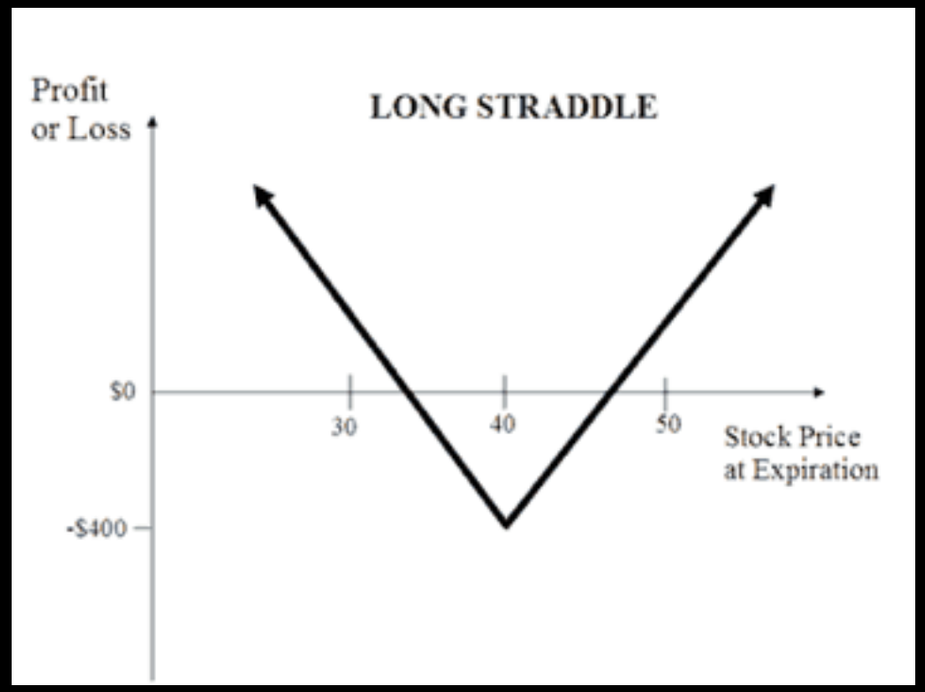
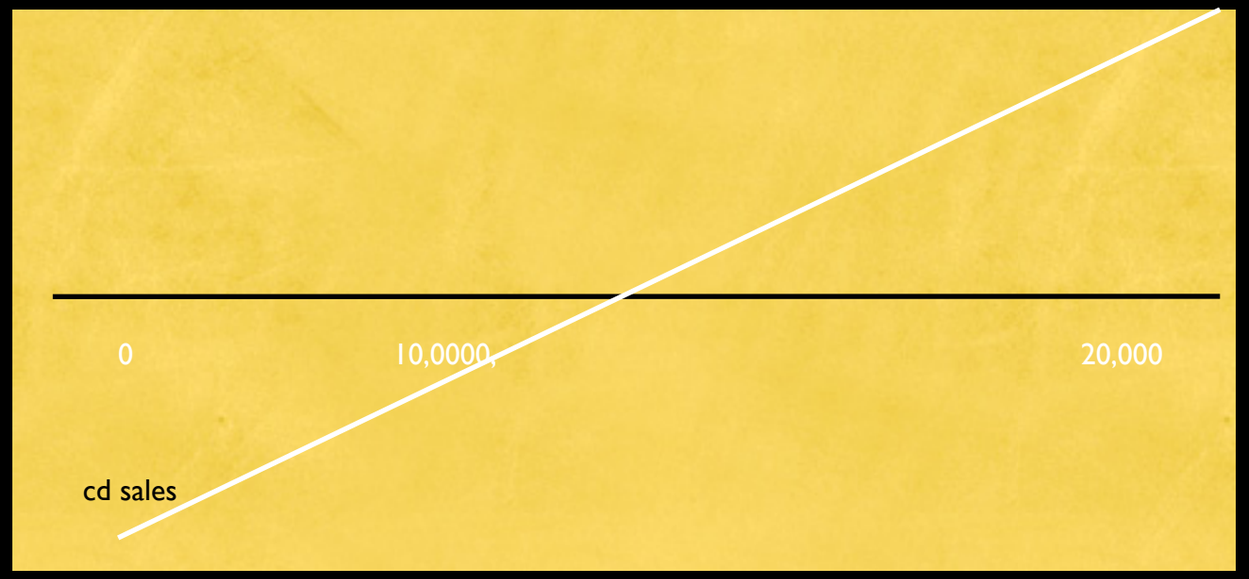
MBUS 3000

