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Virginia's Horse Industry: Characteristics and Economic Contributions

by Terance J. Rephann

Introduction

In the past several decades the horse industry has grown to play an increasingly more visible role in Virginia's farm economy. While annual sales of Virginia's crops and livestock have remained relatively stable in constant dollars, the sales, inventory and total value of horses in Virginia have grown rapidly. However, it would be a mistake to restrict an economic analysis of horses to an examination of their farm roles. Virginia's horse industry encompasses a variety of activities from breeding, training and boarding to recreational pursuits such as racing, showing and other competitions. The intensity, scale and scope of these activities have expanded. Horse ownership has become increasingly popular, and venues offering opportunities for racing, showing and trail riding have spread across the commonwealth. As a result, the horse industry has come to play a more visible role not only in agriculture, but in recreation and tourism as well.

This article is based on a recent study prepared under contract for the Virginia Horse Industry Board.[1] The study relies on extensive survey work and regional input-output analysis to estimate the economic contribution of what is popularly known as the horse industry. "Equine industry," which includes ponies, mules, donkeys and burros, as well as horses, would be a more accurate descriptor, but "horse industry" will be used here because it is a more common term, and the primary focus is on horses. The total economic impact of the industry arises from three categories of spending: (1) expenditures on horse operations by households with horses and by farms, breeders and boarding facilities, (2) expenditures associated with horse shows and competitions, and (3) expenditures connected with pari-mutuel racing activities licensed by the Virginia Racing Commission. Initial spending for these categories affects not only the farm sector, but the household, tourism and recreation sectors whose spending, in turn, supports numerous other industries.

Terance J. Rephann

Virginia's Horse Population

Throughout much of Virginia's history, horses have played a vital role in the state's growth and development. Horses arrived with the settlers at Jamestown. Like elsewhere in America, they were the primary means of transportation and provided much of the energy for farm and industrial production. They were crucial for moving soldiers, materiel and artillery in times of war and communicating with remote outposts; horses were also used for racing and recreation. From 1840 to 1910 they grew in number. However, technological breakthroughs such as the electric motor, automobile, and telephone gradually made horses

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"In the past three decades, after many years of decline, U.S. and Virginia horse populations have rebounded…"

A new member of Virginia's horse population.

obsolete for manufacturing, farming, transporting and couriering; consequently their number dwindled in Virginia and throughout the nation.

In the past three decades, after many years of decline, U.S. and Virginia horse populations have rebounded, stimulated mainly by the increasing interest in horses for recreational activities and sport. This growth parallels national increases in disposable income which enabled consumers to spend more on recreation and leisure activities. The U.S. farm-based horse population more than doubled from a low point of just over 2 million in 1978 to 4.3 million in 2007.[2] Although federal statistical agencies, such as the U.S. Department of Agriculture, do not provide regular estimates of the non-farm horse population, a recent estimate from the American Horse Council places the total horse population at 9.2 million.[3]

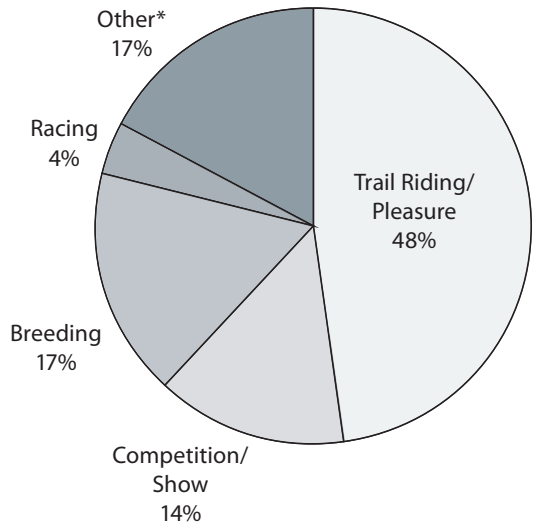
It seems likely that this growth continued until relatively recently. According to a 2009 horse owner survey, respondents said they were more likely to reduce the number of horses they would have two years hence than they were to increase the number. These results are consistent with growing evidence that the number of unwanted and abandoned horses is increasing, in large part due to the downturn in the national economy.[4]

Virginia is an important player in the growing national horse industry. It ranks twelfth in number of horses according to estimates made for the American Horse Council. In contrast, it ranks fifteenth for farm-based horses according to the 2007 Census of Agriculture, reflecting the greater importance of horses in ranching and farming activities in larger agricultural states of the Midwest and West. Still, this farm population figure reflects relatively recent growth, advancing from 71,201 in 1997 to 97,112 ten years later, an increase of 36 percent. Farm-based horse sales made up almost 4 percent of agricultural cash receipts in 2004, compared to less than 1 percent in the 1960s and early 1970s.[5]

Focusing on farm-based horses is too restrictive. Most of Virginia's horse population lives off-farm. Estimates of Virginia's total horse population vary widely because of different sampling sizes and methodologies. However, the most recent survey conducted by the Richmond field office of the National Agricultural Statistics Service estimates that there are approximately 215,000 horses in the state, more than twice the number of the farm-based population estimate.[6] Estimates available from the American Horse Council place the population somewhat larger—239,102 in 2003—but the sampling method used was less rigorous.[7]

Virginia's horses have varied uses and represent many breeds. Almost half of Virginia horses are used for pleasure/trail riding (see **Figure 1**).

