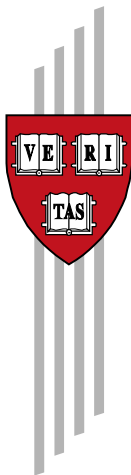


Getting the Ball Rolling: Basis for Assessing the Sports Economy

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Introduction

Data on the sports economy is often difficult to interpret, far from transparent, or simply unavailable. Data fraught with weaknesses causes observers of the sports economy to account for the sector differently, rendering their analyses difficult to compare or causing them to simply disagree. Such disagreement means that claims regarding the economic spillovers of the industry can be easily manipulated or exaggerated. Thoroughly accounting for the industry is therefore an important initial step in assessing the economic importance of sports-related activities. For instance, what do policymakers mean when they discuss sports-related economic activities? What activities are considered part of the “sports economy?” What are the difficulties associated with accounting for these activities? Answering these basic questions allows governments to improve their policies.

The paper below assesses existing attempts to understand the sports economy and proposes a more nuanced way to consider the industry. Section 1 provides a brief overview of existing accounts of the sports economy. We first differentiate between three types of assessments: market research accounts conducted by consulting groups, academic accounts written by scholars, and structural accounts initiated primarily by national statistical agencies. We then discuss the European Union’s (EU) recent work to better account for and understand the sports economy. Section 2 describes the challenges constraining existing accounts of the sports economy. We describe two major constraints - measurement challenges and definition challenges - and highlight how the EU’s work has attempted to address them. We conclude that, although the Vilnius Definition improves upon previous accounts, it still features areas for improvement.

Section 3 therefore proposes a paradigm shift with respect to how we understand the sports economy. Instead of primarily inquiring about the size of the sports economy, the approach recognizes the diversity of sports-related economic activities and of relevant dimensions of analysis. It therefore warns against attempts at aggregation before there are better data and more widely agreed upon definitions of the sports economy. It asks the following questions: How different are sports-related sectors? Are fitness facilities, for instance, comparable to professional sports clubs in terms of their production scheme and type of employment? Should they be understood together or treated separately? We briefly explore difference in sports-related industry classifications using data from the Netherlands, Mexico, and the United States. Finally, in a short conclusion, we discuss how these differences could be more fully explored in the future, especially if improvements are made with respect to data disaggregation and standardization.

Section 1. Market Research, Academic, and Structural Accounts of the Sports Economy

There have been numerous previous attempts to account for the sports economy, most of which belong to one of three broad categories. First, market research accounts generally take the form of market or consulting reports on the sports economy. Often published irregularly, these one-time reports rely on estimations or projections based on aggregated firm-level data. Second, academic accounts are also irregularly published descriptions of the sector with many similar characteristics to market research

assessments. Third, structural accounts of the sector are accounts embedded within national statistical systems. Statistical agencies in most countries collect this sort of information on an annual basis. They categorize every business in their economy under a series of industry codes, identifying some as directly sports-related.

The market research, academic, and structural assessments we consider below aren't meant to be an exhaustive catalog of every account of the sports economy. Instead, the accounts are simply meant to illustrate the kinds of approaches that have been taken to understand sports-related economic activities.

1.1. Existing market research accounts

Market research accounts of the sports sector provide an irregular depiction of sports-related economic activities. These accounts are the result of a specific methodology following their author's own logic rather than more standardized rules. They represent a range of approaches to the sector and vary widely in terms of scope. Some market research accounts focus only on a particular country, while others attempt to cover the entire globe. Some market research accounts limit themselves to a particular aspect of the sports economy, but others purport to be more comprehensive.

The rationale for these accounts also varies. The reports are usually produced because information isn't publicly available at a scale suitable for policymaking. Data might not be granular enough for governments to use, so some reports offer depictions of the economic activity related to a specific geographic area or a specific athletic discipline. Other observers of the sports economy more interested in broader trends sometimes present cross-country aggregations. In this way, market research accounts can offer a global characterization of the sports economy that isn't captured by the national statistical systems of individual countries. In the discussion that follows, we'll consider market research accounts prepared by consulting firms like AT Kearney, PricewaterhouseCoopers, and Deloitte.

The *Winning in the Business of Sports* report published in 2014 by the consulting firm AT Kearney is one of the most widely cited market research accounts. The report examines the market for "sports events" around the globe. It defines the market as revenue derived from tickets, media rights, and sponsorship deals associated with spectator sports. AT Kearney analyzes these revenues in terms of four-year cycles that each includes a Summer Olympics, the Winter Olympics, and the FIFA World Cup.

According to the report, sports market revenues grew from 58.4 billion dollars in 2009 to 76.1 billion in 2013 (Collignon and Sultan 2014). They reached their peak at 78.2 billion dollars in 2012, the year of the Summer Olympics in London. AT Kearney also provides brief estimates of the size of these other sports-related economic activities. They place the market for sporting goods and licensed products at USD 310 billion globally and the market for fitness facilities at USD 105 billion. In total, the report claims that when other sports-related activities are included, such as sporting goods, sporting equipment, and fitness spending, the total global sports economy accounts for about USD 700 billion or about 1% of global GDP (Collignon and Sultan 2014).

Like AT Kearney, the consulting firm PricewaterhouseCoopers (PwC) also recently

produced a report on the sports economy. Also like AT Kearney, PwC primarily focuses on spectator sports. PwC defines the “sports market” as consisting of the following components: team, league, or event sponsorships; gate revenues for live sporting events; media rights fees paid to broadcast or distribute sports; merchandising and the sale of products licensed to sports teams or players. They report that global sports market revenues totaled 121.4 billion dollars in 2010 (PricewaterhouseCoopers 2011).

PwC’s analysis divides these revenues by region. They indicate that North America has the largest sports market with 41% of total revenues, but a region composed of Europe, the Middle East, and Africa isn’t far behind with 35% of revenues. Moreover, the report projects revenues to follow an annual growth rate of 3.7% until 2015 when it estimates that they will reach 145.3 billion dollars. PwC’s more recent report focuses on the North American sports market, placing the continent’s sports economy at 60.48 billion dollars in 2014 (PricewaterhouseCoopers 2015). It predicts that market will grow to 73.52 billion by 2019.

In addition to broad market research accounts of the sports economy, some consulting firms also produce accounts that are more specific to one component of the sports economy. Deloitte, for instance, produces annual reports on European football. Released in 2015, their report titled *Commercial Breaks: Football Money League* compares the top twenty wealthiest football clubs in Europe according to their revenues. Drawing upon audited financial statements obtained directly from each club, the report documents the dramatic increase of revenues amongst Europe’s top clubs. Real Madrid, the richest club in the report, brought in 550 million pounds (854.26 million dollars) in 2013/2014 (Bosshardt et al. 2015).

Deloitte also produces the *Annual Review of Football Finance*, an even more detailed report describing a wider range of clubs. The review has a particular focus on the English Premier League, likely due to both popularity of the league and data availability. It reports that, in the 2013/2014 season, Premier League revenues increased 29% to 3.9 billion euros or 4.74 billion dollars (Jones, Rawnsley, and Switzer 2015). These revenues dwarfed those of the next largest leagues in Germany (2.3 billion euros or 2.80 billion dollars) and Spain (1.9 billion euros or 2.3 billion dollars).

From the brief review above, it is easy to see the inconsistencies between different market research accounts. PwC’s estimate of the global sports market in 2010 is almost 160% of AT Kearney’s estimate in 2013. In fact, PwC’s 2014 estimate of just the North American sports market, 60.48 million dollars, is more comparable to AT Kearney’s 2013 estimate of the global market.

The discrepancies are even more apparent if one compares Deloitte’s figures on football revenues to the AT Kearney and PwC numbers. Deloitte’s report suggests that the revenues of the top twenty European football clubs total more than 9.5 billion dollars. These revenues, which are derived from just a handful of clubs in one sport, account for approximately 12.5% of AT Kearney’s 2013 entire estimate for spectator sports.

It is important to note, of course, that these consulting groups employed different methodologies and definitions of the sports economy. While each of the accounts likely used proprietary firm-level revenue data, part of the difficulty with assessing the industry

is that these methods aren't transparent or easily accessible. Since firm-level data isn't available for every sports club or business, each of the accounts relies on significant projections and estimations, the methodology of which isn't always clear.

1.2. Existing academic accounts

In addition to accounts published by consulting groups, sports economists have also constructed their own accounts. These academic accounts are far more open about their methodology and assumptions. For instance, many of these academic accounts adopt an expenditure-based approach due to the limitations of sports-related data in national accounts.

