Gravity Models Applied to Projections for New Casinos: Techniques and Results

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Overview

- Recent U.S. casino license application processes: “beauty contests”
- Projected benefits (and costs) based on projections for future performance
- Usually involve “Gravity Models”
- 80 projections / 8 lic. processes / 4 states
- Sources / Types of Markets / Methods
- Findings: Wide range of variation

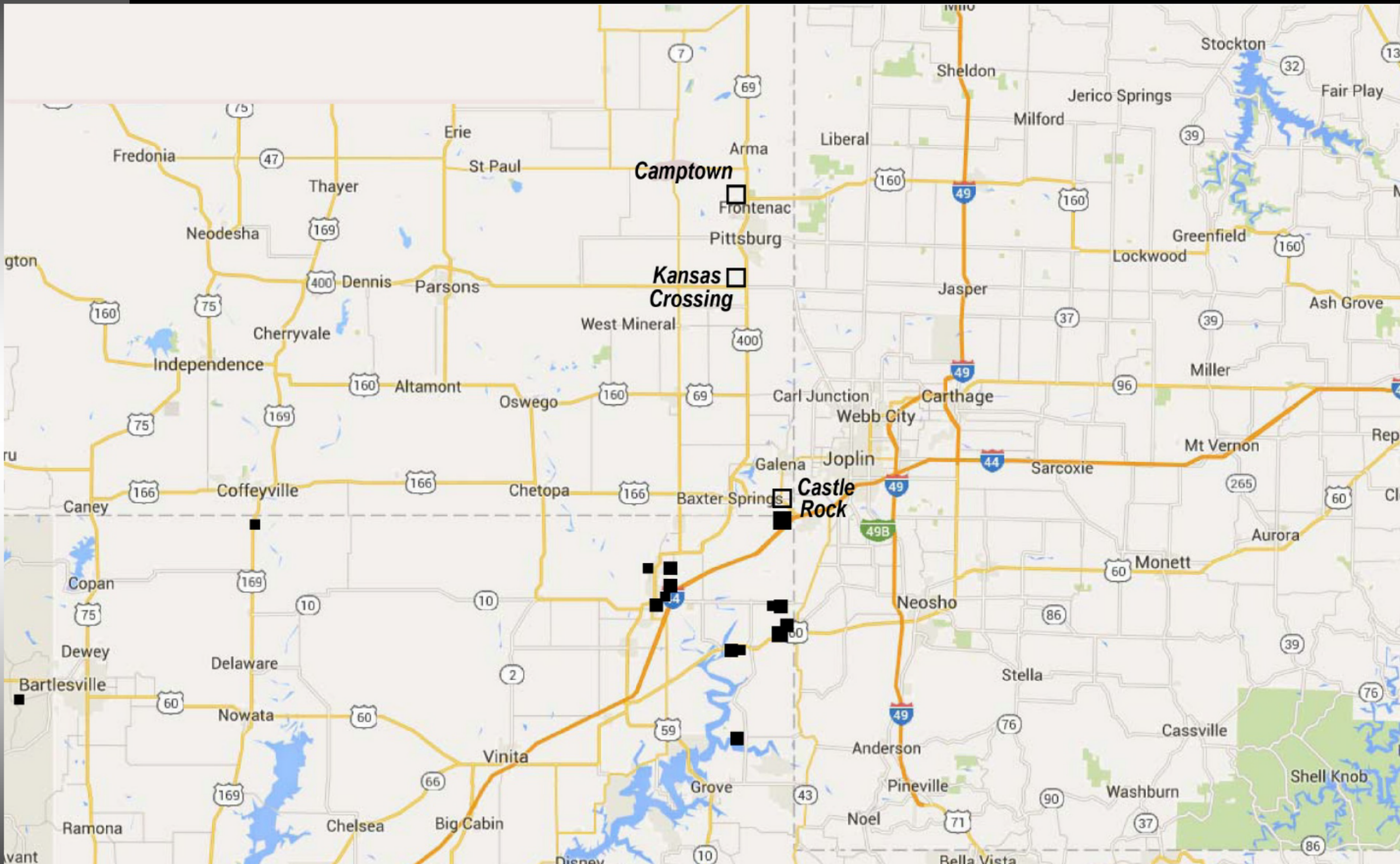
Focus / Limitations . . .

- "Regional" casino markets in North America
  - "Limited" numbers of casinos
  - Customers overwhelmingly live within 2 hours
- Less applicable / less usefully applied to:
  - "Destination resort" casinos (Las Vegas)
  - Highly competitive markets with large numbers/ clusters of casinos (LV, Deadwood (SD), Tunica (MS), Colorado mining towns, etc.)

Gravity Models – Overview

- Location
- Location
- Size
- Everything Else

Example: SE Kansas


Camptown
Kansas Crossing
Castle Rock
Stockton
Sheldon
Jerico Springs
Fair Play
Milford
Liberal
Erie
Fredonia
St Paul
Arma
Thayer
Frontenac
Neodesha
Pittsburg
Greenfield
Lockwood
Dennis
Parsons
Jasper
Ash Grove
Cherryvale
West Mineral
Independence
Miller
Altamont
Oswego
Carl Junction
Carthage
Webb City
Mt Vernon
Galena
Joplin
Sarcoxie
Coffeyville
Chetopa
Baxter Springs
Caney
Aurora
Copan
Monett
Neosho
Dewey
Delaware
Stella
Bartlesville
Nowata
Anderson
Cassville
Vinita
Grove
Pineville
Shell Knob
Washburn
Ramona
Chelsea
Big Cabin
Noel
Disney
Bella Vista

Gravity Models – Overview

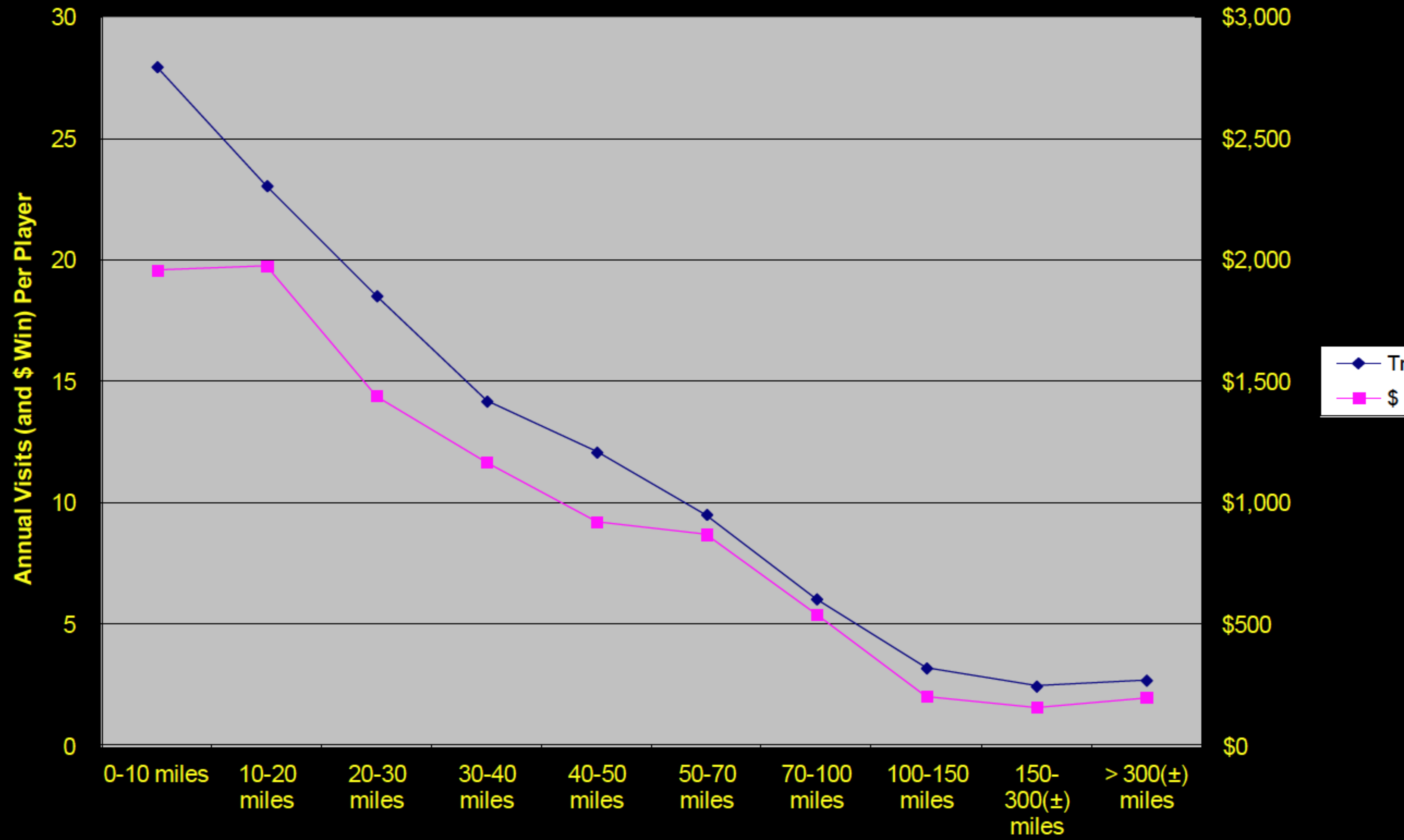
- **Location I**
- Location II
- Size
- Everything Else

Location I:

The Closer, the Better

=“Friction”

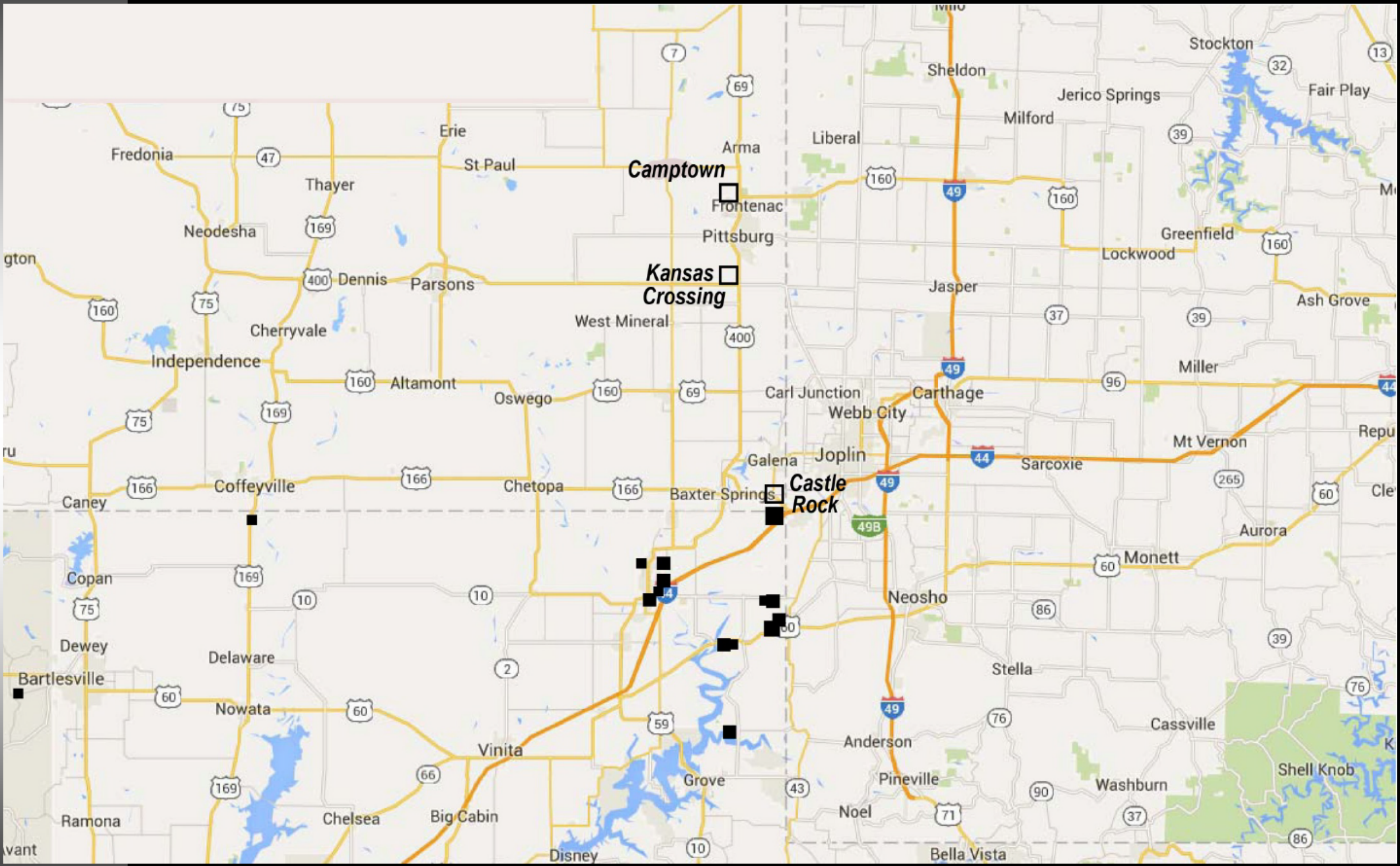
Exhibit A-4: Rates of Visitation (and Win) vs. Distance at Casino Z



