

ICE HOCKEY GEOGRAPHY: EXPLORING THE PARADOX OF PERFORMANCE, ATTENDANCE, AND REVENUE IN THE CORE AND MARGINS OF THE OF THE NHL'S DOMAIN

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ABSTRACT: *The National Hockey League (NHL), the professional ice hockey league in North America, consists of 30 teams throughout Canada and the continental United States. All teams were investigated to determine the greater influence on ticket price and fan attendance: win-loss record or location of franchise. An analysis in team performance, fan attendance, average ticket prices, beer prices, parking prices, metropolitan size, distance from hockey's "cultural hearth," and franchise age suggested that location was indeed the larger influence, NHL teams with the highest and lowest ticket prices from the group were then compared against the professional baseball (MLB) or football (NFL) teams in the same location. This further analysis showed certain cities like Dallas, with a relatively strong NHL team, saw ticket prices and fan attendance at the lower end of the spectrum, whereas the NFL counterpart saw fan attendance exceeding capacity and ticket prices almost three times as great. Other cities like Toronto have an NHL team whose fans exceed arena capacity year after year, despite not winning a championship in decades, and an MLB team that operates at just over half arena capacity with ticket prices one-fifth the price of the hockey tickets. Although it is typically thought that a winning team will have higher ticket prices and more fans in attendance, end results suggest that location is the determining factor.*

Keywords: *ticket price, fan attendance, team performance, franchise location*

INTRODUCTION

The very basis of geography is the relationship between space and place, and the study of sport is no different. Sports are "struggles over space" and "people identify with a place through sport, arguably more so than through any other form of culture" (Hyland, 1990). Just as with philosophy and sociology among other fields, geographic theories are readily applied to the world of sport. Take, for example, Walter Christaller's central place theory, hailed as geography's "finest intellectual product, developed on the basis of a range of central goods which used the assumption that all areas were able to be served from a minimum of central places" (Bird, 1973). Christaller's concept of threshold and hinterland populations can be applied to metropolitan areas within the National Hockey League's domain to determine which locations have the potential to support a franchise (Geddart and Semple, 1987).

John Rooney, widely regarded as the father of sports geography, devised a conceptual framework for the geographical analysis of sport that consists of (1) a topical approach "which starts with a sport and identifies the location of its prototypes and spatial diffusion;" (2) a regional approach "which, having drawn up an inventory of an area's sports, analyzes their spatial organization and regionalization of involvement and interest;" and (3) "an approach focusing specifically on the changing landscape of sport through time" (Rooney, 1975). The sport in this instance is professional ice hockey. The location of its prototypes and points of origin are in Canada. In Rooney's regional approach, the inventory of an area's sports is discussed later on by a comparison of other professional sports leagues to the NHL. The changing landscape can be seen in the spread of the NHL's domain; beginning in the North and spreading outward.

Torsten Hägerstrand's model of geographic diffusion is also relevant to the study of sport. Though Hägerstrand observed the spread of agricultural rather than sport innovations in the real world, the fact that an "innovation is accepted when a potential adopter has become aware of its existence and decides to adopt it" holds true for entrepreneurs and their metropolitan settings, too (Rey, 2013). It is said that an innovation, like an ice hockey team, is adopted by a city "depending on its position both on an economic hierarchy and its distance from the initial city that adopted it" (Bale, 2000). Innovation diffusion is directly relevant to franchise location, and is exemplified by the August 1988 trade of Wayne Gretzky which we will return to later.

The National Hockey League, formed in 1917, is the professional ice hockey league in North America with 30 teams throughout Canada and the United States (Figure 1). Considered by some to be the world's leading

organization in the sport, it is not the only one of its kind, and while over one-half of NHL players hail from Canada, it is common knowledge that Central and Northern Europe are also popular locales for ice hockey. A sizeable number of NHL players are of European origin and professional ice hockey leagues exist all over the planet including the Russian-based Kontinental Hockey League, thought to be the second best league in the world after the NHL.

Considering “the games and sports which people [watch] are related to the physical environment in which they live,” this paper will delve deeper into franchise geography to determine whether team performance or franchise location is the greater influence on ticket price and fan attendance (Hildebrand, 1919). The core and margins of the NHL as referenced in the title are the North and South, respectively. The North, for all intents and purposes, will include all seven Canadian teams, as well as American teams in the Northeast and close to the Canadian border.