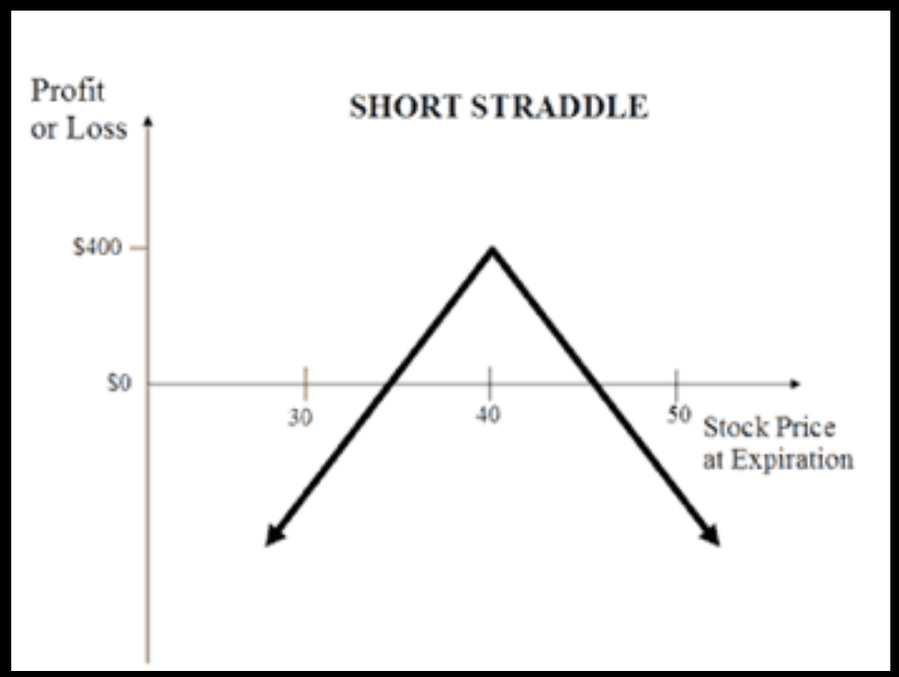
Long Volatility

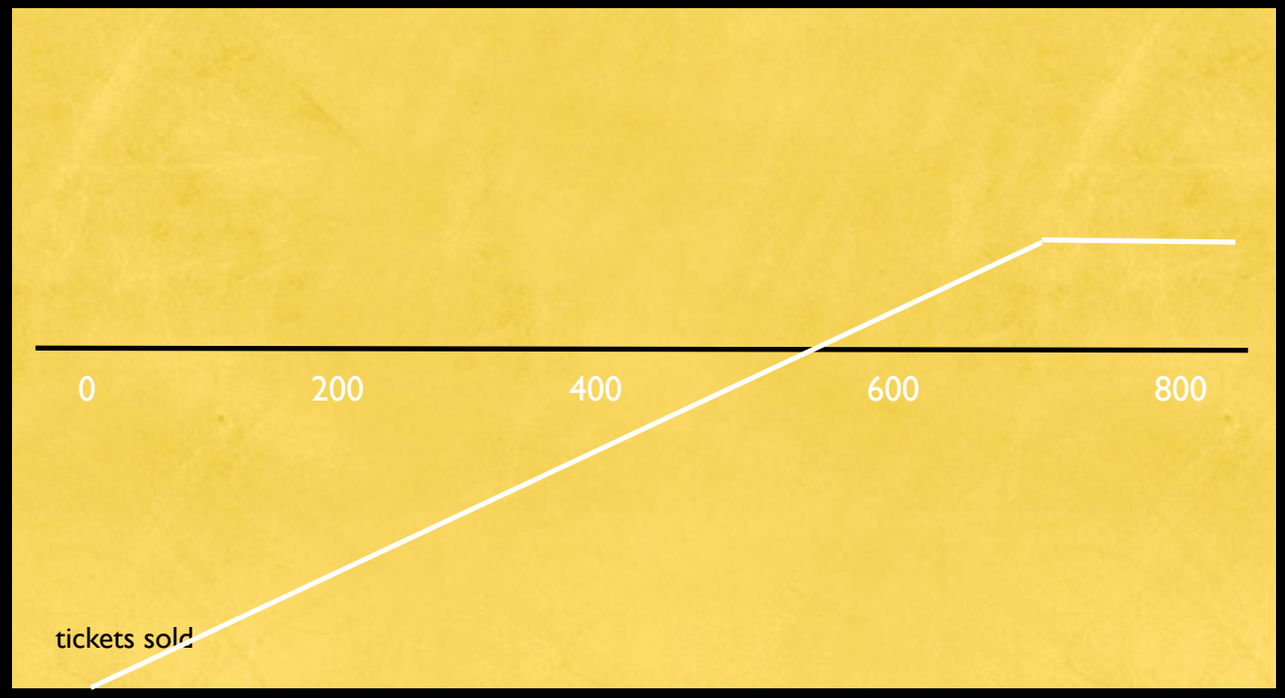




record label profit and loss chart

unlimited upside





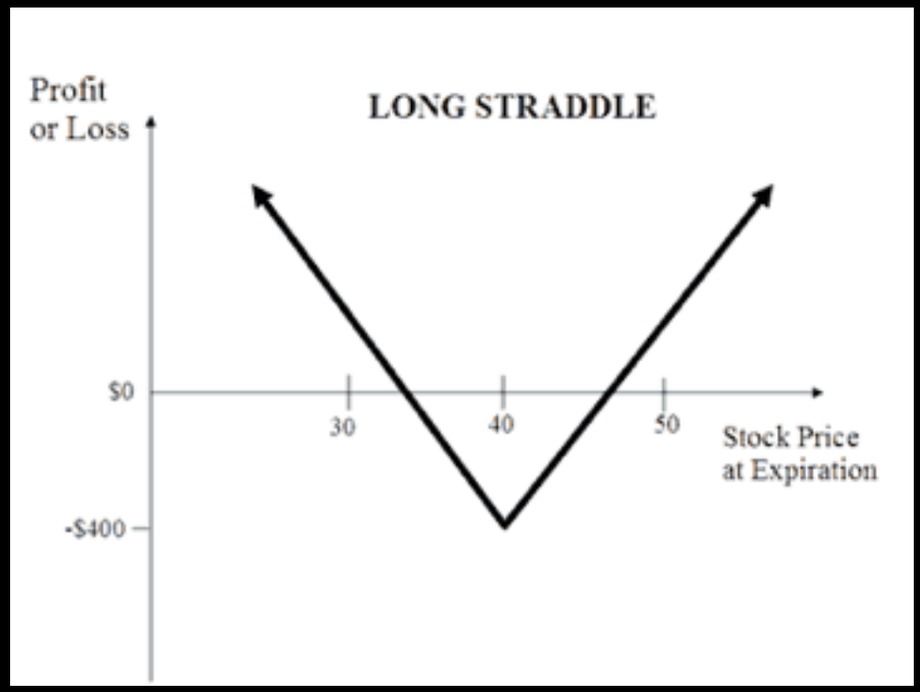
40 watt club presents dinosaur jr.

limited upside

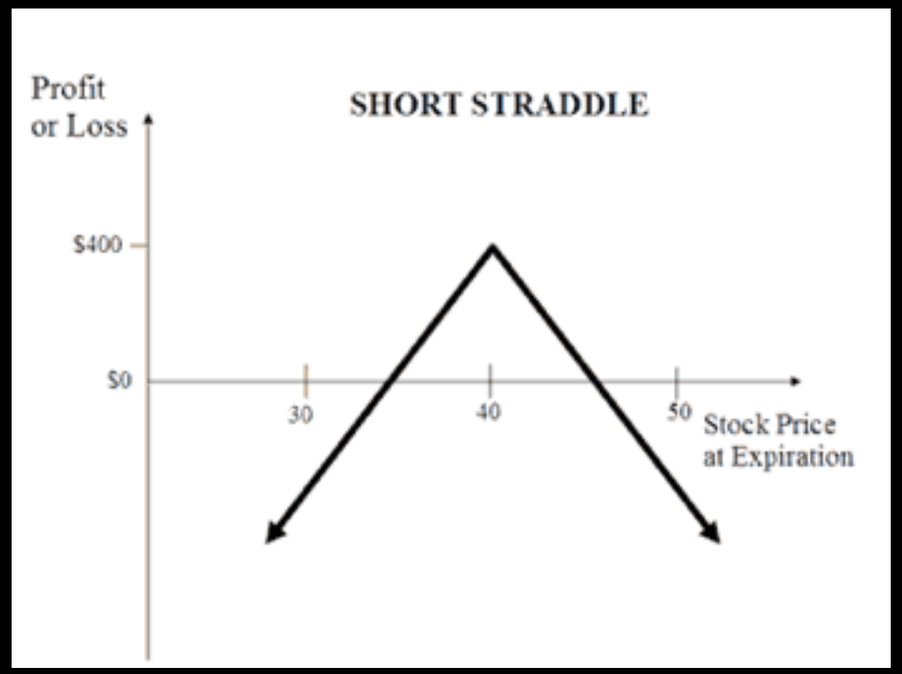
What is Long Volatility?

Demand

In the options trading world being long volatility means you have a limited loss potential or "downside". But an unlimited profit potential or "upside".



You profit when I stock moves around. Or trades in a Volatile manner.



Short Volatility. You Lose when the stock moves around. When it trades in a volatile manner. You profit when things stay stable.

long volatility: you profit if things change beyond expectations

short volatility: you profit when things stay within the range of expectations

long volatility: you profit if things change beyond expectations
Songwriters, Record Companies. Need hit.

short volatility: you profit when things stay within the range of expectations
Concert promoters are hoping that performers draw is approximately the same or as expected.

Folk wisdom from the art of volatility trading.

Long volatility positions tend to not "blow up". They don't go out of business.

Short Volatility positions tend to "blow up" or go out of business. (night clubs are long volatility and tend to go out of business and sold to the next sucker).

Long Volatility positions lose a little money most of the time. But make so much money on their winnings it more than makes up for their losses. (think record labels or songwriters)/

Short Volatility positions make money most of the time. When they lose they tend to wipe out all their previous winnings. (concert promoters this is case).

Certainty is usually overpriced. Uncertainty is usually underpriced.

Who are these entities?

Divide individuals and entities in the music business into two groups.

Those with unlimited profit potential or "upside" Call these individuals Long Volatility.

Those with limited profit potential. Short Volatility.

Who are these entities.

Record labels
Recording artists
Publishers
Songwriters

paid fee on each album sold in perpetuity.
Producers
Mix Engineers.

Indirectly
Managers
Business Managers

All "Long Volatility"

All have unlimited potential "upside" from owning songs or recordings.
And that upside is of a wild variety.
(cause recorded music revenues exhibit wild variation)

Mapping the art/science of Volatility trading onto the music business.

Long Volatility

Songwriters
Recording artists who receive royalties based on Sales
Record Labels
Publishing Companies
Record Producers
Mix Engineers
Managers
Business Managers (paid by % of gross)

Booking Agencies (?)

Royalties directly indirectly

Short Volatility

For hire musicians
Engineers hourly rate
Record executives
Tour Managers
Road Crew
Entertainment Lawyers
Concert Promoters
Music Venues
Accountants hourly

Individual Agents (?)

generally flat fees
hourly salary

MBUS 3000
Review for Midterm II
Lecture 21
March 23 2017

Know the general structure of your Gnucash accounts

Risk and Reward
FV and PV
Stream of income and Present Value
Record/Publishing deals and PV
Bubbles and PV
Bubbles and Music Business
++++++++++++++++++++
Secret Reasons #1
++++++++++++++++++++
Wild Variation and Normal Variation
Long Volatility and Short Volatility
++++++++++++++++++++
Long Tail/Long Volatility as a strategy
to manage above

Long Tail/Long Volatility Strategy

- THE BLEED: many small “bets” that rarely pay out.
- WILDNESS: payouts or "upside" must be virtually unlimited. Payouts must exhibit a "wild" variation. Payouts more than make up for all the small losses.

Scalable even Hyper Scalable

- LOW OVERHEAD: “bets” are inexpensive or acquired free in the course of other activities.

“harvesting luck”

"The music business is cruel and shallow money trench, a long plastic hallway, where thieves and pimps run free, where good men die like dogs. And then there is a negative side."-attributed to Hunter S. Thompson

The music business is not like other businesses.
The music business is built on failure.
Most songs are not hits
Most albums are not hits
Most artists do not have hits.
Successful artists, musicians, labels, producers etc simply fail a little less often than what is considered normal.

Living in the Antechamber of Hope

"The person involved in such gambles is paid in a currency other than material success: hope." As Taleb argues, most artists and scientists spend most of their life waiting for that one big rewarding event that gets them the recognition they'd been hoping for and justifies for "the social consequences of the appearance of continuous failure,"

The music business is dominated by
wildly unpredictable outcomes.

On average and over the long term all successful entities and individuals consciously or unconsciously adopt a "*Long Tail Long Volatility*" strategy.

"Lucky on purpose"

MBUS 3000

Long Tail Long Volatility
Theory of the Music Business

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Long Tail/Long Volatility Strategy

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In probability theory, the **law of large numbers** (**LLN**) is a theorem that describes the result of performing the same experiment a large number of times. According to the law, the average of the results obtained from a large number of trials should be close to the expected value, and will tend to become closer as more trials are performed.

The LLN is important because it "guarantees" stable long-term results for the averages of some random events. For example, while a casino may lose money in a single spin of the roulette wheel, its earnings will tend towards a predictable percentage over a large number of spins. Any winning streak by a player will eventually be overcome by the parameters of the game. It is important to remember that the LLN only applies (as the name indicates) when a *large number* of observations are considered. There is no principle that a small number of observations will coincide with the expected value or that a streak of one value will immediately be "balanced" by the others (see the gambler's fallacy).