Gravity Models – Overview

- Location I
- Location II
- Size
- Everything Else

Location II: Competition



Camptown
Kansas Crossing
Castle Rock

Location II: Reilly's Law

Reilly's Law:

$$ms \sim S / d^2$$

Where

ms : market share

S : outlet size (capacity)

d : distance

Newton's Law:

$$F = m/d^2$$

Where

F :	gravitational force
m :	mass (conjoined)
d :	distance

Reilly's Law:

$$ms \sim S/d^2$$

Where

ms : market share

S : casino size (capacity)

d : distance

Reilly's Law Extended:

$$ms \sim S / tt^2$$

Where

ms : market share

S : casino size (capacity)

tt : travel time / convenience

Midwest Market Projections

Average Distances:

State	County	ZIP	Spdway	KStar	Campt	KSCr	CasR	Dodge	KC7thS	Wh Cl	Horton	Mayetta	Powhat	Argosy	IOC
KS	ALLEN	66732	99	129	49	41	76	267	106	155	141	121	146	109	109
KS	ALLEN	66748	109	115	62	54	87	252	117	152	133	112	138	120	120
KS	ALLEN	66749	100	121	67	59	93	257	108	144	126	105	131	111	111
KS	ALLEN	66751	97	126	62	54	89	261	105	145	129	109	134	108	108
KS	ALLEN	66755	90	135	57	48	84	271	97	146	133	113	138	100	100
KS	ALLEN	66772	103	127	45	37	72	267	110	159	145	125	150	113	113
KS	ANDERSON	66014	66	157	68	59	95	288	73	133	121	102	126	76	76
KS	ANDERSON	66015	89	130	74	66	101	263	97	133	117	97	122	100	100
KS	ANDERSON	66032	70	147	82	73	109	277	78	121	107	87	112	82	82
KS	ANDERSON	66033	60	158	83	74	111	287	68	118	105	86	111	72	72
KS	ANDERSON	66039	78	144	66	57	93	277	86	136	123	103	128	89	89
KS	ANDERSON	66091	80	139	77	69	104	270	88	128	113	93	118	91	91
KS	ANDERSON	66093	87	130	83	75	110	261	96	129	109	88	114	99	99
KS	ATCHISON	66002	42	226	164	155	192	342	50	37	32	44	38	47	52
KS	ATCHISON	66016	44	214	164	155	191	330	53	37	27	32	33	51	56
KS	ATCHISON	66023	52	207	170	161	197	321	61	37	20	24	26	59	64
:	:		:	:	:	:	:	:	:	:	:	:	:	:	:
:	:		:	:	:	:	:	:	:	:	:	:	:	:	:
:	:		:	:	:	:	:	:	:	:	:	:	:	:	:
KS	WYANDOTTE	66106	9	216	120	110	146	338	7	86	79	65	85	10	11
KS	WYANDOTTE	66109	7	217	127	117	154	338	10	78	70	58	76	10	14
KS	WYANDOTTE	66111	7	216	122	112	148	338	7	84	76	63	82	10	11
KS	WYANDOTTE	66112	7	217	124	115	151	338	8	81	74	61	80	10	11
KS	WYANDOTTE	66118	13	223	124	115	147	346	7	88	81	69	88	7	7
	Total KS														

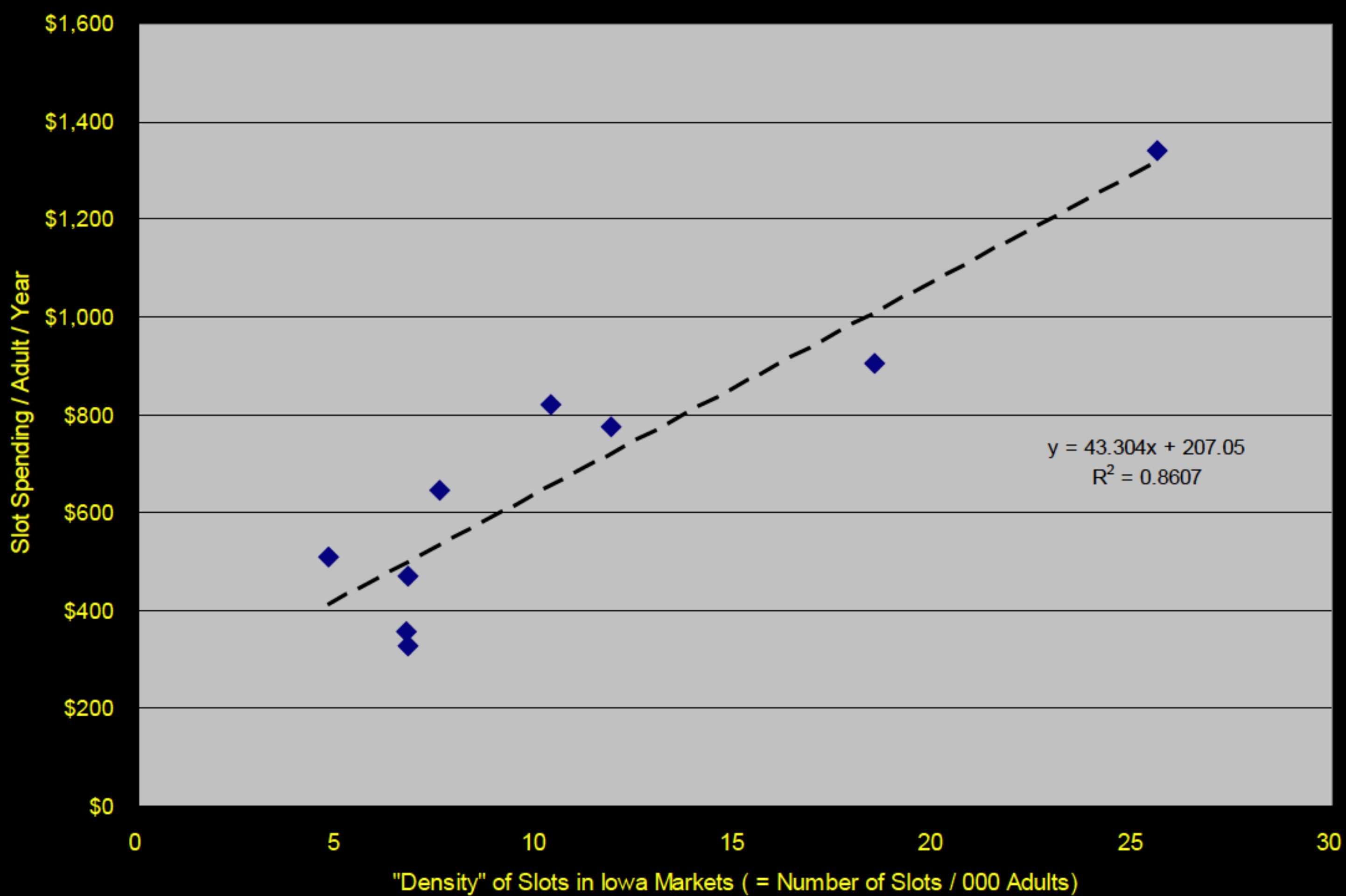
Gravity Models – Overview

- Location
- Location
- **Size**
- Everything Else

Bigger IS Better

- Consumer choice
  - Micro-environments
  - Ancillary attractions
  - Queuing issues even if not capacity-constrained
- Economies of scale
  - Ancillary attractions
  - Player rewards

More Slots, More Spending



Gravity Models – Overview

- Location
- Location
- Size
- **Everything Else**

“Everything Else” I

- Personal Income
- Micro-Access
- Spaciousness
- Game Mix
- Fit & Finish
- Management Skill
- Marketing / Player Rewards

"Everything Else" II

- Hotel
- Parking Garage
- Variety of Dining Choices
- "   / Retail
- "   / Entertainment
- "Brand"
- Tax / Retention Rate

Add-Ons to Gravity Models

- Seasonal residents
- Casino Hotel guests
- Other (nearby) hotel guests
- "Drive-By Intercept"
- Other visitors / extraordinary circumstances

Current Study

Objectives and Scope

- Preliminary Exploration
- Focus: Projections vs. Projections, not Projections vs. Actual Results
- 80 Projections* for 27 Casinos*
- Only 5 actually built (so far)
  (15 projections related thereto)

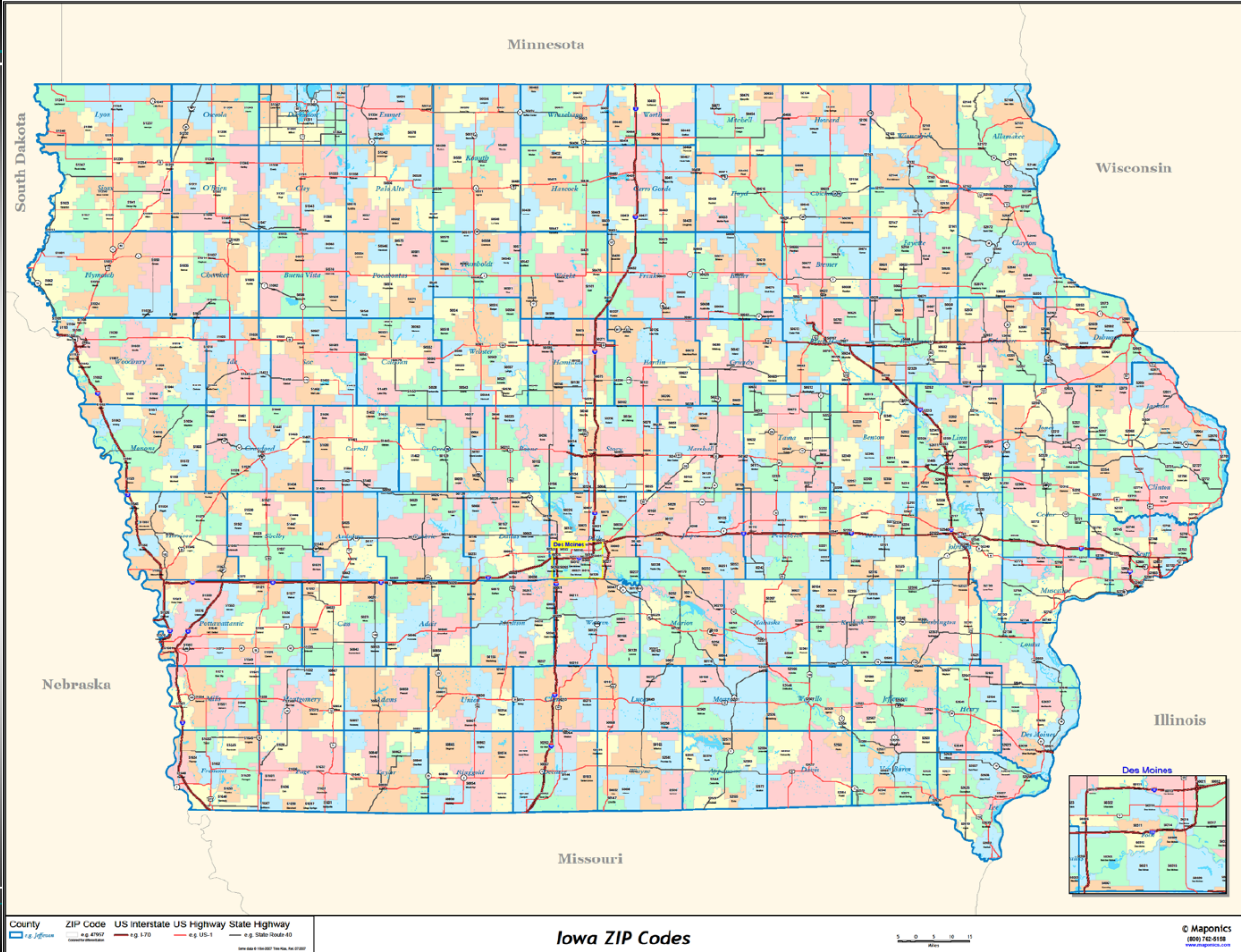
* Excludes "synthetic" projections but includes "generic" casinos