Figure 1. Virginia Horses by Primary Use, 2006

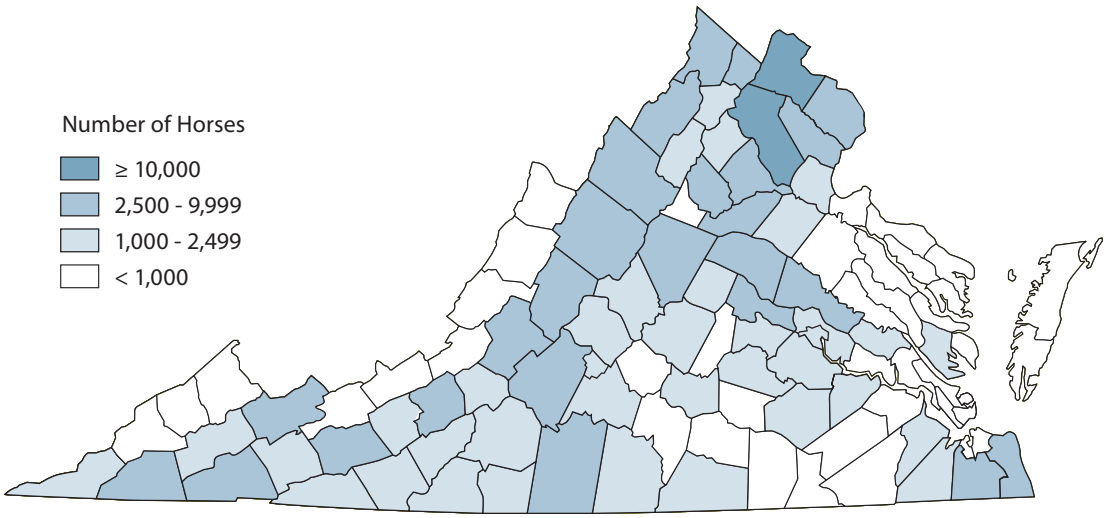


Source: U.S. Department of Agriculture, National Agricultural Statistics Service (2008).

* The "other" category uses include hunting, working, driving, training, dressage, police/rescue, and all other uses.

Similarly, the American Horse Council study shows that 42 percent of horses are used recreationally rather than for competitive, work or breeding purposes. Virginia's two most popular horse breeds, the American Quarter Horse and the Thoroughbred, are also the most popular U.S. breeds. These breeds have a longstanding connection to Virginia. The Quarter Horse was bred in Virginia, while the first Thoroughbreds were imported to America through Jamestown. Both

Figure 2. Virginia Horse Population by Locality, 2006



Source: U.S. Department of Agriculture, National Agricultural Statistics Service, *Virginia Equine Survey Report: 2006* (2008).

breeds are popular choices for racing and other competitive horse events. The Tennessee Walker and Arabian are other important Virginia breeds.

Horses can be found in every Virginia county and some of the larger independent cities. However, greater concentrations are found in urban and suburban counties, particularly in Northern Virginia (see **Figure 2**). This geographical location pattern is quite different from that of other livestock such as cattle, hogs and sheep, which tend to be located in rural areas.[8] A comparison of 2001 and 2006 survey data suggests that the horse population is migrating further away from growing suburban areas because of land development pressures.

Virginia's horse population is supported by a rich horse tradition, an excellent horse industry infrastructure of facilities and services, and an agreeable climate.[9] However, its continued growth and development depends on five factors: (1) availability of affordable undeveloped land, (2) maintenance of an agricultural infrastructure that provides the materials, services and facilities needed for breeding, training, stabling, feeding and caring for horses, (3) a healthy pari-mutuel racing industry, (4) quality show and competition facilities and venues such as the Virginia Horse Center in Lexington, Commonwealth Park in Culpeper, and Meadow Event Park in Caroline County, and (5) an active calendar of shows, competitions and other equestrian events. The economic impact of the industry will largely be determined by the continued popularity of horse ownership and the drawing power of recreational pursuits such as horse racing, showing and other equestrian activities. These topics are explored further below.

Horse Operations

Virginia had 41,000 horse operations in 2006, which generated over $782.9 million in horse-related expenditures for 215,000 horses.[10] Adjusted to 2010 dollars,[11] Virginia residents spent almost $873 million (see **Table 1**).[12] The bulk of this spending was for direct horse maintenance and support.

Horses in pasture.

Typically, there are large differences in average horse expenditure depending on the horse breed and use. Horses used for racing, in particular, and less so, for showing/competitions, incur more expenses for transportation to and from races and competitions and for stabling at races and shows.[13] They also require more spending on training and upkeep due to the stresses, injuries, and demands of competitive sports and showing and the need for specialized tack and equipment. Changes in the composition of horse breeds and horse uses, therefore, have implications for spending on horses. Results from the Virginia equine surveys suggest that racing uses have decreased significantly in recent years, partly reflecting the

"Virginia's horse population is supported by a rich horse tradition, an excellent horse industry infrastructure of facilities and services, and an agreeable climate."

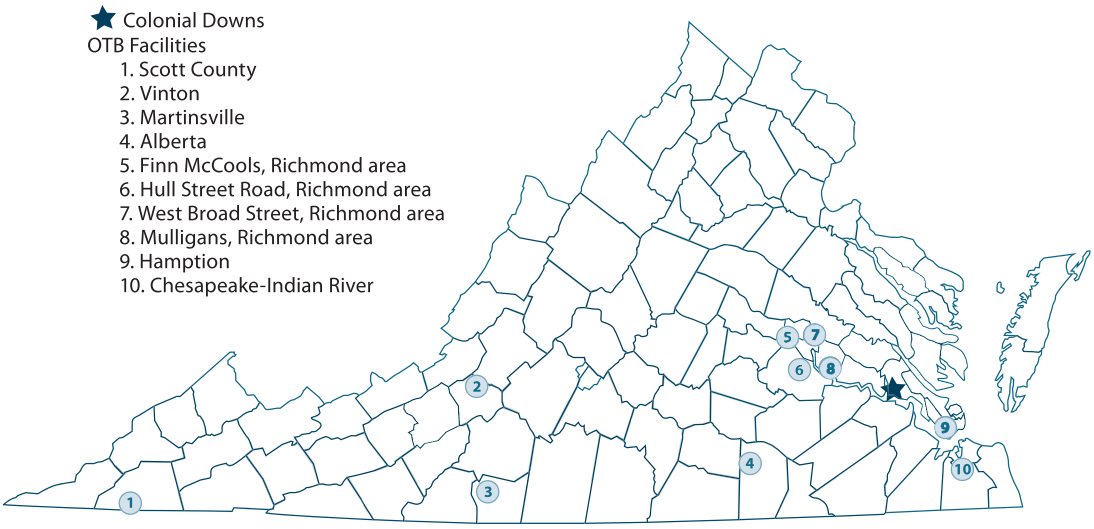
Table 1. Horse Operations Expenditures in 2006 Based on 2010 Dollars

