

Madrid District Classification Analysis

Luis Andrade, August 2021

INTRODUCTION

The objective of this study is to analyze the different patterns that characterize the different districts that conform the city of Madrid, Spain. Each of them have pros and cons depending on the people's profile. There are people to prefer to live in a district full of fun and gastronomic options, while others prefer a quieter environment with more open-space recreational spaces. Some might pursue one of these options assuming a high profile budget whereas others are only willing to afford economic places. Also, safety could also be more a concern for some people than others. We will figure out what aspects could impact more the average property value of each district and also, we will try to understand the similarities among them. To achieve these goals, we will mine some public data of Madrid, apply regression modeling to the mined data and perform clustering techniques to group similar districts.

Before running into the scope of this study it is important to review the main aspects of the Spanish capital and understand its importance. Madrid is the capital of Spain and also Europe's second largest city, after Berlin. With approximately 6,8 million inhabitants according to 2019 projections, it is European Union's second most populated city after Paris. It also holds the third largest GDP in all EU. Madrid is the house of two of the most important European Clubs such as Real Madrid and Atlético de Madrid. Madrid residents are around 75% are Spain-born people and the rest are immigrants mainly from the former Spanish colonies in the Americas.

Madrid is also a very important touristic hotspot. It receives around 10 million visitors from all over the world who come to enjoy its fascinating Renaissance architecture, culture, art, gastronomy and nightlife options, as well as to enjoy of the sport events, mainly the local football league (La Liga) and European championships.

Madrid is also the headquarter of important Spanish multinational enterprises such as Repsol, Telefonica, Iberia, BBVA, among other companies as well as branches of other international companies. Despite the central districts are the ones with more economical weight for the city, its continuous expansion towards suburban areas has opened opportunities for more industries to choose Madrid as its facility headquarters.

Madrid is connected through the air by the Adolfo Suarez International Airport, in the vicinity of Barajas, which is commonly known as Barajas airport. In extension, it is Europe's second largest hub, behind Paris Charles de Gaulle airport, and holds the sixth place as Europe's busiest hub with nearly 62 million travelers using this airport in 2019. Madrid is also very well connected by land with a very efficient road and railroad network to the neighboring communities and rest of the country and European Union territory. This include high-speed train services, known as AVE. Madrid also counts with a suburban rail network known as Cercanias and urban metro network with 12 lines, plus bus complementary services that keeps its residents and visitors very well connected from their origin to destination at reasonable travel times.

The presence of many universities such as Universidad Complutense and business schools such as Instituto Empresa has attracted many students from all over the world, specially from Latin America, to Madrid. This means that more people come with location and service needs, thereby, more opportunities.

In terms of safety, according to Numbeo.com, Madrid holds a crime index of 29.71, occupying the place 47 of 157 European cities, where Bradford, UK holds Europe's highest index of 70.75. In terms of safety index, Madrid has a score of 70.29, which means that it is the 91st safest of 157 European cities, being Zurich the safest city with an 83.64 score. What we see is that Madrid has an intermediate performance in terms of safety, according to European references which are low if we compare to worldwide cases. Thereby, safety is not a very big concern for Madrid residents and visitors. According to several sources and reviews, most of criminal cases are related to pickpockets. Not often we hear about serious or harmful incidents in Madrid. Despite this, we don't know at this point if the safety aspect has an impact in property value of the affected communities or if there are some communities more affected than others.

As we can see, Madrid is a city with multiple features distributed among its 21 metropolitan districts that fit for very diverse people profiles. We are going to extract geographical, real estate, safety and venue information for each of Madrid's district. We will mine each database and integrate the different types of information to better understand each district, find correlation of the different aspects and try to group similar districts and determine in what they are similar.