

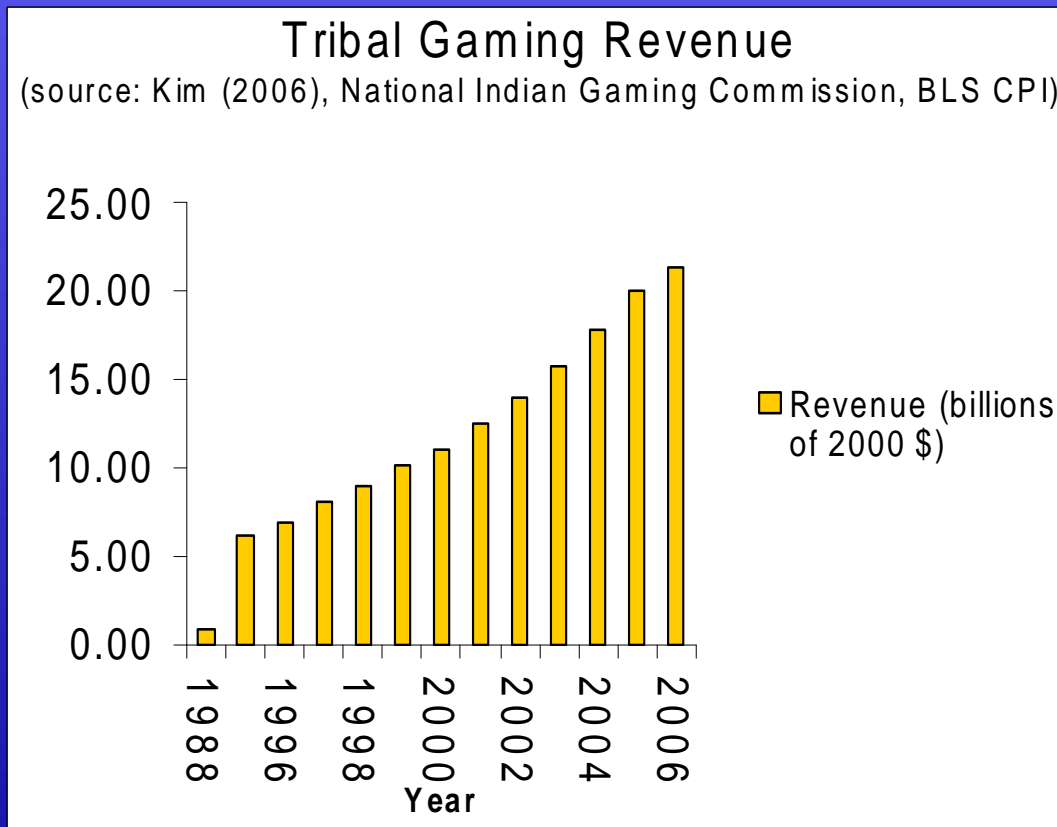
# Tribal Casino Impacts on American Indian Household Well- Being

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# Motivation

- During the 1970s, tribes operated high stakes bingo, and in the 1980s tribes and states battled over the legality of these enterprises.
- IGRA was passed in 1988 and provided a statutory framework for gaming.
  - Net-revenues must reinvested back into the tribe as some form of economic development.
    - Anything from funding government operations to per capita payments
    - ¼ gaming tribes have revenue allocation plans to give out payments.

# Motivation



- In 1995, 8 gaming operations earned about 40% of all gaming revenues. (GAO, 1997).
- In 2006, 5.9% of operations earned about 44% of all gaming revenues. (National Indian Gaming Commission website)

# Previous Literature and Contribution

## ■ Previous Work

- Impacts on employment outcomes, effects on less-educated workers (Evans and Topoleski, 2002, Evans and Kim, 2005, Reagan and Gitter, 2007).
- Increases in household per capita income (Reagan and Gitter, 2007). No significant effects on child poverty (Kim, 2006).
- Reductions in education measures (Evans and Kim, 2005).

## ■ Contribution

- Examine impacts on income and poverty in detail.
- Examine these effects by the education of the householder and household location.

