

# 25) Super returns to Super Bowl ads?

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Davidowitz et. al (2014). **Super returns to Super Bowl ads.**

## Empirical Specification

$$y_{cmt} = \alpha_0 + \alpha_1 x_{cms} + \epsilon_{cmt}$$

$$x_{cms} = \beta_0 + \beta_1 z_{cms} + \delta_{cms}$$

$t$  = date where outcome is measured (opening week)

$s$  = date when ads are seen (Super Bowl)

$y_{mct}$  = outcome for movie  $m$  in city  $c$  at time  $t$

$x_{cms}$  = advIEWS for movie  $m$  in city  $c$  at time  $s$

$z_{cms}$  = fans of team from city  $c$  exposed to ad for movie  $m$  at time  $s$

**Ad views:** Nielsen ratings for the 2004-2014 Super Bowls

56 designated media markets

70 movies advertised

Released within 6 months after the game date

Median = 54 days

SD = 50 days

# Google Trends Data

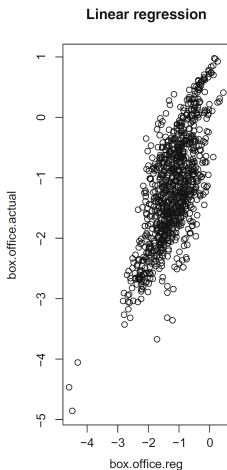
**wolverine:** animal, university mascot, brand of boots, Marvel comics

**Google entity identifier:** disambiguate different uses of a word by using contextual information associated with the search

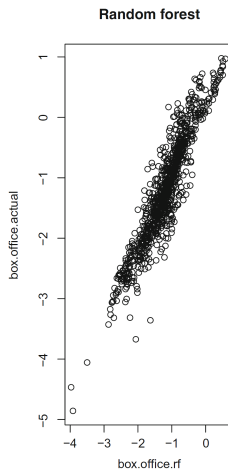
If user searched for other animals in the session where a search for [wolverine] occurred, that user is likely looking for information about the animal

# Box Office Sales vs Prediction?

Google searches prior to the Super Bowl, type of movie, distributor, rating, DMA, city and movie fixed effects



$$R_{ols}^2 = 0.51$$



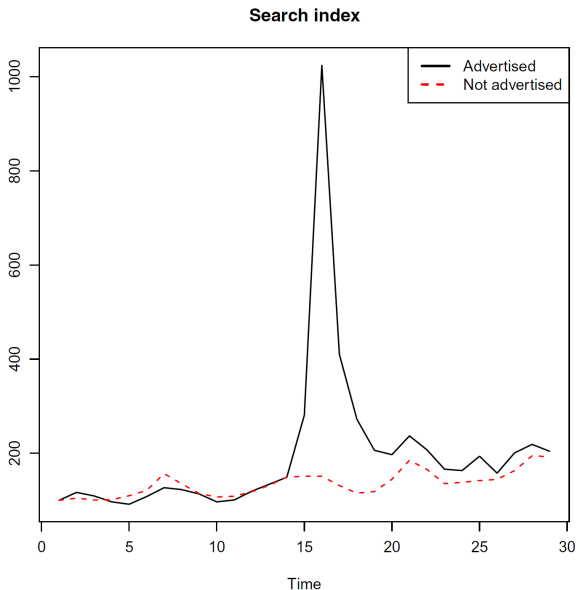
$$R_{rf}^2 = 0.87$$

# First Stage

	Nielsen Ratings	
	(1)	(2)
City of AFC Championship Game Winner		0.077*** (0.009)
City of NFC Championship Game Winner		0.076*** (0.008)
Super Bowl Host City		0.063*** (0.008)
Constant	0.455*** (0.004)	0.451*** (0.003)
Adjusted R-squared	0.66	0.75
Observations	616	616

City and year fixed effects are included in all specifications  
Robust standard errors clustered at the city-year level

# Nationwide Searches for Movies





# Effects of Advertising

	log(Google Searches on Release Week)		log(Box Office PC)	
	(1)	(2)	(3)	(4)
Nielsen Ratings	0.314 (0.243)	0.762** (0.318)	0.484** (0.225)	0.771** (0.362)
log(pre Search)	0.068*** (0.018)	0.069*** (0.017)	0.035*** (0.013)	0.035*** (0.012)
Adj. R-squared	0.89	0.89	0.96	0.96
Observations	3,080	3,080	1,088	1,088
Specification	OLS	2SLS	OLS	2SLS

City and year fixed effects are included in all specifications  
Robust standard errors clustered at the city-year level

