

Investing in Movies:

Private Equity Investment in Entertainment

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Acknowledgement

- **This research was conducted at Procinea Management, LLC. during 2005-2006 when the presenter was Managing Partner in charge of Research. Dr. Mark Ferrari was Director of Research and co-author of earlier presentations and articles, including “Investing in Movies,” presented at the Q Group, Spring 2006. Significant contributions were also made by Adam Cao, Paul Jung, Mark Rozells, Bob Rubin and Scott Ryles.**
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■ Motivation

- **Movies are an Alternative Asset Class**
 - Beneficiary of significant co-financing over the years, mostly tax-driven
 - Total return to the asset class not particularly exciting
- **Research project to construct an active quantitative strategy to deliver attractive returns to investors**
- **Part of a broader initiative to analyze investment potential of Artistic and Intellectual Property**

■ Identifying an Investment Strategy

- **Two major issues**
 - Define appropriate contract to align interests between investors and studios
 - Identify investment strategy
- **Interestingly, it appears relatively difficult to align interests**
 - Investors wary because of unsuccessful attempts by previous investors
 - Participation accounting strongly favors the studio
 - Investors have historically borne studio error, bad judgment and profligate spending
 - Motion picture performance is wholly unpredictable
 - Studios saddle investors with “losers”
- **Key steps in strategy research**
 - Define Universe
 - Rank assets according to “valuation” model
 - Construct portfolio
 - Observe performance

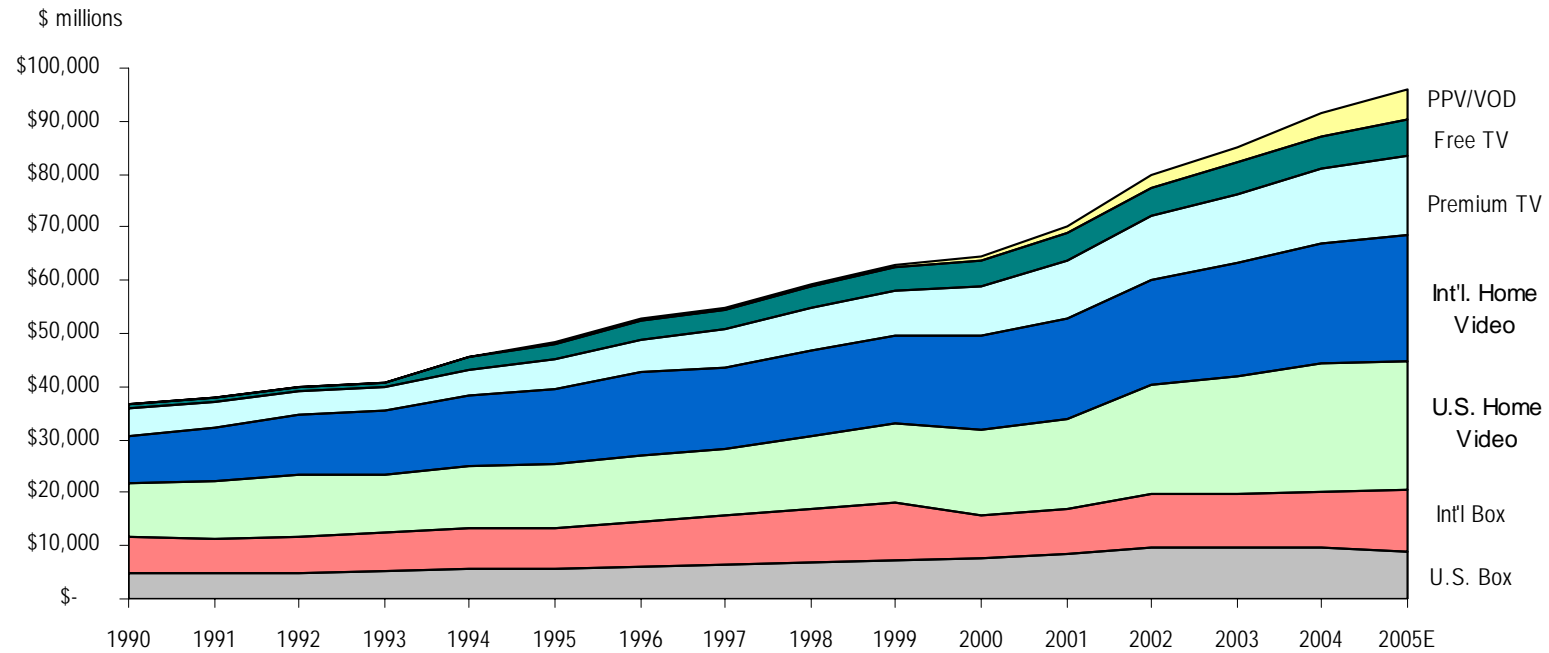
Investing in Movies: Agenda

- 1. Movie Industry**
- 2. Prior Academic Research**
- 3. Procinea Model Estimation**
- 4. Strategy Results**
- 5. Extensions**

■ Industry Players

- **Focus on movies distributed by the major studios and their subsidiaries**
 - Ensure the movies are contracted for world-wide distribution
 - Very different from the “Indies”
- **Lab for behaviorists**
 - Creative vs. business skills
 - Better to fail spectacularly than succeed modestly?
 - An isolated success becomes conventional wisdom
 - “It is a miracle that any movie is ever made...”
- **It is not just the box office**