Category	Expenditures
Purchases and upkeep (e.g., feed, equipment, boarding, utilities)	$665,810,968
Horse related activities (e.g., travel and lodging, professional fees)	39,812,152
Labor and capital improvement expenses	167,370,049
Total	872,993,169

Source: USDA, National Agricultural Statistics Service (2008) and calculations by the author using IMPLAN price deflators.

"Virginia was the center of American racing during colonial days, but had lost that dominance by the end of the 1800s..."

Figure 3. Virginia Pari-mutuel Racing and OTB Facilities



migration of the Thoroughbred population to states offering more competitive breeding incentives.[14] Showing uses, however, have remained relatively stable over the same period.

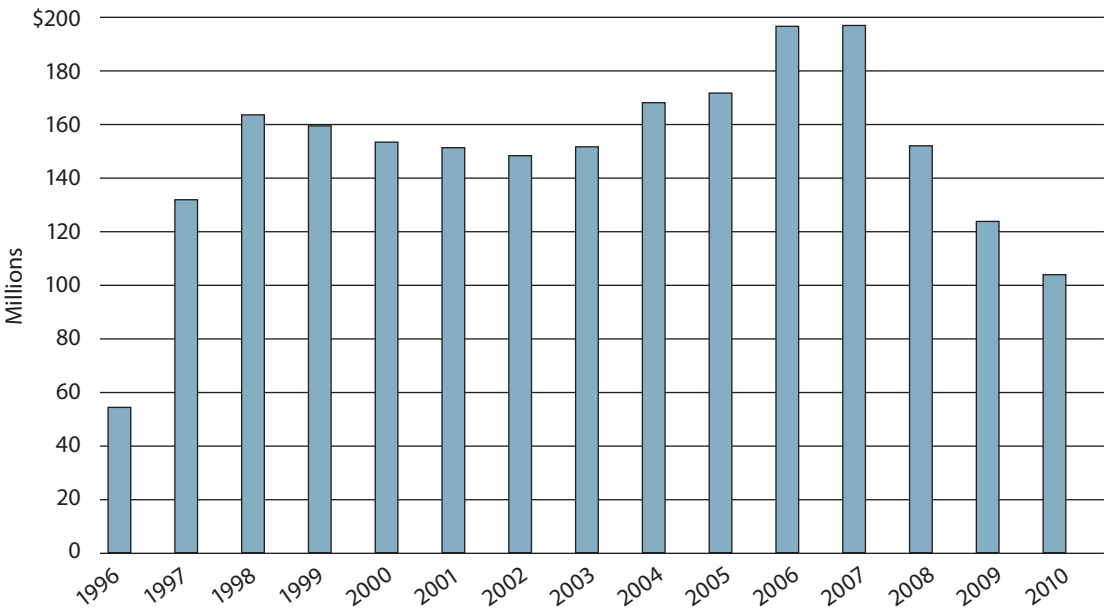
Horse Racing

Virginia was the center of American racing during colonial days, but had lost that dominance by the end of the 1800s since much of the Thoroughbred industry had migrated to Kentucky.[15] It wasn't until the General Assembly legalized pari-mutuel gambling in 1996, established the Virginia Racing Commission as regulatory authority, and authorized the Colonial Downs Racetrack, that the winds began to change. The racetrack, which is located in New Kent County, east of Richmond City, is privately owned by Jacobs Entertainment. It has the nation's premier grass turf racing track, as well as a 1.25-mile dirt track. Colonial Downs features Thoroughbred racing during June to mid-August and Standardbred (harness racing) from mid-September to early November. It also hosts a number of other horse events such as races, tournaments, festivals and concerts during the year. Simulcast wagering is offered at ten off-track betting (OTB) facilities located throughout much of the southern half of Virginia, including four in the Richmond area, two in the Hampton Roads region, two in the Southwest, and two in Southside (see **Figure 3**). These OTBs account for the bulk of state pari-mutuel wagers.

One measure of the Virginia racing industry's overall economic health is the total amount of money wagered. Virginia's racing wagers initially grew with the opening and maturation

Colonial Downs Racetrack, in New Kent County, Virginia.
Photo courtesy of Colonial Downs.

Figure 4. Virginia Pari-mutuel Wagering in 2010 Constant Dollars, 1996-2010



Source: Virginia Racing Commission (2010).

of the Colonial Downs track, expansion of state off-track betting opportunities, interstate simulcast (live horse race video feeds of horse races around the nation and world), and the addition of telephone and computer account wagering. However, like any sporting and recreational product, demand for pari-mutuel wagering overall and at individual locations depends not only on the location, quality and price (i.e., betting odds) of the product, but also on the proximity, price and quality of recreational substitutes and the disposable personal income levels of consumers.[16]

Developments in the gaming industry have had a huge impact on pari-mutuel racing throughout the country. Stand-alone pari-mutuel facilities find themselves rapidly losing market share to casino gambling, Internet gambling, and racinos (i.e., racetracks offering casino gambling options).[17] For Virginia, competition from neighboring states is intense and escalating. West Virginia, Pennsylvania and Maryland have legalized slot machines at track and off-track locations.[18] The recent deep recession has affected racing revenues as hard-pressed consumers cut back on their discretionary spending.[19] As a result, Virginia pari-mutuel wagering has been particularly hard hit and has plummeted to levels in price-adjusted dollars last seen in the first two years of Colonial Downs' operation in 1996 and 1997 (see **Figure 4**).