# Hypotheses

- **Casinos may differentially effect the components of household income**
  - Wages increase due to rise in labor demand
  - Assistance income declines if other forms of income increase above a certain threshold.
- **Use education to proxy for skill and test if casino impacts vary by householder education**
  - Wage impacts dependent on types of jobs created, if low-skill jobs created then bottom impacted more.
  - Per capita payments impact all parts the same.
- **Use MSA to proxy for market size and impacts vary by household location.**
  - Larger markets may have greater demand for casinos, increasing revenue, and ,in turn, impacting tribal member income and poverty.

# Data

- 1990 and 2000 IPUMS USA Census Data, 5% Sample
  - The smallest geographic area consistent across years is a PUMA (Public Use Micro Area) group
  - Reservations can overlap PUMA group boundaries, multiple reservations can be in the same PUMA group
- Use a method similar to Reagan and Gitter (2007):
  - In sample- If householder affiliates themselves with the tribal ethnicity group that has a reservation within the PUMA group.
  - Impacted by the casino- if householder affiliates themselves with the tribal ethnicity group that has reservation within PUMA group and that reservation has a casino.
- Limitations
  - Do not look directly at reservations
  - Many tribal ethnicity groups excluded
- In sample, more Navajo than any other non-gaming tribal groupings.

# Empirical Model

- Differences-in-Differences Model, LHS variables are:
  - Household per capita income, probability of and amounts of household per capita earned income and per capita assistance income.
  - Poverty, Deep Poverty (75% of threshold), Near Poverty (125% of threshold) for families and related children of the householder

$$Y_{ijt} = X_{ijt}'\beta + \alpha Year\_2000_t + d(Year\_2000_t * Casino_j) + v_j + \varepsilon_{ijt} \quad (1)$$

$$Y_{kijt} = X_{ijt}'\beta + \alpha Year\_2000_t + d(Year\_2000_t * Casino_j) + v_j + \varepsilon_{kijt} \quad (1')$$

- PUMA GROUP by TRIBAL GROUP FE
- Controls: Sex, Age, Age Squared, Education, MSA, Disability, Marital Status, Navajo (Reagan and Gitter, 2007)

# Results

## ■ Pooled Model

- Positive effects in household per capita earned and total income
- Poverty results (and total household income) sensitive to the inclusion of the Navajo in the control group.

## ■ Impacts varying by the education level of the householder (Split by High School Degree)

- Casinos increase household per capita total, earned income, and the probability of earned income for less-educated female householders
- Income results for less-educated male householders depend on controlling for changes over time for Navajo headed households
- Casinos reduce deep poverty rates for more-educated female householders and near poverty rates for less-educated female householders

# Results

- **Impacts by varying by whether household is in MSA**
  - Income increases for male householders in MSAs and female householders not defined as in MSAs
  - Casinos reduce family poverty and deep poverty rates for households inside MSAs
  - Effects on family poverty rates of households not identified as in MSAs depend on the treatment of the Navajo
- Casinos are associated with declines in assistance income for female-headed households.
- Child poverty results are significant in only a few models.

# Extensions

- 1990 and 2000 Census Microdata with geographic identifiers
  - Results may be stronger as examining reservations directly.
  - Not all reservations are in my current sample.
- ACS (American Community Survey) Data
  - Examines Casino impacts Post-2000
  - Recession effects on casino success
- TANF and Public Assistance Income
  - Correlation between state TANF laws and tribe location.