Worldwide Filmed Entertainment Revenue



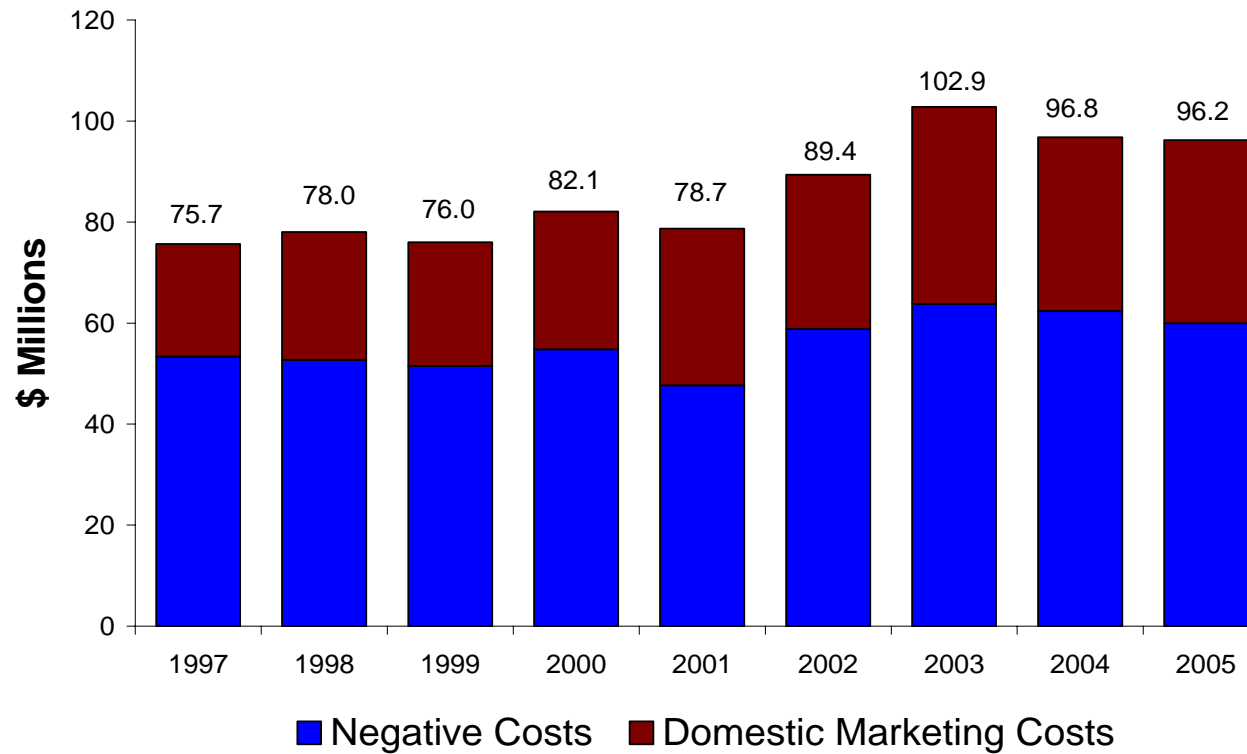
Source: Company Reports, JPMorgan and Procinea Estimates

* At retail level for all windows except FreeTV; Free TV includes network, leased cable and domestic and international syndication

■ Studio Capital Requirements

- **Major studios (Fox, Disney, Paramount, Sony, Universal and Warner Brothers, and their subsidiary brands) finance 100-125 titles per year**
- **Average production and distribution cost of each title exceeds \$100 million, creating annual funding needs of \$10 - \$12 billion**
- **The studios are voracious users of capital. There is a long history of studios using co-financing partners**
- **Procinea estimates a funding gap of \$5 billion or more per year—and this gap is liable to increase as the number of films and costs per film rise**

