

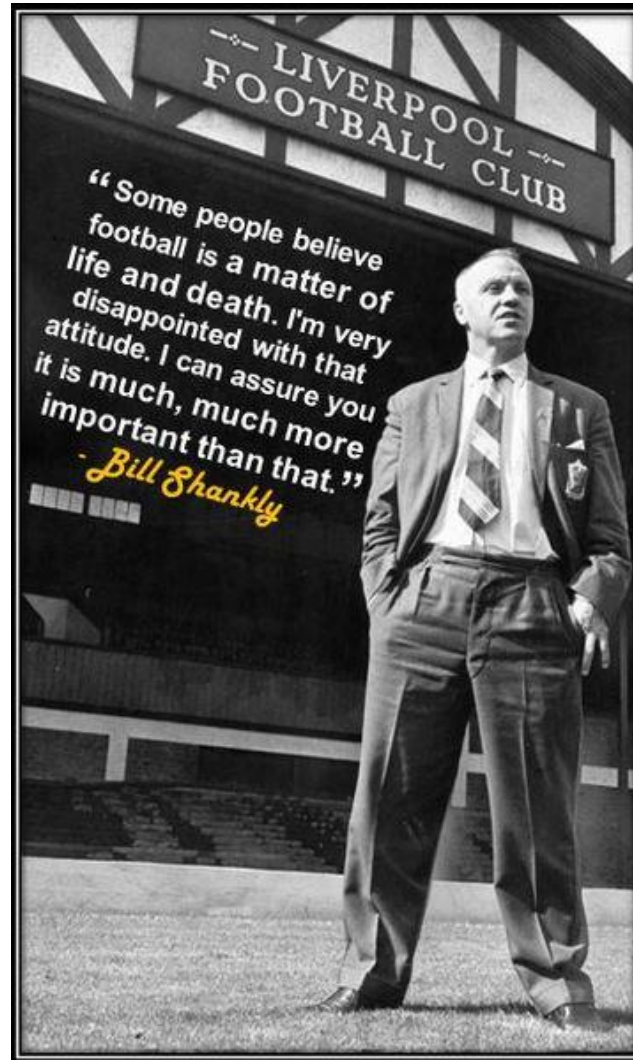
EUROPEAN
CHAMPIONS



7H3 NUM83R5 G4M3
Measurement lessons from football
London- June, 2016

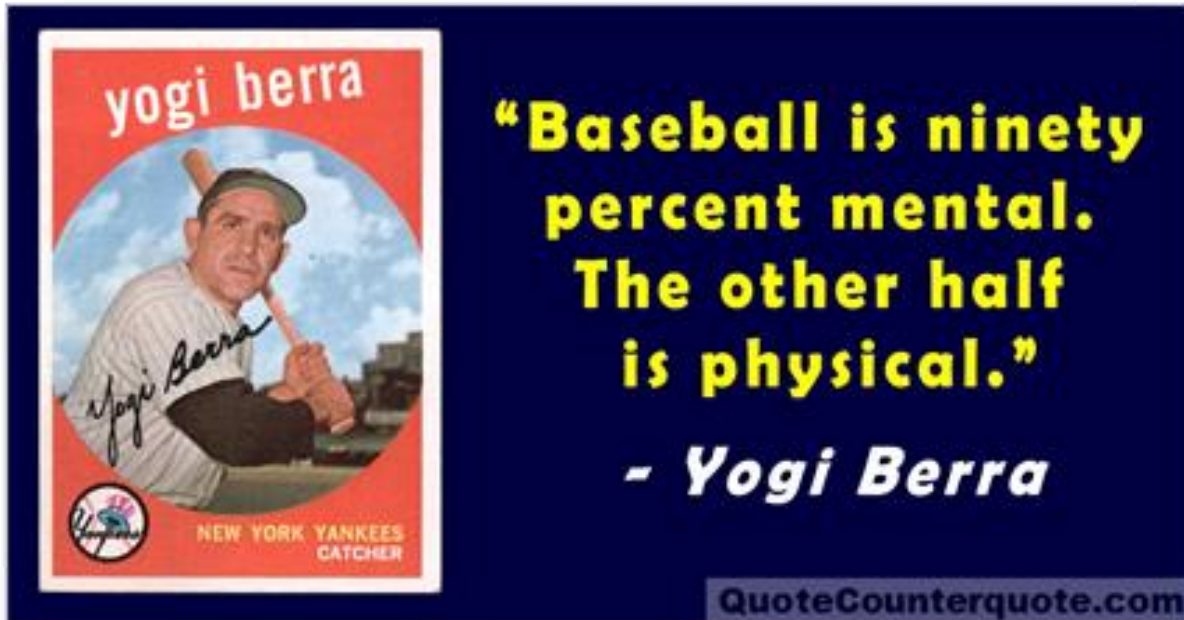


Football is life... the rest is details



But what's the connection with numbers?