Actual results approach
theoretical value

More bets > stable profits

stable profits> successful entity

Simulations

7	1000000	7000000	$0.00	% Return			Investment
5	1000000	5000000	$0.00	-100.00%	Record Company Profit 5 Albums	-$300,000.00	$300,000.00
4	1000000	4000000	$0.00	-100.00%	Record Company Profit 10 Albums	-$600,000.00	$600,000.00
6	1000000	6000000	$0.00	-100.00%	Record Company Profit 25 Albums	-$1,500,000.00	$1,500,000.00
2	1000000	2000000	$0.00	-33.33%	Record Company Profit 50 Albums	-$1,000,000.00	$3,000,000.00
0	1000000	0	$0.00	16.67%	Record Company Profit 100 Albums	$1,000,000.00	$6,000,000.00
2	1000000	2000000	$0.00	58.33%	Record Company Profit 200 Albums	$7,000,000.00	$12,000,000.00
7	1000000	7000000	$0.00	44.44%	Record Company Profit 300 Albums	$8,000,000.00	$18,000,000.00
5	1000000	5000000	$0.00				
3	1000000	3000000	$0.00				
1	1000000	1000000	$0.00				
0	1000000	0	$0.00				

7	1000000	7000000	$0.00	% Return			Investment
4	1000000	4000000	$0.00	233.33%	Record Company Profit 5 Albums	$700,000.00	$300,000.00
10	1000000	10000000	$1,000,000.00	233.33%	Record Company Profit 10 Albums	$1,400,000.00	$600,000.00
1	1000000	1000000	$0.00	166.67%	Record Company Profit 25 Albums	$2,500,000.00	$1,500,000.00
9	1000000	9000000	$0.00	100.00%	Record Company Profit 50 Albums	$3,000,000.00	$3,000,000.00
0	1000000	0	$0.00	66.67%	Record Company Profit 100 Albums	$4,000,000.00	$6,000,000.00
9	1000000	9000000	$0.00	75.00%	Record Company Profit 200 Albums	$9,000,000.00	$12,000,000.00
0	1000000	0	$0.00	61.11%	Record Company Profit 300 Albums	$11,000,000.00	$18,000,000.00
0	1000000	0	$0.00				
10	1000000	10000000	$1,000,000.00				
5	1000000	5000000	$0.00				

5	1000000	5000000	$0.00	% Return			Investment
3	1000000	3000000	$0.00	-100.00%	Record Company Profit 5 Albums	-$300,000.00	$300,000.00
8	1000000	8000000	$0.00	66.67%	Record Company Profit 10 Albums	$400,000.00	$600,000.00
4	1000000	4000000	$0.00	-33.33%	Record Company Profit 25 Albums	-$500,000.00	$1,500,000.00
1	1000000	1000000	$0.00	-33.33%	Record Company Profit 50 Albums	-$1,000,000.00	$3,000,000.00
8	1000000	8000000	$0.00	66.67%	Record Company Profit 100 Albums	$4,000,000.00	$6,000,000.00
10	1000000	10000000	$1,000,000.00	66.67%	Record Company Profit 200 Albums	$8,000,000.00	$12,000,000.00
7	1000000	7000000	$0.00	38.89%	Record Company Profit 300 Albums	$7,000,000.00	$18,000,000.00
1	1000000	1000000	$0.00				
7	1000000	7000000	$0.00				

Law of Large Numbers

If you flip a coin a 3 times you could easily get something statistically unlikely like 100% heads or 0% heads.

If you flip a coin 1000 times you are extremely unlikely to get 100% heads. Your actual results will be very close to 50% heads.

The true odds do not emerge until you play the game dozens, hundreds or thousands of times!!!

If you play a highly unpredictable and random "game" like writing songs or producing records your "talent" (or lack there of) doesn't matter until you play the "game" dozens even hundreds of times. To be successful in the music business you have to be talented AND figure out how to make many many "bets".

Third:
False Signals!

Many who appear talented are actually lucky!

Beware of bad
advice from lucky (not talented) individuals

Suppose music business geniuses can control heads or tails in coin flip.
Suppose that non-geniuses can't.

Flipping a coin and getting all heads test for music business genius.

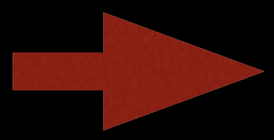
Probability of being fake genius higher with 3 flips
Probability of being fake genius much lower with 100 flips

Law of Large Numbers Again

Songwriters 100's
Music Publishers 10,000's
Record Labels 10,000's
Record Producers 100's
Mix Engineers 1000's

Concert Promoters* 1,000's

fake
genius
+
"Matthew effect"



Agents 100's
Agencies 1,000's
Managers 10's
Management companies 100's

Typical number of times different entities get to play the game.

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Risk and Reward
Expected Value
Practical Skepticism:
Is the music business best treated as random?
Two kinds of randomness in music business

Risk and Reward

When risk increases reward should increase

(When risk decreases reward should decrease)

You are an investor what sort of reward do you expect?

Investing in US Treasury bonds
Investing in a tech startup

Investing in German Government bonds
Investing in Greek Government bonds

Investing in a company that owns oil wells
Investing in a company exploring for oil

Investing in an established artist
Investing in an unknown artist

US 10 year treasury interest 2.89%

Date	1 Mo	3 Mo	6 Mo	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
10/01/15	0.00	0.00	0.08	0.31	0.64	0.92	1.37	1.75	2.05	2.49	2.85
10/02/15	0.00	0.00	0.06	0.25	0.58	0.85	1.29	1.67	1.99	2.44	2.82
10/05/15	0.00	0.01	0.06	0.26	0.61	0.89	1.35	1.74	2.07	2.52	2.90
10/06/15	0.00	0.00	0.07	0.26	0.61	0.90	1.34	1.72	2.05	2.50	2.88
10/07/15	0.00	0.00	0.08	0.27	0.65	0.92	1.37	1.75	2.08	2.51	2.89

Wednesday Oct 7, 2015

Venezuela 10 year bond interest 10.31%

Venezuela Markets	Last	Previous	Highest	Lowest	Unit	
Currency	6.35	6.35	6.35	0.05		[+]
Stock Market	11726.47	12101.16	15580.47	0.76	Index points	[+]
Government Bond 10y	10.31	10.31	19.19	2.40	percent	[+]

+

As risk increases interest rates increase
As risk decreases interest rates decrease

Mortgage interest rate for “prime” borrower 4%

Mortgage interest rate for “sub prime” borrower 8%

Interest rate on credit card good credit 17%

Interest rate on credit card poor credit 25%

Interest rate on car title loan ??

Gambling loan shark loan? 1000%

How do we calculate risk and a proper reward in the music business?

Turns out to be extremely difficult problem

The two principal elements of a recording deal

Example

Artist royalty 15% wholesale
Artist advance $100,000

Reward for label:
85% of wholesale revenues to label

How do we calculate risk and proper reward outside of music business?

1. Markets
2. Financial calculations
3. Educated guesswork

Example established artist

Artist royalty 25% wholesale
Artist advance $750,000

Reward for label:
75% of wholesale revenues to label
Reflects record label assessment of RISK!!

$750,000 advance reflects record
label assessment of Risk

How to caluculate expected value

How to calculate expected value.

Suppose random variable X can take value x1 with probability p1, value x2 with probability p2, and so on, up to value xk with probability pk. Then the expectation of this random variable X is defined as

$$\mathrm{E}[X] = x_1 p_1 + x_2 p_2 + \ldots + x_k p_k \ .$$

Example 1.

You have 1 in 10 chance of winning $100. The other 9 chances you win zero.

$$E[X] = \$100 \cdot \frac{1}{10} + \$0 \cdot \frac{9}{10} = \$10 + \$0 = \$10$$

Example 2.

Roll one dice. You win $1 for a 1. $2 for a 2 etc etc.
Probability for each event is 1 in 6 or 1/6.

$$E[X] = \$1 \cdot \frac{1}{6} + \$2 \cdot \frac{1}{6} + \$3 \cdot \frac{1}{6} + \$4 \cdot \frac{1}{6} + \$5 \cdot \frac{1}{6} + \$6 \cdot \frac{1}{6}$$

E [x] = 3.5

We have a ticket lottery in the class
each ticket has a 1/10 chance of winning $10

What is the expected value of each ticket?

$$\$0 \times \frac{9}{10} + \$10 \times \frac{1}{10} = \$1$$

The pure mathematical value of ticket is $1

Perfectly rational actor would buy ticket for less than $1
Perfectly rational actor would sell ticket for more than $1

52 cards in deck
13 hearts minus the ace of hearts
12 hearts worth $1 (except the ace)
1 Ace of Hearts worth $10
Similarly …
12 spades worth $0
1 ace of spades worth $10
12 clubs worth $0
1 ace of clubs worth $10
12 diamonds worth $0
1 ace of diamonds worth $10

The Probability of drawing an ace? 4/52
The Probability of drawing a heart? 12/52
The Probability of drawing anything else? 36/52

$$\$10\times\frac{4}{52}+\$1\times\frac{12}{52}+\$0\times\frac{36}{52}=\$1$$

Two kinds of randomness

An artist has a 1 in 10 chance of having a hit

A hit might generate
$100,000
$1,000,000
$2,000,000
$10,000,000
?

What advance do you give this artist?
or phrased another way
What is proper reward for this risk?

No expected value calculation

Is the music business really random?

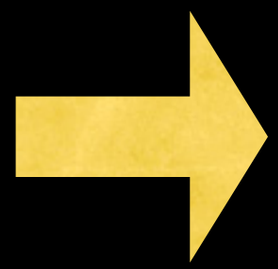
Outcomes in music business are not random

But it’s helpful to treat
outcomes in music business as random

unpredictable

turbulent

chaotic



random

irreducibly complex

the music business is fooled by randomness

two kinds of randomness

Ahmet Ertegun

"throw ten records against the wall and see what sticks"

unpredictable which artist is successful

Michael Jackson

why was "thriller" 40-80 million better than "off the wall?"

