
**ECONOMIC IMPACT
OF
VIDEO LOTTERY TERMINALS (SLOTS)
AT KENTUCKY DOWNS**

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SUMMARY

This reports presents estimates of the of the local and regional economic impact of adding video lottery terminals (“slot machines”) at Kentucky Downs located near Franklin, Kentucky. Direct revenue estimates are generated by statistical models based on comparable facilities. These direct revenue estimates, supplemented by comparable facility data, are used to estimate direct and indirect effects on output, employment, and wages in the area. The Kentucky Downs facility is estimated to generate \$178 million in direct revenue, 979 jobs, and \$23.1 million in wages at the facility. This translates into estimated total impacts on Simpson County of a net increase of \$172 million in total output, 1086 (13.5%) increase in jobs, and \$27 million (9.2%) increase in wages after accounting for indirect effects across all county industries. For a four county region including Simpson and contiguous counties (Allen, Logan, and Warren), the estimated net increase in output is \$225 million with a 1213 (1.8%) increase in jobs and \$33.9 million (1.6%) increase in wages.

IMPORTANT QUALIFICATIONS AND ASSUMPTIONS

1. The methods used in this report are presented in good faith and using standard practices in the discipline of economics and policy analysis. However, any estimates of future revenues, employments, and wages will involve some errors.
2. Where figures are somewhat uncertain, we have chosen lower estimates to offset the general tendency for impact studies to overstate the net benefits of projects.
2. The CAE does not take a political position supporting or opposing the introduction of VLTs.
3. We estimate economic impact in a narrow financial sense only. We do not attempt to measure broader social costs and benefits such as enjoyment of individuals above the value of expenditures, congestion, crime, and related matters.¹
4. The estimates generated here take into account the addition of VLTs at several Kentucky facilities. The estimates do not account for the impact on Kentucky Downs' VLT revenue if similar facilities are added in Tennessee at some time in the future. Currently, no political discussion appears to be taking place in Tennessee.

¹ For an extensive examination of these issues, see "Gambling in Louisiana: A Cost-Benefit Analysis," University of New Orleans Division of Business and Economic Research, 1998, available at <http://business.uno.edu/dber/gambling1998/index.html>.

ESTIMATES OF DIRECT REVENUE EFFECTS

Using statistical techniques incorporating market population, market distance, market income, and highway/hotel traffic, consultants to Kentucky Downs generated revenue estimates for a VLT-only gaming addition. We generate independent, “amrs-length” estimates of revenues for comparison to the proprietary estimates,. With time and cost constraints, we employ a simple statistical methodology relying on publicly available data on comparable facilities across five Midwestern and Mid-Atlantic states. These facilities are chosen for their similarity to the Kentucky Downs location based on distance to sizable metropolitan areas, accessibility via major highways or interstates, population density of the states in which they operate, and data availability.

In our preliminary data analysis, we examined data from 12 VLT facilities from Delaware, Indiana, Iowa, Pennsylvania, and West Virginia. During this phase of the analysis, we also examined several possible influences on revenue to determine which set most accurately predicted revenues among the comparable facilities. These influences included metropolitan (MSA) population within 50 miles of facility, MSA population within 100 miles of facility, median household income of closest MSA, total income base (household income multiplied by number of households) within a given distance, and the number of competing facilities within a given distance.

The preliminary analysis indicated that including facilities with very high MSA populations in the sample substantially reduced the accuracy of the revenue estimates. Therefore, in our final estimates, we use 8 facilities in which the relevant MSA populations are closer to the size of the totals of the Nashville MSA-Clarksville MSA-Bowling Green MSA areas. Table 1 displays summary data for the key variables under consideration for these 8 facilities.