Licensing Processes:

- Kansas
  - 2008, 2009, 2010, 2014
- Iowa
  - 2009, 2013-14
- Massachusetts 2013-14
  - “Slot parlor” only
- Maryland 2013

Markets / Methodologies:

- Type(s) of markets
  - Monopoly
  - Middling
  - Competitive
- Methodological approaches
  - "Fine-Grained" Aggregate Behavior
  - "Coarse-Grained" " "
  - "Black Box" or insufficient info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South Dakota
Nebraska
Illinois
Missouri
Des Moines
County
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Competitive Gaming Market: Iowa & Surrounding States

Note: shaded areas as a whole reflect the primary collective draw area for Iowa's commercial casinos

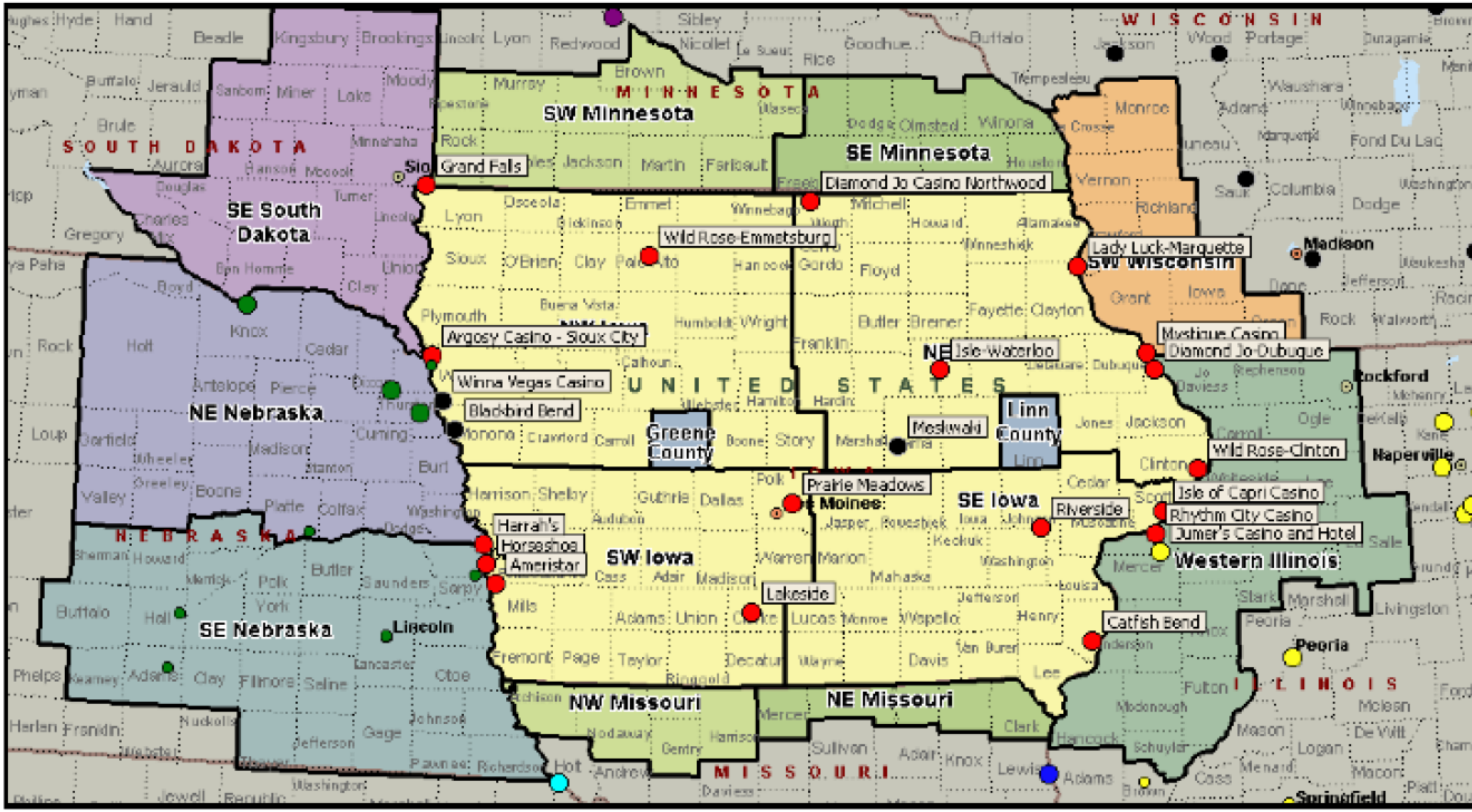


Exhibit 1: Key to Casinos and Geographic Zones

	Casino Code	Year	State	Casino / Proponent	# slots	Lowest Proj'n ($mn)	Highest Proj'n ($mn)	Comments	Zone	Zone
	1	2007-8	KS	generic for zone	na - 838	$30.2	$66.7	4 projections, including 2 synthetic	Kansas SW	SW
	2	2008	KS	Dodge City Resort	800	$46.5	$63.0	3 projections	Kansas SW	SW
	3	2008	KS	Boot Hill / Butler Nat'l	875	$47.2	$70.9	3 projections . . . actual result: $43.3 million	Kansas SW	SW
	4	2008	KS	Penn National	900	$37.2	$93.9	4 projections, including 1 generic for the zone	Kansas SE	SE
	5	2008	KS	Harrahs	2,000	$202.0	$271.6	4 projections, including 1 generic for the zone	Kansas SC1	SCA
	6	2009	KS	Lakes Gaming	2,000	$192.8	$230.0	3 projections at full build-out	Kansas SC1	SCA
	7	2010	KS	Peninsula Gaming	1,655	$184.1	$202.8	3 projections . . . actual result: $181.1 million	Kansas SC1	SCA
	8	2008	KS	generic for zone	1,603-1,750	$132.1	$156.0	3 projections, including 2 synthetic	Kansas SC2	SCB
	9	2008	KS	Penn National Gaming	1,500	$125.7	$214.4	3 projections	Kansas SC2	SCB
	10	2008	KS	Marvel Gaming	2,000	$128.4	$230.4	3 projections	Kansas SC2	SCB
	11	2010	KS	Global Gaming	1,675	$114.6	$148.5	3 projections	Kansas SC2	SCB
	12	2007-8	KS	generic for zone	na - 2,786	$173.3	$271.2	4 projections, including 2 synthetic	Kansas NE	NE
	13	2008	KS	Speedway / Cordish	3,000	$226.7	$358.1	3 projections	Kansas NE	NE
	14	2009	KS	Speedway / Penn Nat'l	2,300	$158.3	$220.2	3 projections . . . actual result: $132.0 million	Kansas NE	NE
	15	2008	KS	Golden Gaming	2,500	$178.3	$284.7	3 projections	Kansas NE	NE
	16	2008	KS	Pinnacle Entertainment	2,300	$193.2	$413.5	3 projections	Kansas NE	NE
	17	2008	KS	Legends Sun	2,000	$163.4	$295.6	3 projections	Kansas NE	NE
	18	2009	IA	Grand Falls Resort	900±	$60.0	$71.4	3 projections . . . actual result: $59.2 million	NW Iowa	Lyon
	19	2013-14	IA	Wild Rose Jefferson	525±	$28.0	$34.3	3 projections	Central IA	Greene
	20	2013-14	IA	Cedar Crossing	840	$75.2	$82.3	3 projections	SE Iowa	Cedar
	21	2012-13	MA	Plainridge Park	1,250	$198.6	$256.6	3 proj'ns . . . actual result: $154.6 million (proj'd)	"slot parlor"	slotp
	22	2013	MD	Penn National	3,000	$412.6	$559.9	3 projections	PrGeoCo	PGCo
	23	2013	MD	Parx	4,750	$617.3	$809.0	3 projections	PrGeoCo	PGCo
	24	2013	MD	MGM Grand	3,600	$688.3	$712.6	3 projections	PrGeoCo	PGCo
	25	2015	KS	Camptown	750	$34.6	$52.4	3 projections	Kansas SE	SE
	26	2015	KS	Kansas Crossing	625	$36.6	$47.2	3 projections	Kansas SE	SE
	27	2015	KS	Castle Rock	1,400	$47.8	$91.7	4 projections (essentially same location as #4)	Kansas SE	SE