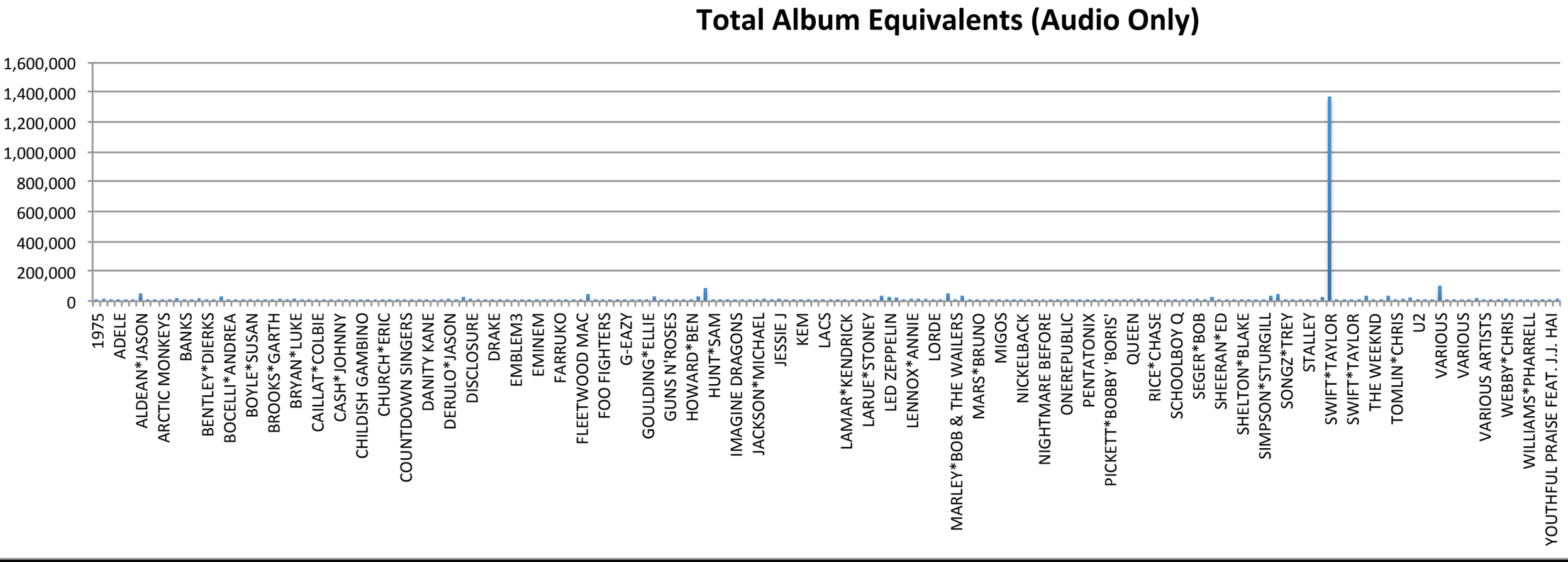
unpredictable size of hit

#2

Two kinds of randomness produce wild variation

There is no expected value

Sales chart and wild variation



Assume Each Artist Possesses Similar Talent

advertising $

tour support

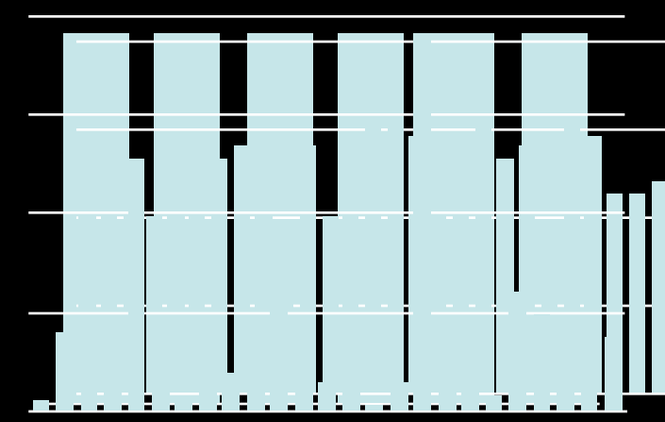
promo person hours

skilled creatives*

video and recording budget

"black ops" bribes,cocaine, prostitutes and payola

hit machine



"wild" or "crazy" simon

gaussian randomness

*songwriters, producers, a&r, etc

#1

The inputs do not have predictable influence over outputs

Also

Talent/Skill is overrated

Which one is most like the music business?

Normal roulette.
35:1 payout
38:1 odds
expected return on $1 is $0.94
You are the sucker!!

good investment roulette
45:1 payout
38:1 odds
expected return on $1 is$1.18
the casino is the sucker!!

wild roulette
no fixed payout: it *seems* >38:1
38:1 odds
no fixed expected return
return on $1 is >$1
most likely a good investment

MBUS 3000
3 Logical Fallacies
Matthew Effect
“Future Value”

Practice Skepticism
a key skill
for management and strategy

Question the evidence
that purports to show
skill, planning and talent outweighs luck
and chance

Why?

The Three Logical Fallacies
+
Matthew Effect

From my 10 Heresies Keynote

#4
Never listen to successful people
in music business

They are often mistaken
about the reasons for their success

Corollary

#5
Take advice from unsuccessful people

Unsuccessful people know exactly
where they went wrong

What happens when you teach the audience to sing
the record company president’s phone number?

Why is my argument important?

Beware the success narrative

To keep you focused on the unpredictable
nature of the music business

To employ probabilistic methodologies to achieve success

Venture Capital funds follow similar strategy?

TECH

Bet on Snap Shows Luck's Role in Venture Busine

Lightspeed's $8 million investment yielded stock that will likely be worth about $1.5 billion in

Startup Stars

A look at some of the best startup investments of all time.

$34M — INITIAL INVESTMENT

$83.9B — RETURN

Tencent — STARTUP
(Naspers, 2001) — INVESTOR, PERIOD
2,469x — RETURN MULTIPLE

$9M
$1.3B
LinkedIn
(Greylock)
144x

$8M
$1.5B*
Snap
(Lightspeed Venture Partners, 2012-2013)
166x

$60M
$3.5B
WhatsApp
(Sequoia Capital, 2011-2013)
58x

$11.8M
$4.8B
Google
(Kleiner Perkins, 1999)
407x

$14.8M
$5.6B
Facebook
(Accel Partners, 2005)
378x

$2.75M
$7.1B
Juniper Networks
(Kleiner Perkins Caufield & Byers, 1996)
2,582x

Alibaba
(Softbank, 2000-2003)
260x
$78B
About $300M

*O… based on the IPO price
Source: Company filings, staff reports

THE WALL STREET JOURNAL.

How we fool ourselves
into thinking the music business predictable

"Gershing"
The Survivorship Bias
The Narrative Fallacy

"success has many fathers, failure is an orphan" - arab proverb

gersh |gərsh|

verb 1990's
to subtly or inconspicuously move away from an artist or project one once championed. often involves passing responsibility for artist or project to a subordinate.
DERIVATIVES
gershed |ˈgərshed| past tense

gershing |gərshing| noun, event or meeting that reveals an artist has been gershed.
ORIGIN: early 1990's .: (unfairly) attributed to long time A&R superstar Gary Gersh.

Where gershing skews evidence

Who qualifies? Not every A&R person on this list has actually worked for a record company. Some were primarily artist managers, others were producers and DJs. But the rule of thumb here is that if they didn't hold an A&R title in some place at some time, or work on behalf of their own production company, then they have to manifest some useful service as a talent scout to people with signing power.

The Survivorship Bias

The stock market Dow Jones Average myth.
When a company goes bankrupt it is thrown out of the index.
The historical rate of return on the dow jones average only measures the survivors. (it's like getting to change your bet in the middle of a horserace).

An executive might explain all of the things that they did to "make" their successful artists successful. They omit from their narrative that they did all these same things for their unsuccessful artists.

A management company's roster, booking agency roster, record label roster is usually a collection of survivors with a few current "experiments".

E.G. I look at Dangerbird Record's website and I see Silversun Pickups and Fitz and the Tantrums. They look very successful. But they don't list the bands they've signed that have failed. And why would they?

Absence of failures from evidence

Pseudo-Scientific Survivorship Bias

Author Jay Frank says the way people consume music in the digital age has changed what makes a hit. In his book Future Hit.DNA he argues that people are discovering music online and not always via radio, so song intros need to be shorter. He recently used Adele's Someone Like You as an example of how the theories in his book are correct. "The intro is five seconds long, it's at walking tempo (105bpm), contains repetition of many lyrics with a choral counter-chorus, has a very sly shift in the chord progression at the bridge, and contains many dynamic shifts throughout the song," he concludes.

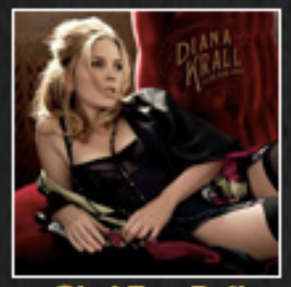
This doesn't exactly tally with stats provided by Billboard, although Adele's hit is in a major key. So who's right? Maybe it makes more sense to look to songwriters who have had plenty of hits. BBC2's brilliant current series Secrets of the Pop Song is trying to shed light on the issue. In it, successful songwriters talk about the craft, and we see hit-maker Guy Chambers in action as he co-writes with a selection of artists.

