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Editorial Note

As a proof of the return to normality – a new normality, post-pandemic, but in many comforting ways also pre-pandemic – this second booklet 2023 is an ordinary, standard, issue of the GeoProgress Journal. In fact, it publishes 5 articles of various contents: such as flat tax, airports, the devastating effects of the pandemic on the rural UNESCO landscapes, the issue related to the recovery or to a new use of the abandoned fields in the Mediterranean areas of the North Africa countries - topics which all are important for this journal and very important for the Geoprogess's association mission.

Innovations in transport - in their technologies, means and infrastructures - are among the main causes and consequences of development. Since the invention of the wheel, the horse-drawn carriage, and then from railways and steam ships up to modern airports, they have profoundly changed the face of the Earth and the organization of its territories. Ports, post stations, as well as railway and bus stations, have always played a fundamental role in territorial development, not only as transport infrastructures but also as places where people can gather and conduct economic activities. This is not the case for airports, usually built near places already organised and often far away from the cities they are supposed to serve and so this has caused them to develop just as infrastructures after a long time. Only in recent times, following continuous urban expansion, have they also become important sub-centres of attraction and organization of urban life. This is the case, for example, of the airports of Seoul, Dallas, and Amsterdam, on which the contribution of Federico De Andreis and Paolo Pane focuses, who explore "how airports can serve as catalysts for urbanization and economics, as well as influence urban planning and the creation of new urban forms: airport cities and aerotropolis".

The first of the 3 articles about Italian issues, although they are now very common in other countries as well, is about the "flat tax", as personal income tax, at the centre of the political debate since 1994 and it is still highly topical. I believe this article, written by Caterina Ferrario, is very important because it arises relevant and unsettling questions about the reason why some political parties are opponent to the proposal of the most democratic forces, devoted to the value of the Italian Republic Constitution, such as a progressivity of tax and National Unity (value to which all parties should adhere). The proposed reform would affect interregional income redistribution: a very important issue, given the still persistent regional disparities, which is rather disregarded in the current debate. The second and the third article are related to the tourism industry in Italy, which after the Covid-19 shock is taking a promising path of constant recovery. The relevance of the industry – despite being pushed by the downfall of the manufacturing sector – was still undeniable even during the pandemic as demonstrated by the study of Veronica Cavagliato, Clementina Bruno, Marco Novarese. The study shows the results of questionnaires and focus groups and analyses the consequences of the pandemic on the tourism sector. The study examines how tourists have changed their preference compared to pre-pandemic times and the emerging opportunities for intermediaries and for the development of less-known areas.

The positive recovery of the Italian Tourism sectors should not allow to forget the pre-Covid issues, such as the neglect of landscape, and above all the UNESCO rural landscape, as explained by Fabrizio Aimar in the third article of the journal. This problem has not disappeared, on the contrary it has

worsened during the pandemic. Therefore, it is necessary to restart the discussion around this topic and push the political forces to promote the planning process at national and regional level and to find appropriate solutions to coordinate industry actors involved. In the matter of the rural landscape, the planning process would avoid the risks of changing the nature of places and compromising their social structure, which is vital for their continuity.

The final article, by Simone Robbiano, Anna Menozzi, Fabrizio Erbetta, Guido Lingua, presents a project, which results should avoid and achieve the starvation issue in the low-income areas in North Africa included in the *ProSmallAgriMed* project funded, as part *Partnership for Research and Innovation in the Mediterranean Area – PRIMA*. The objective of the project is “improving the agronomic practices of North African small farmers, by promoting the rational use of healthy soil microbiota and their positive effects on productivity of intercropped perennial (cactus-pear) and short-term (field crops and winter-grown vegetables) species, as well as to support synergistic cooperation between farmers and the food-value chain”. It would be vital to review the challenges and the realisation of benefits in a couple of years to understand the capabilities of the project to spread and share the new innovative way of work.

Francesco Adamo

ARTICLES

AIRPORTS AND TERRITORIAL RESTRUCTURING

Federico de Andreis*, Paolo Pane¹

Abstract

The airport infrastructure has become a crucial part of modern transportation systems, serving not only as a gateway for air travel but also as a hub for economic development, job creation, and regional growth. As such, airports have multiple functions, some of which are direct, such as providing air transportation services, while others are indirect, such as generating economic activity and enhancing accessibility.

This paper aims to provide a comprehensive analysis of the existing literature on the topic of airport infrastructure and its impact on urban development. By focusing on three case studies of successful airport cities and aerotropolis, namely Seoul, Dallas, and Amsterdam, this paper will explore how airports can serve as catalysts for urbanization and economic growth. These case studies will also shed light on how airport development can influence urban planning and the creation of new urban forms: airport cities and aerotropolis.