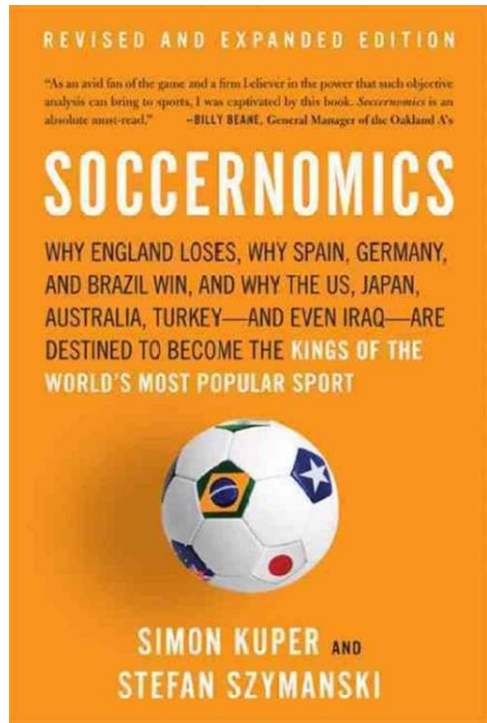
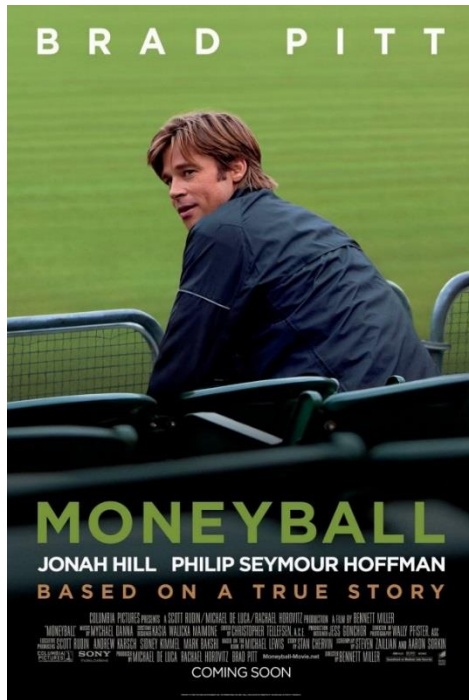
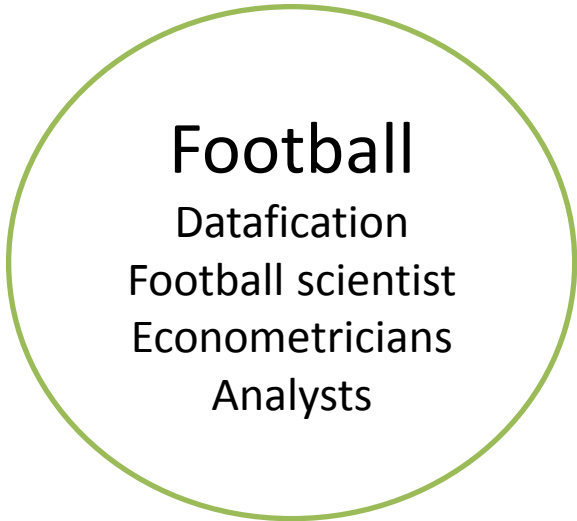
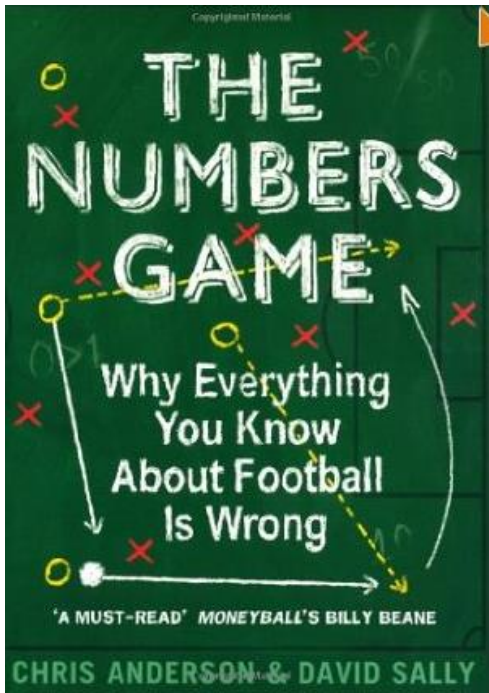
Counting in sports started with baseball...



“Baseball is ninety percent mental. The other half is physical.”

- Yogi Berra

QuoteCounterquote.com



Which is the best football country in the world?
Is it...?



How can we tell?