<Venn Diagram>

DISCOGRAPHY & STORE

Music Productions

The Diving Board
Elton John



Glad Rag Doll
Diana Krall

Storm & Grace
Lisa Marie Presley

Voice of Ages
The Chieftains

Jeff Bridges
Jeff Bridges

I'll Never Get Out of This World Alive
Steve Earle

Low Country Blues
Gregg Allman

National
Elvis Co

The Union
Elton John and Leon Russell

The Secret Sisters
The Secret Sisters

Junky Star
Ryan Bingham

No Better Than This
John Mellencamp

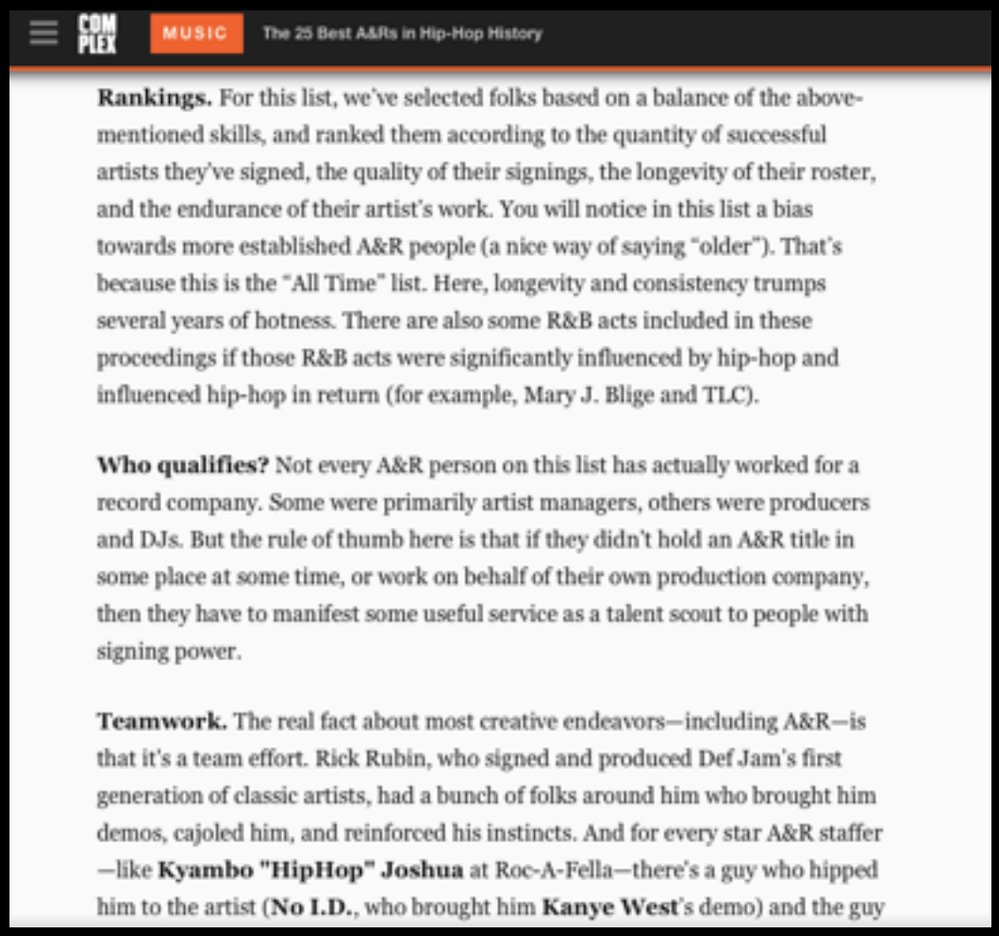
We Walk This Road
Robert Randolph & the Family Band

Country Music
Willie Nelson

Women & Country
Jakob Dylan

Secret, P
Sugar
Elvis Co

Top Hip Hop A&R



Sometime both survivorship bias and gershing

Only surveys the winners

The narrative fallacy addresses our limited ability to look at sequences of facts without weaving an explanation into them, or, equivalently, forcing a logical link, an arrow of relationship upon them. Explanations bind facts together. They make them all the more easily remembered; they help them make more sense. Where this propensity can go wrong is when it increases our impression of understanding.

—*Nassim Nicholas Taleb, The Black Swan*

The Narrative Fallacy

One of my platinum selling albums.
3 MTV hits from this album:
Low
Get off This
Eurotrash Girl

Found myself telling a very compelling success narrative about this album until I examined email history.

Record company, band and producer were focused on two other songs that never became singles. Great resources and energy were devoted to developing these songs.

None of these songs were ever discussed except for Eurotrash girl. Record company did not want eurotrash girl on album. It was a hidden track because band wanted it on album. We literally hid it from the record company.

Video for low was made at insistence of manager and video director. Band nor Label expected this to be a successful MTV hit.

Low became a hit only after the record company had stopped working the single. A lone radio station stayed on the track. Record company went back to it after it became popular in a single market.

Record succeeded in spite of our planning.

Main Consequences

Many successful institutions and individuals in the music business appear successful.

This masks the high failure rate in the music business.

This also masks high degree of unpredictability in the music business.

However

Because the few hits are so profitable having a high failure rate is not a problem.

Corollary

#5
Take advice from unsuccessful people

Unsuccessful people know exactly
where they went wrong

What happens when you teach the audience to sing
the record company president’s phone number?

The Matthew Effect

"For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath."

Sociologist Robert Merton observed that in the sciences success seems to accumulate. He called this "The Matthew Effect" after the biblical verse

Part 2
“Success Breeds Success”
or more accurately
“Luck breeds Success”

Once an individual or entity is successful in the music business, they tend to attract more talented artists.

Remember: Talent is overrated but not irrelevant.

http://phenomena.nationalgeographic.com/2014/04/28/on-privilege-and-luck-or-why-success-breeds-success/

Some jobs in the music business.

Apply the three logical fallacies
and The Matthew Effect.

Managers?

Producers?

Mix Engineers?

Your Instructor?

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Future Value

What is an interest rate?

reflects expectations of inflation
reflects borrower risk

higher interest?
higher risk
higher inflation
or both

subprime borrowers pay higher interest
greece pays higher interest than germany

Example 3

Interest rate of 5% each year. $1000 dollars loan principal. Time period 5 years. The interest is calculated or Compounded once every year.

Never mind how I get this formula.

$$FV = PV \cdot (1+i)^n$$

$$FV = 1000*(1+.05)^5$$

$$FV = 1000*(1.05)^5$$

$$FV = 1000*1.2762815625 = \$1{,}276.28$$

V = future value
PV = Present value
i = interst rate for the specified period.
n = number of time periods

For the first 4 use this formula:

$$FV = PV \cdot (1+i)^n$$

Harder! The interest rate expressed in years but it is compounded monthly

Suppose our terms are as above but we want to calculate the interest each month! Since that is generally the period that payments are made.

It's the same formula except this time each period is a month. So the # of periods is 60!

Next we need to adjust the interest rate. Since it was expressed in years we need to express it in months. **Lets do it this way lets divide the interest by 12 months.***

5% interest per year becomes .4167 % a month.

$FV = 1000*(1 + .004167)^{60}$

FV= 1000* (1.28338)

FV = $1,283.38
Note 1283.38 ≠ 1276.28

what if we compouned daily?

Note: Compounding more frequently increases the future value !

But FV increases to a fixed *limit* as the number of periods increases. That limit is the *compounded continuously* calculation. This is an advanced topic beyond the scope of this course.

			"i"		"n"	"PV"	"FV"
	Annual Interest rate	Number time periods per year	Adj interest rate per time period	Number of Years	Total # time periods	Initial amount	Total
			A/B (as decimal)		B x D		
Prob 1	12.00%	4	0.03	5	20	$5,000.00	$9,030.56
Prob 2	12.00%	2	0.06	5	10	$5,000.00	$8,954.24
Prob 3	12.00%	12	0.01	5	60	$5,000.00	$9,083.48
Prob 4	3.65%	365	0.0001	1	365	$1,000.00	$1,037.17

$5,000 5 years 12% interest quarterly
$5,000 5 years 12% interest semi-annually
$5,000, 5 years 12% interest monthly
$5,000, 1 year 3.65% interest daily

$$FV = \$5{,}000(1 + .03)^{20}$$

$$\text{FV} = \$5{,}000(1 + .06)^{10}$$

$$FV = \$5{,}000(1 + .01)^{60}$$

$$FV = \$5{,}000(1 + .0001)^{365}$$

FV increases when interest rates increase
FV decreases when interest decrease

which loosely implies

FV increases when risk increases
FV decreases when risk decreases

“risk and reward”

From the record company perspective

"Implied interest rate"

100% - Artist Royalty Rate = Implied interest Rate

High Risk New Artist
100% - 10% = 90% implied interest

Greater than

Lower Risk Established Artist
100%-20% = 80% implied interest

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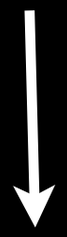
Long Tail and Present Value Stream of Income

As the interest rate increases PV decreases
As the interest rate decreases PV increases

also note

As the interest rate increases FV increases
AS the interest rate decreases FV decreases



As the risk increases PV decreases
As the risk decreases PV increases

Remember this equation
$FV = PV*(1+i)^n$

This implies
$PV = FV/(1 + i)^n$

As usual

PV is present value
FV is Future value
i is the interest rate per period
and n is the number of periods.