indicates casino actually built (red) — rows 3, 7, 14, 18, 21

same casino compared to generic zone projections (orange) — rows 1, 5, 12

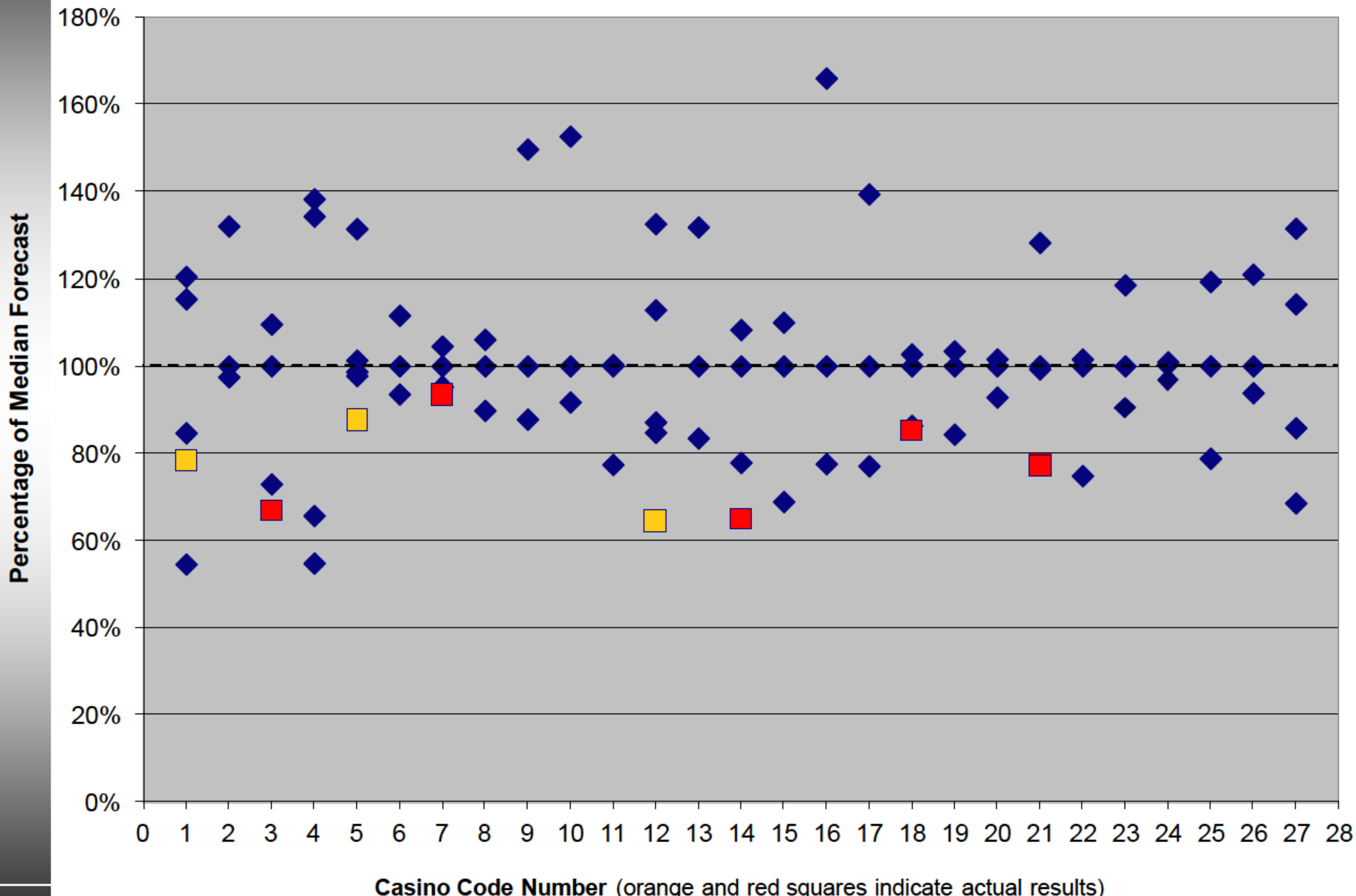
Exhibit 2: Data Points / Sources

ID #	Mnem. Code	State	Zone	Year	Casino Code	Casino	# slots	Proj'n ($mn)	Source *	Characteristics ◊ / Comments			
1	KS1	KS	SW	2007	1	generic	na	$30.2	CBRE	M	I	na	
2	KS1	KS	SW	2008	1	generic	686	$66.7	CCA	M	I	FG	
3	KS1	KS	SW	2008	1	Expert 1 average	838	$46.9	KRGC / expert 1	M	I	FG	average of proj'ns for two facilities
4	KS1	KS	SW	2008	1	Expert 2 average	838	$63.9	KRGC / expert 2	M	I	BB	average of proj'ns for two facilities
5	KS2	KS	SW	2008	2	Dodge City Resort	800	$47.7	KRGC / applicant	M	I	CG	
6	KS2	KS	SW	2008	2	Dodge City Resort	800	$46.5	KRGC / expert 1	M	I	FG	
7	KS2	KS	SW	2008	2	Dodge City Resort	800	$63.0	KRGC / expert 2	M	I	BB	
8	KS3	KS	SW	2008	3	Boot Hill	875	$70.9	KRGC / applicant	M	I	na	
9	KS3	KS	SW	2008	3	Boot Hill	875	$47.2	KRGC / expert 1	M	I	FG	
10	KS3	KS	SW	2008	3	Boot Hill	875	$64.7	KRGC / expert 2	M	I	BB	
11	**KS3**	**KS**	**SW**	**FY13**	**3**	**Boot Hill**	**700**	**$43.3**	**KRGC / actual operating results (Year 3)**				(green shading indicates actual results)
12	KS4	KS	SE	2007		generic	na	$148.5	CBRE	C	I	na	did not foresee major new competitor
13	KS4	KS	SE	2008		generic	1,660	$161.6	CCA	C	I	FG	without that major new competitor
14	KS4	KS	SE	2008	4	generic	965	$93.9	CCA	C	I	FG	(forecasts shaded yellow not used)
15	KS4	KS	SE	2008	4	Penn Nat'l	900	$91.2	KRGC / applicant	C	P	FG	
16	KS4	KS	SE	2008	4	Penn Nat'l	900	$37.2	KRGC / expert 1	C	I	FG	
17	KS4	KS	SE	2008	4	Penn Nat'l	900	$44.6	KRGC / expert 2	C	I	BB	
18	KS5	KS	SCA	2007		generic	na	$160.2	CBRE	C	I	na	major competitor did not materialize
19	KS5	KS	SCA	2008	5	generic	2,150	$209.3	CCA	M	I	FG	
20	KS5	KS	SCA	2008	5	Harrahs	2,000	$271.6	KRGC / applicant	M	P	CG	
21	KS5	KS	SCA	2008	5	Harrahs	2,000	$202.0	KRGC / expert 1	M	I	FG	
22	KS5	KS	SCA	2008	5	Harrahs	2,000	$203.9	KRGC / expert 2	M	I	BB	
23	KS6	KS	SCA	2009	6	Lakes	2,000	$230.0	KRGC / applicant	M	P	na	at full build-out
24	KS6	KS	SCA	2009	6	Lakes	2,000	$192.8	KRGC / expert 1	M	I	FG	at full build-out
25	KS6	KS	SCA	2009	6	Lakes	2,000	$206.1	KRGC / expert 2	M	I	BB	at full build-out
26	KS7	KS	SCA	2010	7	Peninsula	1,655	$184.1	KRGC / applicant	M	P	CG	average between Year 2 and full build
27	KS7	KS	SCA	2010	7	Peninsula	1,655	$202.8	KRGC / expert 1	M	I	FG	average between Year 2 and full build
28	KS7	KS	SCA	2010	7	Peninsula	1,655	$194.0	KRGC / expert 2	M	I	BB	average between Year 2 and full build
29	**KS7**	**KS**	**SCA**	**FY14**	**7**	**Peninsula / Boyd**	**1,825**	**$181.1**	**KRGC / actual operating results (Year 2.5)**				
93	KS20	KS	SE	2015	27	Castle Rock	1,400	$59.8	KRGC / expert 1	C	I	FG	
94	KS20	KS	SE	2015	27	Castle Rock	1,400	$47.8	KRGC / expert 5	C	I	CG	

* KRGC = Kansas Racing and Gaming Commission, IRGC = Iowa ditto, MDL&GCA = Maryland Lottery & Gaming Control Agency, MGC = Mass. Gaming Commission

Results

Exhibit 3: Forecast Variation by Time and Place - Each Location



Statistics - Overall

- Among projections that are not themselves the median, the mean difference from the median is 18.7%
  - Median difference = 15.4%
- Mean pairwise difference between any two projections for the same casino is 26.1%
  - Median pairwise difference = 19.7%

Statistics - Provenance

- “Independent” projections average lower than “partisan” projections by 24% of the relevant median
  - Excluding outlier KCKS: -19%
- Mean pairwise differences:
  - Between independent proj’ns: 19%
  - Partisan vs. independent: 29%

Statistics – Type of Market

- Less dispersion among projections for monopoly/oligopolistic markets than for highly competitive ones
  - Monopoly Markets: 24%
  - Oligopolistic " : 13%
  - Competitive " : 35%

Exhibit 4: Forecast Variation by Magnitude of Median Projection

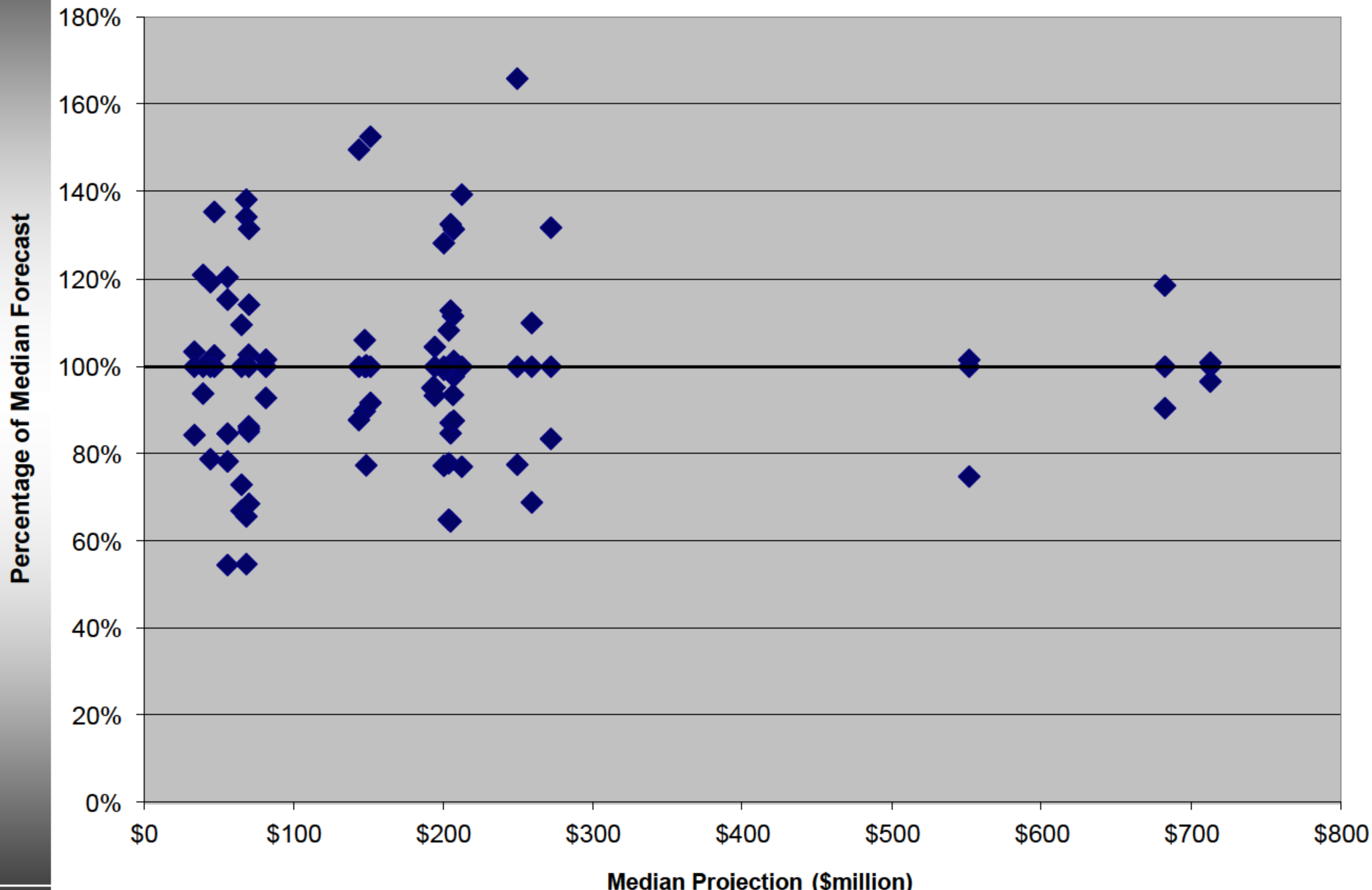
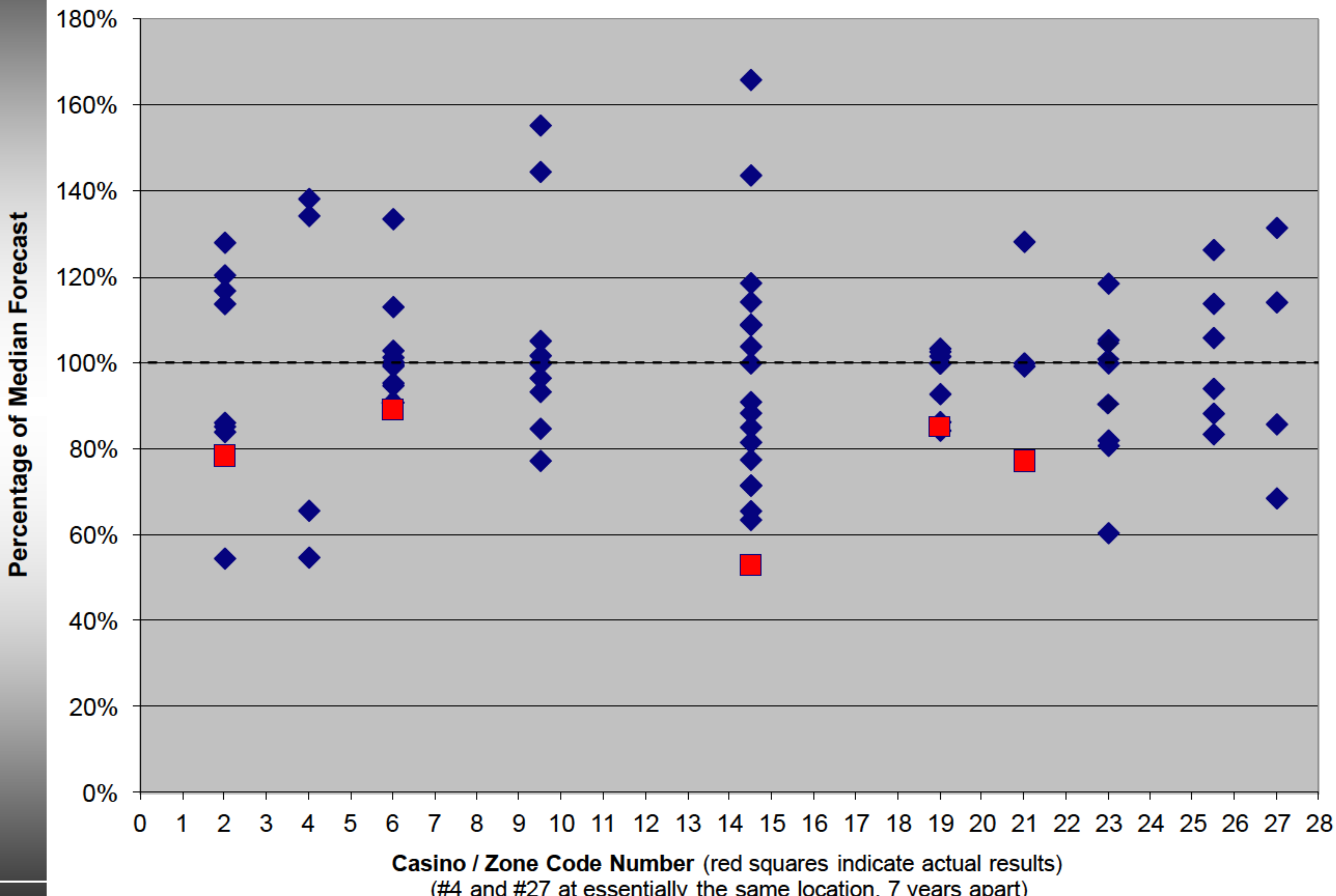