In their estimation of the United States' sports economy, Milano and Chelladurai (2011) use an expenditure-based approach that seeks to account for all of the purchases by final users of sports-related goods and services. Following a methodology typically used to construct national gross domestic product, they divide their estimate into sports consumption, sports investments, sports-related government expenditures, and sports net exports. Each component is estimated using a variety of different sources, ranging from the Bureau of Labor Statistics' Consumer Expenditure Survey for sports consumption to trade data from the U.S. International Trade Commission for sports net exports. Milano and Chelladurai provide three estimates of the size of the United States sports economy: a conservative estimate of USD 168.469 billion, a moderate one of USD 189.338 billion, and a liberal one of USD 207.503 billion. These estimates are roughly equivalent to 1.29%, 1.44%, and 1.58% of United States GDP in 2005.

Humphreys and Ruseki (2008) follow a similar expenditure-based approach in their estimations of the United States sports economy in 2005. Like Milano and Chelladurai, they avoid national accounts data and instead use information from a variety of sources. Their definition of the sports economy has three components: "activities involving participation in sport, activities involving attendance at spectator sporting events; activities involving following spectator sporting events through some media" (Humphreys and Ruseki 2008, 5). Like Milano and Chelladurai, they leverage several different data sources, eventually constructing a supply side and a demand side estimate of the industry in the United States in 2005. Their supply side estimate is USD 73 billion or .55% of GDP in 2005. Depending on the assumptions used, their demand side estimate is between USD 44 billion and USD 60 billion (.33% and .46% of GDP).

According to Humphreys and Ruseki, the difference between the supply and demand side estimates is primarily a result of "the USD 21 billion difference between revenues earned by footwear manufacturers and consumer spending on athletic footwear" (Humphreys and Ruseki 2008, 33). They contend that that this difference most likely reflects exports of athletic footwear.

Even though they are supposedly estimating the United States sports economy in the same year, Humphreys and Ruseki's estimates are far smaller than those of Milano and Chelladurai because the scope of their analysis is more limited. Depending on which of the two definitions and methodologies are used, the scale of the difference is between 124.47 billion dollars and 134.53 billion dollars. The disparity, which is between 65% and 73% of

the estimates made by Milano and Chelladurai, occurs primarily because Humphreys and Ruseki limited their expenditure-based approach to sports-related expenditures made by households. Milano and Chelladurai took a wider approach and included data for sports-related consumption and investment by firms and the government. Including these additional sources greatly increased their overall account.

Unlike market research accounts, there are only a handful of academic accounts of the sports economy, most of which are limited to the United States. They are more transparent about the data they employ and the methodologies they use, but the two academic accounts described here aren't dramatically different from the market research accounts discussed above in the sense that both market research and academic accounts stitch together a variety of sources with the objective of painting a broad picture of the sports economy. Like market research accounts, the resulting assessments can vary significantly in magnitude depending on the precise methodology and the definitions used.

1.3. Existing structural accounts

In the United States and Europe, national statistical agencies compile structural accounts of the sports economy through one of two classifications. The North American Industry Classification System (NAICS) is used in the United States, while the Statistical Classification of Economic Activities in the European Community (NACE) is used in Europe. We focus on these two regions of the world—and their corresponding classification systems—because they have by far the largest sports economies. Perhaps even more importantly, these regions have more developed systems and procedures for gathering data on the structure of their economies and making it publicly available.

These systems define and measure the sports economy differently, but both systems are designed as hierarchical frameworks that group establishments into industries for accounting based on the similarities of their production processes. Establishments are assigned a five-digit code in Europe or a six-digit code in the United States. Industries are nested within progressively broader industry definitions, each of which bears a shorter and hence less specific industry code. For instance, in the United States, the two-digit code “11” corresponds to “agriculture, forestry, fishing, and hunting.” Within that code, the six-digit code “111110” groups establishments related to “soybean farming”.

Countries build industrial classifications in this manner to inform a range of crucially important statistical datasets and publications such as economic censuses, labor surveys, and social security data. These classifications systems are one of the primary mechanisms that policymakers use to understand changes in their economies.

The principal sports sectors in the NAICS and NACE systems can be seen in Figure 0.1 and Figure 0.2. Sports under the 2012 NAICS classification system first appear under the three digit code “711” which corresponds to establishments related to performing arts, spectator sports, and related industries. Within this high-level classification, there are several more detailed codes that are clearly sports-related. At the six-digit level, there are three exclusively sports-related codes: sports teams and clubs (711211), race tracks (711212), and other spectator sports (711219).

The 2008 NACE classification system (known as NACE revision 2) used in the EU collects

data in a similar fashion. Under the NACE structural account, sports are broadly defined under the three-digit code “931” corresponding to sports activities. Under this classification, there are four exclusively sports-related activities: the operation of sports facilities (9311), the activities of sports clubs (9312), fitness facilities (9313), and other sports activities (9319).

Figure 0.1. Principal sports sectors in the NAICS classification system (2012)

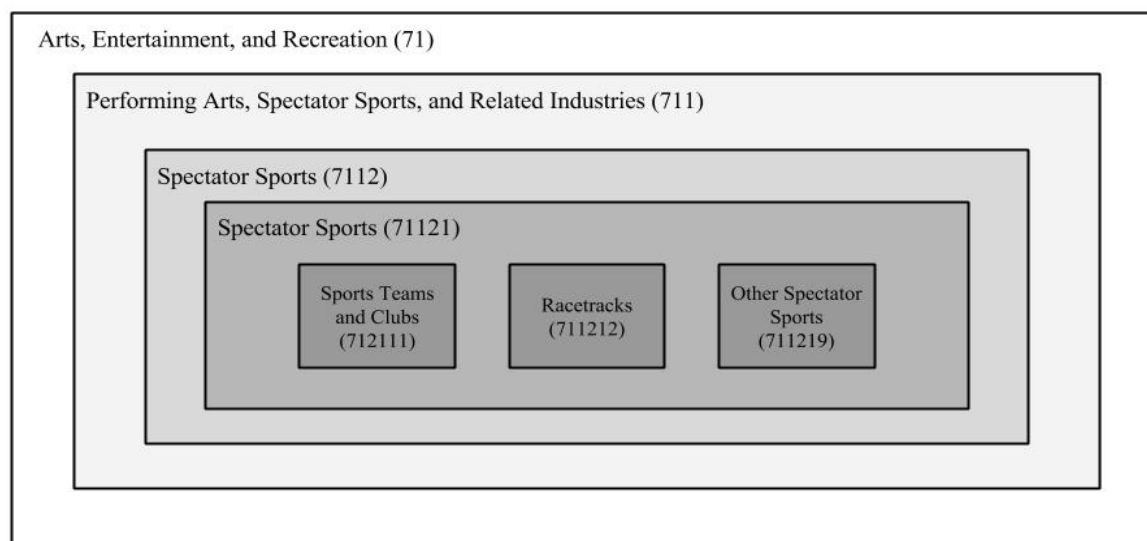
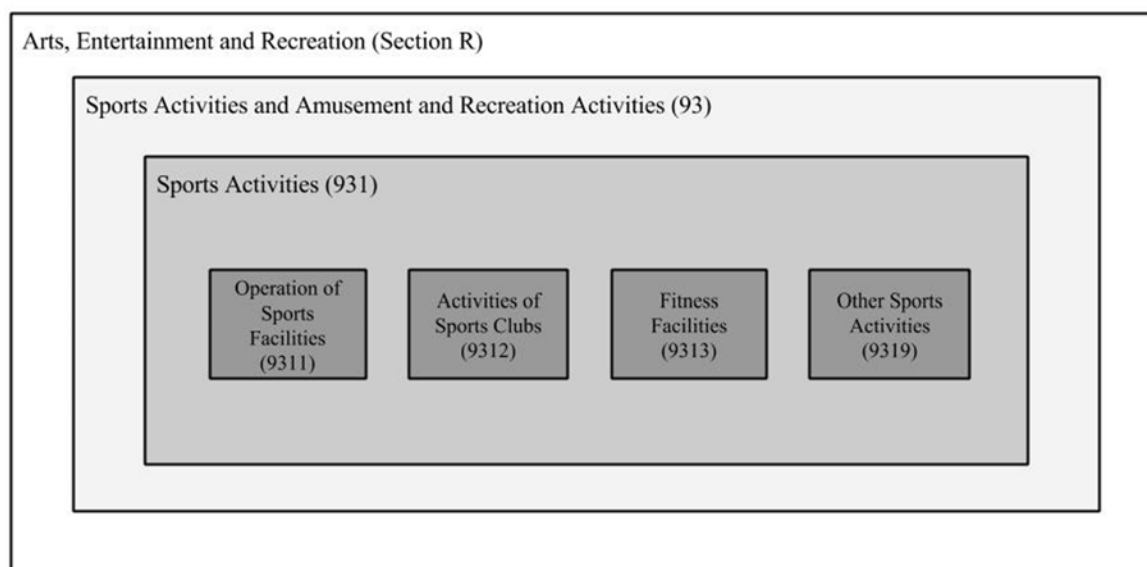