What interest rate do we use?

Interest rate represents the market expectation of inflation + risk.

If we assume this amount is risk free the only thing the interest rate represents is expectations of inflation.

in this case use the interest rate for US treasuries for that period of time.

10/03/11	0.01	0.02	0.06	0.12	0.24	0.39	0.67	1.33	1.80	2.51	2.76
10/04/11	0.01	0.01	0.04	0.11	0.25	0.40	0.90	1.35	1.81	2.53	2.77
10/05/11	0.00	0.00	0.03	0.10	0.25	0.43	0.96	1.45	1.92	2.62	2.87
10/06/11	0.01	0.01	0.03	0.09	0.29	0.46	1.01	1.52	2.01	2.71	2.96
10/07/11	0.01	0.01	0.04	0.11	0.30	0.50	1.08	1.61	2.10	2.78	3.02
10/11/11	0.01	0.02	0.05	0.12	0.32	0.54	1.14	1.68	2.18	2.87	3.11
10/12/11	0.01	0.02	0.06	0.09	0.29	0.54	1.17	1.72	2.24	2.94	3.19
10/13/11	0.02	0.02	0.05	0.11	0.29	0.51	1.11	1.67	2.19	2.90	3.15
10/14/11	0.02	0.02	0.06	0.11	0.28	0.50	1.12	1.71	2.26	2.97	3.22

Friday C[illegible] 14, 2011

* 30-year Treasury constant maturity series was discontinued on February 18, 2002 and reintroduced on February 9, 2006. From F[illegible]ry 18, 2002 to February 8, 2006, Treasury published alternatives to a 30-year rate. See Long-Term Average Rate for more information.

Treasury discontinued the 20-year constant maturity series at the end of calendar year 1986 and reinstated that series on October 1, [illegible]93. As a result, there are no 20-year rates available for the time period January 1, 1987 through September 30, 1993.

Treasury Yield Curve Rates. These rates are commonly referred to as "Constant Maturity Treasury" rates, or CMTs. Yields are interpolated by

absolutely risk free $100,000 due 30 years from now.
we always calculate interest annually
when we are calculating a lump sum!!

treasury 30 year yield is 3.22% (per year)

$$PV = 100{,}000/(1+.0322)^{30} = 38644.20$$

France vs Greece

More risk results in those countries paying a lot higher interest rate than the expected rate based on inflation. There is more risk.

$10,000 from the government of Greece due 10 years from now.
compare that to
$10,000 from the government of France due 10 years from now.

Greece 10 year yield = 26.9%
French 10 year yield =3.017%

$$PV = 10,000/(1+.269)^{10} = 923.38$$

$$PV = 10,000/(1+.0317)^{10} = 7319.23$$

Quarter	Songwriter 1	Songwriter 2
Q1 2011	$4,212.00	$965.00
Q2 2011	$4,134.00	$1,256.00
Q3 2011	$2,291.00	$10,023.00
Q4 2011	$2,784.00	$1,301.00
Q1 2012	$2,989.00	$866.00
Q2 2012	$2,377.00	$897.00
Q3 2012	$4,450.00	$1,007.00
Q4 2012	$3,112.00	$787.00
Q1 2013	$3,249.00	$983.00
Q2 2013	$3,004.00	$1,012.00
Q3 2013	$3,677.00	$687.00
Q4 2013	$2,614.00	$23,756.00
Q1 2014	$3,286.00	$14,321.00
Q2 2014	$3,255.00	$5,534.00
Q3 2014	$3,784.00	$2,312.00
Q4 2014	$4,221.00	$1,478.00
Q1 2015	$2,956.00	$787.00
Q2 2015	$3,429.00	$686.00
Q3 2015	$3,965.00	$954.00
Q4 2015	$3,467.00	$1,168.00
Q1 2016	$3,013.00	$1,201.00
Q2 2016	$2,317.00	$656.00
Total	$72,586.00	$72,637.00
average	$3,299.36	$3,301.68
STDEV	$623.75	$5,573.14

How much would you pay for songwriter 1 catalogue?
songwriter 2?
Which is worth more?

FROM THE ARCHIVES

EMI to Drop Mariah Carey, Sources Say
January 23, 2002

Virgin Records Bets Big on Carey's $80-Million Deal
April 4, 2001

MORE STORIES ABOUT

Music Industry -- Contracts

Recording Industry -- Contracts

Mariah Carey

Virgin Records

Carey Reportedly Signs 4-Album, $80-Million Virgin Records Deal

April 03, 2001 | JEFF LEEDS | TIMES STAFF WRITER

Company Town

Pop diva Mariah Carey has signed a four-album contract with Virgin Records worth an estimated $80 million, a mega-deal that ranks among the biggest ever awarded to an entertainer, said sources close to the negotiations.

The New York native, who turned 31 last week, has been the target of a fierce industry bidding war since she began approaching the end of her Sony contract, which was set to expire with the release of a soundtrack album this year. Speculation about her exit had mounted since her marriage to Sony Music chief Thomas Mottola broke up in 1997.

Record Label Pays Dearly To Dismiss Mariah Carey

By ALEX KUCZYNSKI WITH LAURA M. HOLSON JAN. 24, 2002

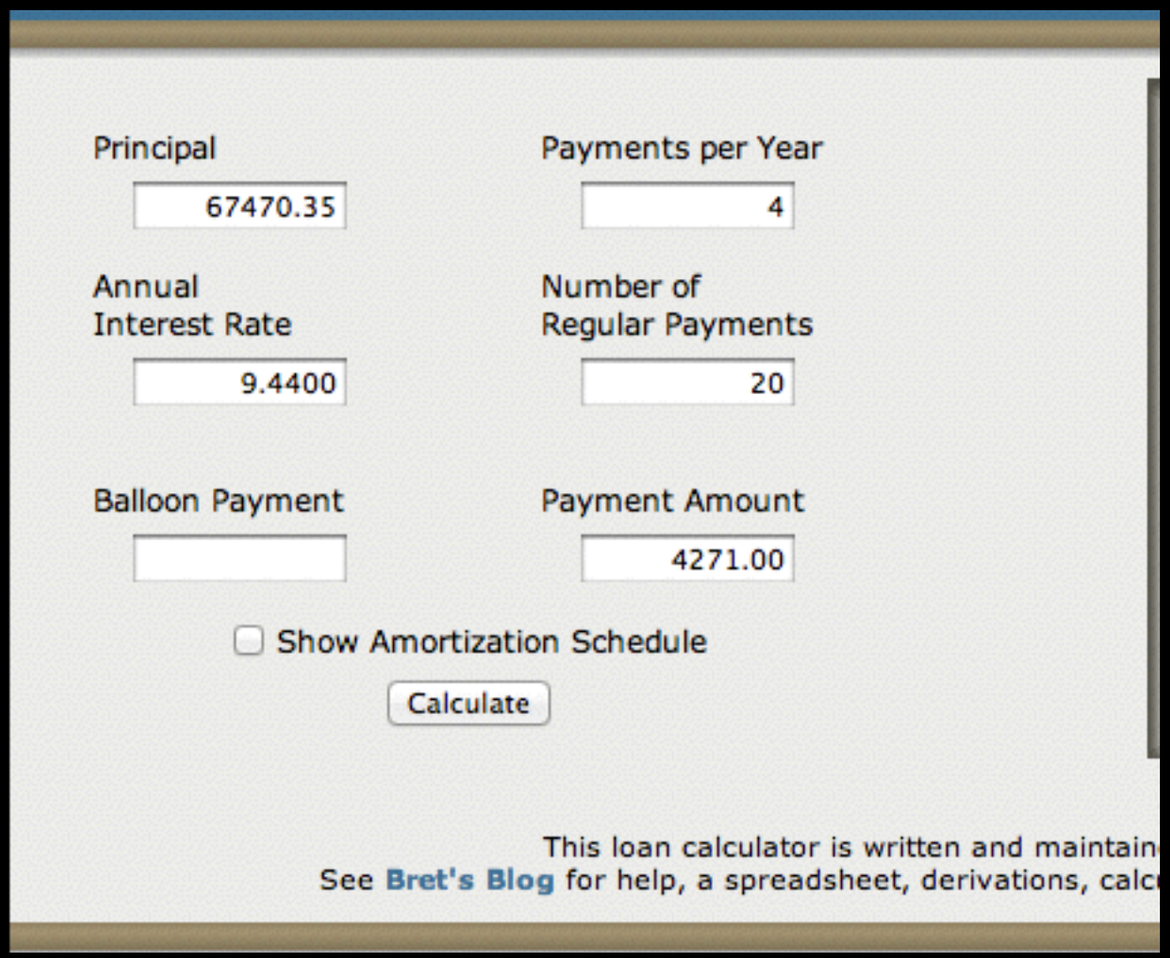
In one of the most spectacular and swift reversals of fortune in the entertainment industry, EMI Records said yesterday that it had ended its agreement with Mariah Carey, who has had more No. 1 songs than any musical artist except Elvis Presley and the Beatles.

EMI signed Ms. Carey only last April to one of the music industry's most lucrative contracts, guaranteeing a reported $80 million for five albums.