Table 1. Summary Data for Eight Comparable Facilities

Variable	Comparable Facilities	Kentucky Downs
Revenue FY 2008	\$176 million	NA
MSA Pop within 50 miles	1.77 million	1.9 million
MSA Pop within 100 miles	3.91 million	\$44,000
Median Household Income	\$37,000	\$44,000
Square Miles per Casino	3102	4444

The preliminary analysis also showed that the most accurate revenue estimates for the comparable site were produced by using MSA population (in millions) within a 50 mile radius.²

² We use regression analysis to estimate the revenue equation in the preliminary and final estimates. Data sources are provided in the Appendix. If any part of the MSA falls within the radius, all of the MSA population is included.

The final direct revenue revenue-estimating equation is:

$$\text{Revenue FY08} = 121 + 30.9 \times \text{MSA Population within 50 mile radius} \\ \text{(millions of \$)}$$

The model projects a base revenue (due to other influences) of \$121 million to which \$30.9 million in revenue are added for each additional one million in MSA population within the 50 mile radius. For the sample of 8 comparable VLT facilities, the equation above accounts for about two-thirds of the differences – a very high figure for such a simple model using a small number of data points. Moreover, the errors between the actual and estimated revenues are small. For 5 of the 8 facilities, predicted revenue are \$10 million or less versus actual revenues. Seven of the 8 are below a \$30 million error. The Waterloo Iowa facility had the largest error, \$67 million.

Direct revenue forecasts for Kentucky Downs based on this model are found by using the combined 1.92 MSA population within 50 miles of Kentucky Downs (Nashville, Clarksville, Bowling Green):

KY Downs Estimated Revenue =

$$\text{\$178 million} = 121 + 30.9 \times (1.92 \text{ million Population})^3$$

This direct revenue estimate of \$178 for Kentucky Downs addition of VLTs is important to all of the subsequent calculations in this report.⁴

ESTIMATES OF DIRECT EMPLOYMENT AND EARNINGS EFFECTS

A VLT operation requires a variety of employees with a range of wages and salaries including equipment technicians, food and beverage servers, cooks, dishwashers, general maintenance personnel, personnel managers, floor managers, sales clerks, accountants, financial analysts, computer systems personnel, and security personnel among other job descriptions.

We use our revenue estimates in combination with employment and earnings data from the VLT (racino) industry to estimate the direct employment and earnings impacts of the Kentucky

³ Statistical models that include MSA population within 100 miles and median income generate a revenue estimate of \$173 million. Models using income base generate a revenue estimate of \$161 million. However, the errors of these models are higher than the one used in the final estimates.

⁴ Our estimate and the proprietary estimates generated by the Kentucky Downs consultants are relatively close even though the methods and data differ somewhat.

Downs facility.⁵ While extensive data exists on casino employment based on facility revenues, VLT-only facilities tend to be more equipment-intensive and less labor-intensive than facilities with VLTs and extensive table games. Therefore, we utilize employment data from five states with VLT-only facilities (or very limited table games). These data appear in Table 2.

Table 2. Racino Revenue and Employment for Five VLT States

State	Racino Revenue (in millions)	Employees	Employees per \$1 mil. in Revenue
Delaware	\$586	2582	4.4
Indiana	\$205	1412	6.9
Iowa	\$466	2668	5.7
Pennsylvania	\$1597	4948	3.1
West Virginia	\$951	5270	5.5
Median Level	\$586	2582	5.5

Based on the median value of 5.5 employees per \$1 million in revenues across these states, we estimate Kentucky Downs direct employment from \$178 million in revenue to be

Kentucky Downs Direct Employment =

$$979 = \$178 \text{ (direct revenue)} \times 5.5 \text{ (median employees per \$ mil. revenue).}$$

Computing earnings (income) effects for employees is problematic due to the lack of public information. Most available wage data pertain to full-service casino operations offering both VLTs and table games.⁶ Casino wages vary considerably based on local labor market conditions. Table 3 shows wage and benefit expenses per employee at casinos in four comparable states.