Racing attendance at Colonial Downs during the 2010 Thoroughbred and Harness seasons was 74,272 while, for the eight OTB locations where tallies were available, 325,222 attended. The various facilities draw primarily in-state patrons; an estimated 89 percent of Colonial Downs attendance was in-state, compared to 78 percent of OTB attendance.[20] Colonial Downs spectators from in-state were generally "day trippers" who travelled to the area for the races. An analysis of ZIP code data indicates that about two-thirds of the attendees were drawn from the Richmond Metropolitan Statistical Area (MSA). The typical OTB patron was a resident of the local region with an estimated one-third being from the same county as the OTB location.

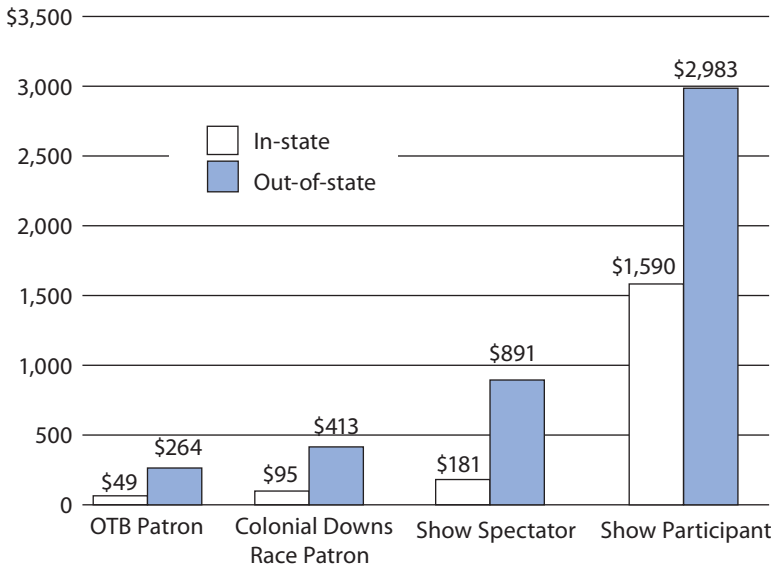
Spending patterns of racetrack and OTB patrons vary by venue and residency. At Colonial Downs (see **Figure 5**), state attendees spent on average $103 on track wagers and $95 on other goods and services. Out-of-state visitors spent on average several days in Virginia and their expenditures reflected those longer stays with $413 in non-wager spending and $34 on wagers. Off-track betting parlor visitors generally had much larger wagers and lower spending on other items. The average state resident spent $153 on wagers and $49 on other goods and services. Out-of-state visitors spent on average $264 on other items.

Shows and Competitions

Virginia hosts some of the nation's most venerable equestrian events, such as the Upperville Colt and Horse Show in Fauquier County (the oldest hunters and jumpers show, which started in 1853), the

"Developments in the gaming industry have had a huge impact on pari-mutuel racing throughout the country."

Figure 5. Average Non-Wager Expenditures per Travel Party for Virginia Horse Events, 2010



Source: Weldon Cooper Center for Public Service, Center for Economic and Policy Studies.

"There were 1,193 horse shows and activities held in Virginia during 2010."

Strawberry Hill Races (a steeplechase race begun in 1895 that is currently hosted at Colonial Downs), and the Warrenton Pony Show (established in 1920). The commonwealth has an extensive annual calendar of horse shows, competitions and other horse related events such as clinics, auctions, trail rides, and polo games. Some of the shows attract national and even international attention.

Horse shows are judged competitions in which awards are made for the conformation, disposition or performance of the horse or for skill exhibited by the rider. They are usually categorized by region, discipline or breed. Many

Hunter jumper horse show.

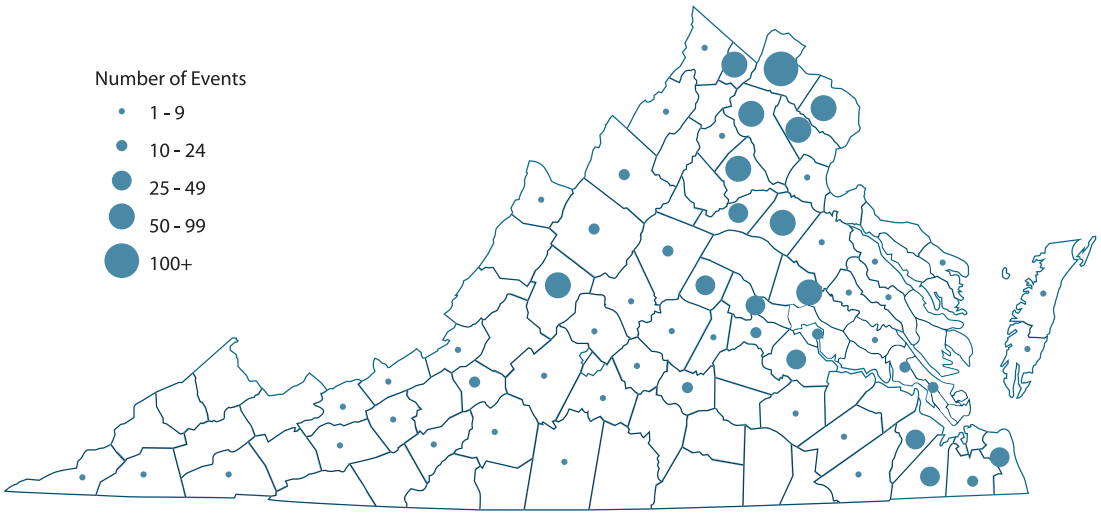
shows are open to different breeds or feature varied disciplines. However, some are restricted to particular breeds or emphasize a specific type of competition. Usually shows are divided into classes in which similar types of horses and rider skill levels compete in a given activity. Shows and competitions may be either sanctioned or unsanctioned. Sanctioning may result from local, state or national organizations. In many instances, local horse clubs are regional affiliates of state and/or national organizations. For instance, the United States Dressage Association has a group member organization, the Virginia Dressage Association, which in turn has eight Virginia chapters (Central, Northeast, Charlottesville, Northern, Shenandoah, Fredericksburg, Southwest and Southeast). The presence and quality of sanctioning can have a substantial effect on show participation.[21]