# Extra Slides

# Summary Statistics

	Casino Group			No Casino, Non-Navajo Group			Navajo Group		
	1990	2000	2000-1990	1990	2000	2000-1990	1990	2000	2000-1990
Household Income									
PCI	7,640 [349]	9,769 [569]	2,129	9,501 [405]	11,558 [782]	2,057	6,327 [227]	8,327 [345]	2,001
PC Earned Income	5,845 [316]	7,654 [438]	1,809	7,582 [361]	9,312 [526]	1,729	4,904 [302]	6,565 [389]	1,661
PC Assist. Income	622 [66]	463 [35]	-159	292 [43]	505 [61]	213	291 [44]	493 [68]	202
Prob(Assit. Income)	0.35 [0.02]	0.26 [0.02]	-0.09	0.18 [0.03]	0.31 [0.03]	0.13	0.17 [0.02]	0.26 [0.03]	0.09
Prob(Earned Income)	0.76 [0.02]	0.78 [0.01]	0.02	0.83 [0.03]	0.83 [0.01]	0.00	0.70 [0.04]	0.74 [0.02]	0.05
Family Poverty									
Prob. Below Poverty	0.47 [0.02]	0.38 [0.03]	-0.09	0.37 [0.03]	0.27 [0.02]	-0.09	0.55 [0.01]	0.41 [0.02]	-0.14
Prob in Deep Pov.	0.37 [0.02]	0.28 [0.03]	-0.09	0.26 [0.03]	0.20 [0.02]	-0.07	0.44 [0.02]	0.30 [0.02]	-0.13
Prob in Near Pov.	0.57 [0.02]	0.45 [0.03]	-0.12	0.46 [0.02]	0.34 [0.02]	-0.11	0.64 [0.01]	0.50 [0.02]	-0.14
Child Poverty									
Prob. Below Poverty	0.58 [0.03]	0.47 [0.03]	-0.10	0.43 [0.03]	0.33 [0.03]	-0.10	0.58 [0.01]	0.43 [0.01]	-0.15
Prob in Deep Pov.	0.46 [0.03]	0.35 [0.03]	-0.11	0.34 [0.04]	0.24 [0.02]	-0.10	0.49 [0.02]	0.32 [0.01]	-0.17
Prob in Near Pov.	0.68 [0.02]	0.55 [0.03]	-0.13	0.54 [0.03]	0.42 [0.03]	-0.12	0.67 [0.01]	0.53 [0.01]	-0.14

Source: Microdata from Ruggles, Steven, Sobek, Matthew, Alexander, Trent, Fitch, Catherine A., Goeken, Ronald, Kelly Hall, Patricia, King, Miriam and Ronnander, Chad. Integrated Public Use Microdata Series: Version 4.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2008. Retrieved from: <http://usa.ipums.org/usa/>. Gaming identified using reservation Census data linked with whether the reservation had casino from Taylor and Kalt (2005) and casino opening dates from William N. Evans.

# Pooled Casino Impacts, Income

Regression Coefficients	HH PCI		Prob(Earned Income)		PC Earned Income		Prob(Assit. Income)		PC Assist. Income	
	(1) Navajo In, No Dummy	(2) Navajo In, No Dummy	(1) Navajo In, No Dummy	(2) Navajo In, No Dummy	(1) Navajo In, No Dummy	(2) Navajo In, No Dummy	(1) Navajo In, No Dummy	(2) Navajo In, No Dummy	(1) Navajo In, No Dummy	(2) Navajo In, No Dummy
year_2000	1,292.18*** [157.40]	1,172.23*** [438.63]	0.02* [0.01]	-0.01 [0.01]	996.87*** [120.68]	849.72*** [309.52]	-0.02*** [0.01]	0.01 [0.01]	21.72 [17.41]	19.6 [26.54]
Navajo*year_2000		165.16 [438.69]		0.04*** [0.01]		202.63 [315.32]		-0.04*** [0.01]		2.92 [34.20]
casino*year_2000	554.51** [264.45]	674.32 [482.16]	0.01 [0.01]	0.04** [0.02]	629.03*** [200.63]	776.01** [343.76]	-0.07*** [0.02]	-0.10*** [0.02]	-197.11*** [38.31]	-195.00*** [42.71]
N	13,383	13,383	13,383	13,383	13,383	13,383	13,383	13,383	13,383	13,383
Adj. Rsq.	0.16	0.16	0.23	0.23	0.18	0.18	0.14	0.14	0.12	0.12

Source: Microdata from Ruggles, Steven, Sobek, Matthew, Alexander, Trent, Fitch, Catherine A., Goeken, Ronald, Kelly Hall, Patricia, King, Miriam and Ronnander, Chad. Integrated Public Use Microdata Series: Version 4.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2008. Retrieved from: <http://usa.ipums.org/usa/>. Gaming identified using reservation Census data linked with whether the reservation had casino from Taylor and Kalt (2005) and casino opening dates from William N. Evans.

