

For Amusement Only: The Availability and Distribution of Simulated Slot Machines in an Urban Center

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Abstract

The first casino with slot machines in Baltimore City opened in August of 2014. Slot machines have been available in Baltimore City for years, however, under the euphemism “For Amusement Only.” Since 2011, Baltimore City has granted licenses for “simulated slot machines” under the condition that the machines not pay out winnings to the players. In this report, we investigate the number and geospatial patterns of these licensed simulated slot machines. The number of machines began decreasing prior to the opening of the new casino, dropping by as much as 50% over 7 years. These machines tend to be in low-income White neighborhoods and are positively correlated with property crime rates. Understanding the historical context of slot machine play in Baltimore City is important for investigating the impact of the introduction of state-sanctioned slot play in an urban environment.

Keywords: Slot machines, geospatial modeling, cultural differences, state sanctioning

Résumé

Le premier casino avec machines à sous de Baltimore a ouvert ses portes en août 2014. Il y a des machines à sous à Baltimore depuis des années, mais dans leur version euphémique « à des fins récréatives seulement » (« For Amusement Only »). Depuis 2011, la Ville de Baltimore accorde des permis d'exploitation de « simulateurs de machine à sous » sous la condition que les machines ne permettent pas aux joueurs de gagner de l'argent. Dans le présent rapport, nous examinons le nombre des simulateurs de machine à sous pour lesquels des permis d'exploitation ont été octroyés et leur répartition géographique. Ce nombre a commencé à décroître avant l'ouverture du nouveau casino, chutant même de 50 % en 7 ans. Ces simulateurs ont tendance à se

trouver dans des quartiers économiquement moins favorisés et dont la population est principalement blanche, et présentent une corrélation positive avec le taux d'infractions contre les biens. Il est important de bien comprendre le contexte historique de l'utilisation des machines à sous à des fins récréatives seulement à Baltimore afin de pouvoir étudier l'impact de l'apparition dans un milieu urbain de machines à sous pour le jeu autorisées par l'État.

Introduction

Electronic gaming machines (EGMs) include games such as modern-day slot machines and video poker terminals. The commonality across various types of EGMs is the ability of the player to gamble on the results of a random number generator, the result being displayed in various ways, depending on the machine. EGMs are believed to be associated with high rates of gambling-related problems and addictions (Dowling, Smith, & Thomas, 2005). Gambling-related problems have been shown to be associated with accessibility to these gambling platforms (Raylu & Oei, 2002), though the exact nature of the relationship is not certain. Recent evidence suggests that the prevalence of gambling problems tends to spike with the introduction of new EGMs in a jurisdiction and then to plateau (Storer, Abbott, & Stubbs, 2009).

In Baltimore City, EGMs have been available for some time, well before the State of Maryland licensed casinos to offer video lottery terminals (slot machines) in November of 2008. These machines are often available “For Amusement Only” in bars, restaurants, liquor stores, and other retail outlets across the city and are not supposed to reward players with winnings. They are therefore not technically gambling machines, but players and owners widely acknowledge that most “amusement only” EGMs provide players with winning compensation, that is, they pay out, acting as de facto slot machines.

Baltimore City licenses these machines and requires operators to pay an annual registration fee. Prior to January 1, 2011, these machines were licensed simply as amusement devices, making it very difficult to identify EGMs from other amusement devices such as pool tables and jukeboxes. A report published in 2006 by The Abell Foundation (Jacobson, 2006) found that Baltimore City licensed 3,650 amusement devices, an estimated 2,106 of which were EGMs. The report found that Baltimore City had more such gambling machines operating within its boundaries than did the next closest legal gambling venue, Delaware's Dover Downs Hotel and Casino. The underreporting of income from these quasi-legal machines, and the consequent loss of tax revenue for the state, was one justification for bringing legalized slot play to Maryland. Baltimore City, possibly in recognition of an untapped revenue stream, instituted a registration tax on these machines as of January 1, 2011, which are now

licensed explicitly as “simulated slot machines” (Baltimore City Code, 2010). The terminology change (abbreviated as SSMs in this report) is at least symbolically relevant, indicating an acknowledgement that these machines do more than provide amusement and require some level of special oversight and treatment.

According to a report published in May 2011, over one fifth (21.3%) of the population of Maryland reported gambling on slot machines outside of casinos, with 1% of them doing so weekly (Shinogle et al., 2011). Among those who reported gambling on machines outside of casinos, the prevalence of problem or pathological gambling was estimated at 8.3%, nearly two and a half times the rate in the general population.