These airport-centered developments, creating new opportunities for businesses and individuals, attracting new investments, generating employment, and contributing to the growth of regional economies, have become a trend in recent years. Airports are no longer seen solely as transportation hubs but also as economic engines that can significantly contribute to the local and regional economy.

By analyzing the existing literature and case studies, this paper will provide insights into how airport infrastructure can influence urbanization and economic growth, but also how it can affect environmental sustainability and accessibility. In conclusion, this paper highlights the importance of studying airport infrastructure and its impact on urban development, as it has the potential to shape the future of our cities and economies.

Keywords: Airports; Geography of transport, Aerotropolis, Airport city.

1. Introduction

The paper aims to analyze the impact of transportation demand on the development of territories surrounding airports. The development of aviation has resulted in airports becoming new dynamic centers of economic activity that have incorporated various services and activities, both within passenger terminals and in the surrounding areas, thus transforming the territory.

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Different concepts addressing this type of development can be found in the literature; this dissertation will focus on the concepts of "airport city" and "aerotropolis". The airport city and aerotropolis models are claimed by some authors to have become the norm for the strategic development of major hub airports in the 21st century.

These new airport development models imply significant territorial, social, and economic impacts, as airports' influence extends well beyond their boundaries. In this process, many airport-related areas have acquired the characteristics of metropolitan central business districts, emerging as new hubs of development.

The paper then examines these forms of spatial restructuring around airports, contributing to the literature on this matter, which remains scarce and often presented from a semi-scientific perspective, sometimes even for publicity purposes.

Specifically, it aims to answer the following research questions:

RQ1. How has the need for mobility influenced the emergence of new urban forms around airports?

RQ2. What are the factors that have driven this need for development?

The paper follows a specific structure. Section 2 presents the methodology used in the research. Section 3 focuses on analyzing the demand for transportation and the resulting needs. Section 4 reviews the literature by examining the changes that airports have brought about in the surrounding territory. Section 5 is dedicated to case studies. Finally, section 6 presents conclusions and potential areas for future research

2. Materials and Methods

The paper initially highlights the importance of transportation in connecting people and places. The literature review then examines the relationship between airports and territorial development.

To gain insight into the impact of this relationship, the paper adopts a multiple case study approach, analyzing Seoul, Dallas, and Amsterdam airports (Yin 2014; Pucher and Renne, 2003).

3. Transport demand

In order to provide a definition of transport, it is necessary to view it not as a final purpose but as a derived demand from people's natural propensity to interact with each other, the places they live, or the places they visit (Button and Vega, 2010).

The term "transportation" refers to the transfer, which involves the movement of people or goods from one place to another, either with or without vehicles.

Therefore, "transportation" can also be defined as the act by which the need for the mobility of people and goods is satisfied, ensuring the mobility of production factors and products as well. This facilitates the intensification of exchanges and social interactions (the social function of transportation). It constitutes one of the essential requirements for the growth and development of the economy and the progress of civilization. In fact, the efficiency of communication routes and the organization of transportation within a nation is a significant indicator of its level of civilization.

The concept of derived demand has been applied to transport since the early decades of the 1900s, with the interest of forecasting the demand for transport based on land use schemes, particularly within metropolitan areas (Hensher, 2007).

While it is true that people travel to reach a destination, the best way to predict transport demand is to examine the land use pattern of a given area, defining the origin

and destination of these trips. This approach emphasizes that mobility should be considered not as a final demand but as an intermediate good or service, offered to meet a direct demand for accessibility to places and services (Mokhtarian and Salomon, 2001).

The demand for transportation, although understood as a relative and not an absolute concept, is primarily motivated by the desire to reach a given destination, which can be a specific place located in a given location or an indeterminate place without well-defined physical boundaries (Banister, 2008).

From this perspective, the transportation system represents an intermediate service with respect to a higher purpose. Travelers are not automatically and exclusively guided to their destination but are given the opportunity to construct their own journey based on the places of departure and arrival, thus putting mobility at the service of places (Hensher and Button, 2001).

It is important to highlight that demand for transportation, however, cannot be merely derived. Although cases in which movement is considered an end in itself are extremely rare, travel is normally undertaken to take advantage of a series of activities often separated from each other spatially (Button and Vega, 2010).

Therefore, it is necessary to consider the demand for transport as a derived demand, but with rare exceptions. Sometimes it is true that time spent traveling can have a positive value to someone, and in some cases, the destination may be the product of the desire to make a trip, but this represents a very small proportion of the cases and is insufficient to refute the theory (Urry, 2002).

In fact, there are a number of activities and trips that are made without the traveler having a specific destination in mind; human beings are, by nature, inclined to move and explore (Levinson and Krizek, 2008).