There were 1,193 horse shows and activities held in Virginia during 2010. These events were categorized in terms of the likely geographical ranges of their audiences, with events being identified as having national, regional, state or local draws. Local events attract participants mainly from the locality where the

The Virginia Horse Center in Lexington, Virginia.
Photo courtesy of The Virginia Horse Center.

event occurs or localities contiguous to the event locality. State events draw primarily from within Virginia. Regional events attract from within the state as well as adjoining states, while national events draw even farther afield. Events are designated as falling into four general categories based on descriptive information and programs for the events. These categories include hunter-jumper shows, dressage competitions (which encompass eventing, horse trials and combined tests), western riding events, and a catch-all category called "other," which includes multi-discipline shows, fun shows, steeplechase races, vaulting, jousting, Gymkhana (a mounted game), etc.

Figure 6. Virginia Horse Shows and Competitions by Locality, 2010



Source: Weldon Cooper Center for Public Service, Center for Economic and Policy Studies.

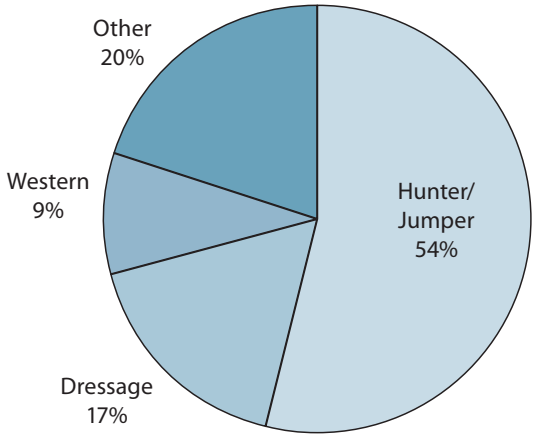
Not surprisingly, the vast majority (84.9 percent) of Virginia events draw primarily from their local areas while 9.3 percent have a statewide focus, and the remaining 5.8 percent draw significant numbers of participants from outside the state. A majority of the national and state events are hosted by the Virginia Horse Center. Sixty-nine of Virginia's 95 counties and 41 independent cities hosted at least one event. However, events are fairly geographically clustered in certain regions. The Northern and Central regions account for the vast majority of events (see **Figure 6**) and the Southside and Southwest regions the least.

Virginia's horse event character reflects its Colonial era beginnings, with English disciplines being the most popular events. Hunter/jumper shows are the most common events, followed by dressage (see **Figure 7**). Nine percent are western themed shows (e.g., cutting, reining, barrel racing). The remainder are breed shows, mixed theme shows, pleasure/fun events or other games and competitions. If one restricts the event list to national, regional and state level shows, like those covered by a recent USDA study of horse events held in six states, it is clear that Virginia's show profile more resembles eastern states, like New York, rather than Texas or Colorado where western riding events are more common.[22]

Attendance at Virginia horse show and competitions is estimated at 938,971 for 2010 (see **Table 2**). This number includes participants and their immediate travel party, as well as spectators. Approximately 53 percent of the headcount were show and competition participants or members of their travel party; the remainder were spectators. A large portion of the spectators, about 42 percent, attended steeplechase races, which tend to attract big audiences. Nearly 46 percent of attendees at horse shows and competitions were drawn from

"Virginia's horse event character reflects its Colonial era beginnings, with English disciplines being the most popular events."

Figure 7. Virginia Horse Show and Competition Events by Discipline, 2010



Source: Weldon Cooper Center for Public Service, Center for Economic and Policy Studies.

Table 2. Virginia Horse Show and Competition Attendance Estimates, 2010

Category	Number	Percent
Residence		
In-county	428,287	45.6
Other in-state	379,554	40.4
Out-of-state	131,030	14.0
Purpose for attending		
Participant	131,147	14.0
Participant travel party	367,422	39.1
Spectator	440,302	46.9
	938,871	100.0

Source: Weldon Cooper Center for Public Service, Center for Economic and Policy Studies.

the locality in which the event was held. Another 40 percent came from elsewhere in Virginia. Fourteen percent were out-of-state residents.

Horse show and competition attendees reported the highest spending levels of the three types of venues surveyed (see Figure 5). In-state spectator parties spent an average of $181. Out-of-state spectator travel expenses were $891, with the largest expense item being lodging. Participant expenses were much higher because of costs associated with horse transportation and care. In-state participants spent an average of $1,590, while out-of-state participants spent nearly twice as much.

"The industry is a significant source of commonwealth economic activity, accounting for 16,091 total jobs in 2010."

Measuring Economic Impacts

Economic impact is computed using input-output analysis, a tool widely used in regional economics developed by Wassily Leontief, a Nobel Prize winner in economics. It is based on models constructed from input-output tables that show flows of purchases and sales among sectors of the economy. An input-output model can represent the total impact of new spending as consisting of three parts, a "direct effect," an "indirect effect" and an "induced effect."

Direct Effect. The direct effect consists of the injection of economic activity or expenditure into the region. For example, the expenditures of horse operations, the expenditures made by horse show facilities, and participant and visitor expenditures would all count as direct expenditures. However, only the portion of the expenditure made in the state or local economy is counted as a direct expenditure. Expenditures made on products and services made out of state are not counted.