# Ad Sales for Super Bowl

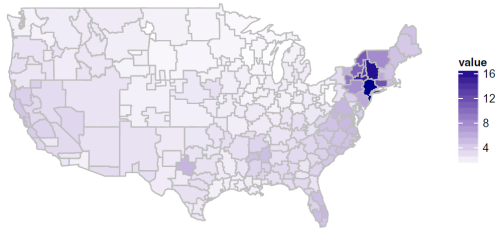
Year	Snippet	Date	Source
2003	fewer than 10 spots available	Jan 06 2003	<a href="http://superbowl.ads.com">superbowl.ads.com</a>
2004	–NA–	–NA–	–NA–
2005	said Thursday all 59 slots had been sold	Feb 02 2005	<a href="http://money.cnn.com">money.cnn.com</a>
2006	80 % sold	Dec 18 2005	<a href="http://www.mediapost.com">www.mediapost.com</a>
2007	first half sold out	Jan 03 2007	<a href="http://money.cnn.com">money.cnn.com</a>
2008	90 % sold out by first week in Nov	Nov 07 2007	<a href="http://money.cnn.com">money.cnn.com</a>
2009	much was sold out by September	Jan 09 2008	<a href="http://money.cnn.com">money.cnn.com</a>
2010	had finished selling commercial time	Feb 01 2010	<a href="http://articles.latimes.com">articles.latimes.com</a>
2011	3 months before	Oct 29 2010	<a href="http://adage.com">adage.com</a>
2012	has sold out	Jan 02 2012	<a href="http://www.bloomberg.com">www.bloomberg.com</a>
2013	advertisers need to announce 5 months out	Sep 03 2013	<a href="http://www.usatoday.com">www.usatoday.com</a>

# Local ad spend compared to Nielsen ratings

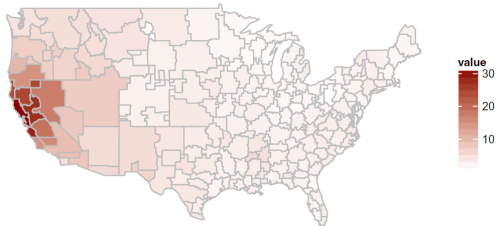
	log(Nielsen Ratings)	log(Ad Spend PC+1)
	(1)	(2)
City of AFC Championship Game Winner	0.107*** (0.021)	-0.003 (0.008)
City of NFC Championship Game Winner	0.133*** (0.020)	-0.011 (0.008)
Super Bowl Host City	0.093*** (0.020)	0.005 (0.008)
Adjusted R-squared	0.80	0.58
Observations	336	336
Fixed Effects	City and Year	City and Year

# Heat Map of Fan Density

New.York.Giants



San.Francisco.49ers



# Variations on baseline model for opening week searches

	log(Google Searches on Release Week)				
	(1)	(2)	(3)	(4)	(5)
Nielsen ratings	0.762** (0.318)	0.684** (0.333)	0.687* (0.355)	0.705 (0.620)	0.721** (0.360)
log(Pre search)	0.069*** (0.017)	0.069*** (0.017)	0.069*** (0.017)	0.069*** (0.017)	0.078*** (0.017)
Adj. $R^2$	0.89	0.89	0.89	0.89	0.92
Observations	3,080	3,080	3,080	3,080	3,080
Specification	+Host	Trends	−Host	+Vegas	Weighted

City and year fixed effects are included in all specifications

Robust standard errors clustered at the city-year level

# Variations on baseline model for opening week box office

	log(Box Office PC)				
	(1)	(2)	(3)	(4)	(5)
Nielsen Ratings	0.771** (0.362)	0.705** (0.342)	0.507 (0.352)	1.401*** (0.527)	0.444 (0.283)
log(Pre Search)	0.035*** (0.012)	0.035*** (0.012)	0.035*** (0.012)	0.038*** (0.012)	0.055*** (0.016)
Adj $R^2$	0.96	0.96	0.96	0.96	0.97
Observations	1,088	1,088	1,088	1,088	1,088
Specification	+Host	Trends	−Host	+Vegas	Weighted