FIFA/Coca-Cola World Ranking

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Men's Ranking

02 June 2016

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[POSITIONS](#)
[1-50](#)
[51-100](#)
[101-150](#)
[151-200](#)
[201-209](#)

■ Worst mover
 ■ Best mover

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ENTER
TO WIN
>

Rank	Team	Total Points	Previous Points	+/-	Positions	2016 (100 %)		2015 (50 %)		2014 (30 %)		2013 (20 %)		
						Avg.	AVG WGT	Avg.	AVG WGT	Avg.	AVG WGT	Avg.	AVG WGT	
1	Argentina	1503 (1503.35)	1532	0	◄	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	▼
2	Belgium	1384 (1383.71)	1364	0	◄	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	▼
3	Colombia	1328 (1328.16)	1337	1	▲	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	▼
4	Germany	1310 (1310.49)	1309	1	▲	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	▼
5	Chile	1293 (1293.33)	1353	-2	▼	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	▼
6	Spain	1267 (1266.6)	1277	0	◄	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	▼
7	Brazil	1257 (1256.82)	1261	0	◄	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	▼

1		Argentina		1503
2		Belgium		1384
3		Colombia		1328
4		Germany		1310
5		Chile		1293
6		Spain		1267
7		Brazil		1257
8		Portugal		1181
9		Uruguay		1150
10		Austria		1077
11		England		1069
12		Italy		982
13		Ecuador		978
14		Netherlands		959
15		Switzerland		948
16		Mexico		942
17		France		925
18		Turkey		919
19		Ukraine		984



1		Belgium
2		Germany
3		Spain
4		Portugal
5		Austria
6		England
7		Italy
8		Netherlands
9		Switzerland
10		France
11		Turkey
12		Ukraine
13		Hungary
14		Bosnia & Herzegovina
15		Romania



16		Slovakia
17		N. Ireland
18		Wales
19		Croatia
20		Poland
21		Russia
22		Czech
23		Rep of Ireland
24		Iceland
25		Sweden
26		Denmark
27		Greece
28		Albania
29		Scotland

FIFA Global Ranking- Methodology

Introduced in 1992
209 countries included > U.N.
A point System
Win/Draw/Lose (3/1/0)

System criticized and Revamped in 1999, and 2006
Last 4 years, instead of last 8 years
More recent results > Less recent results
Match Result (Win = 3 points, Draw = 1 point)
Match status
Opposition Strength
Regional Strength

Rankings used for
Awards: Best Team, Best Mover
Grouping teams for championships

FIFA Global Ranking- Lessons

Helpful to have a global objective measurement
A composite one number based on transparent factors
Actionable
But...

Need to balance accuracy with simplicity
One overall Measure + Key Drivers
Make it transparent
Give Awards for Strength and improvement
Keep learning and improving

Use the measurement for generalizable learning
3 Factors explain most of countries football performance
Population, Wealth, History

**CHARITY
BRAND
INDEX**

2015

Third Sector RESEARCH



A composite measure covering

Awareness

Familiarity

Relevance

Distinctiveness

Trust

Willingness to Donate

KPIs & PIs



In the 2010 champions League final, 2,842 events were recorded, of which two were goals

Insights come from identifying new measures

The trend will continue: If it can be measured, it will be. BIG Data

What to measure?

Not everything that can be counted counts

Goals, shots, passes, free kicks, corner kicks, off-sides, penalties

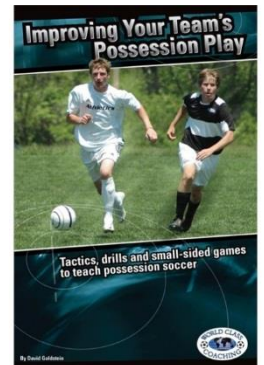
In an average game the ball changes hands (feet) 400 times



Teams scored roughly in 1 out of 9 shots
(Based on data collected over 15 years)

Theoretically, Ball Possession implies more passes and more opportunities to shoot, so, more goals

There are 3 kinds of people...



What to Measure?