Figure 0.2. Principal sports sectors in the NACE rev 2 classification system (2008)



Aggregating data on these NACE codes across the twenty-seven European has an added layer of complexity than performing a similar task for data in the United States. Within the boundaries of the NACE codes, European countries collecting data have some flexibility to tailor the classification to their own economies. The Netherlands is an excellent example of

country-specific adjustments. At the five-digit level of its 2008 Standaard Bedrijfsindeling classification, there are codes ranging from swimming pools (93111) and playing fields (93113) to motor sports (93127) and sports supporters clubs (93194). Other EU countries don't have such detailed industry codes with respect to sports. That means that correspondence can only occur at a higher aggregation, meaning that much of the information in the data with respect to specific activities is lost. Structuring country-specific classifications so they could more easily correspond would make European analyses more informative. However, few countries have such granular classifications and those that do organize them differently.

1.4. Lessons learned from the market research, academic, and structural accounts

Reviewing the market research, academic, and structural accounts above highlights their diversity. Accounts vary widely both in terms of their scope and ambition. Market research accounts like those by AT Kearney and PwC are global in scale, but primarily focus only on sports events and competitions. Academic accounts may be less ambitious in terms of geography, but they attempt to encompass a far broader range of sports-related economic activities. Structural accounts are a final extreme, providing highly disaggregated data both in terms of geography and economic activity. Data in these structural accounts, however, is often difficult to compare across space and time.

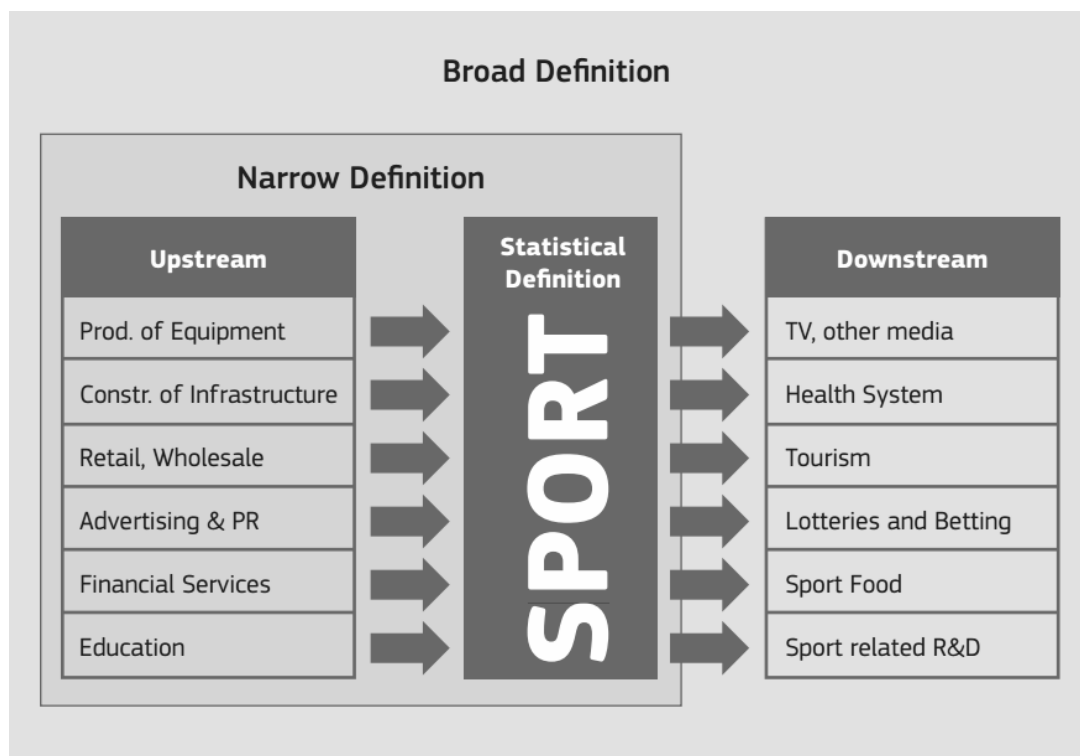
The result is a range of estimates of the sports economy. The AT Kearney and PwC reports, both of which cover only sports market revenues, provide estimates that differ by 43.2 billion dollars. Likewise, the two academic accounts above provide estimates that vary by an amount that's somewhere between 124 billion dollars and 134 billion dollars. Structural accounts based on data aggregated from individual countries would be much smaller than these figures given that they include only data within specific industry classifications. For instance, according to 2012 data, the value added for the three exclusively sports-related industry codes in the United totals more than 33.5 billion dollars.

It is essential to note that all of these accounts consider different measures. Some focus on revenues, others on expenditures, and others still on value added. Moreover, each account uses a different definition of the sports economy that considers different activities to be sports-related. Some accounts may have overlapping or similar definitions, but few are very close. These considerations mean that comparison between accounts is difficult, if not impossible. The general lesson learned from these accounts is that observers of the sports economy have reached little consensus with respect to the best way to analyze and understand the sector. Analysts and practitioners alike often make grandiose statements about the size of the sports sector, but these statements are backed up by few rigorous assessments. Moreover, those accounts that do exist attempt to justify the sports economy's importance through an estimate of its size, but these accounts use widely different data and methodologies. The ultimate result is a muddled depiction of the sports economy.

1.5. The Vilnius Definition of Sport

Recent work within the EU has sought to clarify this muddled depiction. The EU's work is based on the realization, first articulated in the 2007 EU White Paper on Sport, that "the quality and comparability of data need to be improved to allow for better strategic planning and policy-making" (European Commission 2007, 11). Following that call to action, the EU Working Group on Sports and Economics was formed. The challenge before the group of economists, statisticians, and sports economy experts was a daunting one: agree upon a common way of measuring and defining the sports economy in Europe, thereby increasing comparability and the utility of data on sports-related economic activities. While the NAICS and NACE classification systems are useful for understanding a large component of the sports economy, the working group wanted to understand the sports-related economic activity that exists outside of these classifications. Such activity is often mixed with activity that has little or nothing to do with sports.

Figure 0.3. Economic definitions of sports according to the Vilnius Definition



Source: European Commission 2013.

Consider the sector 5510 in the NACE revision 2 classification. Officially labeled as "hotels and similar accommodations," the sector encompasses a range of hospitality activities for travelers. Only part of these activities - hotel rooms purchased by sports teams or sports tourists - is relevant for the sports economy, but it is impossible under either the current NACE codes to separate it from the rest. In an attempt to solve that problem the EU group developed the Vilnius Definition of Sport. The approach outlines three definitions of sport: "a statistical definition" comprised only of the NACE revision 1 or

revision 2 sectors that are explicitly labeled as sports (as described above); “a narrow definition” consisting of all products and services which are necessary as inputs for producing sport as an output; and “a broad definition” consisting of the previous two plus all products and services which have a direct or indirect relation to any sport activity (European Commission 2013). Figure 0.3 above captures the relationship between these three definitions.

The narrow and broad definitions are expansive; encompassing a range of industries that one wouldn’t immediately consider directly relevant to sports. The retail sale of pharmaceutical goods, for instance, is in the narrow definition since athletes often use such medicine during training or competitions. Likewise, many types of hotel accommodations or restaurants are included in the broad definition based on the argument that sports teams and sports tourists purchase their goods and services. Parts of these and other industries were allocated to the narrow and broad definitions and considered parts of the sports economy.

Based on the Vilnius Definition, the EU working group published the “Study on the Contribution of Sport to Economic Growth and Employment in the EU” in 2012. The report focuses on the broad definition, reporting that the sports economy represents 173.86 billion euros in 2005 or 1.76% of total value added in the EU under that definition (SportsEconAustria et al. 2012). Likewise, the study found that the broad definition of sports accounts for 4.46 million European employees, representing 2.12% of total EU employment.

