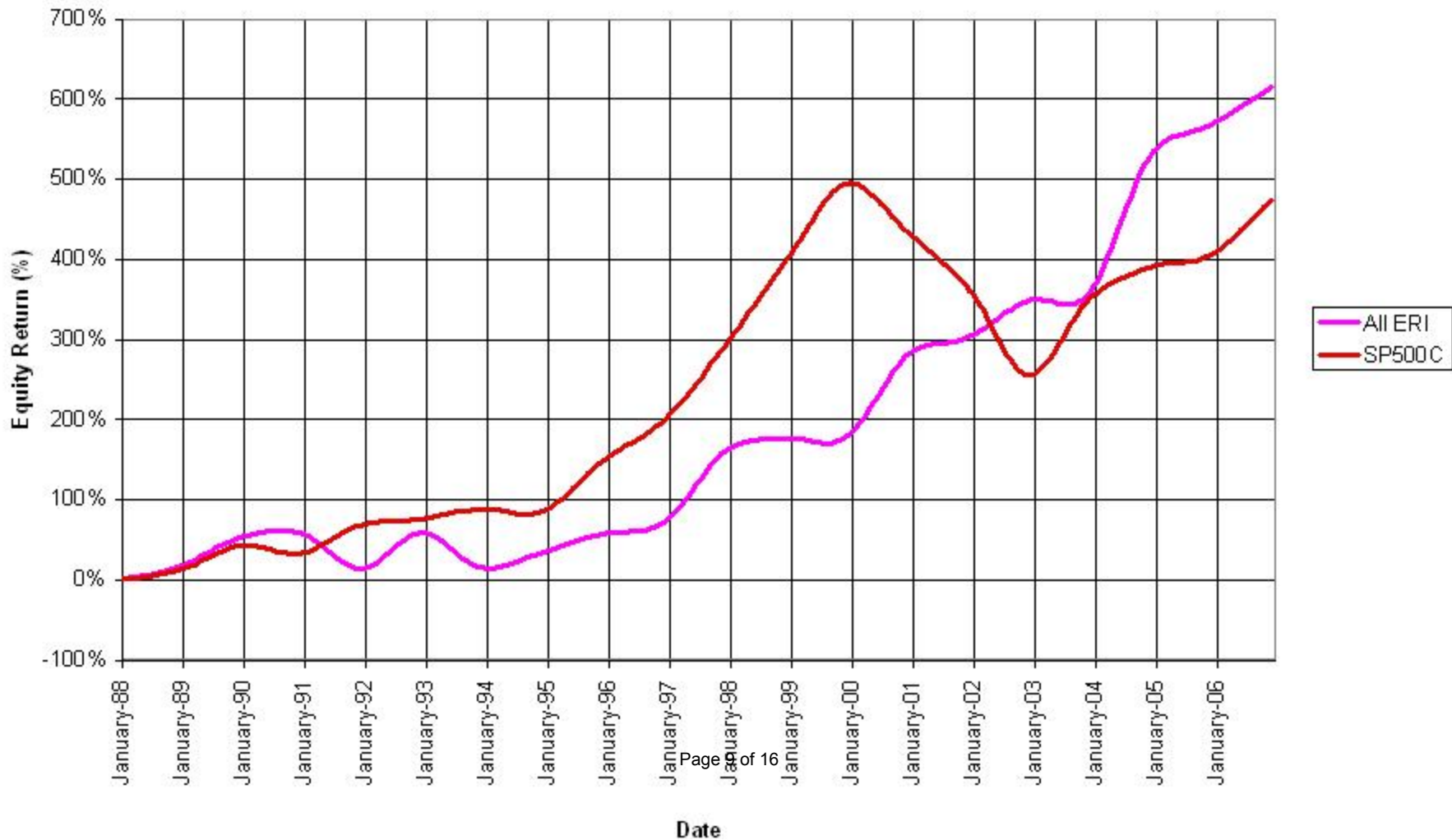


Greenwich Equity Return Index All Sales vs. Dow Jones