Average Cost of Major Studio Feature Films

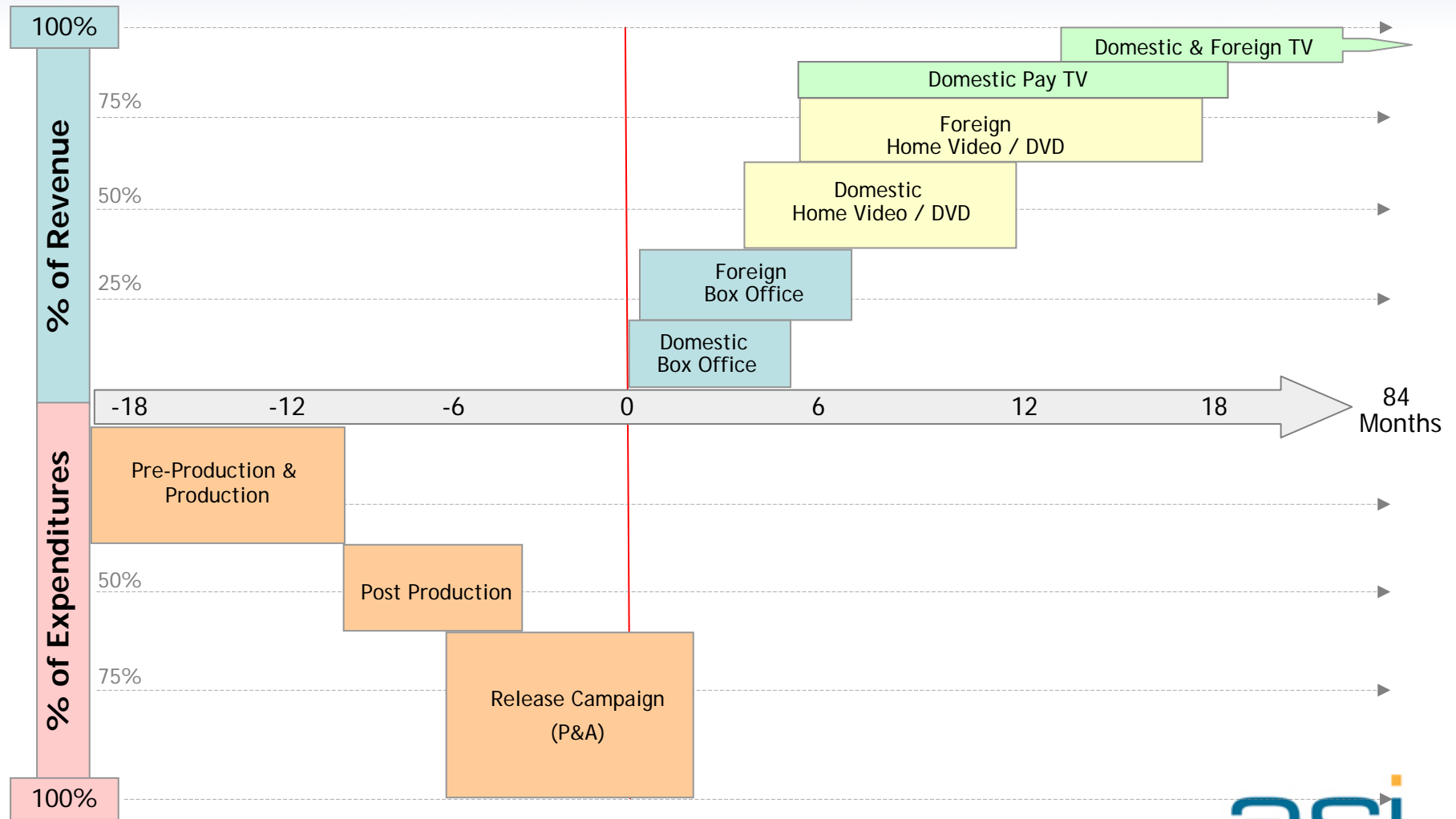


Source: Motion Picture Association of America

■ Production Cost and Revenue

- **Average production cost of \$60-70m**
- **Production cost incurred over 12-18 months**
- **Prints and Advertising (“P&A”) can be as much or more than production cost**
- **Revenue earned relatively quickly after release, but with a long tail**
 - 60% of revenue in first year of release
 - Almost 90% by end of second year
- **We focus on “first cycle” revenues, ignoring library value**

Film Life Cycle



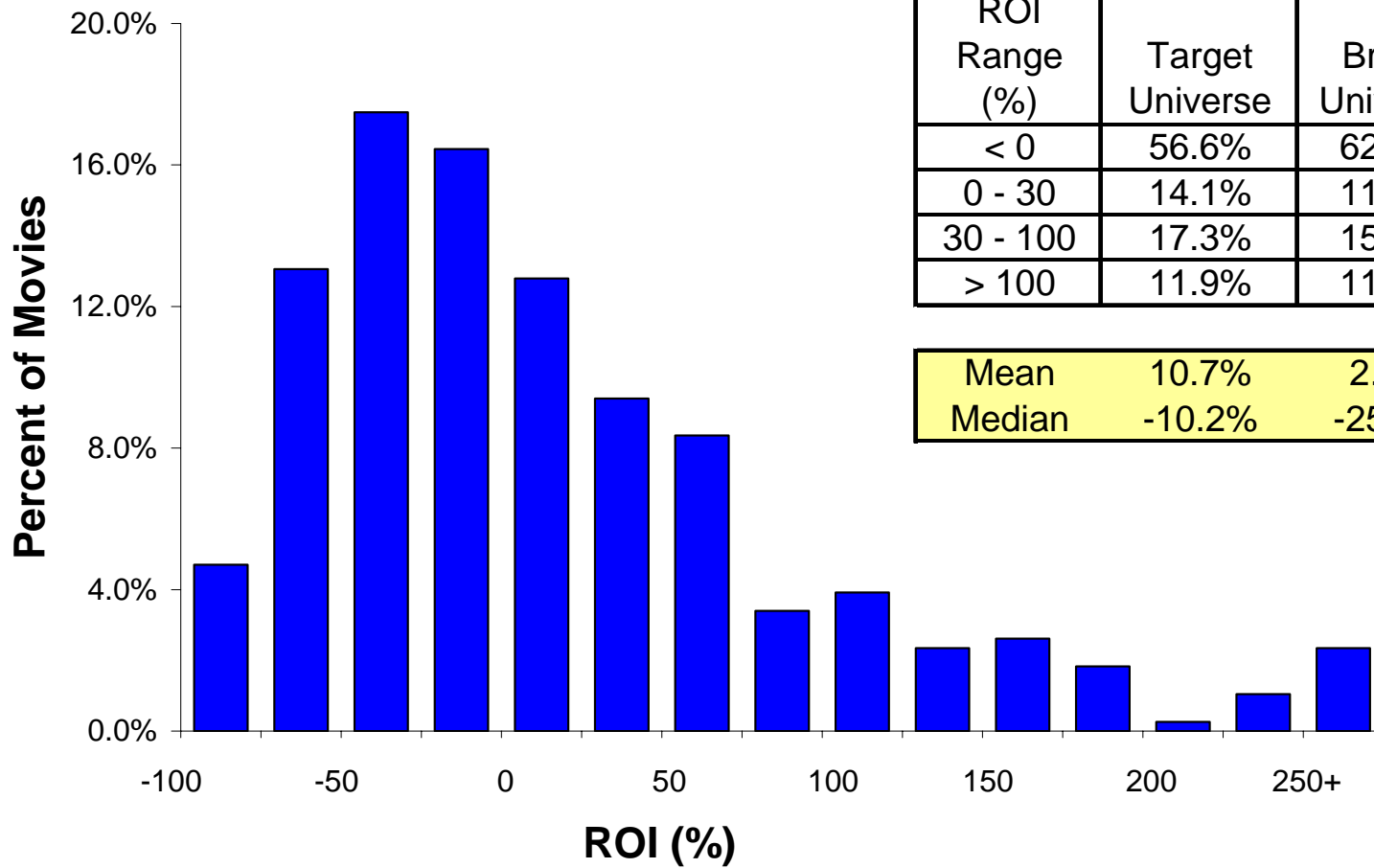
■ Adverse Selection?