The impact of gambling on people and places has long been recognized (Gerstein et al., 1999). The recognition that gambling opportunities are correlated with socioeconomic factors, in particular crime (Seay, 1998), is equally germane. The purpose of this report is to estimate the number of these SSMs in Baltimore City after legalized casino gambling became a reality in the State of Maryland and to describe the socioeconomic predictors of machine density. Machine density is plotted against community characteristics to describe the locales most likely to host these types of machines and the individuals who therefore may be at higher risk of problem or disordered gambling. This information could be used to help focus targeted outreach campaigns for electronic machine gamblers.

Materials and Method

Data on registered SSMs were derived from the Baltimore City Department of Finance via a Maryland Public Information Act request. Data for 2013 licenses included the location of the licensed machine(s), the licensing fee, and the license holder. In 2013, 398 locations were licensed to offer SSMs. The number of machines at each location was recorded for only 103 (26%) of the 398 establishments, though information about fees paid was available for 366 (92%) locations. Therefore, we estimated the number of machines at each location by dividing the total fees paid in 2013 by the fee per device. If the fees paid were missing, the number of machines at the location was imputed to be the modal number of machines across the city.

Data on community level factors were obtained from the Baltimore Neighborhood Indicators Alliance (Baltimore Neighborhood Indicators Alliance–The Jacob France Institute, 2013). Data were available on community statistical areas (CSAs). CSAs are clusters of neighborhoods organized around 2010 Census tract boundaries. There are 55 defined CSAs in Baltimore City (Figure 1).

We derived SSM density by geocoding all licensed machines and cross-referencing them with CSA boundaries. The number of machines registered in the community was then divided by the total population of the community as estimated from the 2010 U.S. Census data. Baltimore City is largely a biracial population: 63.7% Black/African American and 29.6% White. Machine density was plotted against the

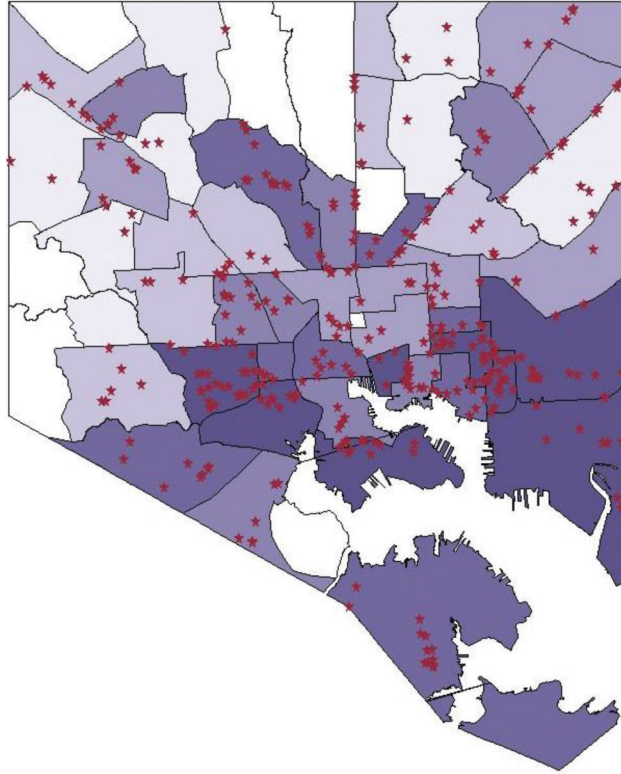


Figure 1. Location and machine density of registered simulated slot machines in Baltimore City, 2013. Areas are community statistical areas. Shading corresponds to the density of simulated slot machines in the community (darker: high density; white: no licensed location in community).

proportions of race and ethnicity in city communities, though the data were likely to be spatially auto-correlated (Gruenewald, Freisthler, Remer, Lascala, & Treno, 2006).

Part 1 crime is defined by the Federal Bureau of Investigation in *Uniform Crime Reports* as homicide, rape, aggravated assault, robbery, burglary, larceny, and auto theft reports to the police department. We defined the Part 1 crime rate as the number of Part 1 crimes divided by the resident population for each community. Part 1 crimes were subdivided into violent crimes—homicide, rape, and aggravated assault and robbery—and property crimes—larceny, burglary, and auto theft. We estimated domestic violence rates from calls to the emergency 911 system. Calls to 911 were used because domestic violence incidents can frequently be subsequently classified as several different criminal offenses in police reports. All crime rates were normalized per 1,000 residents to allow for comparison across areas in the city.