	Team A	Team B
Ball Possession	52	48
Shots at goal	18	14
Corner Kicks	7	5



New Measures- Measuring Quality: The Packing Rate

Principle: To score, teams need to advance & beat defenders

Packing Rate: Number of opponents beaten

Impect Rate: Number of defenders beaten

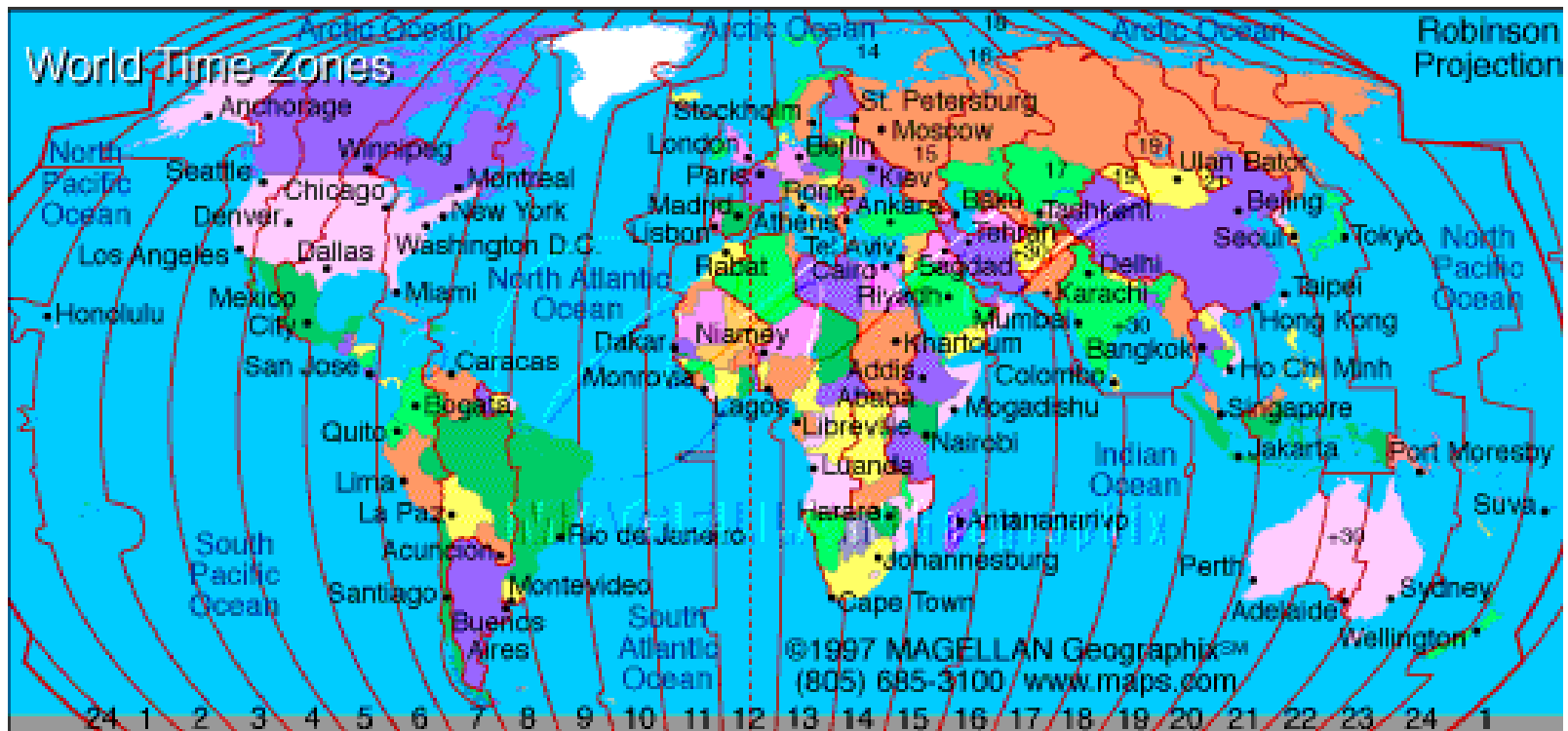
Not all passes are created equal

For offence a higher beat rate is a positive score

For defense, a lower beat rate is a positive score



But Italy is different...

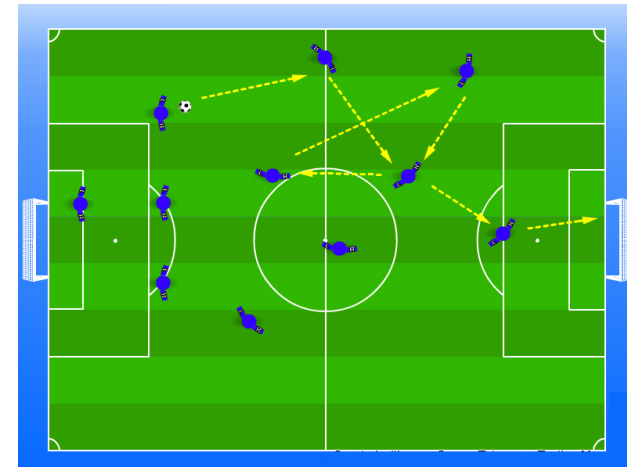


or is it?