- Studios demand increasing financing to fill distribution windows so require outside investors
- Investors could wait until the movie is finished before investing, but this subjects them to adverse selection
- Assumes that studios have superior information
- The stories of *Starman* and *Titanic*
- Alternatively, investors could partner with the studio at “greenlight” and bear risk pari passu with the studios

■ Movies Released from 1997 to 2004

- **Broad universe** **1627 movies**
 - Movies released theatrically in U.S. or Canada
 - Minimum production cost \$2m
 - Exclude unrated and foreign productions
- **Estimation universe** **836 movies**
 - Minimum production cost \$15m, maximum \$125m
 - Exclude sequels, animation, documentary, and NC-17
- **Target universe** **588 movies**
 - Financed (or co-financed) and distributed by a major studio

Distribution of Target Universe ROI



ROI Range (%)	Target Universe	Broad Universe
< 0	56.6%	62.3%
0 - 30	14.1%	11.1%
30 - 100	17.3%	15.1%
> 100	11.9%	11.5%

Mean	10.7%	2.6%
Median	-10.2%	-25.0%

ROI = (Total Revenue / Total Cost) - 1
 Movies released from 1997 to 2004



WOW!

- **Why so many losers?**
 - Approximately 60% of movies fail to cover costs
- **Suggests that studios cannot predict the outcome of a movie**
 - Danger of adverse selection possibly not as great as previously thought
- **Also suggests an active investment strategy**
 - Forecast (net) revenues for each movie
 - Only invest in those movies where forecast revenues are “large enough”

■ Implications for Modeling

- **Limited universe of movies**
- **Revenue is clearly a non-linear function of movie attributes**
- **Interactions between the attributes likely to be very important**
- **Many interesting movie attributes are not publicly available (e.g., actor compensation)**
- **Not an optimistic sign that the studios cannot predict success**
- **Academic literature generally negative**

■ Prior Academic Research

- **Substantial academic literature**
- **Recent works that analyze financial characteristics**
 - Ravid (1999), Postrel (2000), Vogel (2001), De Vany (2004)
- **Findings include**
 - Highly skewed distribution of returns
 - Large budgets, movie stars no guarantee of success
 - Little evidence that movie attributes affect performance
 - Attributes studied include
 - *Budget, stars, sequels, genre, ratings, screens, box office life, year of release*
- **Connection to literature on project finance (Berk et al.)**

■ ■ Motivating Quotes

- **“...most major-distributed films do no better than financially break-even,” Vogel (2001), p.97**
- **“Most movies are unprofitable. Large budgets and movie stars do not guarantee success. Even a sequel to a successful movie may flop,” De Vany (2004), p.82**
- **“...forecasting revenue is futile...,” De Vany (2004), p.90**
- **“The financial performance of a movie is unpredictable because each one is unique...” Vogel (2001), p.97**
- **“There are no formulas for success in Hollywood,” De Vany (2004), p.98**
- **“Most stars do not really make a difference,” Postrel (2000)**
- **“Nobody knows anything,” Goldman (1983)**

Who is Investing in Movies?

- **Co-Financings:**

- Hedge Funds

- *E.g., Stark, Dune*

- Private Equity Funds

- *E.g., Melrose*

- **Debt Offerings, Underwriting**

- *E.g., JP Morgan, Deutsche Bank, Goldman Sachs*

- **Libraries**

- *E.g., Dune*

■ Current Investment Opportunities

- **Single studio, slate** (“Narrow index fund”)
 - E.g., Magic/Kingdom
- **Single studio, some selectivity** (“Narrow Fundamental Index Fund”)
 - E.g., Legendary (Warner Bros), Dune (Fox)
- **Multiple Studios, selectivity** (“Active Management”)
 - Procinea