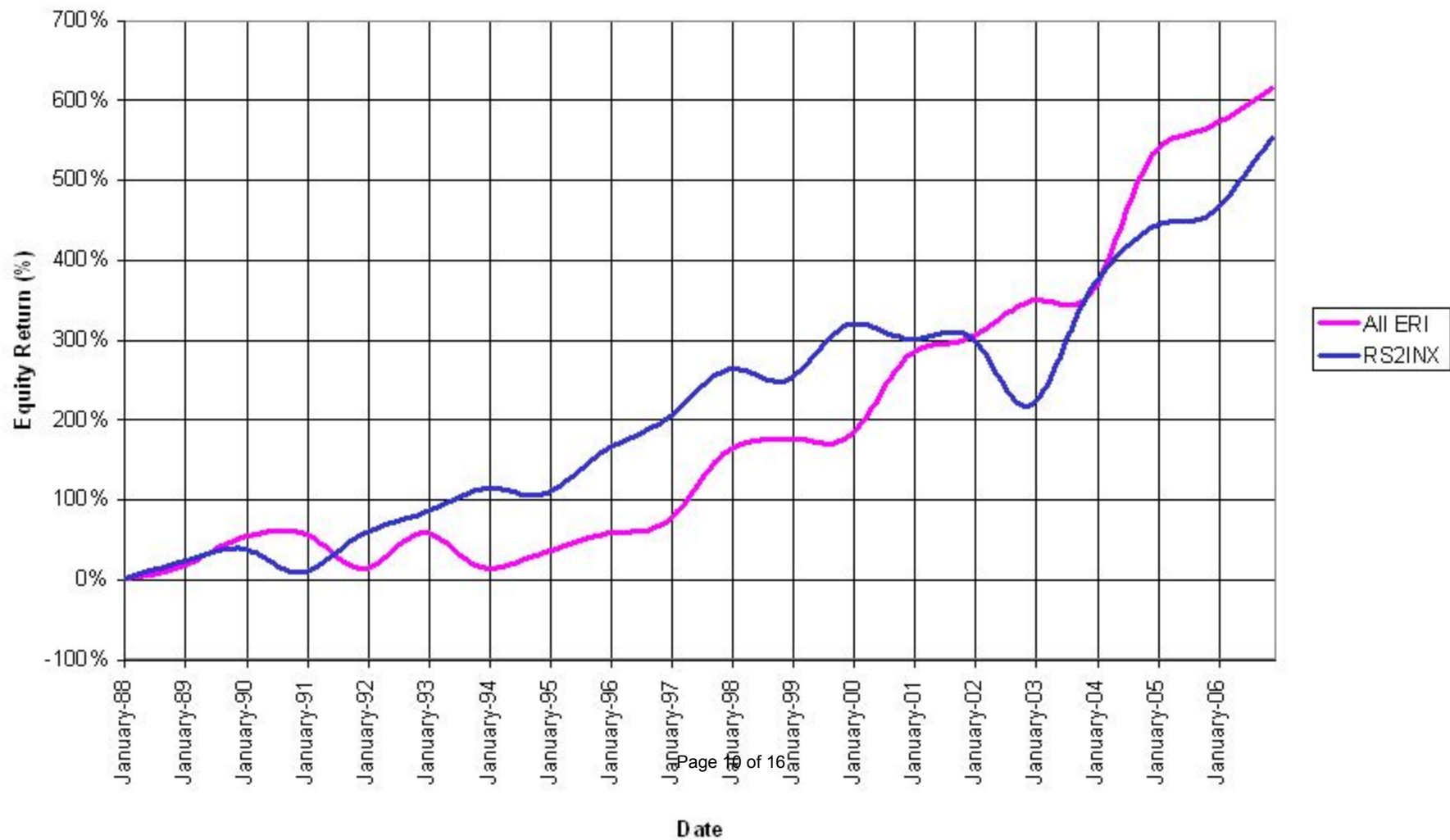


Greenwich Equity Return Index

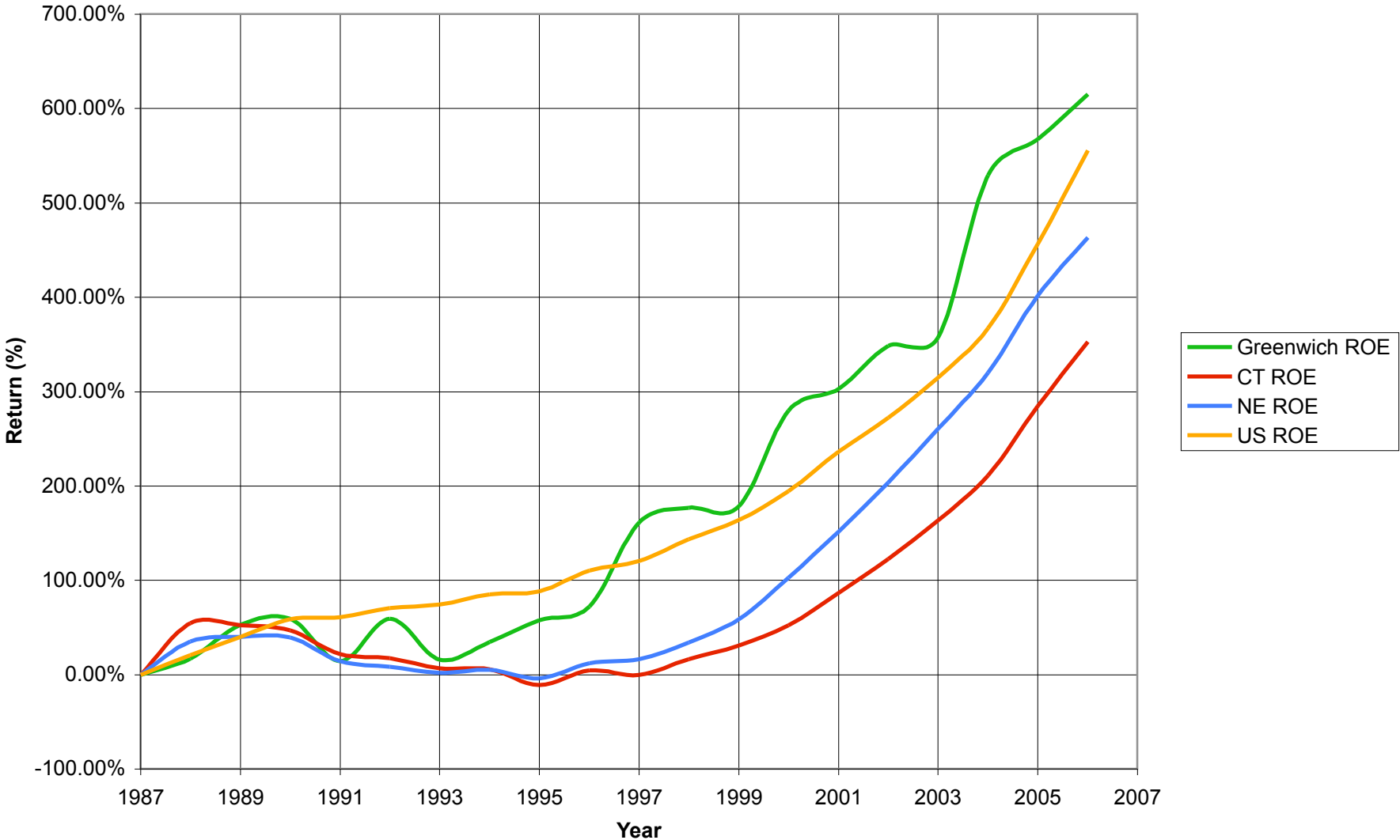