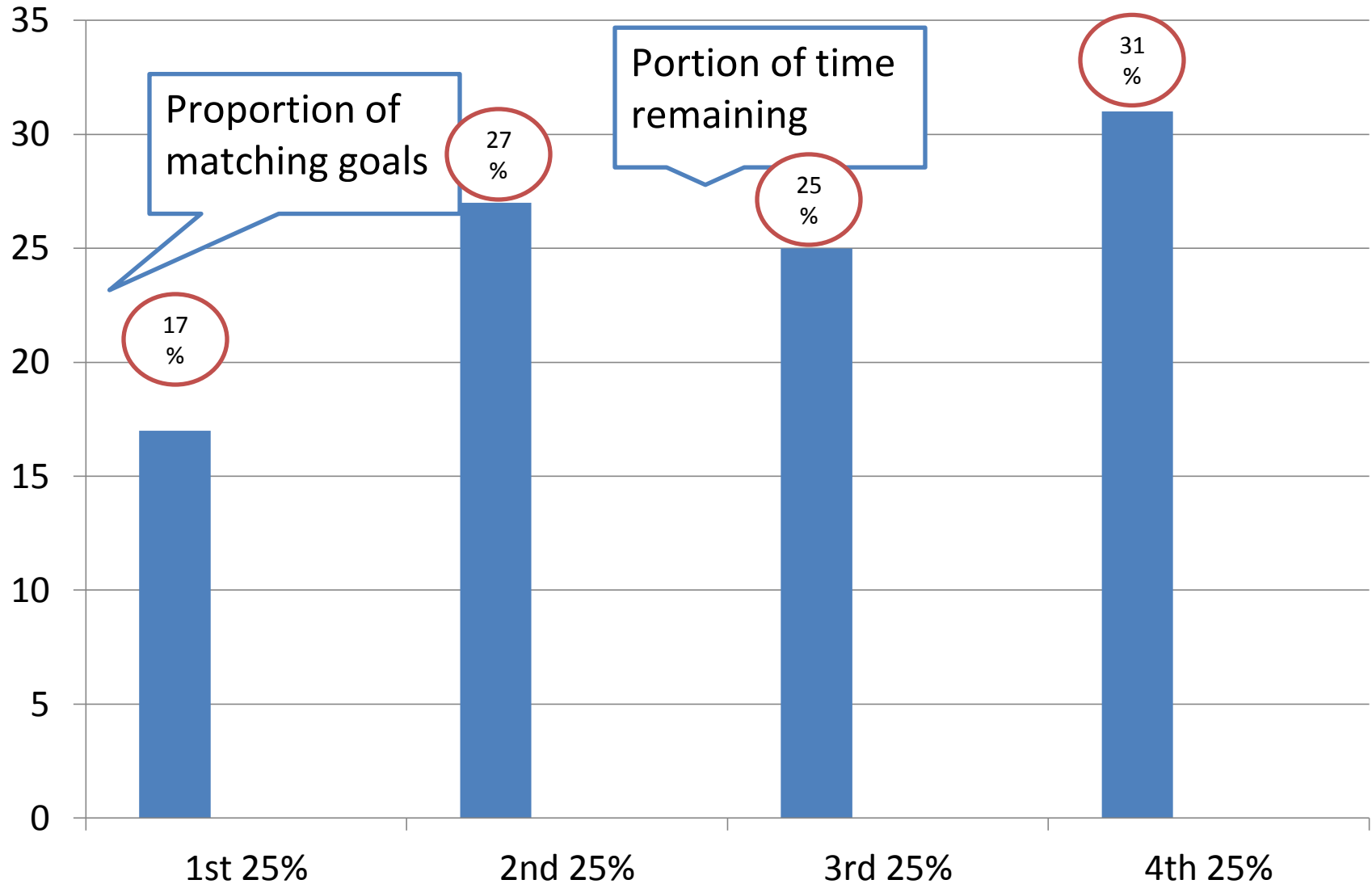
Average per Match	Bundesliga	La liga	Premier league	Serie A
Total passes	425	448	438	449
Long passes	59	56	57	54
Short passes	332	355	343	356
Shots	12.9	13	14.5	13.8
Shots on target	4.6	4.8	4.6	4.4
Corners	4.9	5.4	5.5	5.3
Penalties	0.14	0.15	0.13	0.14

Everybody knows that...

Teams are **most vulnerable** (likely to concede a goal) just after they've scored.



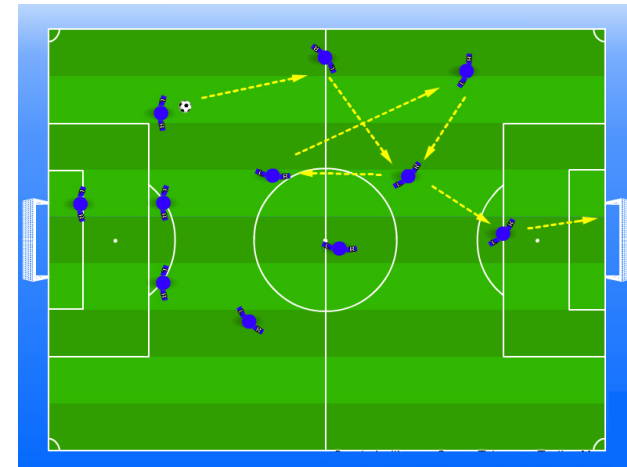
Are teams most vulnerable after they've scored? (Team B is most likely to score after team A has scored?)



Everybody knows that...

Teams are **most vulnerable** (likely to concede a goal) just after they've scored.

Corner kicks are extremely valuable, next to penalty kicks.



Everybody is wrong... (Illusions?)

Teams are **least** vulnerable (likely to concede a goal) just after they've scored.

Corner kicks have practically a zero value (0.022)

Knowledge
Management



Ignorance
Management

I know it is a fact, but is it a true fact?