⁵ The BEA RIMS II database provides estimates of employment and earnings effects based on direct revenue estimates. Because racino's tend to be substantially more capital intensive than is implied in the "other amusements, gambling, and recreation" industry, the direct employment effects tend to be overestimated, so we estimate them through alternative methods.

⁶ See American Gaming Association, "State of The States: AGA Survey of Casino Entertainment," available at http://www.americangaming.org/assets/files/uploads/aga_sos2009web_FINAL.pdf. Wages and benefits for casino operations are reported by state but racetrack casino wages and benefits are not.

Table 3. Wages and Benefits for Casino Operations in Comparable States

State	Total Casino Wages (with benefits)	Employees	Wages & Benefits per Employee
Indiana	\$616	2582	\$38,000
Louisiana	\$643	1605	\$37,000
Mississippi	\$954	3413	\$33,000
Missouri	\$360	1310	\$31,000

These figures for casino wages likely overstate earnings associated with a racetrack VLT operation in that full-service casinos tend to pay higher wages than VLT-only facilities due a larger number of higher skill positions associated with table games and related positions.

Wage and benefit data, however, are available for Pennsylvania, where the majority of gaming revenues derive from VLTs. For Pennsylvania, wages inclusive of tips and benefits are \$211 million out of revenues of \$1597 million, or 13 percent of revenues. We apply this figure to our revenue estimate for Kentucky Downs:

Kentucky Downs Total Wages =

$$23.1 \text{ mil.} = 178 \text{ mil. (revenue est.)} \times 13\% \text{ (wage/benefit percentage)}$$

Divided among the estimated 979 employees, this \$23.1 million is \$23,596 per employee.⁷ This figure should not be interpreted as “average wage” because the employment figure lumps together full and part time jobs.⁸

ESTIMATES OF INDIRECT AND TOTAL IMPACTS

We now develop estimates of the impact of these direct effects on output, employment, and wages for other businesses and households in the area – the indirect or the “multiplier” effects – and the total direct and indirect effects. Reasonable estimates of indirect effects must take account of the interconnections between the primary business and secondary businesses. These differ by region and particular industry. For a VLT facility, the primary secondary industries

⁷ A study of a proposed racetrack casino in the Pittsburgh area estimated total wages per employee to be \$25,000 using the IMPLAN model. See “The Economic Impact of a Category 2 Slot Machine Facility at Harrah’s Station Square Station,” available at http://www.pgcb.state.pa.us/files/impact_reports/Station_Square_Gaming--LIR-Part_2_of_4.pdf.

⁸ This problem of interpreting the “expense per employee” value as a measure of average wage rates+ seems to be some source of confusion in studies of racino impacts.

impacted are likely to be lodging, fuel, restaurants, and retail as well as third-level businesses impacted via increased impacts on the secondary businesses.

Several methods and tools exist for estimating indirect effects. The most common methods employ the use of benchmark “input-output” models based on extensive background testing and research regarding flows across industries and regions. These most widely applied tools and models go by the acronyms RIMS II, IMPLAN, and REMI, each with its particular advantages. We use estimates generated by the RIMS II nationwide model from the Bureau of Economic Analysis, U.S. Department of Commerce. The methodology behind these estimates is explained in more detail in the Appendix. Generally, the BEA uses statistical methods that link inputs in the area to outputs produced in the area based on nationwide studies and then customizes these estimates by region.

Indirect and Total Area Output Estimates

The uniqueness of the casino/racino industry presents particular difficulties in estimating the indirect effects within the area for whatever method is employed. VLT operations fall within the RIMS II industry definition of “other amusements, gambling, and recreation.” With gambling lumped with “other amusements and recreation” the unusually high tax rate applied to casino/racino operations is not taken into account. The state taxes on Kentucky Downs revenues will likely be in the 28-30 percent range with an additional 15 percent taken for subsidies to horse racing purses in the state. These represent “leakages” of revenues from the area to the state-level, offset by only some degree by the return of these revenues through state expenditures in the area or purse distributions to Kentucky Downs. Therefore, the direct revenue figure of \$178 million sets only an upper bound. A lower bound would be set by taking 56% of these revenues (100 percent less 29 percent state tax rate less 15% purse distributions). We provide estimates below based on both these upper- and lower-bounds along with a mid-range figure to take account of some state-level spending of revenues within the area and purse distribution accruing to the facility.