# Pooled Casino Impacts, Family Poverty

Regression Coefficients	Family Poverty Outcomes						Child Poverty Outcomes					
	Prob in Pov.		Prob in Deep Pov.		Prob. In Near Pov.		Prob in Pov.		Prob in Deep Pov.		Prob. In Near Pov.	
	(1) Navajo In, No Dummy	(2) Navajo In, Dummy	(1) Navajo In, No Dummy	(2) Navajo In, Dummy	(1) Navajo In, No Dummy	(2) Navajo In, Dummy	(1) Navajo In, No Dummy	(2) Navajo In, Dummy	(1) Navajo In, No Dummy	(2) Navajo In, Dummy	(1) Navajo In, No Dummy	(2) Navajo In, Dummy
year_2000	-0.09*** [0.01]	-0.05*** [0.02]	-0.08*** [0.01]	-0.03*** [0.01]	-0.09*** [0.01]	-0.07*** [0.01]	-0.13*** [0.02]	-0.08*** [0.03]	-0.13*** [0.02]	-0.08*** [0.03]	-0.12*** [0.02]	-0.11*** [0.03]
Navajo*year_2000		-0.06*** [0.02]		-0.07*** [0.01]		-0.03* [0.02]		-0.04 [0.04]		-0.04 [0.04]		-0.01 [0.04]
casino*year_2000	0.01 [0.01]	-0.03* [0.02]	0 [0.01]	-0.05*** [0.01]	-0.02 [0.02]	-0.04*** [0.02]	0.03 [0.04]	-0.02 [0.04]	0.03 [0.04]	-0.02 [0.04]	-0.02 [0.03]	-0.03 [0.04]
N	13,629	13,629	13,629	13,629	13,629	13,629	20,522	20,522	20,522	20,522	20,522	20,522
Adj. Rsq.	0.16	0.16	0.14	0.14	0.17	0.17	0.15	0.18	0.15	0.18	0.17	0.17

Source: Microdata from Ruggles, Steven, Sobek, Matthew, Alexander, Trent, Fitch, Catherine A., Goeken, Ronald, Kelly Hall, Patricia, King, Miriam and Ronnander, Chad. Integrated Public Use Microdata Series: Version 4.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2008. Retrieved from: <http://usa.ipums.org/usa/>. Gaming identified using reservation Census data linked with whether the reservation had casino from Taylor and Kalt (2005) and casino opening dates from William N. Evans.

# Casino Impacts by HH education

Panel A: No Navajo Dummy	HH PCI		Prob(Earned Income)		PC Earned Income		Prob(Assit. Income)		PC Assit. Income	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
< HS Degree	896.70*	890.53*	-0.03	0.10*	1,028.22**	1,332.55***	-0.03	-0.16***	-107.46	-598.11***
	[495.57]	[505.94]	[0.04]	[0.06]	[439.08]	[395.38]	[0.05]	[0.06]	[130.77]	[212.26]
>=HS Degree	607.15	642.44	-0.04	0.04	359.7	619.55	-0.06*	-0.13***	-16.56	-265.05**
	[443.17]	[626.46]	[0.02]	[0.03]	[425.51]	[595.89]	[0.03]	[0.03]	[59.14]	[122.33]
Observations	7,340	6,043	7,340	6,043	7,340	6,043	7,340	6,043	7,340	6,043
Adj. Rsquared	0.15	0.17	0.26	0.21	0.17	0.18	0.11	0.13	0.11	0.12

Panel B: Navajo*year_2000 Dummy Included	HH PCI		Prob(Earned Income)		PC Earned Income		Prob(Assit. Income)		PC Assit. Income	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
< HS Degree	590.12	1,859.36**	-0.02	0.13*	914.81	2,250.05***	-0.03	-0.25***	50.63	-520.80**
	[1197.73]	[872.54]	[0.06]	[0.07]	[768.17]	[826.38]	[0.05]	[0.06]	[131.78]	[228.97]
>=HS Degree	1,146.75	-149.03	-0.02	0.08**	1017.62	-8.23	-0.04	-0.14***	-37.34	-279.58**
	[857.93]	[835.80]	[0.02]	[0.04]	[655.09]	[790.05]	[0.03]	[0.03]	[62.60]	[114.65]
Observations	7,340	6,043	7,340	6,043	7,340	6,043	7,340	6,043	7,340	6,043
Adj. Rsquared	0.15	0.17	0.26	0.21	0.17	0.18	0.11	0.13	0.11	0.12

Source: Microdata from Ruggles, Steven, Sobek, Matthew, Alexander, Trent, Fitch, Catherine A., Goeken, Ronald, Kelly Hall, Patricia, King, Miriam and Ronnander, Chad. Integrated Public Use Microdata Series: Version 4.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2008. Retrieved from: <http://usa.ipums.org/usa/>. Gaming identified using reservation Census data linked with whether the reservation had casino from Taylor and Kalt (2005) and casino opening dates from William N. Evans.