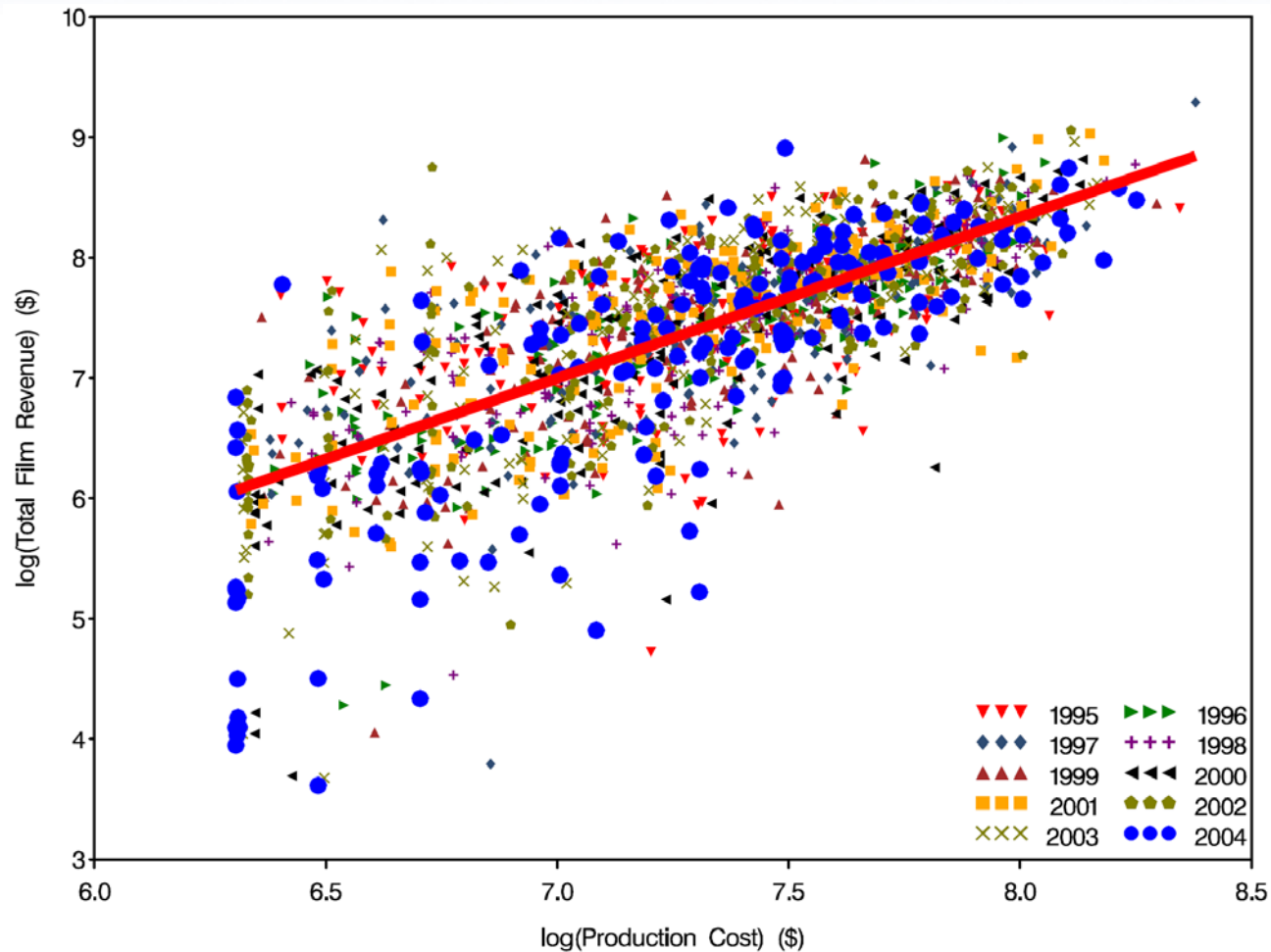
■ ■ Passive or Active: Revenue Modeling

- **It does not appear sensible to take a passive investment approach**
- **Selectivity is important, which requires a valuation model**
- **Total revenue is driven by audience appeal**
- **Why not model return?**
 - Fractional share of investment in each project is fixed
 - Advertising effect in denominator mitigates outliers
- **Guiding principles for sparse data**
 - Sensible
 - Simple
 - Stable

Data Sources

- **Unfortunately no single data source is complete**
- **Collect data from standard industry data sources**
- **Augmented with extractions from on-line entertainment media, media research reports, etc.**
- **Define and collect movie attributes not provided by vendor and industry sources**
 - E.g., cast billed order, story elements, etc
- **Data cross-referenced and cross-validated to achieve a “Compustat-like” database**
 - Includes more than 7,800 films, up to 70 data points/movie
- **Many interesting items still confidential to the studios**
 - E.g., star compensation