Figure 1: A map of current National Hockey League franchises (Frazier, 2014).

METHODOLOGY

Variables

A variety of data were gathered for each of the 30 NHL franchises. Team performance and fan attendance were both investigated as an annual average across six seasons from 2008-2014. Using NHL team statistics, team performance is expressed as a percent of games won, calculated by dividing the sum of games won over the last six seasons by the total number of games played during that time. Each season consists of 82 games, but due to the 2012-13 lockout, that season was only 48 games for a six season total of 458 games played. Fan attendance was calculated in similar fashion, instead using ESPN average attendance figures from 41 home games per season. Because the attendance figures were listed as an average, an intermediate step of averaging the average values was necessary. Fan attendance, expressed as a percent of the arena filled, was calculated by dividing the average attendance over six seasons by the arena capacity for ice hockey games.

Average ticket, beer, and parking prices were compiled via the sports marketing publishing company Team Marketing Report. The company clarifies that the average ticket price is a weighted average of season ticket prices for general seating, determined by factoring the tickets in each price range as a percentage of the total number of seats

in each arena (Team Marketing Report NHL). For simplicity's sake, prices are all listed in USD at the exchange rate of \$1 CAD=\$.959413 USD. Distance was investigated, as well. The distance values represent in global terms how far each franchise location is from the cultural hearth of hockey, Sault Ste. Marie, Ontario, in air miles. While many believe Montreal or Toronto to be hockey ground zero, Sault Ste. Marie, Ontario was the location of the first professional Canadian hockey team, the Sault Ste. Marie Marlboros. Nicknamed the Canadian Soo, the Marlboros were the sole Canadian team in the 1904-1907 International Professional Hockey League, the first fully professional league (Mason, 1998). This is where Hägerstrand's model of geographical diffusion, as well as Rooney's first approach to the conceptual framework for the geographical analysis of sport come in to play. The location of hockey's prototypes and points of origin were proven to be in Canada, and regression analysis could then determine the patterns of spatial diffusion of the innovation of NHL hockey, spatial organization and the presence of a significant North-South franchise difference, and if performance and ticket price among other factors were related to distance from the hearth.

The age of each franchise was also plotted against the above variables to see if any significant relationships existed. The year used to calculate age was the year in which a given team played its first season consistent with the locations of the rest of the data. For example, the Colorado Avalanche began their existence as the Quebec Nordiques in 1972. However, the franchise relocated to Denver in 1995, thus the year used for age analysis is 1995. As Bale notes, "professional sports clubs are increasingly seeking to relocate at both urban and national scales" and "in addition to the physical relocation of clubs, it is also possible to observe the relocation of success" though this is not always the case as with the Winnipeg Jets (Bale, 2000). The Arizona Coyotes first entered the NHL as the Winnipeg Jets in 1972. After repeatedly incurring financial losses in Winnipeg, the franchise relocated to Phoenix in 1996 to become the Phoenix, and as of June 2014 the Arizona, Coyotes. Today, however, the Winnipeg Jets are once again playing in the NHL. This second incarnation of the Jets is due to the relocation of the Atlanta Thrashers in 2011. Because of the dual Winnipeg franchises, it is important to use the year that the team began playing in the current location to remain consistent with the rest of the data, and to be more true to the analyses.

The last variable analyzed, metro size, is the size of the franchise location's metropolitan area. It should be noted that the metro sizes in the United States are based on 2012 Census estimates of the Combined Statistical Areas, whereas the Canadian values are based on 2011 Census Metro Areas as defined by Statistics Canada. The metro size used for the New York Islanders is the sum of the populations for Suffolk and Nassau counties. For the New Jersey Devils and Anaheim Ducks, Newark and Anaheim are incorporated into the metro sizes of New York City and Los Angeles, respectively. Thus for simplicity's sake, the value for the metro size for the Devils and the New York Rangers is the same, and the value for the Ducks and the Los Angeles Kings is as well.