All Sales vs. S&P 500



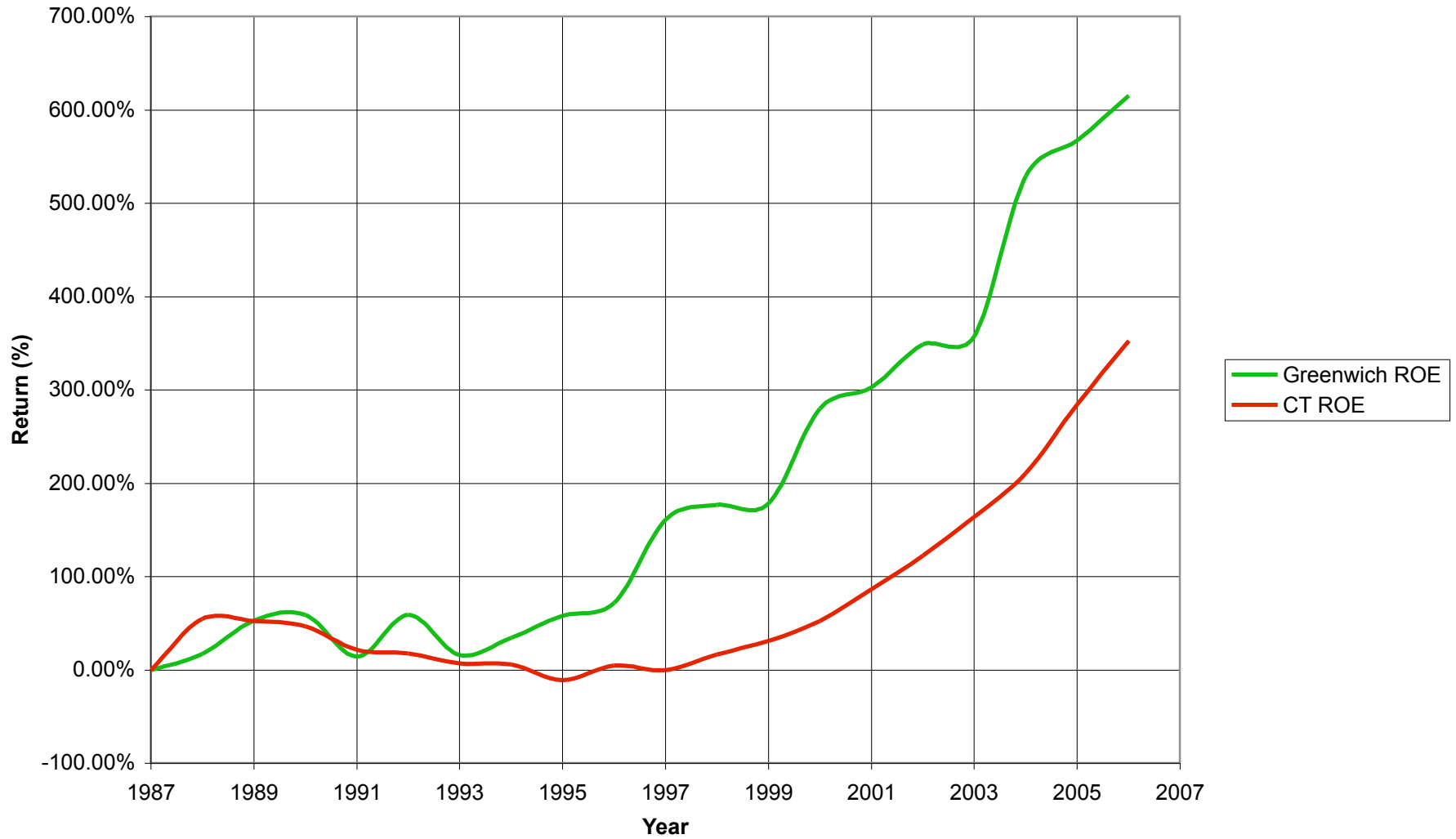
Greenwich Equity Return