Perhaps most importantly, the EU working group’s study outlined a methodology through which European countries could create standardized sports satellite accounts (SSAs). Extensions of the annual national economic accounts of a given country, SSAs are specifically aimed at depicting the size of the sports economy in a given country according to the same Vilnius definition framework standardized by the working group. While they aren’t mandatory for EU countries to create, many countries publish them every year or every couple years. The United Kingdom, for instance, reported the value of its sports economy as 38.8 billion pounds (62.6 billion dollars) in 2012 according to the broad Vilnius Definition (Kokolakakis 2015). That accounts for 2.6% of British gross value added. Other accounts have so far been created by Austria, Cyprus, Germany, Netherlands, Poland, and Switzerland.

The Vilnius Definition represents a significant improvement from previous accounts of the sports economy. It is a rigorous effort to standardize and harmonize the way that policymakers, academics, and analysts interpret sports-related economic activity. If the Vilnius Definition is widely used in future accounts, policymakers will develop a better understanding of the sports economy in their jurisdiction. Better informed sports policy would likely result. In this sense, the development of SSAs would be beneficial, especially if other areas of the world should also follow the EU’s lead and craft a similar type of standardized understanding of the sports economy. However, while the Vilnius Definition is an important improvement, it is far from perfect. Efforts to assess the sports economy are still ridden by a range of limitations

Section 2. Difficulties in Assessing the Sports Economy

Existing accounts of the sports economy, such as those described above, have some positive characteristics. In particular, the EU working group's Vilnius Definition and the resulting SSAs represent significant steps forward in attempting to describe a complex industry. However, significant room for improvement remains. We describe two main limitations that hinder attempts to understand the size of the sports economy: challenges with measurement and challenges with defining sports as an economic activity. Transparently acknowledging these issues is an essential step in improving our understanding of the sports economy. We then discuss the EU working group's efforts to address these challenges through the Vilnius Definition as these efforts successfully addressed some of these issues, but other challenges remain.

2.1. Challenges with measurement

Measurement challenges occur when sub-optimal statistics are used to depict the size of the sports economy. Ideally, accounts of the sector would be based on the total value added or GDP generated by every type of sports-related activities. Unfortunately, not all countries track these data. Even when these data are collected, the values collected are highly aggregated and usually limited to either the narrowest definition of the industry or just part of it (like professional sports). Moreover, even when countries collect value added information at a rather disaggregated level, there are often differences in the industry classification used. These industry differences significantly limit consolidation and comparability.

In light of these limitations with respect to value added data, many accounts have relied on revenues as an alternative measure of sports-related activity. The practice is particularly prevalent amongst market research accounts, although some academic accounts do it as well. For one, revenues are useful because they are measured similarly across the globe, making them more comparable. Moreover, because they are usually available at a firm level, they are a flexible measure that easily allows for aggregation under different definitions of sports.

Revenues, however, have their own problems. First, revenues aren't value added and, as a result, they may overemphasize the production of a sector through double counting. Using revenue as a measure is problematic because it encompasses the entire value chain, making the sector seem bigger than it is. For example, revenues of firms in the manufacturing, wholesale, and retail sectors might be including much of the same information. The tendency to double count through revenues is exacerbated even further when considering sports revenues because many different portions of the sports economy share elements of the value chain.

Second, revenues aren't profits. Many accounts - and the media reports that highlight them - focus on revenues to reflect how professional sports are booming. Equating revenues with economic performance hides the high costs that many professional teams face. Other than a handful of exceptional performers in the top sports leagues, the reality is that many professional clubs struggle to make ends meet. Buraimo, Simmons, and Szymanski (2006) note that, between 1999 and 2004, 22 of the 72 clubs in the English Football League (i.e.

excluding the Football Association Premier League) were forced to restructure their finances in order to avoid bankruptcy. These financial difficulties aren't always limited to the smallest clubs. Lago, Simmons, and Szymanski (2006) describe how, in the Italian Serie A, even large teams such as AC Milan and Juventus have operating losses that occur year after year. More broadly, analyses by Andrews and Harrington suggest that clubs in 35 of Europe's 52 leagues face high or medium risk with respect to their financial sustainability (Andrews and Harrington 2016).

Finally, and perhaps most importantly, it isn't always mandatory for revenues to be made publicly available. Rules and regulations regarding the transparency of a given firm's financial reports differ across countries. In countries with limited publicly available data, many accounts of the size of the sports economy must make significant projections to cover the resulting gaps. These projections are based on the potentially flimsy assumption that the "veiled" parts of the sector behave in the same way as the "unveiled" parts. The assumption is particularly tenuous given that these "veiled" components of the sector may choose to keep their revenue data private exactly because they behave different than other firms. Firms have an incentive to do so if their financial reports would disclose uncomfortable statistics or inconvenient business relationships.

Furthermore, differences in revenue transparency across countries are also problematic because it limits comparability. The composition and relative size of the sports economy may significantly vary across countries for cultural, geographic, or economic reasons. These disparities aren't captured if some countries don't have publicly available revenue data. For example, revenue data for major sports-related firms in developed countries is generally publicly available, but similar data in developing countries is difficult to uncover. That is problematic because, if we are attempting to understand the size, composition and impact of sports for the purposes of economic development, the insights we gain from significantly developed economies might not be applicable worldwide. Overall, many of the limitations mentioned above indicate that using revenue as a proxy for the size of the sports sector likely results in an overestimation of the economic importance of the sector.

While they have their flaws, it is still important to recognize that both value added and revenue measures can provide insightful information. For sports industry accounts using revenue measures, it is important to be explicit as possible in delineating what figures are factual and what are projections. Likewise, accounts leveraging revenues should improve their transparency with respect to the sources they use and the caveats that accompany them. Additionally, it would be useful to increase the transparency of financial reporting for firms in the industry and to consolidate publicly available information. These efforts would help observers of the sports economy better gauge their real understanding of the sector.

2.2. Challenges concerning economic definitions of sports

At the moment, structural, academic, and market research accounts employ different and often problematic definitions of which activities should be considered part of the sports economy. To start, market research and academic accounts of the sports economy use "top-down definitions" decided upon by the consulting firm or research group performing the analysis. Sometimes top-down definitions follow the contours of NAICS or NACE classifications, but often they expand far beyond them. These definitions represent largely

arbitrary choices as to whether or not a given economic activity should be classified in the sports economy. Some of these selections, like professional sports teams, make sense, but others, such as sporting goods manufacturers, are less straight forward. Top-down definitions are therefore very subjective categorizations and can vary widely between accounts.

In addition, top-down definitions are more prone to double accounting, especially when compared to industry classifications like NAICS or NACE. Industry classifications benefit from the fact that every activity only fits into one code, but that isn't necessarily true for top-down definitions. If sporting goods manufacturing are included in an account of the sports industry, should they then also be included in an account of the manufacturing industry? If so, the same activity could fall under multiple different codes and the sum of such sectorial accounts would far exceed true economic activity in a given jurisdiction. The same critique can be made of top-down definitions that include industries such as hotels, restaurants, or financial services in the sports economy.

Finally, market research or academic accounts with top-down definitions tend to favor some aspects of the sports economy more than others. In particular, these definitions are detailed with respect to certain professional sports teams and leagues since these organizations have the most publicly available firm-level data. Beyond these organizations, they are vague and based on projections. For example, the consulting firm AT Kearney provides detailed information on the "sports events market," which they define as roughly consisting of professional sports teams and leagues. The sports events market, they claim, totaled USD 80 billion globally in 2014, but they place the total "sports market" between USD 600 to USD 700 million (Collignon and Sultan 2014). Because of data limitations, such a figure is a rather weakly substantiated estimation.

Structural accounts are generally based around industry classifications. Definitions built around industry classifications are an improvement to the more arbitrary top-down approach, but they have their own problems too. First, economic activities in these systems are strictly defined, meaning that considering only sectors explicitly coded as sports may exclude much of the sports-related activity in the broader economy. There is economic activity that could be included in other sectors, but following the industrial classification systems prevents one from identifying these firms. Consider, for instance, sports-related broadcasters like ESPN. These firms are significant players in the sports economy. Professional sports wouldn't have as wide an audience without these firms. Moreover, the broadcasting arrangements that ESPN makes with many professional leagues are a significant component of their revenues. ESPN, however, would be categorized as a media company according to the NAICS or NACE systems. It therefore would be bundled with businesses like NBC, Universal or News Corporation, companies that are far more engaged with the production and transmission of general interest news and entertainment rather than just sports-specific stories.