Median household income was obtained from the American Community Survey performed by the U.S. Census Bureau, with analysis provided by the Baltimore Neighborhood Indicators Alliance. Liquor outlet density was estimated from the number of Class A offsite or BD7 tavern liquor licenses granted by the Baltimore City Liquor Board.

Correlations between community-level EGM density and social factors were estimated by Pearson correlations. Linear regression models were used to account for colinearity of the predictors. All statistical analyses were performed with SAS v9.3 (SAS Institute, Cary, NC).

Results

Accessibility to SSMs

In 2013, 398 locations were licensed to carry SSMs in Baltimore City. The imputed number of machines at each location ranged from one machine to 20. The median number of machines was two and only 13 locations had more than four. We estimated that 868 machines were licensed in Baltimore City in 2013.

Geographic Distribution of SSMs

Registered machines were geographically distributed across the city (Figure 1). We calculated machine density as the number of machines divided by the total population in each community. Machine density varied widely in the city. Some communities had no registered machines, whereas other communities had over four dozen machines. Two communities of east Baltimore, Highlandtown and Orangeville/East Highlandtown, had over six machines for every 1,000 residents. For comparison, the casino plans to install 2,500 video lottery terminals (Haber, 2013) in a city of 620,961 residents (U.S. Census, 2010), a machine density of only four machines per 1,000 residents.

Social and Economic Correlates of EGM Density

Figure 2 shows the proportion of Black, White, Asian, and Hispanic residents by community. There is a strong correlation between the racial and ethnic composition of communities and the density of SSMs (Table 1). SSM density is negatively correlated with non-Hispanic Black/African American composition and positively correlated with White and Hispanic community composition. Among the predominantly White communities (defined as communities with > 50% White residents) there was a negative correlation with household income, although this did not reach significance (Pearson correlation = $-.41$, $p = .16$). The density of SSMs was also strongly positively correlated with the density of liquor outlets (Pearson correlation = $.58$, $p < .0001$).

The areas that housed SSMs in Baltimore City were also correlated with a number of indices of crime and safety. Part 1 crime rates were positively correlated with machine density (Pearson correlation = $.27$, $p = .05$), with the correlation being driven primarily by the property crime rate (Pearson correlation = $.29$, $p = .03$).

Because many socioeconomic factors are distributed in Baltimore City colinearly with race and ethnicity, we ran multivariate models. After controlling for race and