Indirect Effect. The direct expenditure causes an indirect effect on the regional economy when direct effect money is re-spent. For example, state businesses provide supplies and services to the horse industry such as bedding and feed, veterinarian services, utilities and insurance. These businesses spend a portion of their sales revenues on their supplies and services from other local and state firms who, in turn, purchase a portion of their supplies and services from other local and state firms. This cascading sequence of spending continues until the subsequent rounds of spending dissipate due to leakages in the form of taxes, savings, and spending outside the state or region. The cumulative effect of these cascading rounds of inter-industry purchases is referred to as the indirect effect.

Induced Effect. Workers employed by businesses involved in the direct and indirect effects use their incomes to purchase goods and services from local and state firms. They, in turn, purchase a portion of their labor and material inputs from other local and state firms and so forth. Again leakages occur at each round due to taxes, savings, and purchases of goods and services outside of the region or state. The induced effect is the sum of all impacts associated with household purchases.

The impact analysis for this study used IMPLAN (IMpact analysis for PLANning), an industry standard model that has been used in many economic impact studies, including studies of the regional economic impacts of the horse industry in Virginia and other states.[23] Impacts are evaluated with IMPLAN using four different measures: (1) total sales or total industrial output (TIO), (2) labor income, (3) value added, and (4) employment. In addition, tax revenue impacts are estimated using additional information outside the model. Total sales or industry output is the total value of industry production during a one-year period. It measures sales of intermediate inputs for use in production as well as sales of products to final consumers. Value added is a subset of total industrial output. It reflects only sales to final consumers, avoiding the double counting that occurs when intermediate inputs are included. It is the most commonly used measure of economic activity. Value added is the concept behind gross domestic product (GDP) and can be compared to the GDP numbers provided by the Bureau of Economic Analysis for states and metropolitan areas. It can also be represented as total factor income plus indirect business taxes. Employment is measured in terms of person-years of employment. A person-year of employment is a job of one year in duration. This measure includes full-time and part-time workers as well as the self-employed and is measured by place of work.

Results of the Input-Output Analysis

Direct expenditures are generated from spending of horse operations such as farms, breeding facilities and boarding facilities; the expenditures of pari-mutuel race facilities and spectators; and the expenditures of horse show and competition providers, spectators and out-of-state participants. After making adjustments to avoid double counting and to correct for out-of-state spending leakages, it was found that in 2010 horse operations contributed a direct expenditure of $493 million, horse shows and competitions accounted for $95.9 million, and the pari-mutuel industry made direct expenditures of $54 million for a combined direct sales impact of $642.9 million. **Table 3** shows this direct impact along with indirect and induced spending.

The industry is a significant source of commonwealth economic activity, accounting for

Table 3. Direct, Indirect, Induced and Total Impacts of the Virginia Horse Industry, 2010

Impact	Employment	Labor Income	Value Added	Total Sales
Direct	12,098	$323,567,325	$347,346,016	$642,927,067
Indirect	1,288	66,090,711	108,945,789	198,293,499
Induced	2,705	112,752,202	213,529,230	360,795,434
Total	16,091	502,410,239	669,821,036	1,202,016,001

Source: Weldon Cooper Center for Public Service, Center for Economic and Policy Studies.

16,091 total jobs in 2010. The labor income impact was $502.4 million. The value added impact (which includes labor income, property income such as dividends, interest, rent and profits, and indirect business taxes, and is directly comparable to gross domestic product) was $669.8 million. The total sales impact (which includes intermediate sales as well as sales for final demand) was $1.202 billion.

The industry also generates revenue for state and local government. According to these estimates, the Virginia horse industry accounted for $65.3 million in total state and local taxes in 2010. State taxes were estimated at $37.5 million, and of this total, the largest portion was from the individual income tax ($18.5 million), followed by the sales and use tax ($9.2 million). Other taxes (e.g., corporate income taxes, motor fuels) amounted to $7.9 million. Pari-mutuel racing license tax revenues were $1.9 million. Local government taxes were estimated at $27.8 million. The largest category was "other taxes" ($20.9 million) of which real property taxes formed the largest part. The local options sales and use tax and meals tax each brought in more than $2 million dollars. Pari-mutuel revenues were $911 thousand.

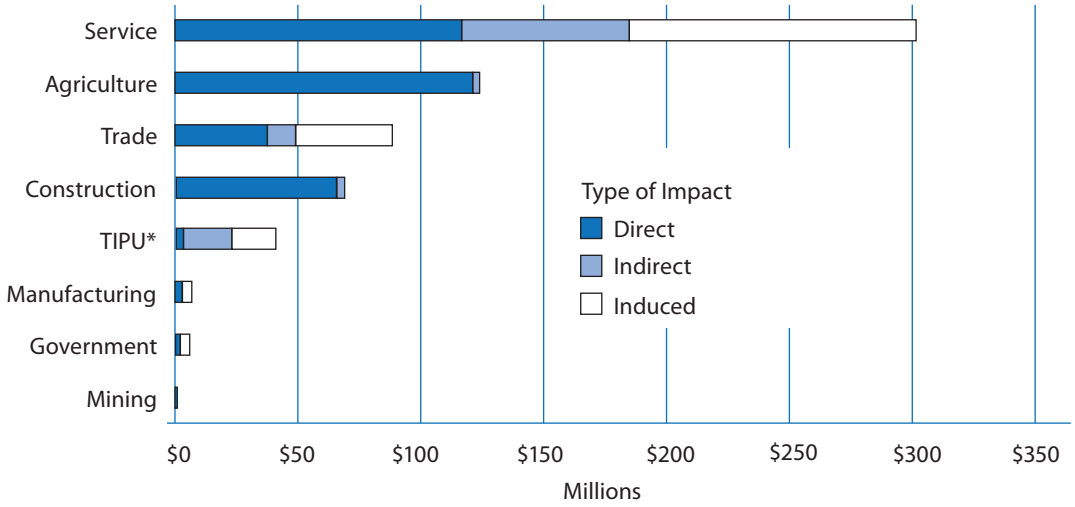
The value added impacts of the Virginia horse industry were felt in many sectors of the economy (see **Figure 8**). The largest effects in terms of employment were in the agriculture and service sectors. Trade and construction also experienced large economic effects. The direct effects of industry purchases were dominant in agriculture which includes farming as well as agricultural support services, such as farriers (horseshoers) and groomers. Services and retail sector impacts reflect the direct effects of industry spending, as well as indirect and induced effects.