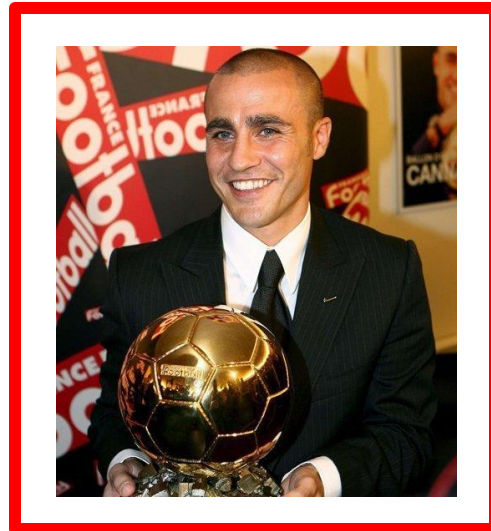
The great tragedy of science -
the slaying of a beautiful
hypothesis by an ugly
fact. Thomas Huxley



From Sherlock Holmes' Silver Blaze



Past 50 years, 1 one defender won the Ballon d'Or award of best player. Why? Well, attackers score goals; defenders don't. You see the goal that was scored, but you don't see the goal that was prevented. Some analysts estimate that a prevented goal is more valuable than a scored one.



Dogs that don't bark

0>1

BUT THE DOG DID
NOTHING IN THE
NIGHTTIME! THAT IS
THE CURIOUS
INCIDENT!

QUOTEHD.COM

Zero goals conceded is more valuable than one goal scored
Goals that don't happen are more valuable than goals that do

Defense statistics are harder to measure than offence statistics

Today, football analysts are tracking and measuring the passes and goals prevented by defenders –directly, through clear interventions, and indirectly, through moving to the right space at the right moment





What is the best thing for the goalkeeper to do in a penalty kick?



Jump to the right

Jump to the left

Jump right & left

Stay in the center

It doesn't matter





A study of 286 penalty kicks, worldwide, the optimum strategy is to...
Stay in the goal's center

However
Most goalkeepers jump to the right or left
Why?

The norm is to jump.
A goal feels worse following inaction (stay in center)
Than following action (jumping)

**TAKE
ACTION
NOW!**



False Dilemma

A type of logical fallacy that involves a situation in which only two alternatives are considered, when in fact there are additional options (sometimes shades of grey between the extremes)

Our competitor launched a new product?
We must launch our new line-extension, even if research says x, y, and z.
We cannot sit here and do nothing!

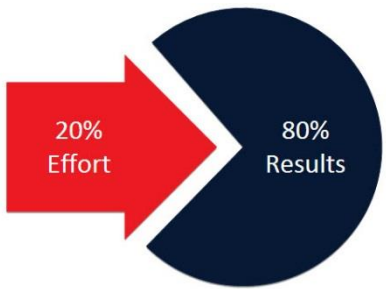
Fix the product and launch later.
Launch on a smaller scale.
Focus on the current business.
Launch brand building advertising.
Run tactical promotions.
Do nothing.





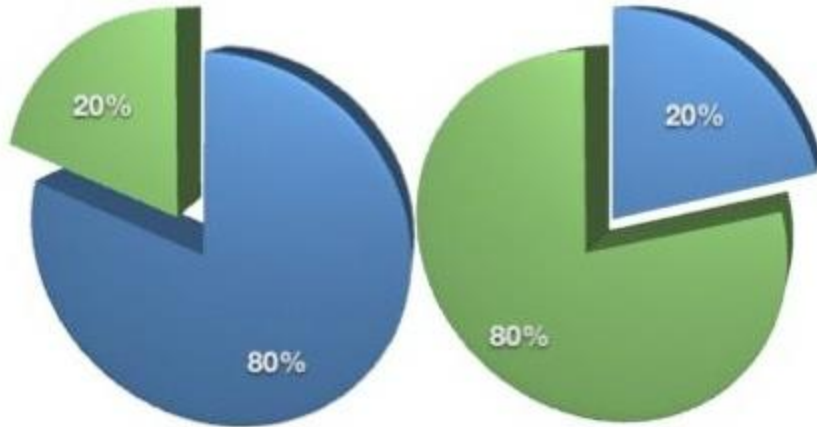






	La Liga	Copa del Rey	Champions League	Total
Suarez	40	5	8	53
Messi	26	5	6	37
Neymar	24	4	3	31
Rakitic	7	0	2	9
Munir	3	5	0	8
Pique	2	2	1	5
Sandro	0	3	0	3
Turan	2	0	0	2
Bartra	2	0	0	2
Rafinha	1	0	0	1
Alves	0	1	0	1
Iniesta	1	0	0	1
Alba	0	1	0	1
Roberto	0	0	1	1
Others	1	1	1	3
Top 3	90 (83%)	14 (52%)	17 (77%)	121 (75%)
Total	109	27	22	161

Pareto Principle



20% of the input (time, resources, effort)
accounts for 80% of the output (results, rewards)

A prioritization tool, applied to:
Brands, products, SKUs, Retailers,
Customers, Countries, etc.
For current value, and Change

The 50/5 Principle

The 50/5 Rule

Bottom 10 players scored 12 of 121 goals

	La Liga	Copa del Rey	Champions League	Total
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Turan	2	0	0	2
Bartra	2	0	0	2
Rafinha	1	0	0	1
Alves	0	1	0	1
Iniesta	1	0	0	1
Alba	0	1	0	1
Roberto	0	0	1	1
Others	1	1	1	3
Bottom 10 (of 17)	7 (6%)	3 (11%)	2 (9%)	12 (7%)
Total	109	27	22	161