City and year fixed effects are included in all specifications

Robust standard errors clustered at the city-year level

# Advertisers: Movies that Advertised in Super Bowl

	Movie	Release Date	Distributor	Rating	Budget (\$Mil.)
1.	16 blocks	2006-03-03	Warner Bros.	PG-13	45
2.	50 first dates	2004-02-13	Sony Pictures	PG-13	75
3.	act of valor	2012-02-24	Relativity	R	12
4.	alamo	2004-04-09	Walt Disney	PG-13	92
5.	alice in wonderland	2010-03-05	Walt Disney	PG	200
6.	angels and demons	2009-05-15	Sony Pictures	PG-13	150
7.	avengers	2012-05-04	Walt Disney	PG-13	225
8.	batman begins	2005-06-15	Warner Bros.	PG-13	150
9.	battleship	2012-05-18	Universal	PG-13	209
10.	be cool	2005-03-04	MGM	PG-13	75
11.	benchwarmers	2006-04-07	Sony Pictures	PG-13	35
12.	captain america first avenger	2011-07-22	Paramount Pictures	PG-13	140
13.	cars	2006-06-09	Walt Disney	G	70
14.	chronicles of narnia prince caspian	2008-05-16	Walt Disney	PG	225
15.	constantine	2005-02-18	Warner Bros.	R	75
16.	cowboys and aliens	2011-07-29	Universal	PG-13	163
17.	fast and furious	2009-04-03	Universal	PG-13	85

# Placebos: Movies that Did Not Advertise in Super Bowl

	Movie	Release Date	Distributor	Rating	Budget (\$Mil.)
1.	10,000 bc	2008-03-07	Warner Bros.	PG-13	105
2.	3 days to kill	2014-02-21	Relativity	PG-13	28
3.	adjustment bureau	2011-03-04	Universal	PG-13	50.2
4.	around world in 80 days	2004-06-16	Walt Disney	PG	110
5.	basic instinct 2	2006-03-31	Sony Pictures	R	70
6.	battle los angeles	2011-03-11	Sony Pictures	PG-13	70
7.	be kind rewind	2008-02-22	New Line	PG-13	20
8.	break up	2006-06-02	Universal	PG-13	52
9.	captain america winter soldier	2014-04-04	Walt Disney	PG-13	170
10.	cars 2	2011-06-24	Walt Disney	G	200
11.	chronicles of riddick	2004-06-11	Universal	PG-13	120
12.	clash of titans	2010-04-01	Warner Bros.	PG-13	125
13.	da vinci code	2006-05-19	Sony Pictures	PG-13	125
14.	doomsday	2008-03-14	Universal	R	33
15.	drillbit taylor	2008-03-21	Paramount Pictures	PG-13	40
16.	duplicity	2009-03-20	Universal	PG-13	60
17.	eight below	2006-02-17	Walt Disney	PG	40



# Effects of Advertising: Placebo movies

	log(Google Searches on Release Week)			
	(1)	(2)	(3)	(4)
Nielsen Ratings	-0.091 (0.374)	-0.373 (0.387)	0.059 (0.444)	0.198 (0.876)
log(Pre-Super Search)	0.083*** (0.019)	0.083*** (0.018)	0.084*** (0.019)	0.084*** (0.019)
Adjusted R-squared	0.87	0.87	0.87	0.87
Observations	2,747	2,747	2,747	2,747
Specification	2SLS	2SLS (Trends fans)	2SLS (-Host)	2SLS (+Vegas)

# Placebo and advertised movies

	log(Google Searches on Release Week)			
	(1)	(2)	(3)	(4)
midrule Nielsen Super Bowl Ratings	-0.483** (0.238)	-0.091 (0.374)	-0.373 (0.387)	0.059 (0.444)
Nielsen X Super Ad	0.797*** (0.305)	0.853* (0.448)	1.057** (0.461)	0.628 (0.483)
log(Pre-Super Search)	0.083*** (0.019)	0.083*** (0.019)	0.083*** (0.018)	0.084*** (0.019)
Adjusted R-squared	0.88	0.88	0.88	0.88
Observations	5,827	5,827	5,827	5,827
Specification	OLS	2SLS	2SLS (Trends fans)	2SLS (-Host)

City and year fixed effects are included in all specifications

# Coefficients for other specifications

	Ad Spend PC			
	(1)	(2)	(3)	(4)
Nielsen Super Bowl Ratings	-0.006 (0.004)	-0.016* (0.009)	-0.007 (0.008)	0.012 (0.011)
log(Pre-Super Search)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Adjusted R-squared	0.63	0.63	0.63	0.62
Observations	2,002	2,002	2,002	2,002
Specification	OLS	2SLS	2SLS (-Host)	2SLS (+Vegas)

# Description of steps used to calculate estimated returns to super bowl advertisements

row	number	definition
1	0.5	estimated impact of ratings on box office
2	42	average ratings points for Super Bowl
3	21	impact of ratings (row 1 $\times$ row 2)
4	4	opening weekend revenue (millions)
5	8.4	incremental revenue (row 3 $\times$ row 4 $\times$ .1)
6	3	cost of Super Bowl ad (millions)
7	2.8	total return (row 5 divided by row 6)