Production Cost Is an Important Factor



Data: March 2005

Power law with exponent greater than one

In-sample explanatory power is a strong function of range of cost

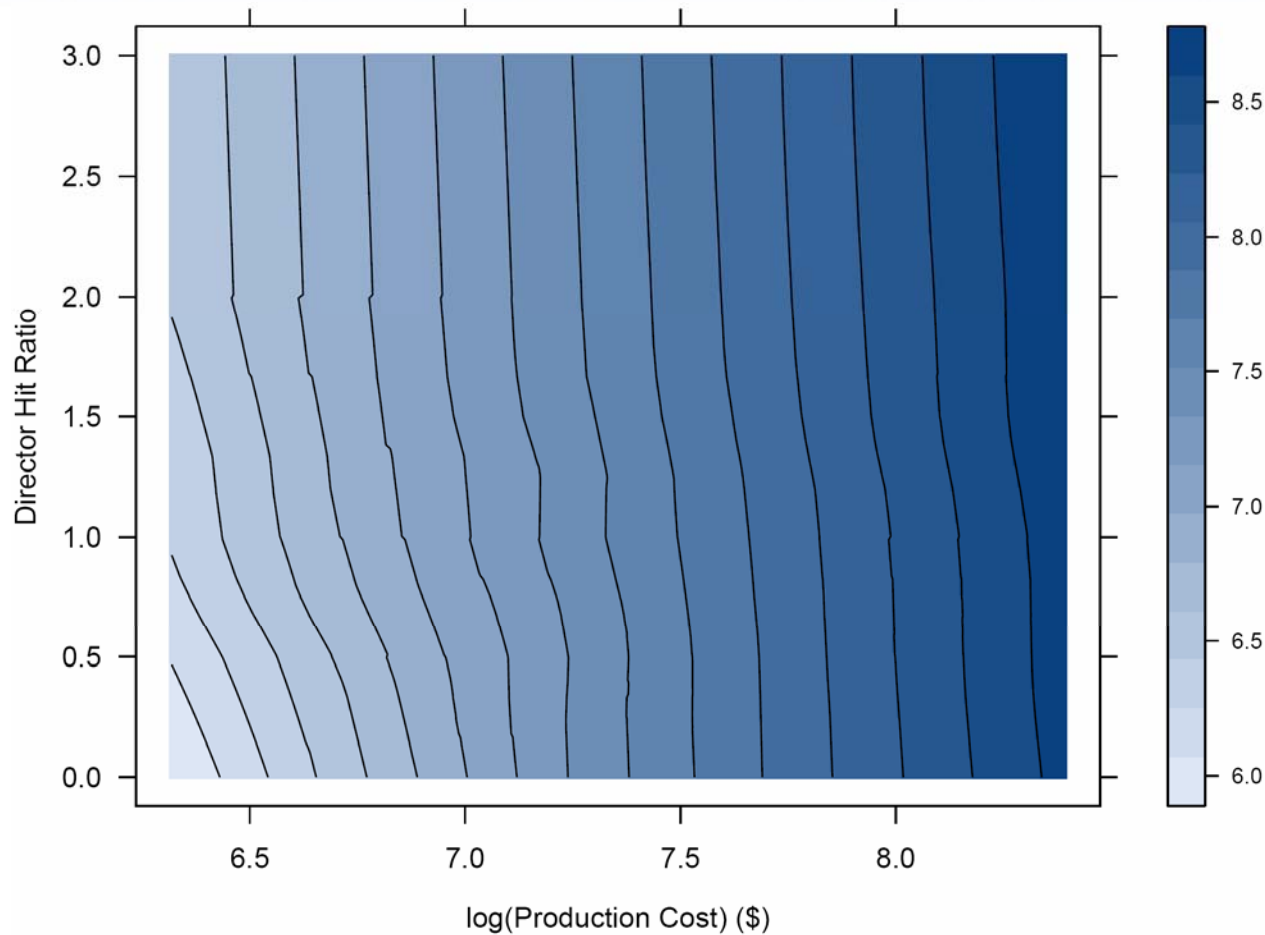
Lower-budget movies are riskier

Prior to video release, recent movies appear to under perform

Locally Weighted Regression

- Procinea's proprietary hit ratio D quantifies past financial performance of director
- Correlation of cost C and hit ratio is 0.34
 - Both factors and their interaction are significant predictors of revenue R_i of movie i according to OLS
- Locally Weighted Regression approach naturally handles interaction and heteroskedasticity

Director's Track Record Matters



- **Better director increases log(Revenue) for any budget**
- **A little skill really helps a small project**
- **A little cash really helps a struggling director**
- **Excellent directors cannot outperform if cash-constrained**

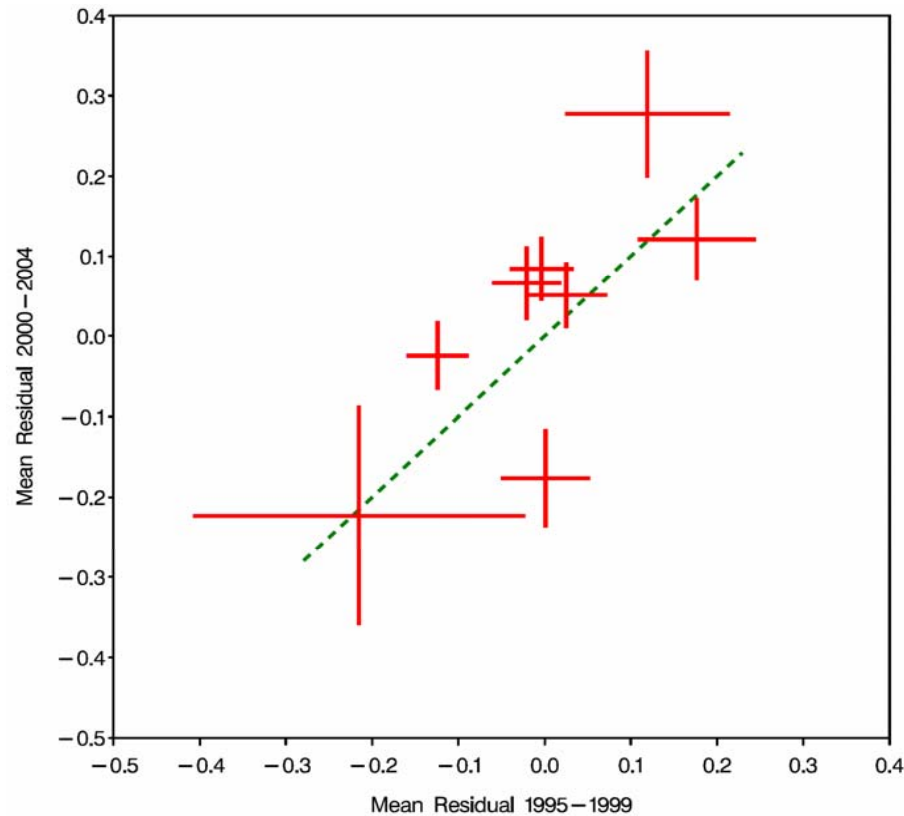
Data: September 2005

Revenue Depends on Season and Rating

	Summer	Holiday	Off Season	Full Year
1995-1999				
G, PG, PG-13	0.21 13%	0.01 10%	-0.03 26%	0.04 49%
R	0.05 9%	0.00 10%	-0.08 33%	-0.04 51%
2000-2004				
G, PG, PG-13	0.17 15%	0.06 13%	0.01 34%	0.06 63%
R	0.02 5%	-0.07 7%	-0.13 25%	-0.10 37%

- Mean residual η_i and fraction of movies in each cell
- Typical standard error of mean residual = 0.05
- Season and rating effects are significant at the 95% level
- Interaction of season and rating is not significant

Consistent Abnormal Revenue of Genres



- **Primary genre from Nielsen**
- **Genres combined until none contains fewer than 30 movies**
- **Mean residual in each genre computed for two sub-periods**
- **Analysis of variance shows significant explanatory power in each sub-period**
- **Correlation shows significant persistence**

Quality Is Rewarded

	Intercept	M_{raw}	M_{neut}	Adjusted R^2
Mean		49.5	0.0	
Std Dev		17.0	16.4	
Raw Metascore	-0.275 (-5.98)	0.00665 (7.57)		6.9%
Genre Neutral	0.054 (3.70)		0.00843 (9.40)	10.3%

- **Metascore® between 0 and 100 from metacritic.com**
- **763 movies from estimation universe, 1995-2004**
- **Perfect foresight test, not model component**
- **Like a valuation ratio, performs better when genre neutral**
 - Action, Comedy, Drama, Horror, Romance, Sci-Fi, Thriller, and Other
- **Two standard deviations is an 89% increase in revenue**