Index All Sales vs. Russell 2000



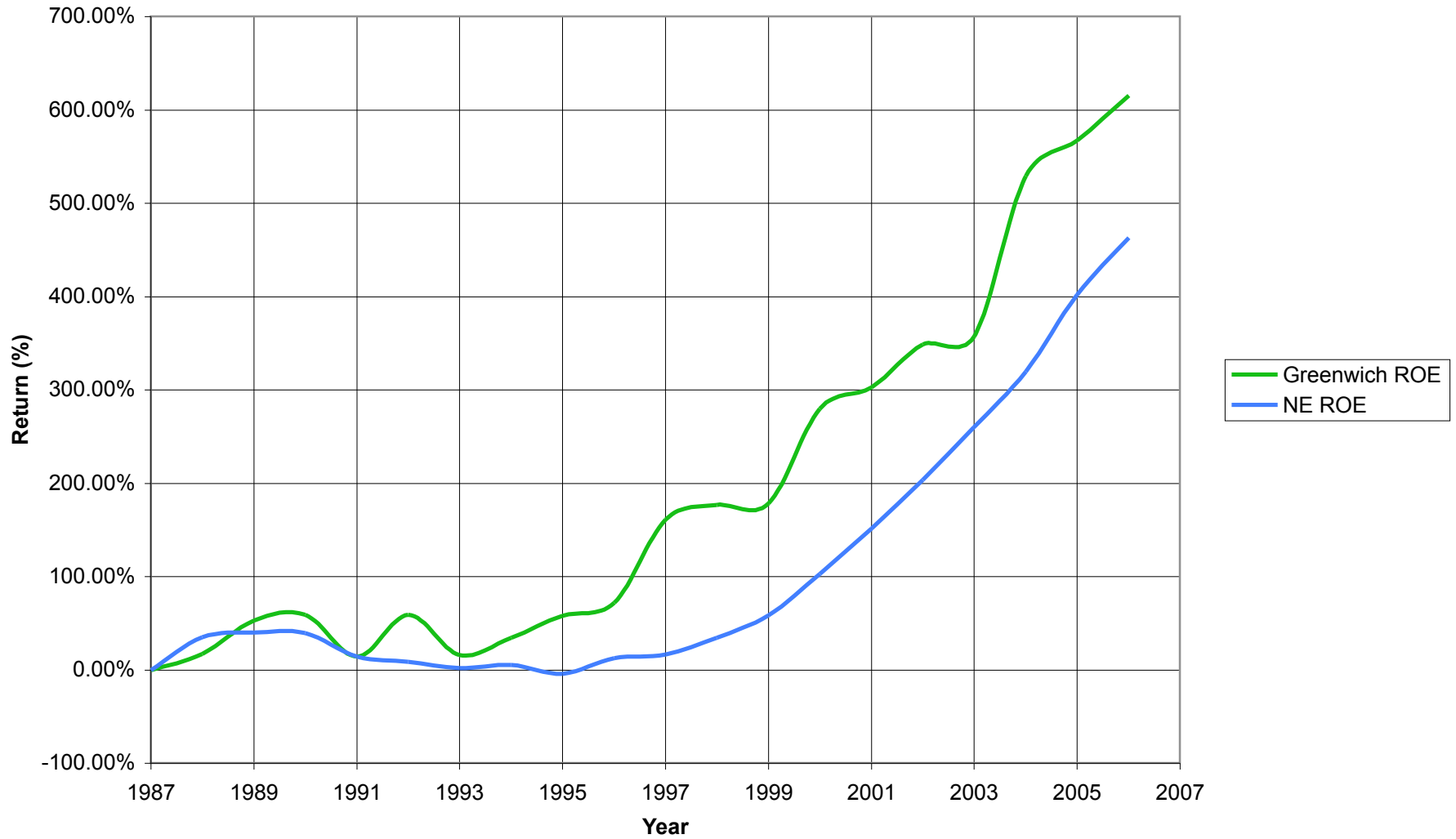
Return on Equity