Second, comparability of classifications is often difficult across time and across geography. Comparability is difficult across time because classifications like NAICS or NACE are revised every couple years to reflect changes in the economy. These revisions are important, but without detailed correspondence tables, they can render time-series analysis impossible. Comparability across geography is difficult because different countries

group economic activities with different classifications. As Figure 0.1 and Figure 0.2 demonstrate, NAICS and NACE have broad sections covering sports, but they differ in how they're divided. In NAICS, the spectator sports classification appears at the five-digit level of the hierarchy and can be divided further into three different six-digit classifications: sports teams and clubs, race tracks, and other spectator sports. In NACE revision two, sports activities appear at the three-digit level and are divided into four categories: operation of sports facilities, activities of sport clubs, fitness facilities, and other sports activities.

Comparing different countries' classifications or different versions of the same countries' classification is complicated. For example, comparing spectator sports data at the NAICS five-digit level with sports activities data at the NACE three-digit level would be misleading since the NACE category includes fitness facilities but the NAICS grouping doesn't. These comparisons are also difficult at a more granular level. For example, NACE classifies the operation of sports facilities under sports activities, but NAICS places the management of such facilities under a group labeled as promoters of performing arts, sports, and similar events with facilities, which is placed outside of the sports activities category. Correspondences exist that help assuage these challenges, but they often aggregate the classifications, sometimes to the point where there is only one identifiable sports industry.

2.3. Attempts to address these challenges through the Vilnius Definition

The Vilnius Definition of Sport described above represents the most comprehensive attempt to understand and account for the sports economy thus far. Many relevant stakeholders, such as national statistical agencies and research universities, were included in its formation and have agreed upon the methodology it uses. Perhaps most importantly, it has motivated several EU countries to begin producing their own SSAs, each of which is constructed under the same framework. Important improvements would be made if these efforts continue and data were collected for a significant period using such a definition. These attributes are laudable and deserve to be recognized.

The Vilnius Definition, however, isn't without its own challenges. First, the methodology through which the EU working group included or excluded sectors in the narrow and broad definitions is not clear. The statistical definition, the smallest categorization, is derived simply from industry classifications, but the two other categories involved considerable subjectivity. The approach describes the narrow definition as consisting of the statistical definition of sport plus those products and services required to "do" sport but it is unclear how these activities are determined. Likewise, the Vilnius Definition describes the broad definition as consisting of the narrow definition plus those products and services having a direct or indirect relation to sport.

These definitions are the compilation of a wide range of industries chosen through a process that seems arbitrary. Industries in the narrow and broad definitions were selected through discussions between the sports economy experts and analysts that gathered for the EU working group. Each expert argued, under their own criteria, for those industries he or she thought was important to consider within the sports economy. Other than the statistical definition at the core of these categories, it appears industries were included as the result of debate, discussion, and subjective considerations rather than an explicit

objective framework.

The result is that the economic importance of sports is likely overestimated. While it doesn't fully consider the production of each sector, the definition labels over 130 NACE classifications at the four-digit level as sports-related. The group reports that 1.76% and 1.13% of EU total gross value added falls under the broad and narrow definitions of sport. In contrast, only 0.28% of total EU value added is included in the statistical definition (SportsEconAustria et al. 2012). It compares the share of sport in European value added to that of the sum of value added in agriculture, forestry, and fishing activities. These comparisons culminate in the primary policy implication of the report: the observation that sports are a significant industry in the European economy that is worthy of focused policies and attention. However, if one were to create a satellite account of the agriculture, forestry, and fishing sectors according to a similar "broad definition," it would surely dwarf the broad definition of sports. Comparing the narrow or broad definition of sports to other size of other industries according to only their industry classification is unfair. It is a comparison based largely on double counting and ultimately tends to exaggerate the size of sports.

The second problem with the Vilnius Definition is the method through which production in the sports-related industries of the narrow and broad definitions is allocated to the sports economy. As mentioned above, the Vilnius Definition considers only a portion of production in those industries as sports-related. More precisely, the definition calculates a given sector's "sports-related production" as the total production value of that sector, as obtained through national statistical systems, multiplied by the sports-related share of the sector. Members of the working group determined the "sports-related share" on an industry-by-industry and country-by-country basis. In almost every sector outside the statistical definition, however, the proper "sports-related share" is difficult, if not impossible, to determine.

For most commodity industries, the Classification of Products by Activity (CPA) system was used to derive an approximation of the sports-related share. Since it is a very granular classification, the CPA system allowed the EU group to determine what proportion of products a given industry creates is directly sports-related. For non-commodity industries, the EU group was forced to rely on industry surveys, individual interviews, and company accounts to make an approximation of the sports-related share. Such research is legitimate, but it means that the narrow and broad definitions should be reframed and discussed as the result of a series of largely arbitrary decisions. In other words, they actually suffer from many of the same challenges relating to top-down definitions frequently found in market research accounts.

While the Vilnius Definition represents a step forward in the construction of data on the sports economy, there are still many limitations with the approach. First, the process through which industries were included and excluded from the narrow and broad definitions may be troublesome. It likely resulted in double counting and an exaggeration of the economic importance of sports. Second, the sports-related share of production in those industries that are included in the narrow and broad definition is largely unknown. It can only be estimated through a series of ad hoc procedures that vary by industry and country. In light of these difficulties, future work should therefore consider alternative or

complementary ways of thinking about and approaching the sports economy.

Section 3. How Can We Move Forward?

Some of the challenges described above can be solved in a relatively straight forward way. For instance, some accounts exclude important aspects of the sports economy or include aspects that aren't sufficiently related to sports. Simply restructuring data that is already collected could greatly improve these accounts. Other challenges described above are more difficult to address. These challenges result from data collection structures embedded within national statistical systems. Further disaggregating data within countries or increasing data comparability across countries would improve the capability of sports economy observers to provide insights tailored to a specific geographic area or industry. Overcoming these challenges would take time since it requires the restructuring of industry classifications and the collection of data over several years.

Addressing these challenges is important and necessary, but we believe that accounts of the sports economy would also benefit from a more fundamental paradigm shift. Most assessments of sports, whether they are market research accounts, structural accounts, or the EU working group's Vilnius Definition, combine a diverse array of sports-related activities together. Emphasis is placed on top-line statistics that highlight the "size" of sports and the proportion of gross domestic product or gross value added that it represents in a given economy. Perhaps the most highlighted number from the EU working group's 2012 study is the figure that 1.76% of total EU gross value added comes from the Vilnius approach's broad definition of sports (SportsEconAustria et al. 2012). The fundamental question these accounts ask with respect to the sports economy is "How big?" We believe, however, that another question is more appropriate: "How different?" Shifting the paradigm in this way would allow for an assessment of the sports economy that more accurately captures the great diversity within it.

3.1. Distinguishing between core sports and the sports periphery

Asking "How different?" is important to understanding the economic role of sports because the economic activities commonly understood to be sports-related are really quite diverse. As previously mentioned the Vilnius Definition— and many of the top-down definitions employed by market research accounts— group a wide variety of economic activity under the sports umbrella. Generally speaking, we believe that these economic activities should be divided at least into two categories: *core sports* and the *sports periphery*. Core sports activities are those that require knowledge that is highly specific to sports. Examples include activities like the operations of sports or fitness facilities found in the Vilnius approach's statistical definition. Sports periphery activities are those that only possess some sports-specific knowhow. Firms performing these activities either belong to a distinct sub-sector (such as sporting goods manufacturing) or are part of a set of businesses specializing in sports (such as sports-specific broadcasting firms ESPN and Sky Sports).

What distinguishes the sports periphery from core sports activities is the type of knowledge and skills that sectors in these categories require. The knowledge and skills required to participate in core sports activities is primarily about sports itself. Participating

in these sectors is about playing, teaching, coaching, managing or staging these activities. These activities correspond to sectors in the Vilnius approach's statistical definition: the operation of sports facilities, the activities of sports clubs, fitness facilities, and other sports activities. Industrial classification systems have different ways of naming them, but almost every system has several sectors covering these activities. As described above, four core sports sectors can be identified in the NACE revision 2 classification system: the operation of sports facilities, the activities of sports clubs, fitness facilities, and other sports activities.