Story Elements

	Young Protag	Male Protag	Happy Ending	Adjusted R^2
Mean	0.179	0.771	0.791	
De-Meaned	0.145 (2.76)	-0.086 (-1.82)	0.067 (1.37)	3.0%
Genre Neutral	0.165 (3.08)	-0.087 (-1.75)	0.065 (1.26)	3.4%

- **Manually collected story surveys**
- **397 movies from estimation universe, 1995-2004**
- **All variables are de-meanded before regression**
- **Story elements influence revenue independently of their correlation with genre**

Revenue Forecasting Factors

- **Sensible**
 - Production cost
 - Talent (director, actor, writer, producer, ...)
 - Studio, Rating, Season
 - Genre, story elements, demographics, Run time
 - Interactions (teams repeat, stars specialize by genre, ...)
- **Excluded to prevent look-ahead**
 - Advertising expense
 - Opening screens
 - Prediction markets (hsx.com)

Comparison of Models

1. “No one knows anything”

- Average revenue of past movies in estimation universe
- EWMA with 5 year half life

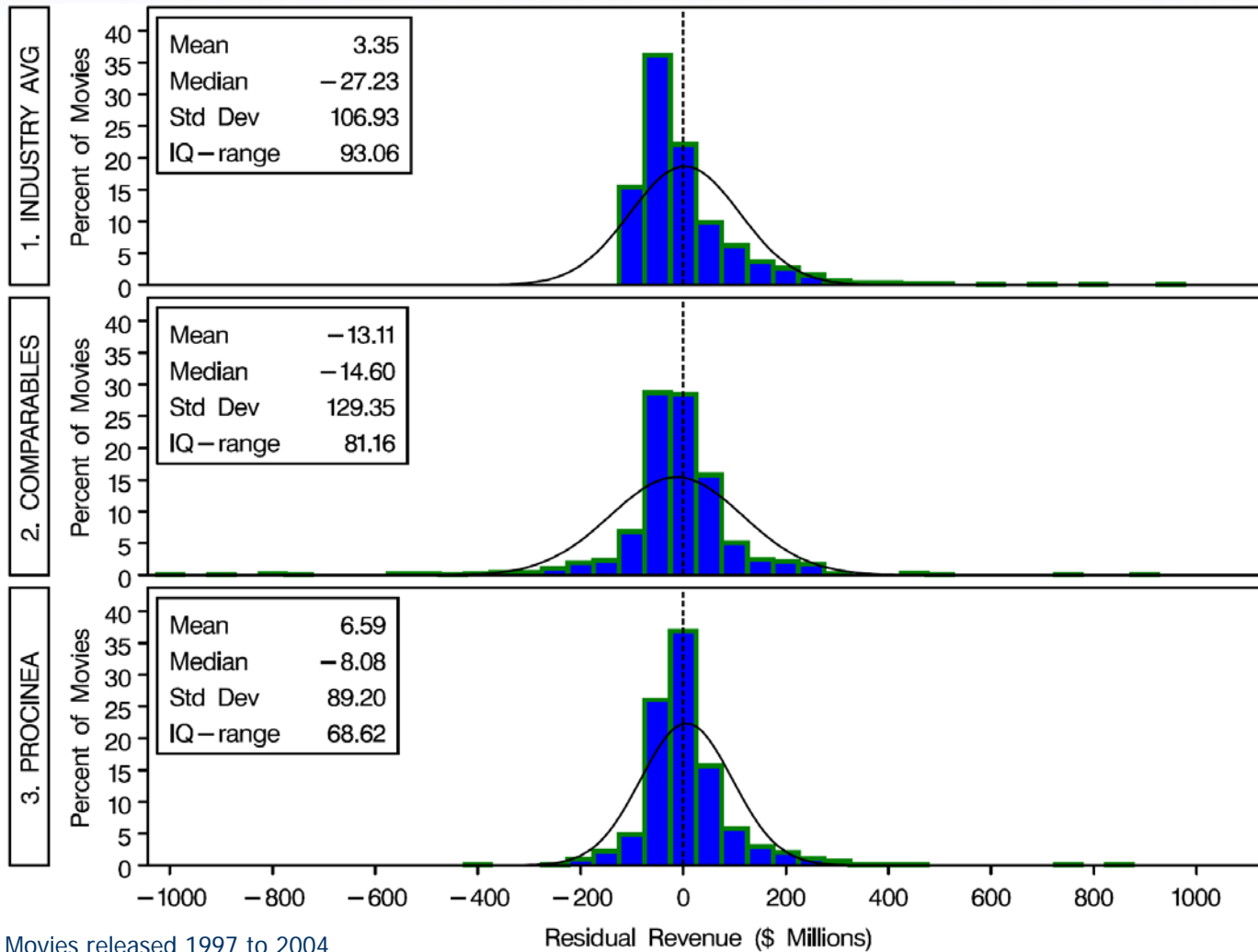
2. Average over comparables in one of roughly 60 clusters

- Production cost
- Talent
- Rating
- Season
- Genre

3. Procinea revenue model

- **All models updated monthly using realistic lags**
- **Out of sample test in estimation universe**