Analysis

IBM's SPSS software was used to run a series of linear regressions and scatter plots. The first regression series listed team performance of all teams as the independent variable while fan attendance, ticket prices, beer prices, and parking prices were the dependent variables. Because Canadian teams are able to charge high prices and consistently sell out arenas regardless, a second regression using only American teams was run to see if a significant relationship between team performance, fan attendance, and ticket prices existed when Canadian teams capitalizing on tradition are excluded. The third regression series was between metro area, beer prices, and parking prices. It is typically thought that larger cities tend to charge more for beer or parking, and these regressions were to see if the costs were indeed a function of city size. Distance from Sault Ste. Marie, as well as franchise age were also run as separate regression series with the dependent variables being team performance, fan attendance, ticket price, beer price, and parking price. The final regression series was franchise age as a function of distance. Scatter plots were created for each individual regression that was run.

DISCUSSION OF RESULTS

Team Performance

As expected, team performance is related to fan attendance and with a p-value of 0.030 it is significant at the 95% confidence level. However, the franchises with the highest percentage of respective arena filled are located mostly in the North (Figure 2). Teams located in areas like Toronto, Minnesota, Edmonton, and Buffalo have won less than 50% of the games played over the six seasons, yet consistently operated at close to full or full arena capacity including Toronto operating at above full capacity. Teams located in the South, for example Florida, Dallas, or Arizona, are playing in arenas that are well below the attendance than those of the Northern counterparts, despite Southern teams having actually won more games. This suggests that franchise location is more important than team performance regarding fan attendance.

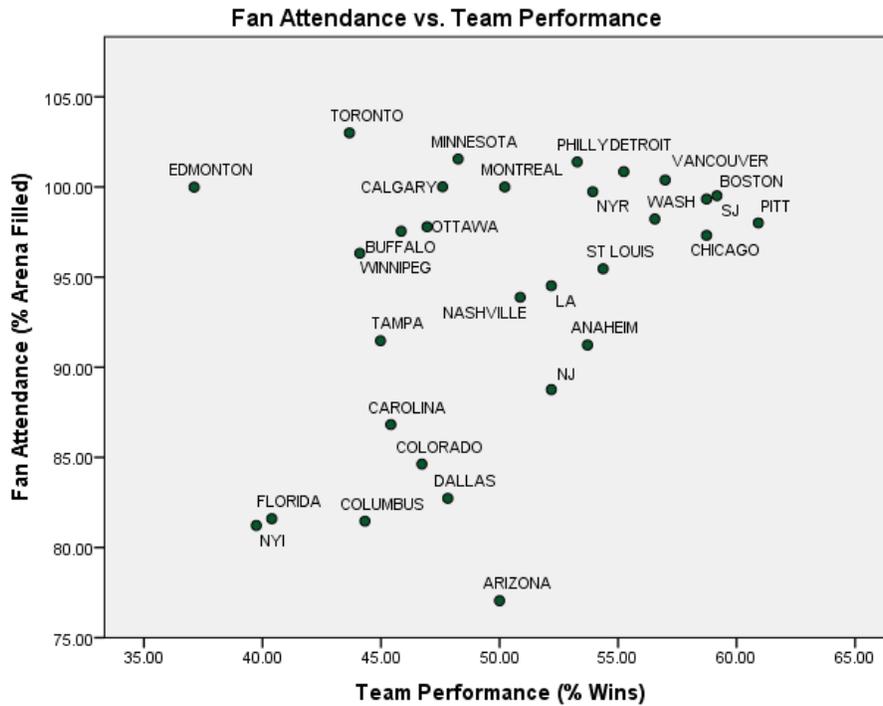


Figure 2: The scatter plot illustrates the significant relationship between fan attendance and team performance across the entire league ($r^2=0.156$, $p=0.030$).

Team performance is not a significant predictor of average ticket price ($p=0.623$). In looking at all 30 teams within the league, price rises not as performance rises, but as the demand rises. In Toronto, prices are the highest in the league because the demand is there. Diehard fans will pay nearly any price in order to witness the Maple Leafs play, despite lackluster results over the six seasons analyzed and a failure to win the Stanley Cup in decades. Almost all of the teams charging prices above the league average are located in Canada and the Northern half of the United States.

While beer consumption may be intrinsic to the game experience of many NHL fans, there is no association between beer prices charged and their team's prospects ($p=0.886$). This is exemplified with the New York Islanders who, despite being unable to fill the arena to the extent of other teams, are able to charge the highest beer price in the league.