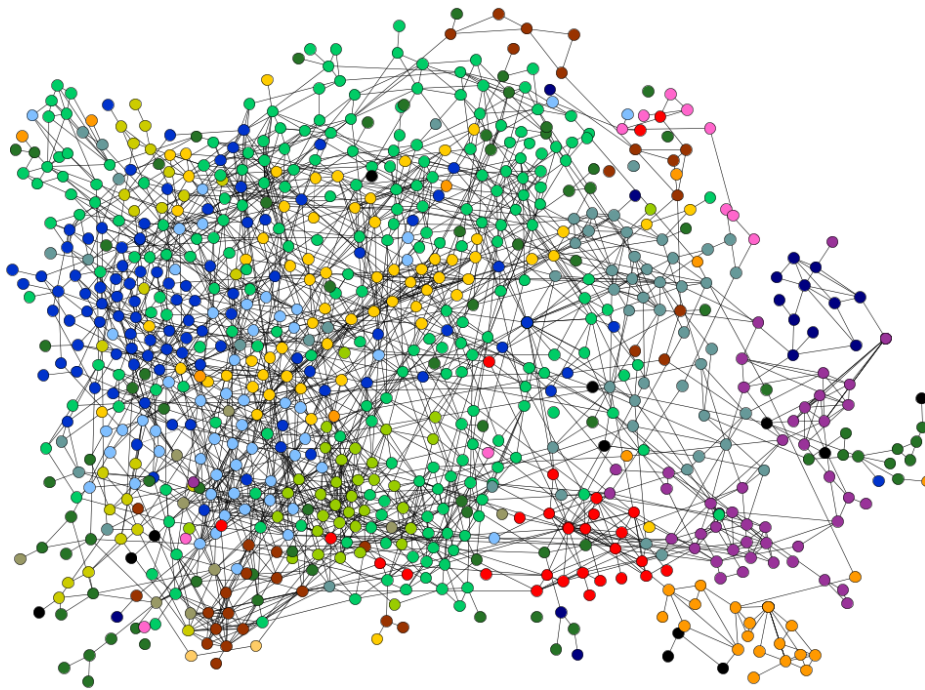
Such sports-specific knowledge can be juxtaposed with the knowledge required to participate in sports periphery activities. Sports periphery activities align, for the most part, with the narrow and broad definitions of the Vilnius approach. Participating in these sectors is about manufacturing shoes, broadcasting shows, or operating hotels. These shoes, shows, and hotels might be related to sports through productive linkages or other economic relationships, but they don't explicitly require sports-specific knowledge themselves. Sporting goods manufacturing businesses like Nike are more about textile manufacturing, fashion and retail than they are about sports. Similarly, sports broadcasting firms like ESPN are more about television, news, and mass media than they are about sports themselves. The activities captured in the sports periphery are therefore diverse and generally only related to each other by the fact that they share some sort of economic linkage with core sports activities. Unlike with core sports, the basic knowledge required for the activity is about a sector other than sports.

The industry space is a useful methodology for understanding the distinction between core sports and the sports periphery. It is a network that illustrates the industrial structure of a given geographic area by emphasizing the knowledge linkages between economic activities. Nodes in the network represent economic sectors and linkages in the network connect sectors requiring similar knowledge or skills. To create these linkages, we assume that labor flows observed in the data contain implicit information about the similarity or relatedness of the knowledge required by industries. We then calculate the skill-relatedness between any two sectors by assessing the labor flows between economic activities. Skill-relatedness is a measure of the degree to which labor flows between any two industries exceeds the labor flows that we would expect between any two industries chosen at random.

Industries requiring similar skills, such as automobile manufacturing and heavy machinery manufacturing, will have a high skill-relatedness since many workers will move between them. Conversely, industries that require very different skills, such as automobile manufacturing and hospitals, will have a low skill-relatedness because very few workers will switch between them. If core sports activities have a high skill-relatedness with sports periphery activities (and are thus highly connected to them in the industry space), then we could say that they share much of the same knowledge. Alternatively, if core sports activities have a high skill-relatedness with other core sports activities (and are thus mainly clustered together in the industry space), then we can say that these sectors require sports-specific knowledge that can't be found in sports periphery activities.

To illustrate the approach, we use labor flow data from the Netherlands. The Dutch data covers the period between 2001 and 2008, capturing more than 1.4 million labor flows. Data from the Netherlands are used because, as mentioned above, the country has highly detailed classifications with respect to sports-related activities that are not available elsewhere. Of the 826 activities discernible in the Netherlands data at the five-digit level, there are twenty-nine activities that can be considered as core sports activities. Appendix 1.A contains the core sports activities in the Netherlands.

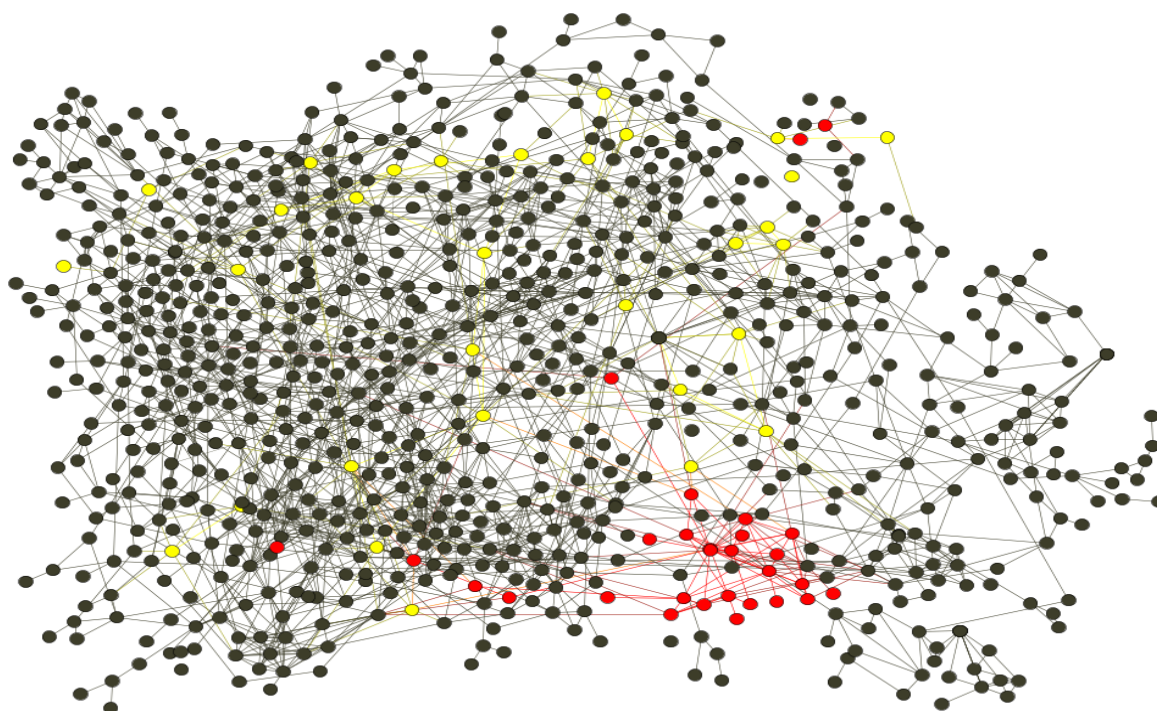
Figure 0.4. Netherlands industry space colored at the NACE rev. 1 two-digit level



Note: Core sports activities are colored red. See 0 for the labels of other clusters. Source: Own calculations using data from Statistics Netherlands.

Analyzing the Netherlands industry space produces two initial insights. First, in the industry space depicted in Figure 0.4, we observe that similar economic activities cluster together. For instance, the group of dark blue nodes in the left-hand part of the network represents metal and machinery manufacturing activities. Likewise, the purple nodes in the bottom right-hand corner of the network represent a health and social work cluster. Core sports nodes; colored red, have their own cluster in the bottom right portion of the network. The fact that these activities group together suggests that they require similar kinds of knowledge for their production processes. Such knowledge is sports-specific and can be juxtaposed with the knowledge that other sectors require. For instance, the red core sports activities have little, if any, linkages with the dark blue metal and machinery manufacturing nodes.

Figure 0.5. Netherlands industry space colored according to core sports and the sports periphery



Note: Core sports activities are colored red and sports periphery activities are colored yellow. See 0 for the activities included in these classifications.

Source: Own calculations using data from Statistics Netherlands.