In computing the total output effect for the region, the tax treatment does not reduce the direct revenue itself because the before-tax economic gaming activity at the Kentucky Downs facility is not reduced by the tax treatment. Rather, these taxes are paid after gaming activity and revenue from it is collected. Table 4 presents the estimates for the multiplier and total output effects for Simpson County and a multi-county area of South Central Kentucky including Simpson and contiguous counties (Allen, Logan, and Warren).

Table 4. Estimates Total (Direct and Indirect) Output Effects

Region	Gross Revenue Low/High (in millions)	After-Tax-Purse Revenue Low/Mid/High (in millions)	Direct Revenue RIMS II Multiplier	Total Output Impact Low/Mid/High (in millions)
Simpson County	\$178	\$100/\$139/\$178	1.24	\$124/\$172/\$221
Simpson-Allen- Logan-Warren			1.62	\$162/\$225/\$288

The mid-range estimate for the total impact on output in Simpson County is \$172 million or about \$26,000 per current household. For the four county region, the mid-range total impact on output is \$225 million or about \$4300 per household.

Indirect and Total Area Employment and Wage Estimates

Several researchers have investigated the indirect employment and wage impacts of racinos/casinos. For example, the Ball State Center for Business Research examines long-run evidence (1978-2004) on the employment impacts of West Virginia racinos and finds a net 1.1 percent impact on area employment.⁹ An extensive examination by the University of New Orleans Business Center finds an average impact across Louisiana sites of 1.7 percent, but this figure varies widely across areas from a low of 0.8 percent to a high of 8.5 percent.¹⁰ The highest impacts (5.5 percent and 8.5 percent) are found where the area is near a state border with Texas – environments more closely resembling Kentucky Downs. A difficulty with such figures based on increases from base employment levels for a county or area is that the sizes of the bases differ making the use of an average impact such as “1.1 percent” or “1.7 percent” difficult to interpret. Employment in a large fiscal unit multiplied by a given effect size (for example 1.7%) yields a much larger impact than multiplying by employment in a small fiscal unit. For example, a 1.1% net effect based on Simpson County would imply a total employment impact of about 90 net jobs while the same effect based on the multi-county employment base would be over 700 jobs. In order to use such figures correctly, standardized population units must be employed, although population is not, in reality, standardized across units.

Alternatively, the RIMS II tables provide indirect employment and wage (earnings) estimates based on direct employment estimates where the size of the multiplier (indirect effect) depends on the size of the fiscal unit under consideration. Tables 5A and 5B summarize the estimated indirect and total employment and wage impacts these estimates:

⁹ See Michael J. Hicks, “Racino Gaming’s Impacts on Wages, Employment, and Economic Diversity,” *Journal of Economics*, 35 (No. 1, 2009).

¹⁰ See “Appendix L: The Economic Impact of Casino Gambling in Louisiana” in “Gambling in Louisiana: A Cost-Benefit Analysis,” University of New Orleans Division of Business and Economic Research, 1998, available at <http://business.uno.edu/dber/gambling1998/index.html>.