Team Performance – American Teams

Though ticket price and fan attendance do indeed increase with team performance, the increase is stronger without the Canadian teams. This returns to the notion that Canadian franchises are essentially capitalizing on tradition because hockey is considered Canada's game. While there is a significant relationship between American team performance and fan attendance, the North-South difference in franchise location is still apparent even without the Canadian outliers ($p=0.00$). The Minnesota Wild and Dallas Stars have only a 0.43% difference in the amount of games won over the six seasons, yet the Wild play in an arena that is 101.55% filled with fans, while the Stars' arena is filled to barely 80% capacity. Though the Canadian teams have been excluded, it is still clear that franchise locations close to the Canadian border are more likely to have more fans in attendance than their Southern counterparts (Figure 3). This is evident comparing another location close to the border, Buffalo, with another Southern team, Arizona. The Coyotes surprisingly have won 50% of games played, yet have the league's lowest percentage of fan attendance at only 77% filled capacity. Buffalo, on the other hand, having won 45% of games played, sees its arena filled to 97.5% capacity.

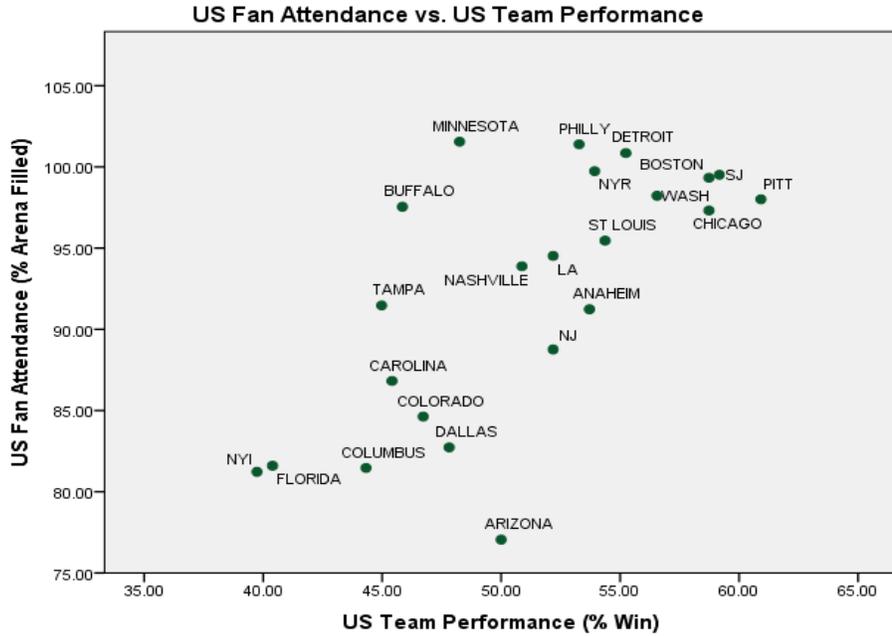


Figure 3: The scatter plot illustrates the significant relationship between fan attendance and team performance for American teams only ($r^2=0.473$, $p=0.00$).

When looking at team performance and ticket price, the localized influence is very prominent. With a p-value of 0.030, significance at the 95% confidence level suggests teams in the North with a similar or worse win record are charging more than those in the South (Figure 4). On the low end of the performance spectrum, the New York Islanders are charging almost \$30 more per ticket than the Florida Panthers, despite having almost the exact same percentage of games won (39.74% and 40.39%, respectively). On the high end of the spectrum, the Pittsburgh Penguins are charging almost \$20 more per ticket than the San Jose Sharks, despite again having almost the exact same percentage of games won (60.92% and 59.17%, respectively).