Exhibit 5: Forecast Variation by Aggregate Location / Geographic Zone



Statistics – By Zone

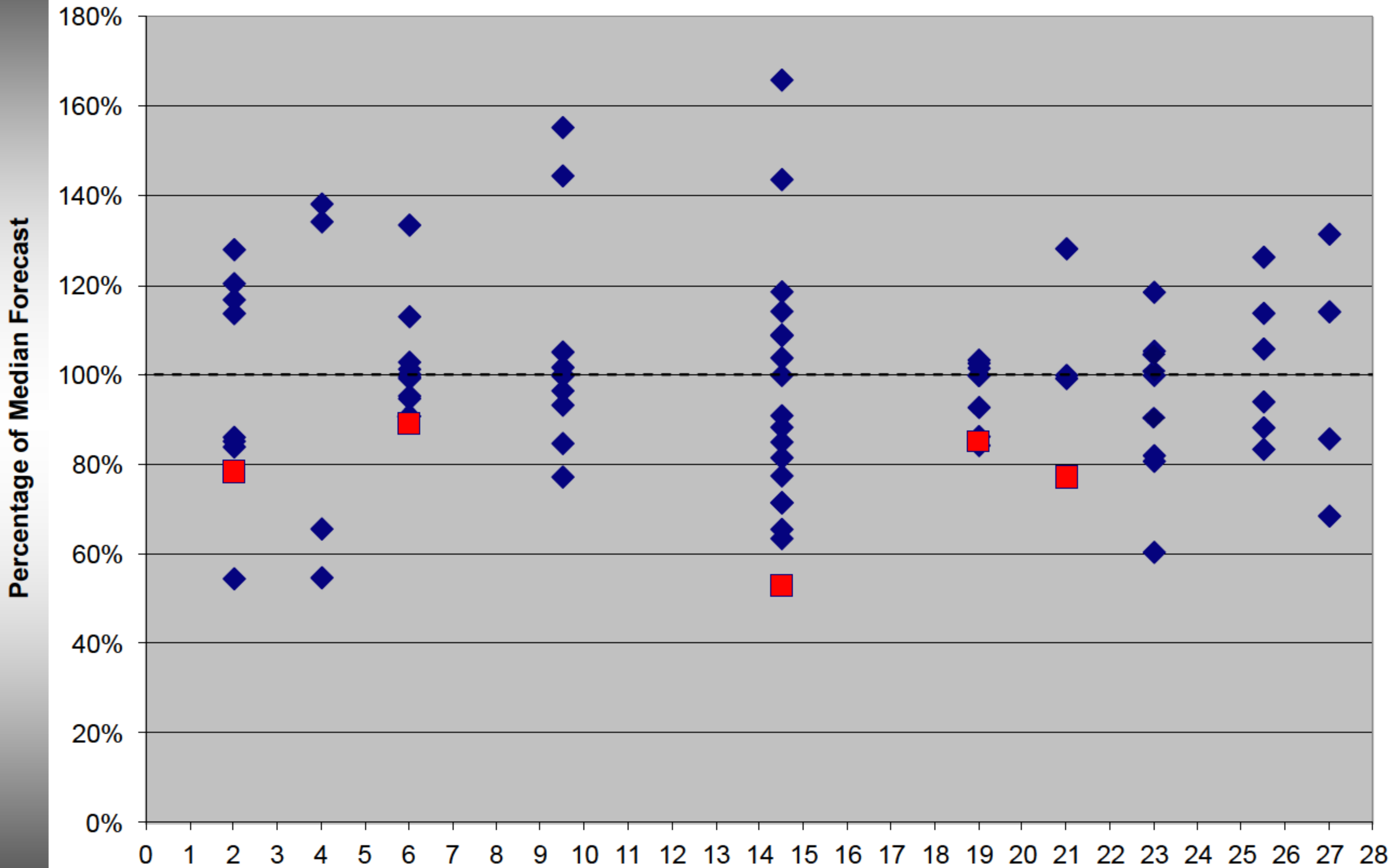
- Among projections that are not themselves the median, the mean difference from the median is 17.3%
  - Median difference = 14.2%
- Mean pairwise difference between any two projections in any particular zone is 25.9% (vs. 26.1% for each property alone)
  - Median pairwise difference = 19.5%

No Findings re "Methods"

- Too few "pure" examples of each type
- Treatment of "Everything Else" probably dominates
- Distance/Size relationships **may** matter, but are rarely disclosed explicitly

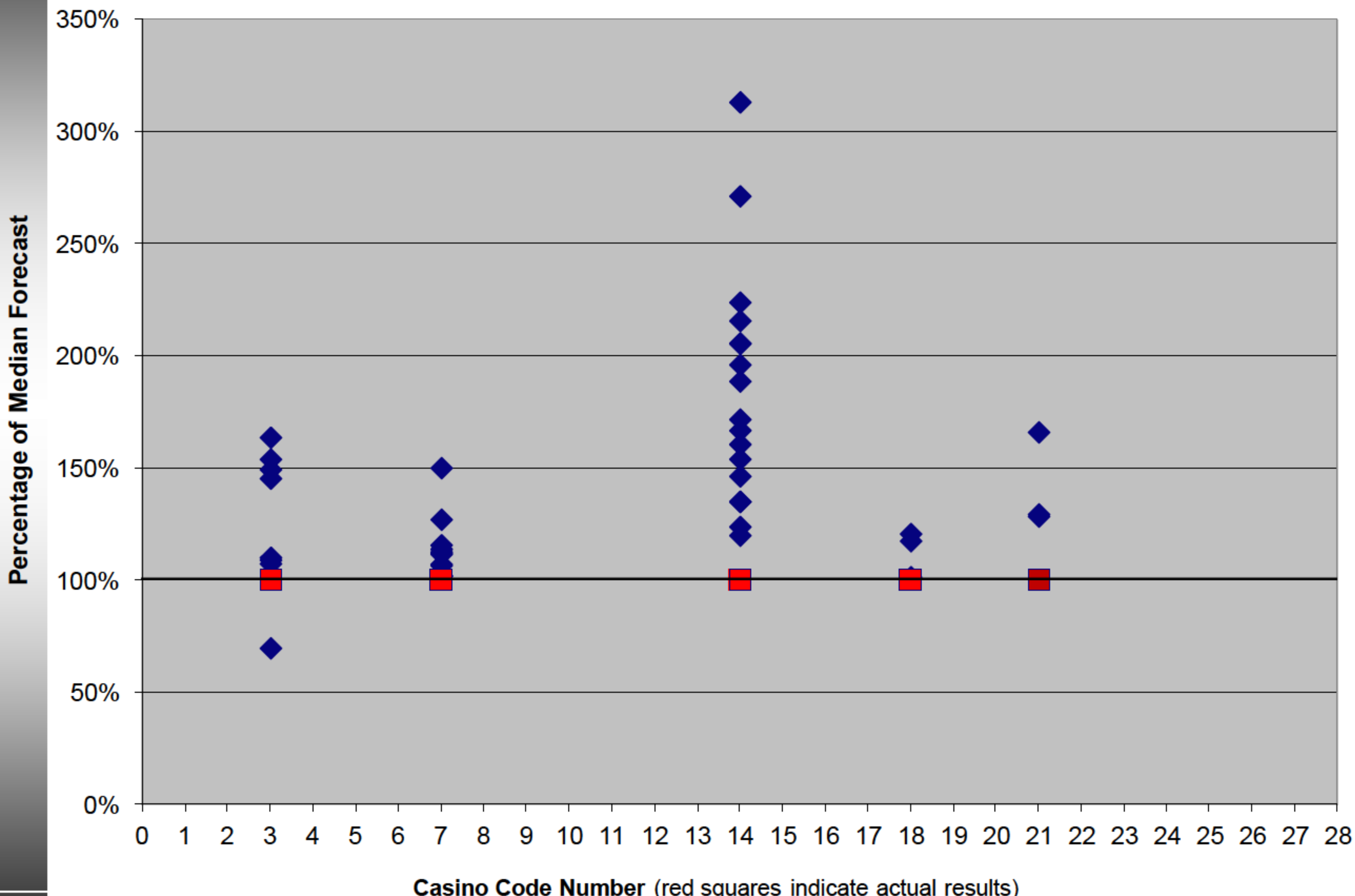
Forecasts vs. Actuals

Exhibit 5: Forecast Variation by Aggregate Location / Geographic Zone



Casino / Zone Code Number (red squares indicate actual results)
(#4 and #27 at essentially the same location, 7 years apart)

Exhibit 6: Forecast (Broadly Defined) Versus Actual Performance



Five Casinos Actually Built

- The mean difference from actual results (ideally, 3rd year) is 48% (N=41)
  - Median difference = 35%
- Excluding outlier KCKS (N=24), the mean difference is 21.5%
  - Median difference = 13.2%
- Only **one** of 41 projections was low (none of the 24 for KCKS)

Bottom Line

- Dispersion of results is wide
- "Gravity Models" . . .
  - Nonlinear
  - Underdetermined
  - Proprietary
- Not subjected to rigorous estimation / precision is low
- Rx: Take with a large grain of salt