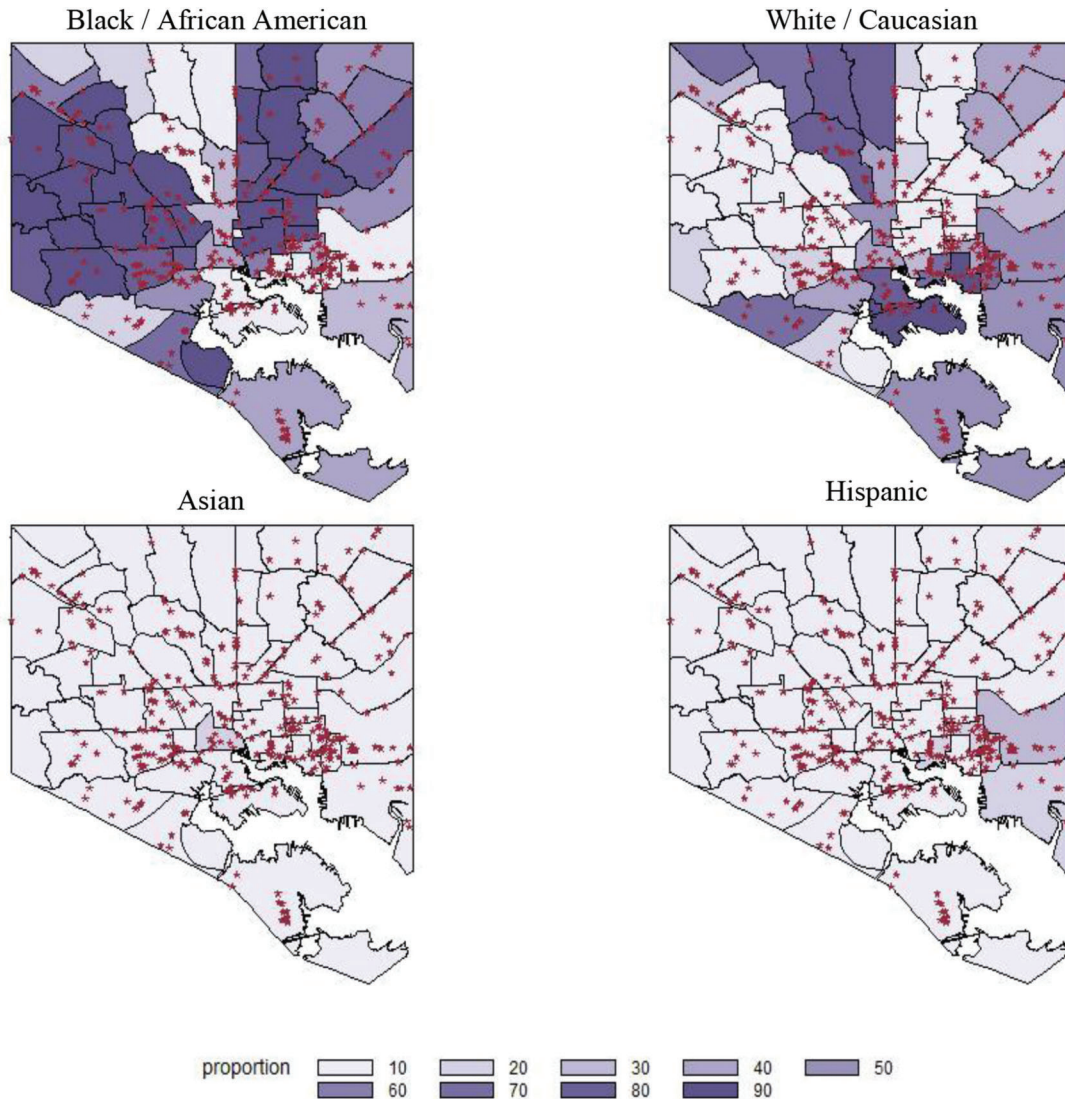


Figure 2. Location of registered simulated slot machines in Baltimore City in 2013 plotted against the proportion of race/ethnicity of community residents.

ethnicity, we found that the density of SSMs was significantly correlated with calls for domestic violence (beta = 0.02 per 1,000 residents $p = .02$) and with the unemployment rate (beta = 0.08 per 1,000 residents, $p = .03$).

Discussion

A nontrivial level of accessibility to EGMs was available within Baltimore City in 2013, the year prior to the opening of a casino in the city. There were an estimated 868 registered SSMs in city bars, restaurants, liquor stores, and other meeting places. A fair amount of uncertainty is involved in this estimate, because a minority of licensees reported the number of machines at the location. Therefore, we used the amount of fees paid to the city as a proxy for the number of machines available at

Table 1

Univariate Correlation of Simulated Slot Machine (SSM) Density and Percentage of Community Residents by Race/Ethnicity and Crime Rates in Baltimore City, as Estimated by Pearson Correlation Coefficients

| Community Characteristic | Correlation with SSM Density | <i>p</i> |
|---------------------------------------|------------------------------|----------|
| Race/Ethnicity | | |
| Black/African American (non-Hispanic) | -0.49 | .0001 |
| White/Caucasian (non-Hispanic) | 0.40 | .002 |
| Asian (non-Hispanic) | 0.16 | .24 |
| Hispanic | 0.70 | <.0001 |
| Crime | | |
| Part 1 crime rate | 0.27 | .05 |
| Violent crime rate | 0.19 | .16 |
| Property crime rate | 0.29 | .03 |
| Domestic violence calls | 0.18 | .20 |

each location because fees must be paid for each registered machine. However, this number is less than half the total number of SSMs estimated in 2005 (Jacobson, 2006), a time with even lower quality record keeping. The number of registered machines may be an underestimate of the true number of SSMs in the city. Anecdotally, a popular lunch destination of the authors, in proximity to the university's campus, offers a machine and does not appear on the registered list. It is likely not the only one. It would be near impossible to gather an accurate estimate of the total number of SSMs in Baltimore City, as many machine operators do not register the machines with city agencies and simultaneously do not prominently display them. A 2006 report (Jacobson, 2006) encountered the same problem, noting that even among registered operators, the number of machines is often under-reported and in conflict with zoning laws.

Despite the likely underestimation of the total number of machines, it is also likely that the true number of SSMs has decreased with time. One possible reason is the anticipation of competition with the new casino. In the community of South Baltimore alone, three known businesses registered SSMs in January 2013 and are either no longer in business or they removed the machines prior to the new casino opening.