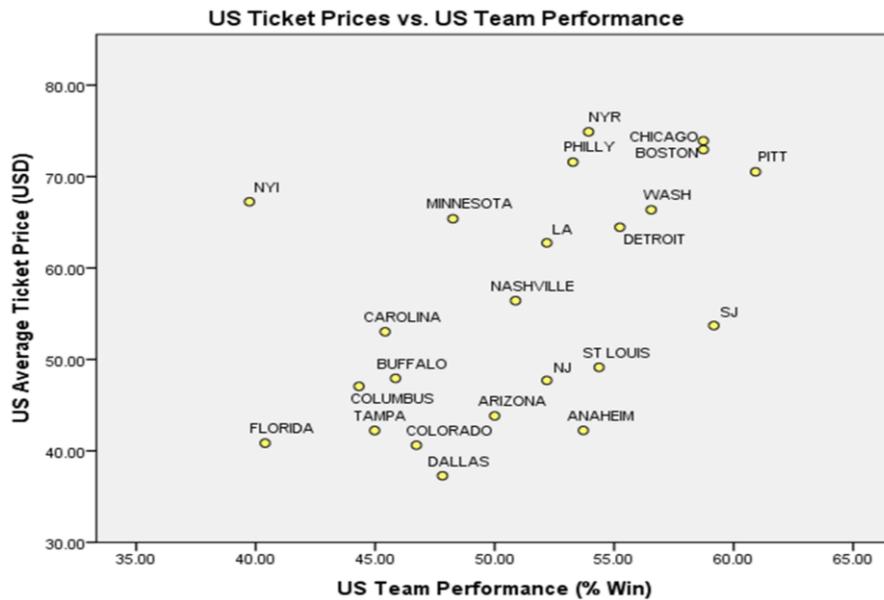


Figure 4: The scatter plot illustrates the significant relationship between ticket price and team performance for American teams only ($r^2=0.156$, $p=0.030$).

Metro Size

As expected, larger metros like Boston and New York City are able to charge more for parking while smaller cities like Winnipeg, Edmonton, and Buffalo, charge less. A significant p-value of 0.003 suggests that the price of parking is a function of city size and available physical space, not team performance. Locations also charging higher beer prices are in larger metro areas, like Long Island (the populations of Nassau and Suffolk Counties combined) and Anaheim, whereas those charging lower prices are in smaller areas, like Ottawa and Raleigh, North Carolina. Because the linear regression between price of beer and team performance was not significant, while that of beer and metro size is, franchise location may be more relevant factor when determining the price of beer.

Distance

It could be expected that team performance is consistently better closer to the core and less so on the outer margins. As discussed earlier, distance was measured in air miles between NHL franchise location and Sault Ste. Marie, Ontario. However, distance from the hearth of hockey does not seem to be an associated factor. With non-significant results on all regressions in this series, it is evident that neither team performance, fan attendance, ticket price, nor even the price of beer has anything to do with the distance from hockey's cultural hearth.

Age of Franchise

For American teams, it is apparent that the older the franchise, the better the performance. However, Canadian teams do not follow this pattern because they are marching to the beat of a very different drum. In terms of fan attendance, Canadian teams are not doing as well as one would expect, given the age of the franchises. Older franchises enjoy more loyal fans. When fan attendance is compared with the age of each franchise, significant association is observed ($p=0.046$). Parking charges also reflect franchise age in that newer arenas tend to have better parking infrastructure than older arenas.

CONCLUSION

While team performance is clearly associated with certain measures within the National Hockey League, franchise location is more influential. In the case of the Edmonton Oilers, one may think that a team which once had the great Wayne Gretzky on its roster would not be "missing the playoffs season after season, but this has had no effect on the Oilers' fans. The team has played to a full capacity crowd since the last lockout" (Settimi, 2012). Hockey is considered Canada's sport, and fans in Edmonton may not care whether or not their team has an impressive record so long as they see the sport they love being played. For Arizona, despite being a playoff contending team season after season, fan attendance figures are quite low and location may be to blame. Phoenix weather is hot and dry, conditions atypical to that of a hockey team. Regarding low attendance, "there just may not be many ice loving sports fans in the desert" (Settimi, 2012).