	La Liga	Copa del Rey	Champions League	Total
Suarez	40	5	8	53
Messi	26	5	6	37
Neymar	24	4	3	31
Rakitic	7	0	2	9
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Turan	2	0	0	2
Bartra	2	0	0	2
Rafinha	1	0	0	1
Alves	0	1	0	1
Iniesta	1	0	0	1
Alba	0	1	0	1
Roberto	0	0	1	1
Others	1	1	1	3
Top 3	90 (83%)	14 (52%)	17 (77%)	121 (75%)
Total	109	27	22	161



brightspot

FAIRSHARE

Football Forecasting



Success Rate 85% (11/13)

9 countries out of 50 European countries won the 14 championships (18%)

3 countries won 8 cups, more than half



Year	Host	Winner	Second
1960	France	S. Union	Yugoslavia
1964	Spain	Spain	S. Union
1968	Italy	Italy	Yugoslavia
1972	Belgium	Germany	S. Union
1976	Yugoslavia	Czech	Germany
1980	Italy	Germany	Belgium
1984	France	France	Spain
1988	Germany	NL	S. Union
1992	Sweden	Denmark	Germany
1996	England	Germany	Czech
2000	Be + NL	France	Italy
2004	Portugal	Greece	Portugal
2008	Aust + Switz	Spain	Germany
2012	Pol + Ukr	Spain	Italy
2016	France		

Germany	3
Spain	3
France	2
Italy	1
NL	1
Denmark	1
Greece	1
S. Union	1
Czech	1

3 times out of 14 (21%)

The host won

41 countries never won

Some highly unlikely...

Judgment





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EURO 2016



The following is an analysis from Goldman Sachs Research economists Jan Hatzius, Jari Stehn and Donnie Millar, originally published June 3, 2016.

THE ECONOMETRICIAN'S TAKE ON EURO 2016

- We present a model for predicting the outcome of the 2016 European Football championship in France from June 10 to July 10. It is similar to our model for the 2014 World Cup. Using historical performance data for each team – most importantly:

How the forecasting model works



A probabilistic model

Uses Multiple Regression to predict number of goals

Input is Historical Data:

All international matches since 1958 (4,719 matches)

Number of goals scored by team

Number of goals conceded by opponent

A Home factor

A Euro Championship factor

No room for human judgment

Output is :

A set of probabilities, by stage

Goldman Sachs Euro 2016 Forecasting Model Outcome

Exhibit 1: Probabilities of Advancement in Euro 2016

Team	Second Round	Quarters	Semis	Final	Champion	Memo: Elo Rating
France	97.5	73.0	54.1	34.8	23.1	1947
Germany	95.7	72.5	50.0	31.9	19.9	2037
Spain	88.3	61.6	39.4	24.0	13.6	1977
England	92.0	60.7	35.7	20.4	10.5	1934
Portugal	91.9	56.0	30.3	16.5	8.0	1885
Belgium	84.7	47.8	25.3	12.5	5.7	1896
Russia	77.7	39.9	17.1	6.9	2.6	1747
Croatia	63.6	30.5	14.0	5.9	2.2	1794
Ukraine	68.8	32.3	14.4	5.7	1.9	1797
Czech Republic	61.8	28.8	12.7	5.1	1.7	1728
Poland	68.9	31.2	13.3	4.8	1.5	1762
Italy	65.2	27.2	11.1	4.5	1.5	1844
Turkey	57.0	25.0	10.5	3.9	1.3	1797
Switzerland	65.0	26.5	10.2	3.5	1.2	1753
Austria	70.6	29.1	10.1	3.6	1.1	1766
Ireland	62.5	25.0	9.9	3.5	1.1	1751
Romania	65.2	26.2	10.3	3.7	1.0	1738
Sweden	58.0	22.3	8.1	2.8	0.9	1735
Slovakia	58.8	23.6	7.9	2.3	0.7	1715
Hungary	57.8	19.6	5.7	1.7	0.3	1671
Iceland	47.5	14.3	3.5	1.0	0.2	1647
Wales	39.5	11.9	2.7	0.5	0.1	1638
Northern Ireland	30.3	7.6	1.9	0.5	0.1	1578
Albania	31.6	7.6	1.8	0.4	0.0	1578