Economic impacts were also estimated for each major industry component—horse operations, shows and competitions, and pari-mutuel racing. The largest component of impact is related to the expenditures of Virginia horse owners. This component includes the expenditures of Virginia owners on horse-related expenses but does not include associated tourism expenditures of in-state residents and expenditures of out-of-state visitors related to shows and competitions. In addition, this component does not include the expenditures of the state's racetrack and OTBs and pari-mutuel visitor spending outside of the racetrack and OTB facilities.

Horse operations accounted for 12,685 jobs, $410.1 million in labor income, $526.1 million in value added, and $926.3 million in total sales in 2010. Shows and competitions accounted for 2,294 jobs, $59.3 million in labor income, $92.6

"...the Virginia horse industry accounted for $65.3 million in total state and local taxes in 2010."

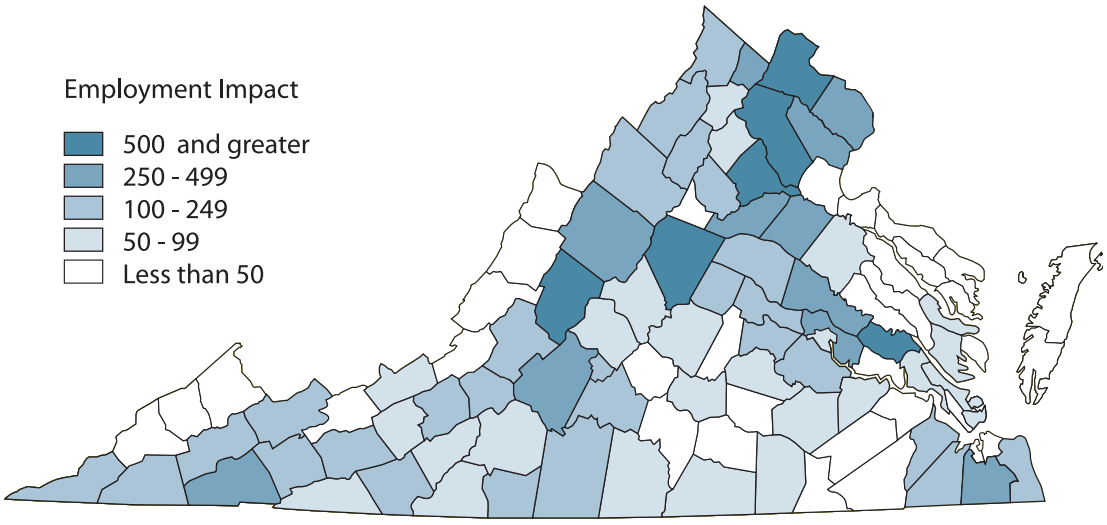
Figure 8. Value Added Impact of the Virginia Horse Industry by Sector and Type, 2010



Source: Weldon Cooper Center for Public Service, Center for Economic and Policy Studies.
*Transportation, information and public utilities.

"The most popular category of horse use in Virginia is recreational riding, including trail riding."

Figure 9. Total Employment Impact of the Virginia Horse Industry by Locality, 2010



Source: Weldon Cooper Center for Public Service, Center for Economic and Policy Studies.

million in value added, and $172.6 million in total sales. Pari-mutuel racing activities had an economic impact of 1,112 jobs, $32.9 million in labor income, $51.1 million in value added, and $103.2 million in total sales.

Lastly, impacts were computed for Virginia's localities. The employment impacts are illustrated in **Figure 9**. The largest concentration of economic impacts is in Northern Virginia. Indeed, Fauquier and Loudon counties each had over 800 jobs attributable to the horse industry. The largest employment impact, however, is found in Rockbridge County (including the cities of Lexington and Buena Vista), where an estimated 1,331 jobs were stimulated. This impact reflects the important roles of the Lexington-based Virginia Horse Center, other horse shows and competitions held in the county, and a relatively large inventory of 3,700 horses. New Kent County, home to the Colonial Downs racetrack, which directly employs nearly 400 people during the Thoroughbred racing season, is another significant economic activity center, with a total employment impact of 789.

Other Economic Effects

The Virginia horse industry provides additional economic benefits and some costs that are not captured in the previous discussion, which only examined how flows of certain horse-related expenditures affect the economy. For instance, the economic impacts attributable to expenditures of out-of-state residents who visit Virginia for non-competitive pleasure and trail riding are not included, nor are the economic impacts of horse-related higher education programs. In addition, the impact estimating technique cannot capture the wider social benefits and costs of horse-related activities and open-space preservation. However, some estimates of the magnitude of the contribution of these other activities are available from other studies. These impacts, social benefits, and costs are discussed below for the topics of trail and pleasure riding, the environment, health and wellness, and higher education.