Distribution of Dollar Forecast Error



Movies released 1997 to 2004

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■ Valuation Ratio

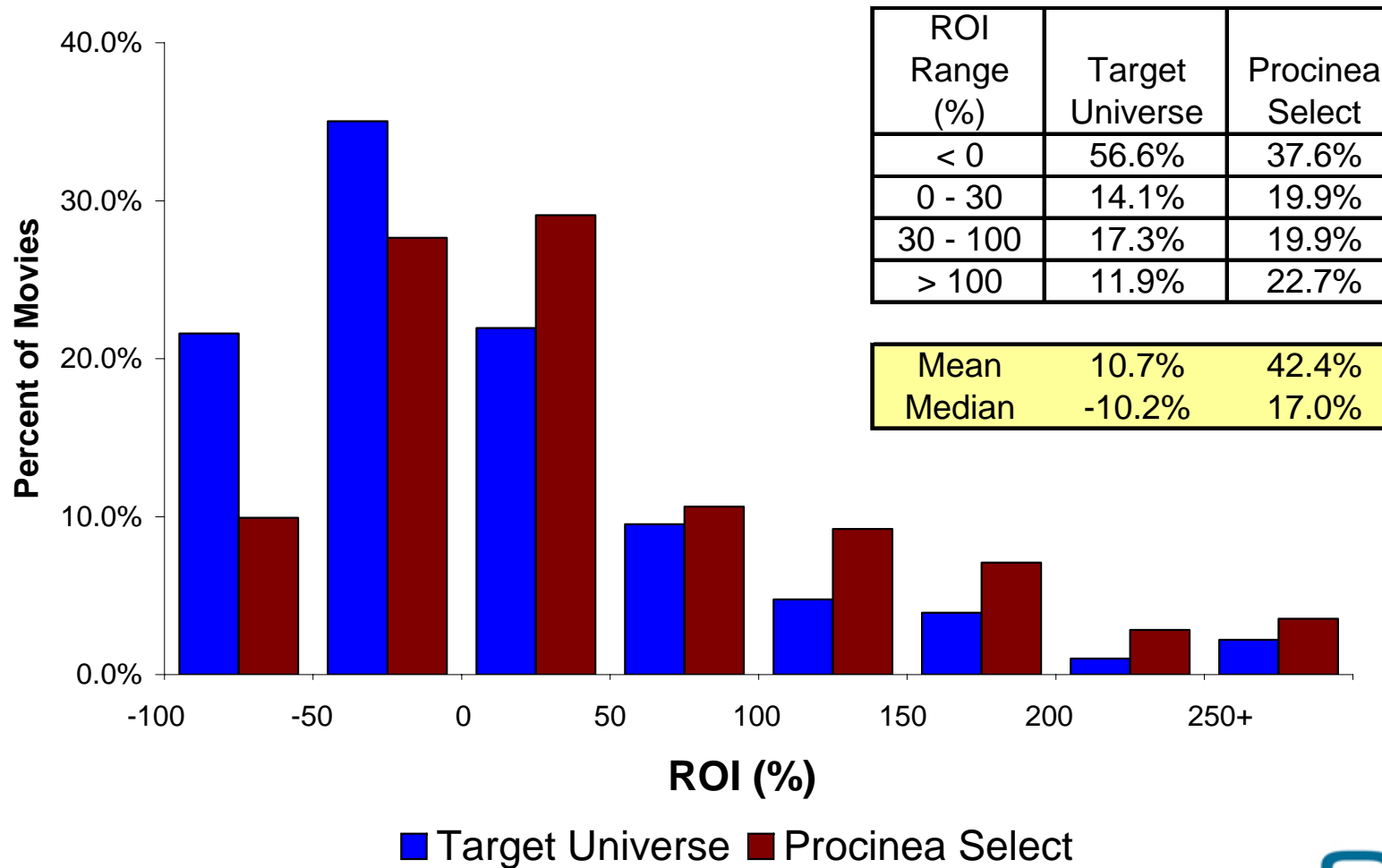
■ Decision rule for each movie

- Given attributes at greenlight, model predicts total revenue
- Total revenue is divided among channels according to historical fractions
- Channel revenue is scheduled according to historical time envelopes
- Value is estimated as the present value of these cash flows at a fixed required rate
- Project is accepted if value exceeds fully loaded production cost, including a cost-dependent estimate of P&A

■ 141 movies selected from 1997 to 2004

- 24% of target universe

Movies Selected by Model Have Superior ROI



■ New Territory

■ Artistic and Intellectual Property

- “The sheer volume of intellectual property worldwide is staggering,” Borod (2005), p.65
- Patents
 - *Intellectual Ventures, Ocean Tomo, RIM vs. NTP, LabCorp vs. Metabolite*
- Other areas
 - *Pharmaceuticals, video games*

■ Non-linear models and interactions

- Not a significant area of research in mainstream finance
- Techniques suggest that useful progress could be made beyond standard linear factor technology

■ Nobody Knows Anything? Ha!

- **Forecasting revenue is not futile**
- **Movie attributes can be used as a basis for an active investment strategy**
 - Story elements do help
- **There is lots we don't know**
 - Models of compensation and advertising budget
 - Really understanding the role of stars
 - The impact of managing the contracting process
 - Sequels, animations, foreign movies, Bollywood,...
- **Thoughts for the future**
 - Structure of the industry
 - *organization, production process, who should benefit from movies, technology, etc*
 - Art or science?

Epilogue

- **Procinea: A story of innovation, creativity and success, or a story of avarice, greed and re-organization...**
 - Our Chairman & wife: www.moulicohen.com & www.stacycohen.com
- **Stranger than fiction, or larger than life?**
 - Malcolm Gladwell, “The Formula,” The New Yorker, October 16, 2006
 - Richard Morgan and Vipal Monga, “New Cast, old script,” The Deal, 2007
 - Amy Wallace, “The Kid Pays for the Picture,” Conde Nast Portfolio, May 2007
- **In the last year, Hollywood has**
 - Recognized it needs external financing
 - Been very receptive to offers of financing
 - Been selective the way it structures deals
 - Generated many unhappy investors
 - Been the focus of many articles and blogs:
 - http://equityprivate.typepad.com/ep/2007/06/johnny_fontane_.html
 - http://fmvla.com/nearing_the_end_of_the_portfolio_film_financing_era%3F
 - http://fmvla.com/the_dangers_of_portfolio_film_pricing_models