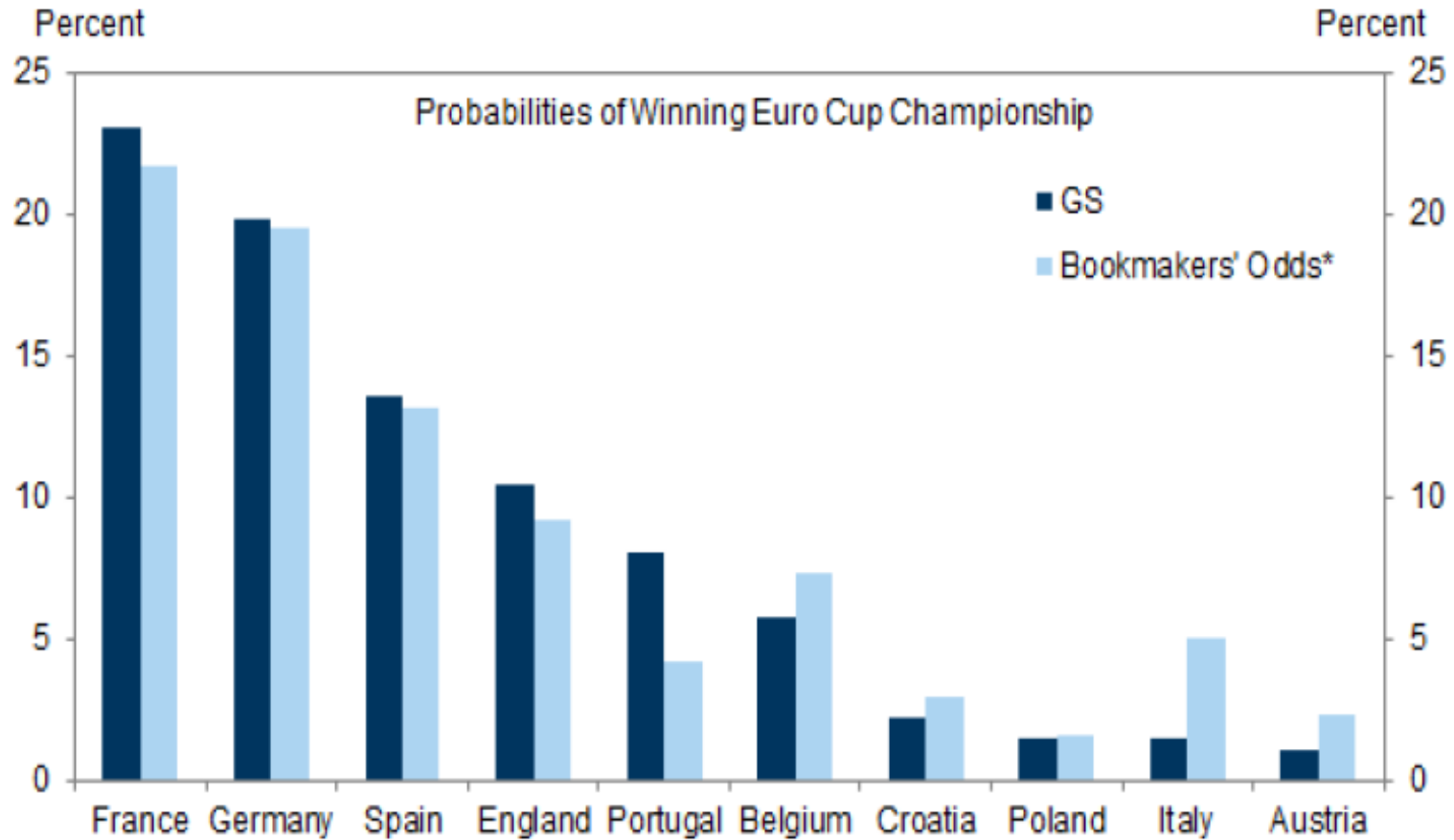
The football forecaster



GoWin!

Cross-check the model vs. betting

Exhibit 5: Not Very Far from Bookmakers' Odds



* Rescaled to account for the bookmakers' over-round. See "Understanding The Math Behind Betting Odds & Gambling" on Investopedia.com for additional detail.

Validating the Model against 2014 World Cup Hits & Misses

Identified 3 of 4 Semifinalists

Updated forecasts were
accurate

Got 9 of 16 advancing teams

Gave Brazil 48% probability
of winning the WC

Important Tips for Forecasting

Check your inputs

Cross check your forecast against other estimates

Validate your forecast and refine your model

Update your forecast with new data, regularly



Study the past, if you would divine the future.


(Confucius)

izquotes.com

- History is a good, but not perfect, predictor
- Build solid historical databases
- Identify patterns
- Narrow down the forecasting range
- Will miss the completely new
- Cross-check your forecast against other estimates
- Validate your forecast and refine your model

So, who will win today?

Russia		Slovakia	

France		Albania	

Romania		Switzerland	

Drinks

Me

If you forget everything else, remember



Use an overall indicator and measure its drivers



Verify myths “What everybody knows” - Ignorance management



Use Analysis Tools: 80/20 Rule (and 50/5 rule), Fair Share, ...




Take Action, but avoid the Action Bias and the False Dilemma



Track what does not happen and what is not said



Identify new measures and refine current ones



Study the past to forecast the future
Assess the inputs, Check vs. other forecasts, Update, Validate



and think how best to communicate your data and analysis...

Two important tips for success in communicating data, and for communication in general

1. Never tell people everything you know