PV of a stream of income
using mortgage calculator backwards

http://bretwhissel.net/amortization/amortize.html

Let's try pricing this catalogue again.
This time let's pretend that we got expert advice from the risk management dept
They told us to use the median quarterly income and an interest rate of $9.44 %



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MBUS 3000

Interest Rates, PV and Financial Bubbles

Bubbles in the Music Industry
The Three I’s

two ways of understanding bubbles

interest rates in PV calculations

Minsky Theory

Hedge
Speculator
Ponzi
(same as three “I” s)

France vs Greece

More risk results in those countries paying a lot higher interest rate than the expected rate based on inflation. There is more risk.

$10,000 from the government of Greece due 10 years from now.
compare that to
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Properly Functioning Markets

The Recording Advance and Royalty

Unknown/New Artist
12% royalty
Implied Interest rate 88%
$100,000 Advance

Reflects increased risk

Risk priced properly

Established Successful Artist
18% artist royalty
Implied Interest Rate 82%
250,000 Advance

The Recording Advance and Royalty

Unknown/New Artist
16% royalty
Implied Interest rate 84%
$250,000 Advance

if too close

Bubble !!

Established Successful Artist
18% artist royalty
Implied Interest Rate 82%
250,000 Advance

Subjectively

our method

Often there are loans associated with these assets.
Formal bank loans or margin loans.
Or informal loans like
in music business things like “advances”
and recording budgets

When the difference between interest rates
for risky borrowers and safe borrowers *seems* too narrow
You have a bubble.

Financial Bubbles
(and Interest rates)

One of the most vexing financial problems
(And how music business helps you understand it)

Some famous financial bubbles

Tulips Holland 1634-38
The French Mississippi Company 1719-1720
The South Sea Company 1720
Railway Mania UK 1840s
Florida Land Boom 1926
Roaring ‘20s Stock market bubble 1929
Japanese Stock/Real Estate Bubble 1980’s
Dot Com Bubble 1995-2000
US Housing Bubble 1999-2006

The Grunge Bubble 1992-1999

Minsky the financial instability hypothesis

Minsky made a pretty good attempt at defining bubbles. He noted that when the “hedge borrowers, speculative borrowers and ponzi borrowers” begin accumulating a lot of debt you have a bubble underway. Without going into this in too much detail that is what happened in our recent financial crisis.

The "hedge borrower" can make debt payments (covering interest and principal) from current cash flows from investments. For the "speculative borrower", the cash flow from investments can service the debt, i.e., cover the interest due, but the borrower must regularly roll over, or re-borrow, the principal. The "Ponzi borrower" (named for Charles Ponzi, see also Ponzi scheme) borrows based on the belief that the appreciation of the value of the asset will be sufficient to refinance the debt but could not make sufficient payments on interest or principal with the cash flow from investments; only the appreciating asset value can keep the Ponzi borrower afloat. Because of the unlikelihoodof most investments' capital gains being enough to pay interest and principal, much of this type of finance is fraudulent.

Hedge Borrower
Speculator
Ponzi

example from mortgages

Normal mortgage: principal plus interest
Sub Prime: interest only
Negative Amortization: payment doesn't cover interest.

Or in stock traders parlance

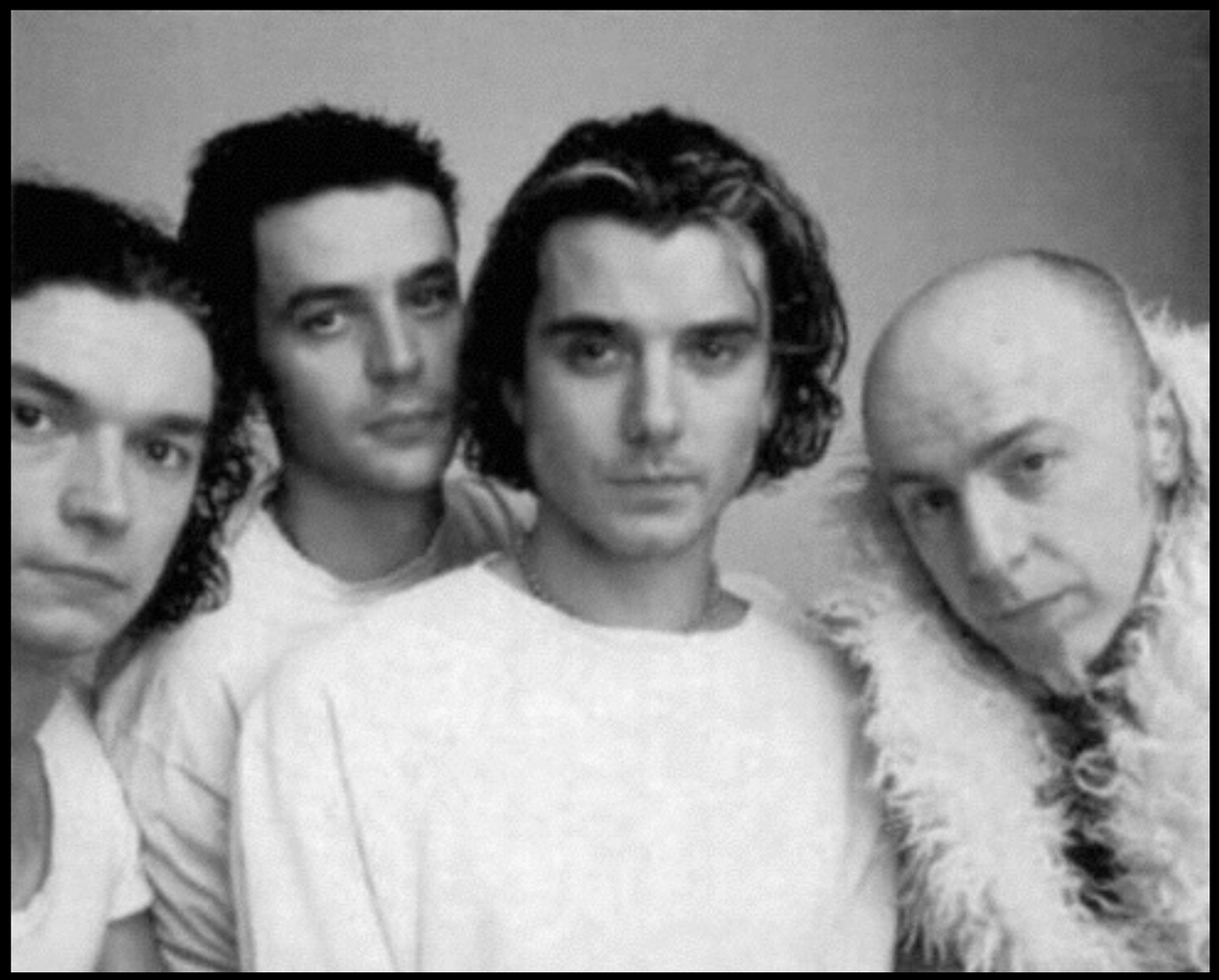
The 3 “I”s
Innovators
Imitators
Idiots

The Grunge Bubble 1992-1999

Pearl Jam

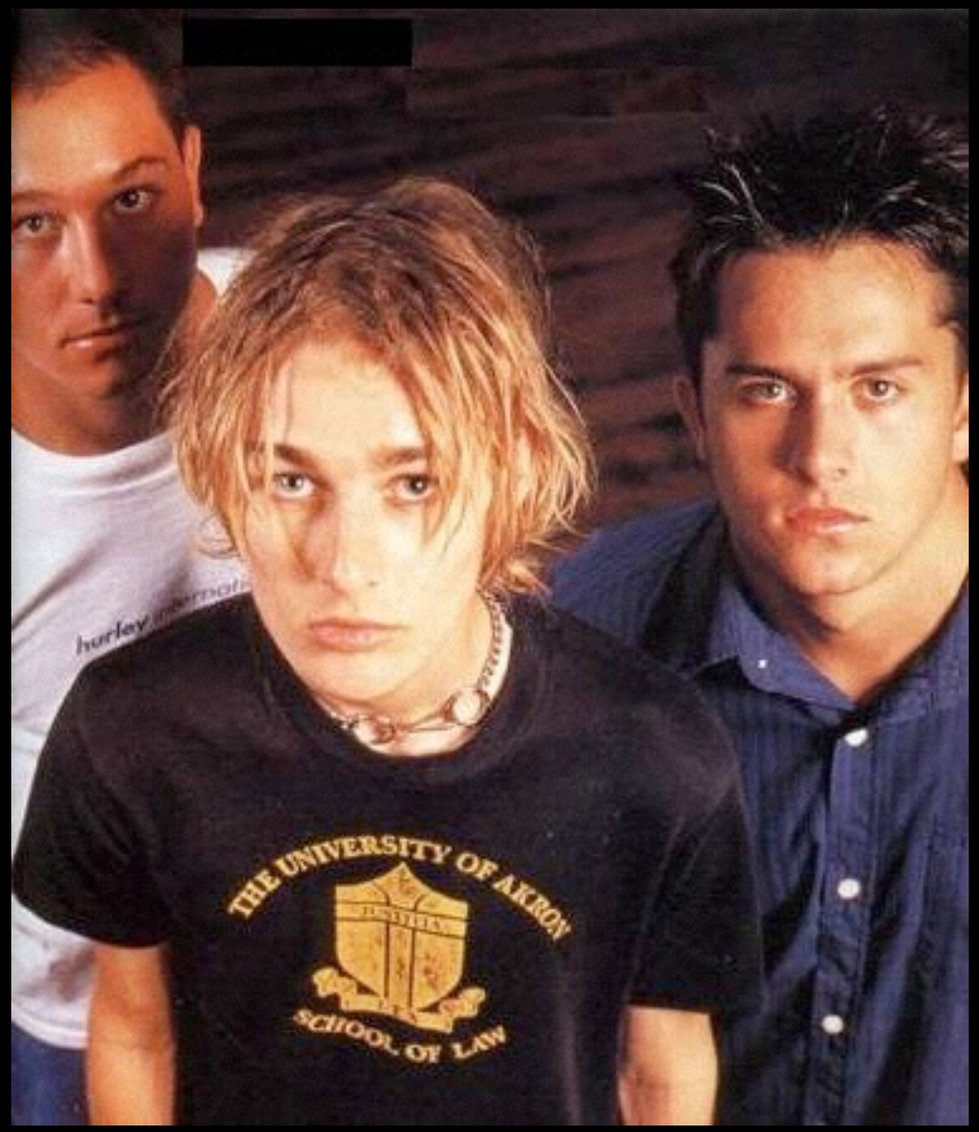
Stone Temple Pilots

Candlebox



Bush

(who's the weird old guy in feather boa?)