Trail and Pleasure Riding. The most popular category of horse use in Virginia is recreational riding, including trail riding. Over 285 public access horse riding trails in the state support recreational riding.[24] The previous analysis captures only the economic impacts of a portion of this important market—the expenditures of Virginia horse operations that cater to this market. Not included in the economic impact results are (1) the horse tourism-related expenditures of residents and non-residents who do not own horses and (2) the horse and tourism-related expenditures of out-of-state residents who bring their horses to Virginia for riding. Studies conducted elsewhere shed some light on this market segment. A study of Kentucky trail riders found that trail

Trail riding.

riders make 11 horse-related trips per year and incur approximately $210 in travel expenses each time.[25] A study of the Knott Country 2008 Trail Ride, situated in Eastern Kentucky, found that average trip expenditures were $325 for a multi-day stay.[26] While these trip expenditure estimates are much smaller than expenditures associated with horse shows and competitions, they have the potential to add up because of a relatively large number of participants. For instance, an economic impact study of overnight horse camping in Southern Illinois found that out-of-state riders directly spent $16 million in the region.[27]

The Environment. Virginia's horse industry is an important buttress for Virginia's rural economy; it helps preserve open spaces and maintain the state's rural character and historical heritage. The horse industry, which includes farms that can be found throughout the commonwealth, creates demand for agricultural crops that use farm open space and supports networks of trails and open spaces areas for horseback riding. Preserved horse farmland confers amenity benefits to many non-farm dwellers such as scenic views and protection from the environmental effects of urban sprawl.[28]

Horse activity and operations may sometimes impose social costs. Horses are a type of livestock and therefore require best management practices used in other types of agriculture (e.g., manure management, off-stream watering with fencing) to minimize environmental impacts, such as surface runoff and groundwater pollution. Surveys of horse operations conducted outside of Virginia indicate that some horse operations, particularly smaller and non-commercial ones, have not yet adopted best management practices.[29] Concerns have also been expressed about the environmental effects of intensive trail riding in ecologically sensitive areas.[30] Sometimes land use conflicts arise that when residential areas and horse operations are in close proximity.[31]

The Marion duPont Scott Equine Medical Center in Leesburg, Virginia.
Photo courtesy of Marion duPont Scott Center.

Health and Wellness. Horse activities provide many physical, psychological and other therapeutic benefits. In an era when obesity and the costs of obesity-related health problems continue to mount, equine activities contribute to improved fitness. Moreover, horse-related activities such as 4-H, pony clubs, and therapeutic riding can help build children's self-confidence and physical agility and teach self-discipline, responsibility and leadership. Some horse activities such as pari-mutuel gambling, however, may create social costs along with the benefits. For instance, problem or pathological gambling can lead to increased alcohol abuse, depression, bankruptcy and crime.[32] However, the structural characteristics of pari-mutuel betting, with contests being decided at less frequent intervals than say, casino style gambling, may make it less addictive than alternative gambling forms.[33]

Higher Education. Several Virginia higher education institutions offer horse study programs and even more offer horse sports activities. These distinctive programs and activities are important for attracting out-of-state students and retaining in-state students who are interested in equine fields of study. Programs of higher education can have a significant economic impact on the Virginia economy through the expenditures made by students on tuition and living expenses; the attraction of external grants, technology and business spinoffs that result from research and development activities; and the increased earnings and productivity of graduates.[34] Virginia Tech provides a diverse range of higher education equine activities exemplified by an equine science program within the Department of Animal and Poultry Sciences that provides preparation for careers in the equine industry. Virginia Tech recently expanded program offerings to the Middleburg Agricultural Research and Extension (MARE) Center, a 420-acre facility in the heart of Northern Virginia's horse country. The Virginia-Maryland Regional College of Veterinary Medicine offers equine veterinary training and care at two facilities in Blacksburg and the Marion duPont Scott Equine Medical Center (EMC) in Leesburg. The Marion duPont Scott Center is a leading national equine veterinary hospital and research facility with approximately 120 staff dedicated to equine health. In addition, Virginia Tech's Cooperative Extension Service provides horse industry support in the fields of animal agriculture and 4-H youth development and operates an agricultural

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experiment center in Middleburg that conducts cutting edge research on equine pastoral nutrition and offers facilities for education programming. Several other Virginia colleges and universities offer competitive credit equine programs. Virginia Intermont College, a private college located in Bristol, awards a bachelor of science in equine studies with concentrations in dressage, eventing and management. It graduated 26 students during the 2007-08 academic year. Another private college, Averett College in Danville, provides a bachelor's degree in equestrian studies. It enrolled 18 students during the 2007-2008 academic year. Bridgewater College offers a minor in equine studies. Sweet Briar College offers a certificate. Other Virginia colleges and universities offering either individual classes, recreational riding programs, or clubs for their students include Hollins University in Roanoke County, James Madison University in Harrisonburg, Liberty University in Lynchburg, Lord Fairfax Community College in Northern Virginia, Lynchburg College, Randolph College in Lynchburg, Radford University, the University of Richmond, the University of Virginia, Washington and Lee University in Lexington, and the College of William and Mary in Williamsburg. Many college team riders compete in horse competitions held by the Intercollegiate Horse Show Association (IHSA).

Conclusion

This article reports the results of a comprehensive study that examined the economic impact of Virginia's horse industry using input-output analysis, a research tool that allows one to quantify the impact of an economic activity or expenditure in a region. For Virginia's horse industry, the spending associated with horse owners, commercial horse operations, out-of-state show and race participants, and horse event spectators constitutes the direct contribution to the state's economy. Linkages with other industries in Virginia's supply chain mean that this spending has further stimulative effects that result from the purchases of goods and services and payments to employees. The horse industry expenditures causes a "ripple effect" or "multiplier effect" that results when money is re-spent in an economy.

The Virginia horse industry has increased in size and economic influence over the past few decades because of the continued growth in the Virginia horse population and associated horse spending, introduction of racing at Colonial Downs in 1997, and an expansion in the Virginia show and competition calendar fostered in part by public investments such as the Virginia Horse Center in Lexington which opened in 1987. The Virginia racing industry, which is the smallest of the three components, grew until 2007 but experienced a contraction in attendance and wagering after then because of competitive pressures and the effects of the recent recession on consumer spending. While the downturn may have damped horse spending, as economic growth resumes and consumer spending on recreation and leisure increases, the industry is likely to expand and benefit.

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Endnotes

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