SSMs in Baltimore City are concentrated in predominantly low-income White communities. There are several possible reasons for this. One large influence on the distribution of these machines is the marketing of the machines by the licensing companies. Half of the SSM locations in the city are licensed to only seven vending companies. These companies tend to have long-standing relationships with bar and tavern owners in certain communities and, as a result, machine density is highest in those locations. It is also possible that social and cultural influences contribute to the popularity of certain types of gambling activities. EGMs may be particularly popular forms of gambling within lower income White communities. Other forms of

gambling, such as dice or card games, may be popular elsewhere. Treatment and outreach professionals who are interested in reaching EGM players may need to concentrate on low-income White urban neighborhoods, where individuals may be disproportionately exposed to this type of gambling.

Machine density in Baltimore City is positively correlated with property crime. Because of the quasi-legality of the machines themselves (the machines are licensed but paying out winnings is still illegal), it is possible that this correlation is due to varying levels of familiarity or acceptance of crime by community members. That is, it is possible that residents of high-crime neighborhoods are more likely to accept “victimless” crime such as illegal slot machine payouts. Businesses in more affluent, crime-free areas of the city have little incentive to install SSMs in their respective establishments if players in the area are scared off by the nature of the payout. Thus, the association between machine density and crime rates should not necessarily be interpreted as machine play or players being responsible for an increase in crime rates. It is just as likely that this observed association is because businesses in low-crime affluent areas choose not to install these types of machines.

The recent expansion of legalized slot play in Baltimore City brought an estimated 2,500 new EGMs within the city limits. This study demonstrates that these new machines will be added to an already existing fabric of machines. Although some evidence indicates that the number of SSMs licensed by the city has declined in recent years, a substantial amount of electronic game play still occurs, particularly in lower income White communities. Future prevalence and incidence studies of gambling problems will need to account for the historic ebb and flow of accessibility to electronic games in the city. The new casino has not introduced slot play to Baltimore City, but rather adds to existing play and alters the delivery and location of the play.

References

- Baltimore Neighborhood Indicators Alliance–The Jacob France Institute. (2013, Spring). *Vital Signs 2011*. Retrieved from: http://bniajfi.org/vital_signs/archives/
- Dowling, N., Smith, D., & Thomas, T. (2005). Electronic gaming machines: Are they the ‘crack-cocaine’ of gambling? *Addiction, 100*, 33–45.
- Gerstein, D., Murphy, S., Toce, M., Hoffmann, J., Palmer, A., Johnson, R. A., Sinclair, S. (1999). *Gambling impact and behavior study: Report to the National Gambling Impact Study Commission*. Retrieved from National Opinion Center at the University of Chicago website: [http:// govinfo.library.unt.edu/ngisc/reports/gibstdy.pdf](http://govinfo.library.unt.edu/ngisc/reports/gibstdy.pdf)
- Gruenewald, P. J., Freisthler, B., Remer, L., Lascala, E. A., & Treno, A. (2006). Ecological models of alcohol outlets and violent assaults: Crime potentials and geospatial analysis. *Addiction, 101*, 666–677.

Haber, G. (2013, July 5). A few minutes with Alex Dixon, assistant general manager, Horseshoe Baltimore casino. *Baltimore Business Journal*. Retrieved from <http://www.bizjournals.com/baltimore/print-edition/2013/07/05/a-few-minutes-with-alex-dixon.html>

Jacobson, J. (2006, January). *Underground video gambling industry costing Maryland more than \$15 million annually in uncollected taxes*. Retrieved from The Abell Foundation website http://www.abell.org/sites/default/files/publications/ec_underground_gambling._106.pdf

Raylu, N., & Oei, T. P. (2002). Pathological gambling: A comprehensive review. *Clinical Psychology Review*, 22, 1009–1061.

Seay, D. (1998). *An overview of gambling and crime*. Retrieved from <http://govinfo.library.unt.edu/ngisc/meetings/10sept98/seay.pdf>

Shinogle, J., Norris, D. F., Park, D., Volberg, R., Haynes, D., & Stokan, E. (2011). *Gambling prevalence in Maryland: A baseline analysis*. Retrieved from the website of the Maryland Department of Health and Mental Hygiene <http://dhmh.maryland.gov/mha/Documents/GamblingPrevalenceinMD.pdf>

Storer, J., Abbott, M., & Stubbs, J. (2009). Access or adaptation? A meta-analysis of surveys of problem gambling prevalence in Australia and New Zealand with respect to concentration of electronic gaming machines. *International Gambling Studies*, 9, 225–244.

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