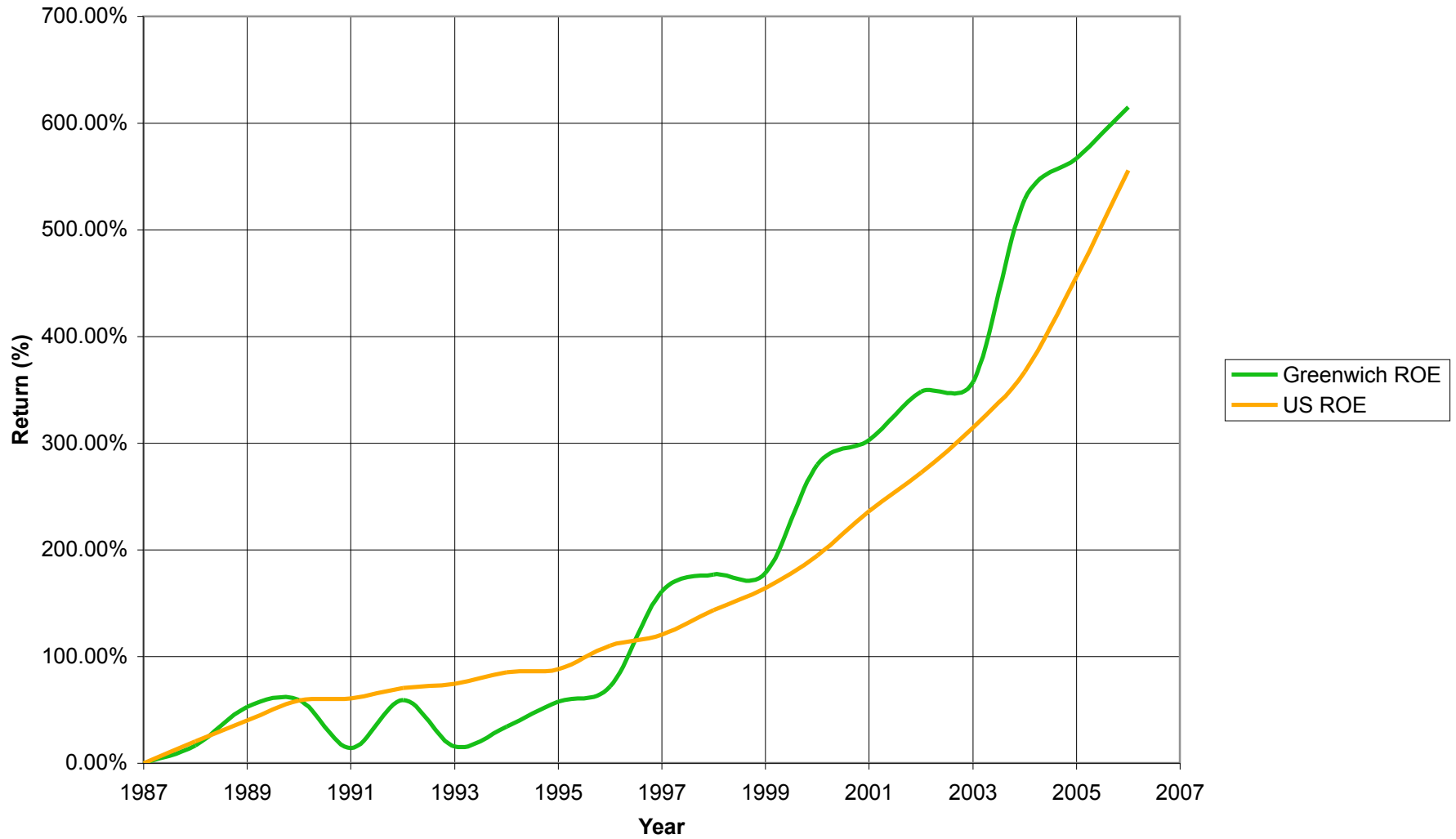
Return on Equity CT vs. Greenwich



Return on Equity NE vs. Greenwich



Return on Equity US vs. Greenwich



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