As most hockey fans know, a monumental trade occurred in August 1988. Wayne Gretzky, arguably the greatest hockey player to set skates to ice, used to play for the Edmonton Oilers but was traded to Los Angeles that summer. "The Great One" was the pioneer in making ice hockey a popular sport in California, and in doing so ultimately paved the way for franchises in places like Phoenix, Dallas, and Florida. With Gretzky retired, however, Southern fans may have lost interest in an icy sport. The city of Dallas exemplifies this idea, as well as Rooney's approach to the geographical analysis of sport. With a knowledgeable head coach and extremely talented roster, it should be no surprise that the Dallas Stars outperform some of the Northern teams, yet average ticket prices are quite low. While Wayne Gretzky may have paved the way for hockey in the South and West, this by no means changes the fact that Dallas is not a city of hockey, but one of football. The Dallas Cowboys' stadium capacity is 80,000 and during the last NFL season, they saw an average 88,043 fans in attendance (ESPN NFL, 2013). The football stadium operated at well over full capacity, while the hockey arena was well below. The Cowboys' also charged the most expensive average ticket price last year at \$110 (Team Marketing Report NFL, 2014). When compared to the Stars' \$36 ticket, it becomes even clearer that loyalty amongst Dallas sports fans lies with the NFL, not the NHL.

Similar observations can be made when returning to Arizona. Gretzky himself was head owner of the franchise as well as head coach until it declared Chapter 11 bankruptcy in 2009. However, "overwhelming evidence shows that sports franchises do little to revive a local economy, but states and cities continue to spend hundreds of millions of dollars to get teams" (Euchner, 1993). This may explain a low attendance, but is also indicative of the location choice. After relocating to Phoenix from Winnipeg in 1996, the franchise was rapidly losing money most likely because Phoenix is a poor location for an ice hockey team. While incurring losses in Winnipeg, thus the move; the Atlanta Thrashers, as previously discussed relocated back to Winnipeg to become the second incarnation of the

Winnipeg Jets and appear to be successful. Canadians eat, sleep, and breathe hockey, whereas Arizona residents do not. Team performance is irrelevant because Arizona is not a hockey region.

In looking at Phoenix football, the Arizona Cardinals have a slightly lower ticket price than the National Football League average yet fans are willing to pay twice as much for football than hockey in Phoenix. Despite the Cardinals' attendance figures being towards the bottom in comparison with the rest of the NFL, the stadium was still operating at 96% (ESPN NFL, 2013). When you compare these figures to that of the Arizona Coyotes, and recognize that the hockey arena is only operating at 77%, a league low, it is clear that desert hockey teams are not as successful.

The Toronto Maple Leafs, on the other hand, is a team that had sold out every game in its previous arena from 1946 to 1999 and sold out every game in the current Air Canada Centre arena since 2002. It is clear that win-loss record is not indicative of Toronto's high ticket prices and above arena capacity operation. While Toronto has a Major League Baseball team, baseball is America's pastime. Last year, the Toronto Blue Jays' stadium was operating at just over 50% capacity, while the hockey arena operated at 103% and is consistently sold out (ESPN MLB, 2013). Although the extent of the NFL is only in the United States, Canada has its own professional football league but attendance for football in Toronto is even lower than that of baseball (Fitz-Gerald, 2013). The Blue Jays ticket price is below the MLB average and roughly 1/5th the price of a Maple Leafs ticket, supporting the influence of franchise location (Team Marketing Report MLB, 2014).

After investigation of performance, attendance, and revenue in the core and margins of the NHL's domain, it is evident that while team performance is significantly associated with several measures, franchise location is ultimately the greater influencing factor in this instance. Further research is intended for analysis on an East-West difference between the Leagues' two Conferences, as well as investigation into the impact of key franchise players. While franchise location is important, additional analysis is warranted to examine for example if Pittsburgh's success is because it is more North, or because it has a long history of key players such as Mario Lemieux and Sidney Crosby.

Consider one last example emphasizing the importance of location. In 1987, Christaller's central place theory predicted that Saskatoon, a city in the Canadian province of Saskatchewan, had too small of a threshold population to house an NHL franchise. Yet, "despite a small metropolitan population, fan interest levels were very high and there existed a tradition of long-distance travel to Saskatoon by affluent hinterland population" (Geddart and Semple, 1987). As scientist Stephen Leacock once said, "Hockey captures the essence of Canadian experience. In a land so inescapably and inhospitably cold, hockey is the chance of life, and an affirmation that despite the deathly chill of winter, we are alive" (Forbes, 2014). In the North, hockey is a way of life. In the South, hockey is a way to just find something to do. The stark differences between the two epitomize the vast importance of franchise location.

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