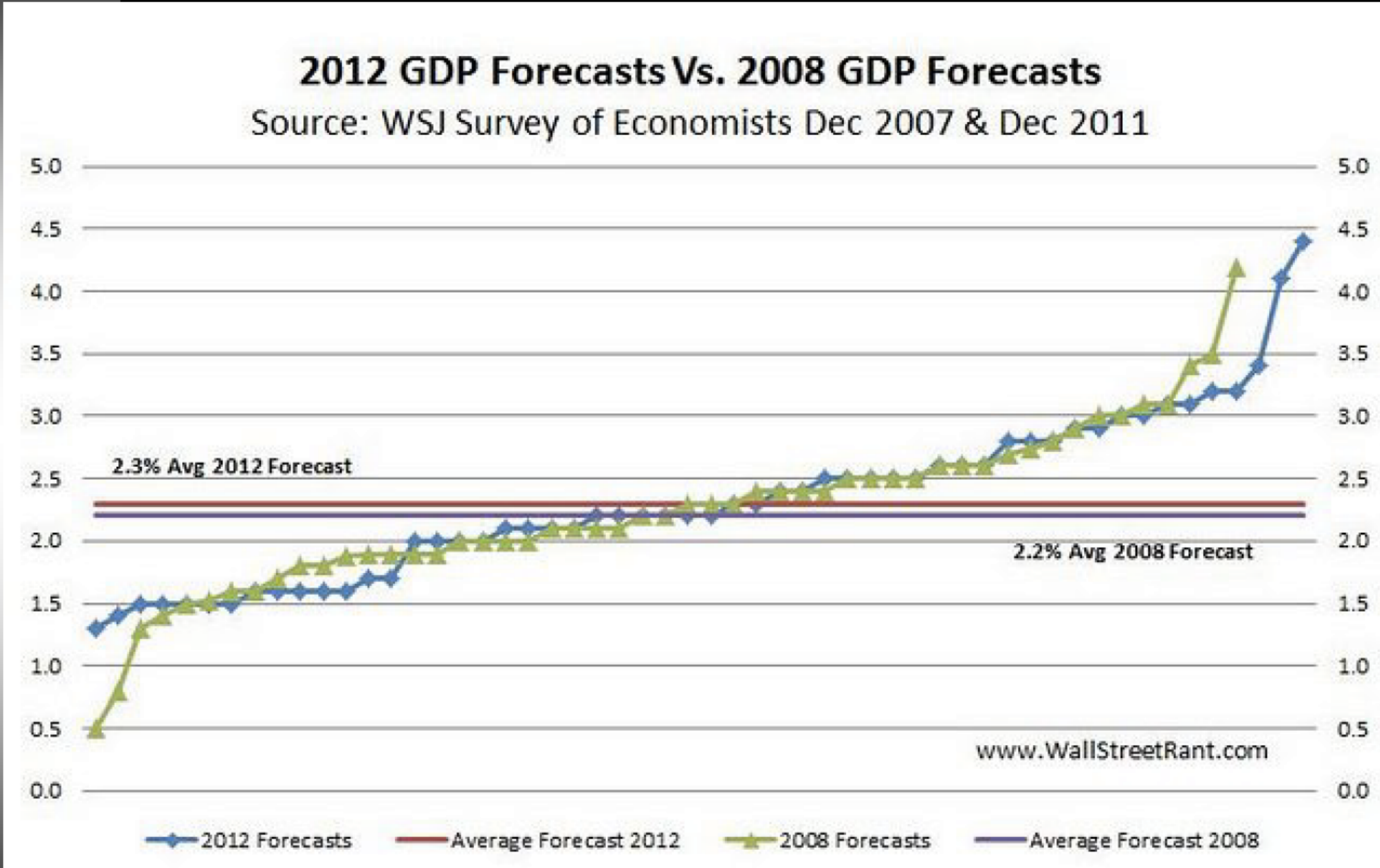
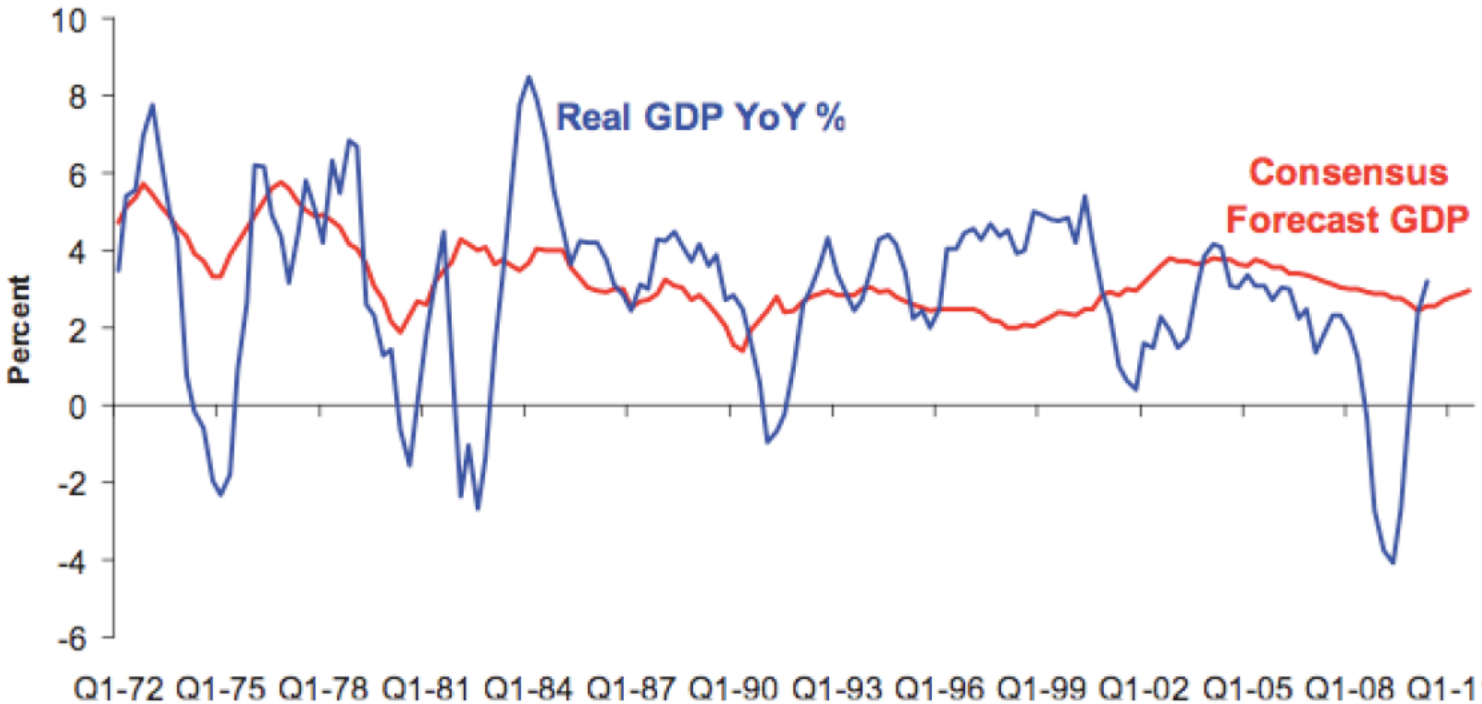

2012 GDP Forecasts Vs. 2008 GDP Forecasts
Source: WSJ Survey of Economists Dec 2007 & Dec 2011
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2.3% Avg 2012 Forecast
2.2% Avg 2008 Forecast
www.WallStreetRant.com
2012 Forecasts
Average Forecast 2012
2008 Forecasts
Average Forecast 2008

Exhibit 4: Economists Can't Forecast for Toffee (GDP % YoY, 4q ma)



Source: Federal Reserve Bank of Philadelphia *Actual data through Jun 2010; projection through Sep 2011*

Source: Blodgett, 2011

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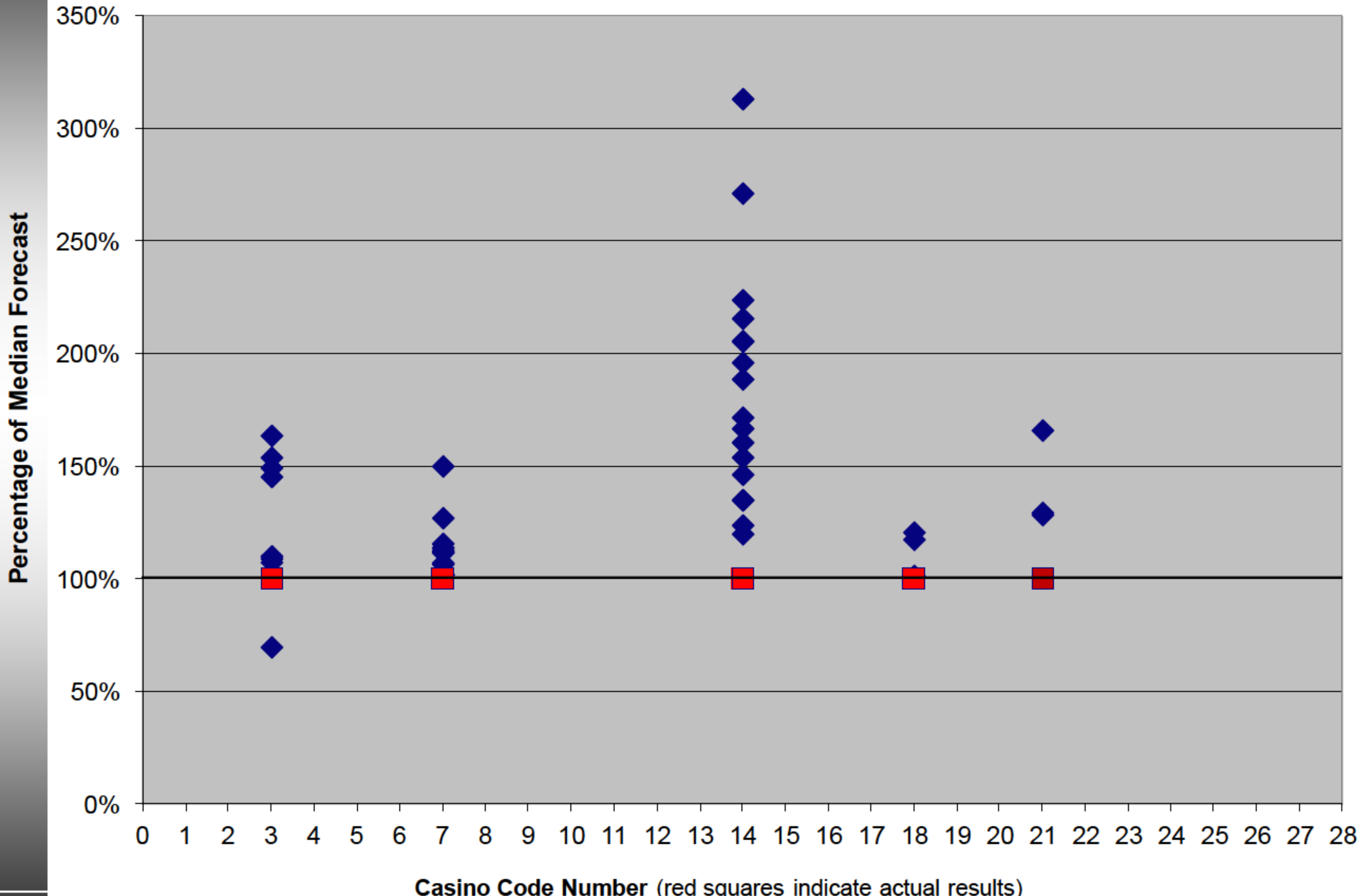
Exhibit 6: Forecast (Broadly Defined) Versus Actual Performance



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Alternative Versions

Exhibit 1: Key to Casinos and Geographic Zones

Casino Code	Year	State	Casino / Proponent	# slots	Lowest Proj'n ($mn)	Highest Proj'n ($mn)	Comments	Zone
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3	2008	KS	Boot Hill / Butler Nat'l	875	$47.2	$70.9	3 projections . . . actual result: $43.3 million	
4	2008	KS	Penn National	900	$37.2	$93.9	4 projections, including 1 generic for the zone	Kansas SE
5	2008	KS	Harrahs	2,000	$202.0	$271.6	4 projections, including 1 generic for the zone	
6	2009	KS	Lakes Gaming	2,000	$192.8	$230.0	3 projections at full build-out	Kansas SC1
7	2010	KS	Peninsula Gaming	1,655	$184.1	$202.8	3 projections . . . actual result: $181.1 million	
8	2008	KS	generic for zone	1,603-1,750	$132.1	$156.0	3 projections, including 2 synthetic	
9	2008	KS	Penn National Gaming	1,500	$125.7	$214.4	3 projections	Kansas SC2
10	2008	KS	Marvel Gaming	2,000	$128.4	$230.4	3 projections	
11	2010	KS	Global Gaming	1,675	$114.6	$148.5	3 projections	
12	2007-8	KS	generic for zone	na - 2,786	$173.3	$271.2	4 projections, including 2 synthetic	
13	2008	KS	Speedway / Cordish	3,000	$226.7	$358.1	3 projections	
14	2009	KS	Speedway / Penn Nat'l	2,300	$158.3	$220.2	3 projections . . . actual result: $132.0 million	
15	2008	KS	Golden Gaming	2,500	$178.3	$284.7	3 projections	Kansas NE
16	2008	KS	Pinnacle Entertainment	2,300	$193.2	$413.5	3 projections	
17	2008	KS	Legends Sun	2,000	$163.4	$295.6	3 projections	
18	2009	IA	Grand Falls Resort	900±	$60.0	$71.4	3 projections . . . actual result: $59.2 million	NW Iowa
19	2013-14	IA	Wild Rose Jefferson	525±	$28.0	$34.3	3 projections	Central IA
20	2013-14	IA	Cedar Crossing	840	$75.2	$82.3	3 projections	SE Iowa
21	2012-13	MA	Plainridge Park	1,250	$198.6	$256.6	3 proj'ns . . . actual result: $154.6 million (proj'd)	"slot parlor"
22	2013	MD	Penn National	3,000	$412.6	$559.9	3 projections	
23	2013	MD	Parx	4,750	$617.3	$809.0	3 projections	PrGeoCo
24	2013	MD	MGM Grand	3,600	$688.3	$712.6	3 projections	
25	2015	KS	Camptown	750	$34.6	$52.4	3 projections	
26	2015	KS	Kansas Crossing	625	$36.6	$47.2	3 projections	Kansas SE
27	2015	KS	Castle Rock	1,400	$47.8	$91.7	4 projections (essentially same location as #4)	