Teeny bopper entry
Silverchair

What is Normal Variation?

Wild Variation?

Gauss

normal variation

gaussian variation

---

adult male height

all baseball statistics

number of consecutive “heads”

tons of coal per worker per day

radioactive decay *

cauchy

mandelbrot

variation gone wild

"wild"

Cauchy

Non-Gaussian

Mandelbrotian variation

---

frequency of words in english

distribution of wealth in a society

Stock price changes

website hits

book sales

YouTube video views (proxy song sales)

Normal Variation

Average US Male Height 5’ 9.5”

Bao Xi Shun 7’ 9”

1,000 american men in room average = 5’9.5”

Remove one and add Bao Xi Shun

5’9.502

“Tyranny of the Average”
Individual events not consequential

Wild Variation

Average net worth 25-34 American
$8,525

1,000 Americans 25-34 in room average net worth
$8,525

Take one out and add richest American 25-34

Black Swan → (Mark Zuckerberg $40.4 Billion)

$40,408,516.48

“Tyranny of the Accident”
“Black Swans”
Individual events can be highly consequential

Wild Variation

(hypothetical values)

Average revenue generated by album per year
$8,525

1,000 albums average revenue per year
Total revenue = 8,525,000

Take one out and add best selling album
$40.4 million

Average per album $48,916.47
Total Revenue $48,916,475

“Tyranny of the Accident”
“Black Swans”
Individual events can be highly consequential
Long Volatility/Long Tail Strategy
allows entity to capture all the upside

Secret Reason #1 Record Labels, Publishers
and other aggregators of music rights are profitable.

Secret reason #1 record labels/publishers other aggregators are profitable:

The variation in revenue from recorded music is wild *

The music business is a marketplace for songs and recordings
Marketplaces tend to undervalue wild variation**

On average and over the longterm the marketplace undervalues the songs and recordings***

(especially the "longshots")
(not Mariah Carey)

* YouTube views as proxy for record sales
**Option trading theory and strategies suggest this. Also "The Black Swan" Nassim Taleb
*** Empirical observation: record labels and publishers are profitable. Also "prospect theory."

Markets tend to underprice revenue streams when “wild” variation present.

Specifically Artists/Songwriters on average and over long term underprice their recordings and songs.

Which means labels buy them under market value.

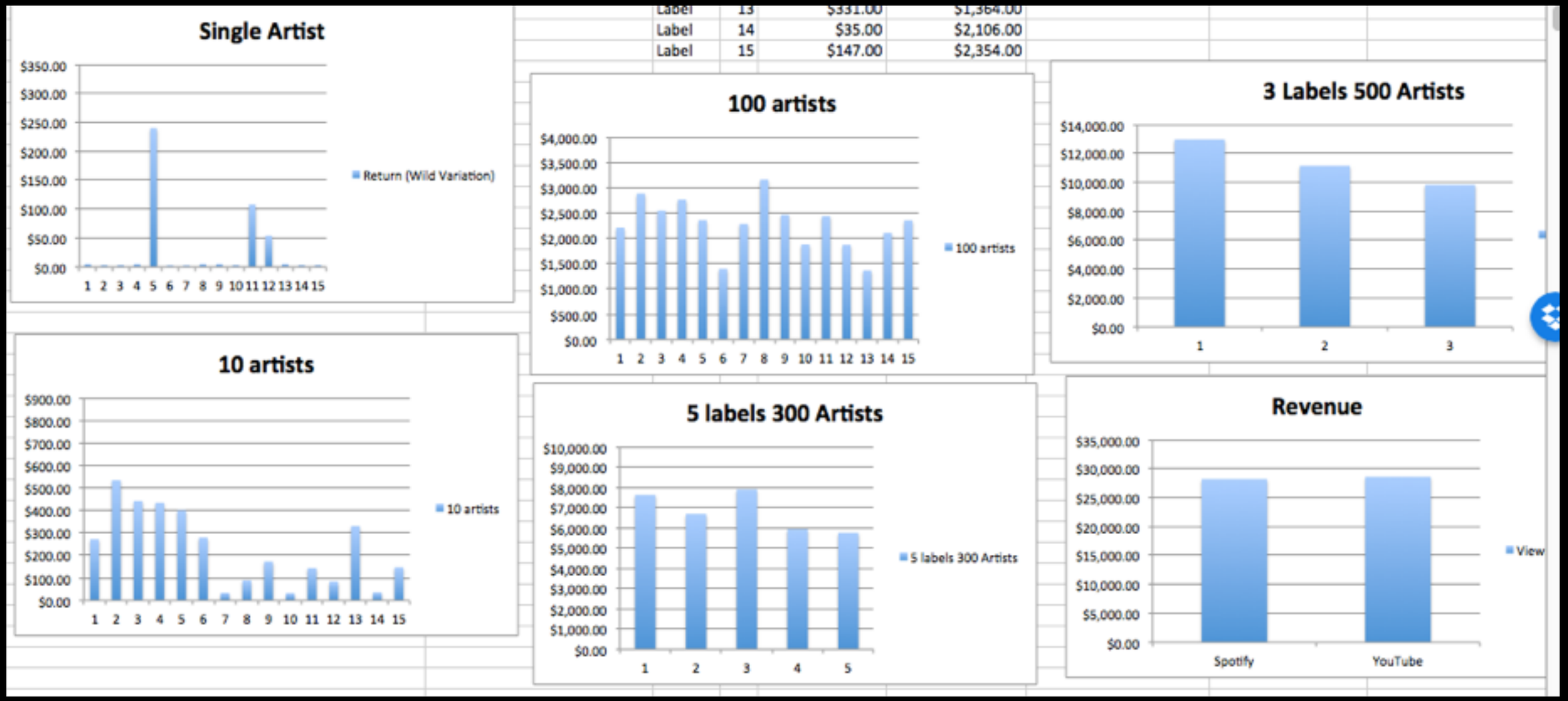
Who are the “aggregators”
in music business?

<white board>

<Whiteboard examples>

On midterm I will give you different scenarios
and ask you if entity is Long Tail/Long Volatility

Long Tail/Long Volatility in Action



more “long tail” →

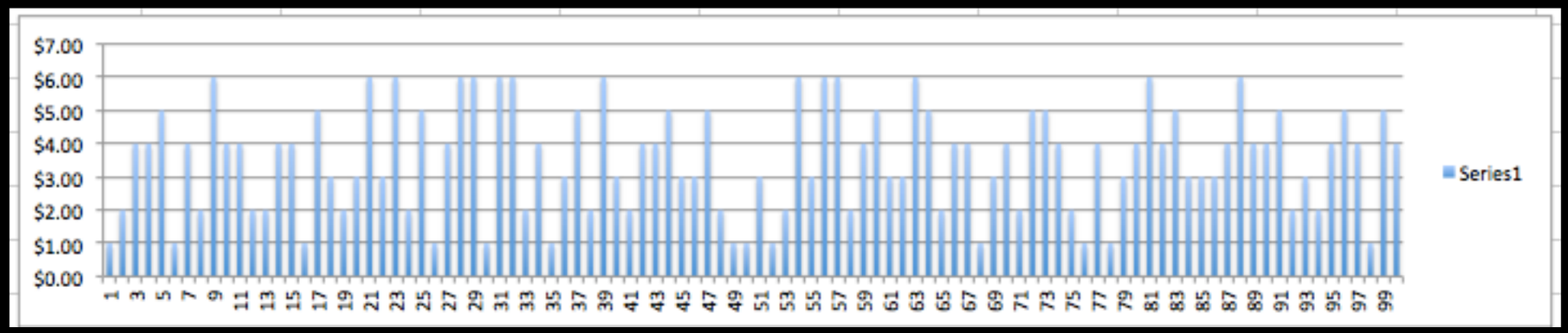
Revenue more stable when more “bets”

Wild to Normal

Businesses with stable revenue more likely to stay solvent

Less Risk/Lower Interest

Normal Variation
concert revenue single venue
short volatility
limited upside
skill important
Problem: market *generally* overprices* live performances



*Overpriced?
Everyone wants to be in showbiz. “Aspirational” buyers.
Cross Subsidy. Concert venue also selling beer liquor food parking can pay too much