# Casino Impacts by HH education

Panel A: No Navajo Dummy	Family Poverty Outcomes						Child Poverty Outcomes					
	Prob Below Pov.		Prob in Deep Pov.		Prob Near Pov.		Prob Below Pov.		Prob in Deep Pov.		Prob Near Pov.	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
< HS Degree	0	-0.05	0.02	0.01	-0.05	-0.11***	0.01	0	0.07	0.08	-0.06	-0.10*
	[0.04]	[0.04]	[0.03]	[0.05]	[0.04]	[0.03]	[0.07]	[0.06]	[0.07]	[0.07]	[0.07]	[0.05]
>=HS Degree	0.02	-0.03	0.02	-0.08**	0.02	-0.05	-0.03	0.01	-0.02	-0.05	-0.06	0.02
	[0.03]	[0.04]	[0.02]	[0.04]	[0.03]	[0.03]	[0.05]	[0.05]	[0.05]	[0.06]	[0.05]	[0.05]
Observations	7,504	6,125	7,504	6,125	7,504	6,125	11,139	9,383	11,139	9,383	11,139	9,383
Adj. Rsquared	0.15	0.16	0.13	0.14	0.15	0.16	0.16	0.17	0.14	0.17	0.15	0.16
Panel B: Navajo*year_2000 Dummy Included	Family Poverty Outcomes						Child Poverty Outcomes					
2000 Dummy Included	Prob Below Pov.		Prob in Deep Pov.		Prob Near Pov.		Prob Below Pov.		Prob in Deep Pov.		Prob Near Pov.	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
< HS Degree	-0.08	-0.05	-0.05	-0.09	-0.04	-0.14**	-0.05	-0.11	-0.05	-0.07	-0.06	-0.20**
	[0.05]	[0.06]	[0.04]	[0.08]	[0.06]	[0.05]	[0.10]	[0.09]	[0.10]	[0.10]	[0.09]	[0.09]
>=HS Degree	-0.03	-0.01	-0.02	-0.07*	-0.02	-0.03	-0.05	0.03	-0.01	-0.01	-0.04	0.04
	[0.05]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.06]	[0.07]	[0.06]	[0.07]	[0.06]	[0.06]
Observations	7,504	6,125	7,504	6,125	7,504	6,125	11,139	9,383	11,139	9,383	11,139	9,383
Adj. Rsquared	0.15	0.16	0.13	0.14	0.15	0.16	0.16	0.17	0.14	0.17	0.15	0.16

- Only female-headed-more-educated family deep poverty and female-headed-less-educated-less educated family and child near poverty impacts significant.

# Casino impacts by MSA status

	HH PCI		Prob(Earned Income)		PC Earned Income		Prob(Assist. Income)		PC Assit. Income	
Panel A: No Navajo Dummy	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
IN MSA	3,291.62*** [1252.20]	-170.22 [946.62]	-0.01 [0.06]	0.10** [0.04]	3,637.54*** [1124.58]	-10.71 [982.03]	-0.02 [0.04]	-0.15* [0.08]	267.63 [169.77]	-209.62* [118.05]
NOT IDENTIFIED AS IN MSA	277.27 [304.96]	786.7 [499.16]	-0.04*** [0.01]	0.06 [0.04]	232.09 [321.14]	1,073.52** [412.72]	-0.06* [0.03]	-0.18*** [0.02]	-131.53** [62.64]	-466.91*** [72.72]
Observations	7,340	6,043	7,340	6,043	7,340	6,043	7,340	6,043	7,340	6,043
Adj. Rsquared	0.15	0.17	0.26	0.21	0.17	0.18	0.11	0.13	0.11	0.12
Panel B: Navajo*year_2000 Dummy	HH PCI		Prob(Earned Income)		PC Earned Income		Prob(Assist. Income)		PC Assit. Income	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
IN MSA	3,255.25** [1443.53]	-1067.32 [933.50]	-0.03 [0.06]	0.06* [0.03]	3,483.15*** [1325.64]	-827.25 [942.98]	-0.06 [0.05]	-0.20** [0.08]	205.11 [175.37]	-315.73** [120.89]
NOT IDENTIFIED AS IN MSA	95.22 [424.65]	926.1 [747.26]	0.01 [0.02]	0.12*** [0.03]	217.61 [414.13]	1,214.93** [576.13]	-0.03* [0.01]	-0.12*** [0.02]	-74.41 [48.47]	-409.20*** [64.63]
Observations	7,340	6,043	7,340	6,043	7,340	6,043	7,340	6,043	7,340	6,043
Adj. Rsquared	0.15	0.17	0.26	0.21	0.17	0.18	0.11	0.13	0.11	0.12