indicates casino actually built

same casino compared to generic zone projections

Exhibit 2: Data Points / Sources

ID #	Mnem. Code	State	Zone	Year	Casino Code	Casino	# slots	Proj'n ($mn)	Source *	Characteristics ◊ / Comments			
1	KS1	KS	SW	2007	1	generic	na	$30.2	CBRE	M	I	na	
2	KS1	KS	SW	2008	1	generic	686	$66.7	CCA	M	I	FG	
3	KS1	KS	SW	2008	1	Expert 1 average	838	$46.9	KRGC / expert 1	M	I	FG	average of proj'ns for two facilities
4	KS1	KS	SW	2008	1	Expert 2 average	838	$63.9	KRGC / expert 2	M	I	BB	average of proj'ns for two facilities
5	KS2	KS	SW	2008	2	Dodge City Resort	800	$47.7	KRGC / applicant	M	I	CG	
6	KS2	KS	SW	2008	2	Dodge City Resort	800	$46.5	KRGC / expert 1	M	I	FG	
7	KS2	KS	SW	2008	2	Dodge City Resort	800	$63.0	KRGC / expert 2	M	I	BB	
8	KS3	KS	SW	2008	3	Boot Hill	875	$70.9	KRGC / applicant	M	I	na	
9	KS3	KS	SW	2008	3	Boot Hill	875	$47.2	KRGC / expert 1	M	I	FG	
10	KS3	KS	SW	2008	3	Boot Hill	875	$64.7	KRGC / expert 2	M	I	BB	
11	**KS3**	**KS**	**SW**	**FY13**	**3**	**Boot Hill**	**700**	**$43.3**	**KRGC / actual operating results (Year 3)**				(green shading indicates actual results)
12	KS4	KS	SE	2007		generic	na	$148.5	CBRE	C	I	na	did not foresee major new competitor
13	KS4	KS	SE	2008		generic	1,660	$161.6	CCA	C	I	FG	without that major new competitor
14	KS4	KS	SE	2008	4	generic	965	$93.9	CCA	C	I	FG	(forecasts shaded yellow not used)
15	KS4	KS	SE	2008	4	Penn Nat'l	900	$91.2	KRGC / applicant	C	P	FG	
16	KS4	KS	SE	2008	4	Penn Nat'l	900	$37.2	KRGC / expert 1	C	I	FG	
17	KS4	KS	SE	2008	4	Penn Nat'l	900	$44.6	KRGC / expert 2	C	I	BB	
18	KS5	KS	SCA	2007		generic	na	$160.2	CBRE	C	I	na	major competitor did not materialize
19	KS5	KS	SCA	2008	5	generic	2,150	$209.3	CCA	M	I	FG	
20	KS5	KS	SCA	2008	5	Harrahs	2,000	$271.6	KRGC / applicant	M	P	CG	
21	KS5	KS	SCA	2008	5	Harrahs	2,000	$202.0	KRGC / expert 1	M	I	FG	
22	KS5	KS	SCA	2008	5	Harrahs	2,000	$203.9	KRGC / expert 2	M	I	BB	
23	KS6	KS	SCA	2009	6	Lakes	2,000	$230.0	KRGC / applicant	M	P	na	at full build-out
24	KS6	KS	SCA	2009	6	Lakes	2,000	$192.8	KRGC / expert 1	M	I	FG	at full build-out
25	KS6	KS	SCA	2009	6	Lakes	2,000	$206.1	KRGC / expert 2	M	I	BB	at full build-out
26	KS7	KS	SCA	2010	7	Peninsula	1,655	$184.1	KRGC / applicant	M	P	CG	average between Year 2 and full build
27	KS7	KS	SCA	2010	7	Peninsula	1,655	$202.8	KRGC / expert 1	M	I	FG	average between Year 2 and full build
28	KS7	KS	SCA	2010	7	Peninsula	1,655	$194.0	KRGC / expert 2	M	I	BB	average between Year 2 and full build
29	**KS7**	**KS**	**SCA**	**FY14**	**7**	**Peninsula / Boyd**	**1,825**	**$181.1**	**KRGC / actual operating results (Year 2.5)**				
93	KS20	KS	SE	2015	27	Castle Rock	1,400	$59.8	KRGC / expert 1	C	I	FG	
94	KS20	KS	SE	2015	27	Castle Rock	1,400	$47.8	KRGC / expert 5	C	I	CG	

* KRGC = Kansas Racing and Gaming Commission, IRGC = Iowa ditto, MDL&GCA = Maryland Lottery & Gaming Control Agency, MGC = Mass. Gaming Commission

◊ C = competitive market, M = monopoly, O = oligopoly, I = independent study, P = partisan, CG = 'coarse-grained' approach, FG = 'fine-grained', BB = 'black box'

Exhibit 3: Forecast Variation by Time and Place - Each Location

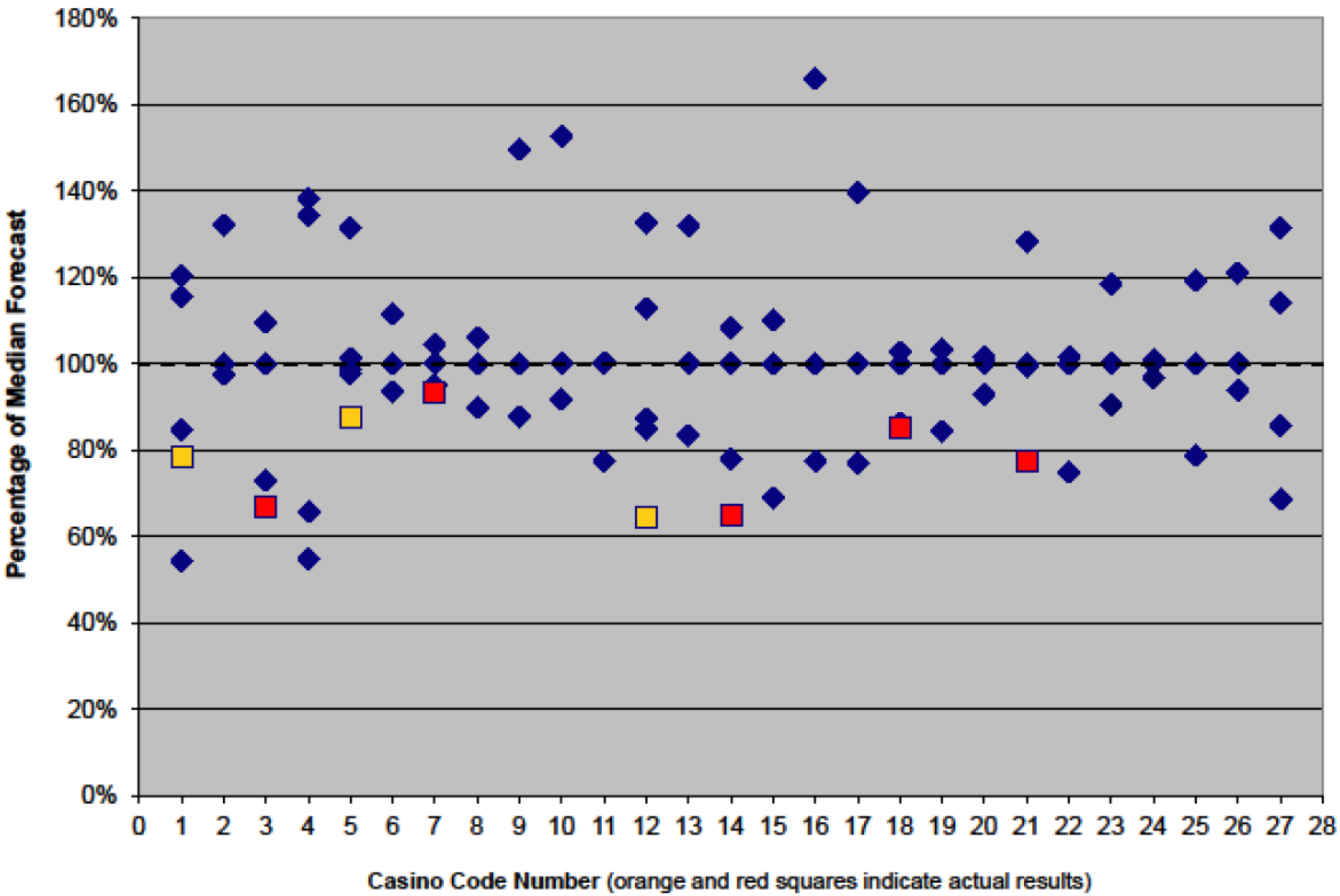

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Exhibit 4: Forecast Variation by Magnitude of Median Projection

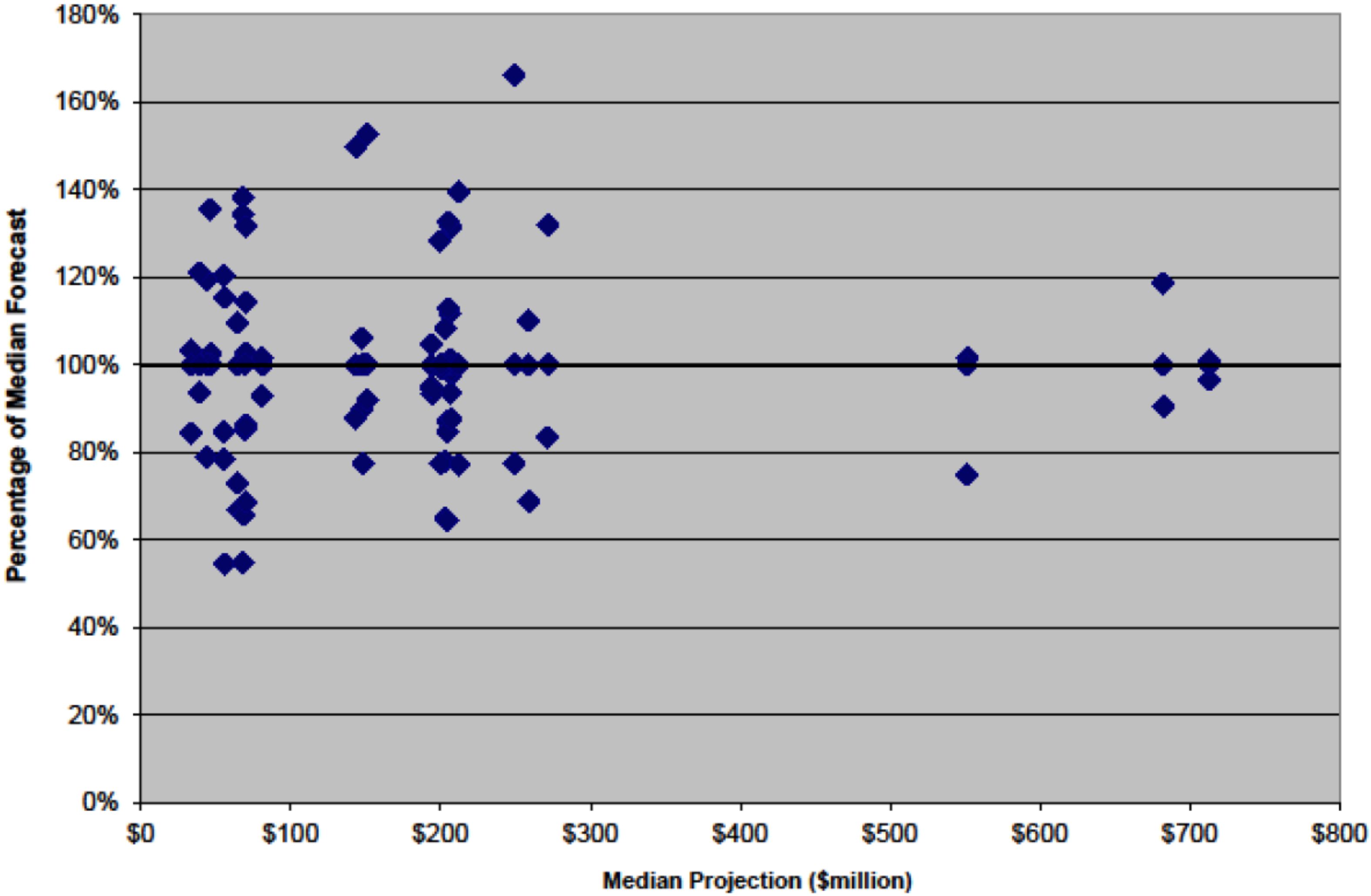

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Exhibit 5: Forecast Variation by Aggregate Location / Geographic Zone