Table 5A. Indirect and Total Employment Impacts

Region	Direct Employment Impact (Jobs)	RIMS II Employment Multiplier	Total Employment Impact (Jobs)	Employment Impact as % of Current Employment
Simpson County	979	1.11	1086	13.5%
Simpson-Allen-Logan-Warren		1.24	1213	1.8%

Table 5B. Indirect and Total Wage Impacts

Region	Direct Wage Impact (mil.)	RIMS II Employment Multiplier	Total Wage Impact (mil.)	Wage Impact as % of Total Area Income
Simpson County	\$23.1	1.17	\$27.0	9.2%
Simpson-Allen-Logan-Warren		1.47	\$33.9	1.6%

Based on the direct employment effect at Kentucky Downs and the RIMS II multiplier, we estimate a total 1086 job impact in Simpson County. If employment impacts of this size were realized, they would increase employment in the county by 13.5 percent relative to current levels. For the four county region, the estimated employment impact is 1213 jobs or a 1.8 percent increase. Total wages in Simpson County are estimated to increase by \$27 million or a 9.2 percent increase. The percentage increase in wages falls below the percentage increase in employment because wages associated with the facility are expected to fall below average wages in the area. For the four county region, the estimated increase in total wages is \$33.9 million or 1.6 percent.

Appendix -- Direct Revenue Estimates

Data Sources:

VLT Revenue

Delaware Lottery Games (<http://lottery.state.de.us/games/video/>)

Indiana Gaming Commission (<http://www.in.gov/igc/2363.htm>)

Iowa Gaming and Racing Commission (<http://www.iowa.gov/irgc/>)

Pennsylvania State Gaming Control Board (<http://www.pgcb.state.pa.us>)

West Virginia Lottery (<http://www.state.wv.us/lottery/vidsum.htm>)

VLT Facility Employment

American Gaming Association (<http://www.americangaming.org/Industry/state/statistics.cfm>)

Population (MSA Data)

Population -- (<http://www.census.gov/population/www/metroareas/metroarea.html>)

Income

Median Household Income –

([http://en.wikipedia.org/wiki/Highest-](http://en.wikipedia.org/wiki/Highest-income_metropolitan_statistical_areas_in_the_United_States)

[income_metropolitan_statistical_areas_in_the_United_States](http://en.wikipedia.org/wiki/Highest-income_metropolitan_statistical_areas_in_the_United_States))

Summary of Methods for RIMS II Multipliers (Indirect Effects)

There are several, related, methods for estimating the indirect or multiplier effects from direct revenue estimates. We employ the RIMS II Multipliers as estimated by the BEA. Below, we present a brief summary of the details behind the estimation of these figures.¹¹

1. Manufacturing and services are broken into separate industries;
2. Input-output relationships are determined across industries with these relationships laid out in a matrix (rows, columns) format with the same industries laid out on both rows and columns, with the intersection between industries taking account of inter-relationships between them;
3. Shares or weights are attached to each industry according to the percentage of total output in each industry is accounted for by each of the other industries;
4. National estimates are regionalized by the applying “location quotients”
5. The basic structure of the relationships between inputs and outputs, along with shares for each industry are established using 1997 data.
6. The basic model is updated with 2006 data.
7. The industry applicable to our study is “Other amusements, gambling, and recreation”

Accuracy of RIMS II Estimates

RIMS II multiplier estimates have the following advantages: consistent procedures across regions and over time; a large amount of industry-specific detail to avoid aggregation errors; regular data updates. The main weakness of the estimates is that they are not adjusted for substitutions by producers when a particular factor becomes much more costly in the short run, such as gasoline prices in the summer of 2008. In comparisons with much more time-consuming, survey-based methods of establishing input-output relationships, RIMS II multipliers have been shown usually to be within 5 percent of the alternative estimates, and, in general, within 10 percent.¹²

¹¹ For further discussion, see “U.S. Department of Commerce, Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II),” Washington D.C., 1997.

¹² See Tim Lynch, “Analyzing the Economic Impact of Transportation Projects Using RIMS II, IMPLAN, and REMI. U.S. Department of Transportation, Office of Research and Special Programs, October 2000.

Center for Applied Economics/WKU

Department of Economics

Gordon Ford College of Business

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This report prepared by Dr. Brian Goff, Distinguished University Professor, Department of Economics with comments and assistance from Dr. Bill Davis, Dr. Robert Pulsinelli, and Mr. Zach Timpe.