Source: Microdata from Ruggles, Steven, Sobek, Matthew, Alexander, Trent, Fitch, Catherine A., Goeken, Ronald, Kelly Hall, Patricia, King, Miriam and Ronnander, Chad. Integrated Public Use Microdata Series: Version 4.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2008. Retrieved from: <http://usa.ipums.org/usa/>. Gaming identified using reservation Census data linked with whether the reservation had casino from Taylor and Kalt (2005) and casino opening dates from William N. Evans.

# Casino Impacts by MSA Status

Panel A: No Navajo Dummy	Family Poverty Outcomes						Child Poverty Outcomes					
	Prob Below Pov.		Prob in Deep Pov.		Prob Near Pov.		Prob Below Pov.		Prob in Deep Pov.		Prob Near Pov.	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
IN MSA	-0.11*	-0.08	-0.07	-0.15***	-0.07	-0.07	-0.17	0	-0.08	-0.11	-0.18	0.03
	[0.06]	[0.07]	[0.07]	[0.06]	[0.05]	[0.07]	[0.11]	[0.13]	[0.10]	[0.13]	[0.12]	[0.13]
NOT IDENTIFIED AS IN MSA	0.04*	-0.02	0.04**	-0.03	0.01	-0.06***	0	0.01	0.03	0.02	-0.04	-0.02
	[0.02]	[0.02]	[0.02]	[0.02]	[0.03]	[0.02]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]	[0.04]
Observations	7,504	6,125	7,504	6,125	7,504	6,125	11,139	9,383	11,139	9,383	11,139	9,383
Adj. R2	0.15	0.16	0.13	0.14	0.15	0.16	0.16	0.17	0.14	0.17	0.15	0.16

Panel B: Navajo*year_2000 Dummy	Family Poverty Outcomes						Child Poverty Outcomes					
	Prob Below Pov.		Prob in Deep Pov.		Prob Near Pov.		Prob Below Pov.		Prob in Deep Pov.		Prob Near Pov.	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
IN MSA	-0.15**	-0.04	-0.08	-0.11*	-0.08	-0.03	-0.21**	-0.07	-0.09	-0.11	-0.16	-0.02
	[0.06]	[0.06]	[0.07]	[0.05]	[0.05]	[0.06]	[0.10]	[0.13]	[0.09]	[0.12]	[0.12]	[0.13]
NOT IDENTIFIED AS IN MSA	-0.02	-0.04	-0.02	-0.08***	-0.02	-0.09***	-0.02	-0.02	0	-0.02	-0.05	-0.04
	[0.03]	[0.03]	[0.03]	[0.02]	[0.03]	[0.02]	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]	[0.06]
Observations	7,504	6,125	7,504	6,125	7,504	6,125	11,139	9,383	11,139	9,383	11,139	9,383
Adj. R2	0.15	0.16	0.13	0.14	0.15	0.16	0.16	0.18	0.14	0.17	0.15	0.16

Source: Microdata from Ruggles, Steven, Sobek, Matthew, Alexander, Trent, Fitch, Catherine A., Goeken, Ronald, Kelly Hall, Patricia, King, Miriam and Ronnander, Chad. Integrated Public Use Microdata Series: Version 4.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2008. Retrieved from: <http://usa.ipums.org/usa/>. Gaming identified using reservation Census data linked with whether the reservation had casino from Taylor and Kalt (2005) and casino opening dates from William N. Evans.