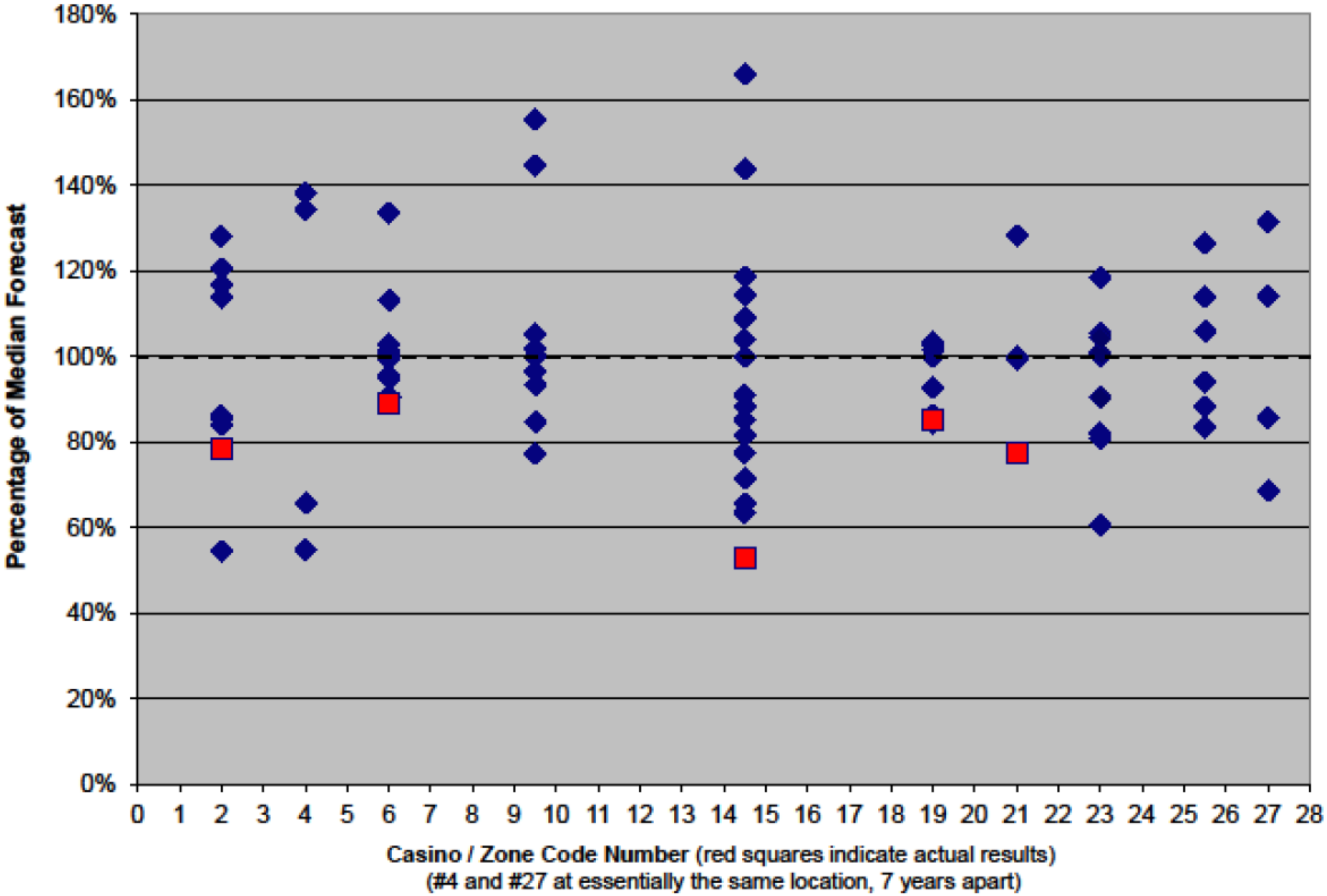


Exhibit 6: Forecast (Broadly Defined) Versus Actual Performance

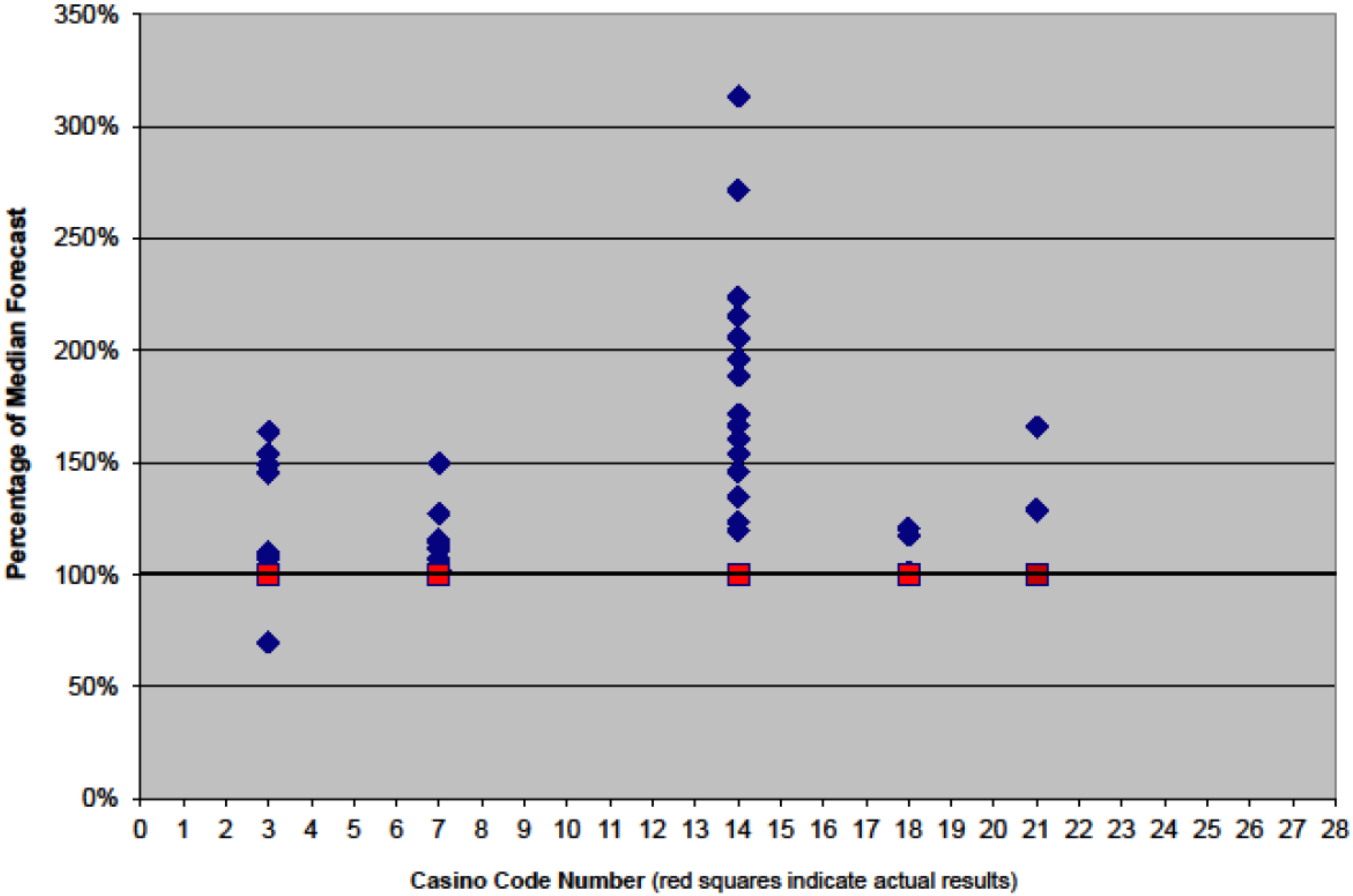
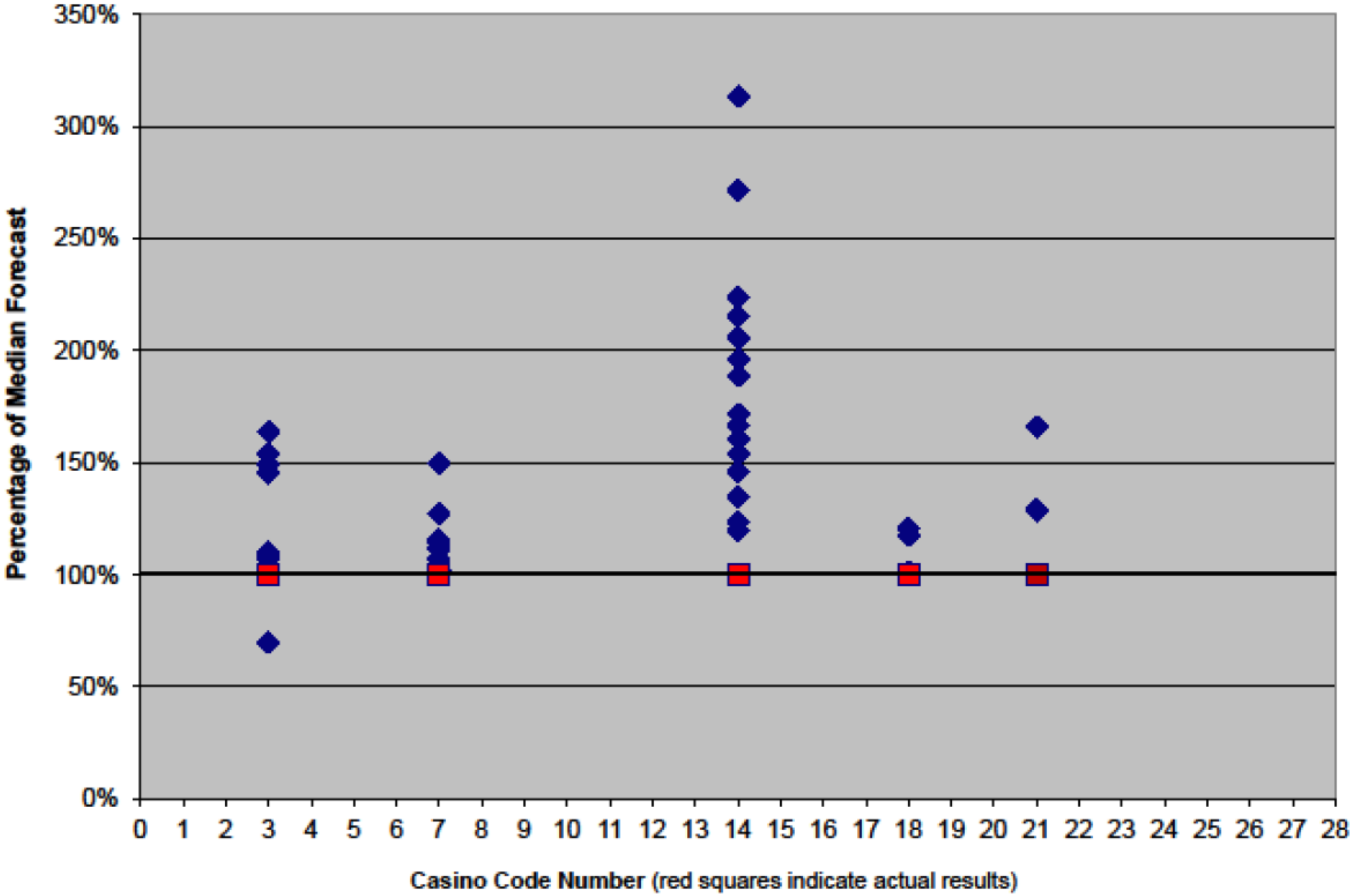


Exhibit 6: Forecast (Broadly Defined) Versus Actual Performance



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