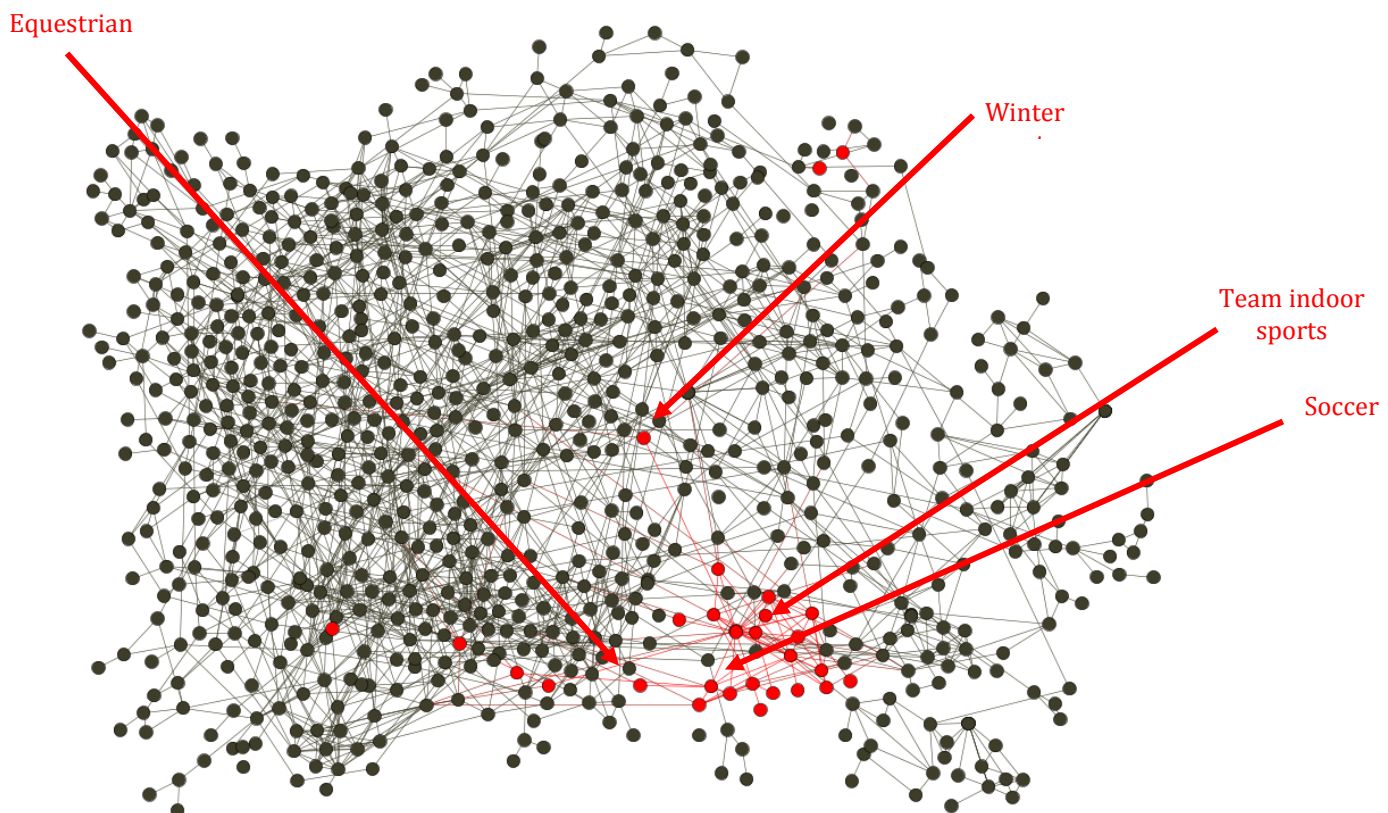
Figure 0.5 depicts the same Netherlands industry space as shown in Figure 0.4 with the only difference being the colors of nodes. Nodes in Figure 0.5 are colored red if they belong to the core sports cluster and yellow if they are classified as sports periphery activities. The sports periphery activities we consider here, which are listed in Appendix 1.A, aren't an exhaustive list of sectors that could be considered part of the sports periphery. They represent only a selection of activities included in the narrow and broad categories of the Vilnius Definition. Nonetheless, differentiating between these different types of activities reveals a second important insight: core sports activities aren't closely connected to other more peripheral activities often associated with the sports economy. Since sports periphery activities are located in clusters other than the core sports cluster, they require knowledge and skills different than those required by core sports. For example, sporting goods manufacturing is skill-related to and therefore grouped with other manufacturing industries such as the manufacture of household electrical appliances. Similarly, radio and TV production are more closely connected to news agencies or the performing arts than they are to sports. We can conclude that sports periphery industries require skills and knowledge that are more about manufacturing, broadcasting, hospitality, or another activity than they are about sports. Acknowledging and understanding these differences is an important step in shifting from a paradigm that asks "How big?" to one that asks "How

different?”

3.2. Distinguishing between activities within core sports

The industry spaces above illustrate that the activities many previous accounts consider to be “sports-related” require skills and knowledge unrelated to sports. In addition to the difference between core sports and sports periphery activities, there are important differences between core sports activities themselves. With activities ranging from spectator sports activities to fitness and recreation sports activities, core sports activities can vary widely in terms of their size and relationship to other parts of the economy. Just as it is important to disentangle core sports activities from the sports peripheries, it is therefore also essential to distinguish between different core sports activities themselves.

Figure 0.6. Netherlands industry space with the core sports colored



Note: Core sports activities are colored red. See Appendix 1.A for the activities considered to be core sports.

Source: Own calculations using data from Statistics Netherlands.

Figure 0.6, a final version of the Netherlands industry space with only the core sports nodes highlighted in red, demonstrates the point. While most core sports activities are clustered in the bottom right-hand corner of the network, there is still significant diversity within the core sports category itself. Winter sports, for instance, are in the center of the network and linked to non-sports activities such as general machinery and public passenger transport.

Similarly, the equestrian node is linked to only two other nodes, one of which is the wholesale of cattle, an activity with no sports-specific knowledge. Contrast these nodes with the team indoor sports or soccer nodes, both of which are at the heart of the core sports group. These activities are linked to many other nodes, almost all of which are core sports activities. Figure 0.6 therefore suggests that there is diversity not only between the core sports and the sports periphery, but also within the core sports cluster itself.

The diversity within core sports at which Figure 0.6 hints can be better seen even more clearly through data from the 2012 U.S. Economic Census. Consider two different sectors in the NAICS classification: sports teams and clubs (711211) and fitness and recreational sports centers (713940). Figure 0.6 displays several descriptive variables of the two sectors. At an initial glance, their total wages and total revenues are comparable. Sports teams, for instance, are in the 72nd percentile in terms of revenues, while fitness centers are in the 74th. Fitness centers, however, appear to be a far larger sector, at least in terms of the sheer number of establishments and employees. Fitness centers are in the 94th and 96th percentiles in terms of these two variables, but sports teams are only in the 44th and 65th.

Table 0.1. Size of industries 711211 and 713940 in the United States

Industry	Sports teams and clubs		Fitness and recreational sports centers	
NAICS code	711211		713940	
Total revenues, thousands of USD (% rank)	22,393,140	(0.72)	26,064,739	(0.74)
Total wages, thousands of USD (% rank)	14,323,508	(0.93)	7,883,461	(0.86)
Establishments (% rank)	1,005	(0.44)	29,682	(0.94)
Employees (% rank)	57,784	(0.65)	605,316	(0.96)

Source: 2012 United States Economic Census

However, in terms of the revenue per establishment and total wages per employee, sports teams far exceed fitness centers. Total wages per employee for sports teams, for instance, are in the highest percentile possible. They are the second highest in the economy, only lower than investment banking and higher than industries like portfolio management and commodity contracts. Fitness centers, in contrast, have some of the lowest total wages per employee in the economy. Sports teams therefore appear to be an industry with a few high cash flow establishments, while fitness centers are an industry with many low cash flow firms.

Table 0.2. Size per establishment and employee of industries 711211 and 713940

Industry	Sports teams and clubs		Fitness and recreational sports centers	
NAICS code	711211		713940	
Revenue per establishment, thousands of USD (% rank)	22,281.73	(0.76)	810.75	(0.12)
Total wages per employee, thousands of USD (% rank)	247.88	(1.00)	13.02	(0.01)

Source: 2012 United States Economic Census

These differences in overall sector size and size per establishment are likely indicative of further differences in terms of required inputs and subsequent production processes. Sports teams require significant physical capital inputs such as stadiums and training facilities. Likewise, they require workers who are highly trained athletes, coaches, or management executives. In contrast, fitness centers are far less capital intensive, as they require only the construction of a relatively small gym or studio. The labor that they employ is likely more similar to the education and health sectors than it is to sports clubs.

In addition to their relationship with other businesses and production, sports teams and fitness facilities also offer different services and therefore have very different relationships with consumers. Sports teams offer an entertainment experience to their consumers. Consumers can access that experience in person by attending a game, but the Internet and modern broadcasting systems mean that the game can also be seen by fans that are farther away. Both local and international spectators can participate in the experience. Fitness centers, on the other hand, offer an experience that end users desire for a mixture of health and entertainment reasons. Some people attend gyms because they want to stay healthy, but others derive pleasure from exercising. Moreover, almost all of the consumers participating in fitness and recreational activities are local consumers.

As a result, we would expect the productive, human capital, and consumption linkages between these two sectors and other parts of the economy to be very different. Professional sports teams may have stronger productive relationships with construction firms and broadcasting businesses, while fitness facilities may have no relation to these sectors at all. Conversely, fitness facilities may have strong human capital linkages to education and health services, but professional sports teams likely wouldn't share these connections. Moreover, sports teams may have strong co-consumption linkages with restaurant, bars, and merchandise stores, but these connections wouldn't be present for fitness facilities. These relationships are difficult to identify, especially with the current state of data on the sports economy. It is clear, however, that, in addition to separating out the sports periphery, future accounts of the sports economy should avoid analyzing even core sports activities as one monolithic entity. Failing to do so would obscure these nuances, therefore limiting the ability of policymakers to make informed decisions.

3.3. Implications for future work on the sports economy

Shifting the paradigm from one focused on the size of the sports economy to one focused on the diversity of sports-related economic activities has important implications for future work. Moving forward, analysts and academics need to carefully distinguish between those

activities at the core of sports and those activities that are more peripherally related. Distinguishing between activities in this way will likely diminish the overall size of the sports economy that future accounts estimate, but it would allow for more nuanced and ultimately more impactful policies. Once the paradigm has shifted from one focused on size to one focused on diversity, there are a number of different economic profiles and relationships on which future work should focus. These include some of the following analyses:

- *Employment profiles* could describe the kinds of employees that participate in sports-related activities. What types of occupations and skills are required in these activities? Do these positions offer relatively higher wages? How experienced are workers in these activities? What demographic profile do these workers possess?
- *Geographic profiles* could describe the distribution of these sports-related activities over space. What locations have particularly high concentrations of sports-related activities? Are there certain characteristics of these locations that attract sports-related activities?
- *Input/output linkages* would depict the productive connections that a given sports-related activity has with the rest of the economy. What inputs do sports-related activities need? To what other industries do sports-related activities serve as an input?
- *Co-location linkages* would offer insights on the industries that place themselves near sports-related activities. Do certain sports-related activities cluster together? What other industries are found near sports-related ones?
- *Co-consumption linkages* would describe the other purchases that consumers make when they buy products or services from sports-related activities. What is the elasticity of these relationships? What industries benefit from these purchases?

Due to the diversity described above, these profiles and relationships will likely vary across core sports and sports periphery activities. Disaggregating these analyses and performing them for specific activities is the best way to analyze the differences within the sports economy.

Conclusion

Many current characterizations of the sports economy face important limitations. Whether they are market research or structural accounts, these depictions of the sports economy have a variety of challenges. Because value added data is relatively rare, many accounts rely on firm-level revenues, much of which is based on sometimes dubious estimations. These revenue-based accounts also often disguise the costs and subsequent profitability of the firms in the sports economy. Measurement challenges are compounded by a range of issues relating to the definition of sports as an economic activity. For instance, when value added data is collected by national statistical agencies it is often done so according to industry classifications that render it incomparable across time and geography. These industry classifications can also make it difficult to include components of the sports economy, such as sports broadcasting or sporting goods manufacturing, that straddle the

boundary between sports and other economic activities. Market research accounts sometimes leverage firm-level data in an effort to escape this problem, but they in turn rely on questionable top-down definitions. These top-down definitions are often opaque and rely on significant projections about the industry's size.

Developed by the EU Working Group on Sports and Economics, the Vilnius Definition of Sport is perhaps the best attempt to accurately assess the size of the sports economy. The working group includes three definitions of sports, each of which are increasingly broad in scope. The broad definition - the approach's most inclusive grouping and the one on which the working group focused - includes portions of any industry with a direct or indirect relation to any sport activity. We believe that definition of the sports economy is too broad. The definition ultimately includes many products and services produced or consumed by people not involved in the sports economy.

The result is a definition that captures six times the value added of the sectors that the NACE industry classification specifically labels as sports-related.

We believe that the path forward requires a two-step approach. First, efforts must be made in the long term to improve data collection within structural accounts. One area of improvement is the synchronization of industry classifications across time and across countries. Another is the disaggregation of classifications to more accurately capture the diversity and nuances of the sports economy. Second, in the short to medium term, future assessments of the sports economy should ask "How different?" rather than "How big?" In other words, accounts should attempt to disaggregate the sports economy as much as possible and focus on the economic relationships of individual sports-related activities. Potential relationships to analyze include input/output linkages, co-location linkages, and co-consumption linkages. Recognizing the diversity within the sports is perhaps the most important step to improving future accounts and ultimately enhancing sports policy.

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Appendix A. Core Sports and Sports Periphery Activities in the Netherlands

Table Error! No text of specified style in document..1. Core sports activities in the Netherlands

Standaard Bedrijfsindeling 1993 Five-digit Industry Code*	Industry
92611	Operation of sports facilities
92612	Operation of swimming pools
92613	Operation of sports halls
92614	Operation of sports fields
92621	Operation of other sports
92622	Football
92623	Field sports (other than football)
92624	Athletics
92625	Tennis
92626	Equestrian (including riding schools)
92627	Cycling
92628	Motorsports
92629	Winter sports
92631	Other outdoor sports
92632	Sports halls for individual sports
92634	Sports halls for team sports
92635	Martial arts
92635	Bowling, billiards, and similar sports
92636	Puzzles
92641	Swimming
92642	Boating, canoeing, and sailing

Standaard Bedrijfsindeling 1993 Five-digit Industry Code*	Industry
92643	Sailing and surfing schools
92644	Marinas
92651	Professional sportsmen
92652	Sports instructors
92653	Gyms
92654	Sports fans and supporters associations
92655	Organizers of sports events
92656	Sports umbrella, cooperation, and advisory bodies


















Table Error! No text of specified style in document..2. Selected sports periphery activities**

Standaard Bedrijfsindeling 1993 Four-digit Industry Code*	Industry
3640	Manufacture of sports goods
3512	Building and repairing of pleasure and sporting boats
4523	Construction of highways, roads, airfields, and sport facilities
5147	Wholesale of other household goods
5248	Other retail sale in specialized stores
5511	Hotels and motels, with restaurants
5512	Hotels and motels, without restaurants
9220	Radio and television activities
9271	Gambling and betting activities
9272	Other recreational activities n.e.c.

*Standaard Bedrijfsindeling (SBI) is the Dutch industry classification system. The first four-digits of SBI 1993 correspond to NACE revision 1.

**The table here isn't necessarily a comprehensive list of all sports periphery activities. It is instead a list of selected sports periphery activity chosen from the Vilnius Definition. Because they are selected from the Vilnius Definition, the codes listed here are four-digit codes corresponding exactly to those in NACE revision 1 rather than the five-digit codes listed for core sports activities. Since nodes in Figure 0.5 represent industries at the five-digit level in SBI 1993, there are more nodes highlighted in Figure 0.5 than four-digit codes listed here.

Appendix B. Node Colors in Figure 0.4. Netherlands industry space colored at the NACE rev. 1 two-digit level

Color		Standaard Bedrijfsindeling 1993 Two-digit Industry Codes*^	Industry
	Bright Blue	05	Fishing
	Gray	10-14	Mining and quarrying
	Yellow/Green	15-16	Manufacturing of food products, beverages, and tobacco products
	Orange/Yellow	17-22	Manufacture of textiles, textile products, wood and wood products
	Light Blue	23-26	Manufacture of petroleum, chemicals, rubber, and non-metallic minerals
	Dark Blue	27-37	Manufacture of basic metals, fabricated metal products, machinery, furniture, and other equipment
	Peach	40-41	Electricity, gas, and water supply
	Dirty Yellow	45	Construction
	Aqua	50-52	Wholesale and retail trade
	Pink	55	Hotels and restaurants
	Brown	60-64	Transport, storage, and communication
	Orange	65-67	Financial intermediation
	Dark Green	70-74	Real estate, renting, and business activities
	Black	75	Public administration
	Dark Blue	80	Education
	Purple	85	Health and social work
	Aqua/Green	90-93 (excluding 926 industries)**	Other community, social, and personal service activities

*Standaard Bedrijfsindeling (SBI) is the Dutch industry classification system. Ranges of codes are listed here to capture broader groups of related industries.

** 926 industry nodes are excluded because they are colored red as core sports activities.

^Note that agriculture, hunting, and forestry activities are excluded from the labor survey data.