Similarly, there are situations where a greater cost or longer time spent traveling is justified by the realization of benefits in other areas. For example, the choice to travel a scenic route rather than the shorter one is made to better appreciate the place where one is transiting (Geurs and Van Wee, 2004). Nevertheless, even in these cases, accessibility, intended as the ability to reach a destination through a combination of mobility and proximity, only increases the value of these activities.

The essence of accessibility lies precisely in the ability to reach a place, not in shortening the journey, as is often misjudged. An area that offers multiple destinations and places to move and explore is more attractive than one without places of interest or isolated from its surroundings (Condeço-Melhorado et al., 2004).

However, it remains true that, in the vast majority of cases, time spent traveling is viewed as a cost rather than a benefit, and a decrease in travel time is generally preferred to an increase in it. In fact, travel presupposes a number of negative externalities to be considered, such as road congestion, psychological stress of the driver, noise and air pollution, etc., which travelers decide to deal with if they have the opportunity to interact with their destination and receive compensatory benefits.

These benefits may be evident in the choice of destination or origin, during the journey itself, or in the manner in which it is accomplished.

However, even if allocating investment to expedite travel allows people to be more free, for example, in choosing the location of their residence or vacation destination, and provides them with great mobility to move wherever they want at any time, this policy also brings consequences for society in terms of environmental sustainability and accessibility (Wegener, 1991; Fu et al., 2010; Urry, 2002).

4. Literature review - Accessibility, airport city and aerotropolis

Accessibility refers to the capacity of a particular region, characterized by residential settlements and economic activities, to interact effectively with other territories (Scott, 1996).

When we talk about accessibility to a place, we mean the ease with which a specific geographical site can be reached, taking into account various factors such as connectivity infrastructure (roads, parking spaces, access points to public transport networks, etc.) and the barriers or spatial obstacles that shape the overall layout of the place and its surroundings. Thus, the role and development of transportation play a central role in this context (Rodrigue et al., 2013).

The continuous evolution of transportation means has significantly enhanced accessibility. This improvement can be measured by the level of connectivity offered to the population, enabling easier access to employment opportunities, education, healthcare, leisure activities, and more (Farrington, 2007).

This aspect plays a crucial role in the growth and development of an area and its residents, ensuring a fair distribution of opportunities. Therefore, the focus lies on establishing minimum service levels that ensure well-connected peripheral areas and appropriate transportation options to meet the demand in densely urbanized regions.

The subject is closely linked to the so-called "right to mobility," which, though lacking a strictly legal foundation, is grounded in a broader sociological and social concept. Presently, it serves as a fundamental reference point in the formulation of transport policies, not only in urban areas but also beyond (Preston and Rajé, 2007).

In this study on accessibility in the modern world, it is crucial to focus on aviation, considering the significant impact of airline deregulation, the liberalization of air transport routes, and the continuous rise in air transport demand. These factors, along with the liberalization of airports, have led to decisive changes in the industry, mobility, and accessibility (de Andreis, 2023). The landscape has seen the emergence of new airlines, the implementation of new operating plans, aggressive business strategies, and the adoption of new organizational schemes, replacing the old ones. Furthermore, there has been a construction of new airports, expansion of existing ones, and the development of multi-airport systems (Forsyth et al., 2004).

Airports play a pivotal role as key catalysts for urban growth and economic development, particularly in an era of rapid global urbanization. Beyond their evident global economic functions, the multifaceted connectivity and localized impacts of air transport infrastructure position them at the very core of city-regional politics and planning (Addie, 2014).

Over time, the very functions of airports have transformed, just as cities have evolved. Historically, airports were considered primarily as landing sites for aircraft, control towers, and facilities for communication and transportation.

Today, this traditional model is being replaced by the concept of "airport cities," which assumes that, in addition to their aviation infrastructure and services, airports also offer additional services unrelated to aviation. These services serve as a source of revenue for the airport and add to its attractiveness for people (Sassen, 2019). Airports have become dynamic centers of economic activity, incorporating various commercial services and businesses, both within passenger terminals and on their landside areas.

Through this process, airports have taken on characteristics resembling metropolitan central business districts and have established themselves as new regional development poles known as "airport cities" and "aerotropolises" (Gosling et al., 2013).

With the development of aviation, airports have indeed become the hubs for cargo and people, undergoing revolutionary changes in their operations and strategies (Rodrigue et al., 2013).

In the early 1930s, airports started to be seen as analogous to railway stations - specialized components of urban transportation. Ideally located at a higher elevation than the surrounding areas to avoid obstacles and away from commercial districts due to significant externalities (Krasner, 2010).

After World War II, airports evolved from small components of intra-metropolitan transportation systems to essential elements of national infrastructure, playing a crucial role in transforming cities from industrial to postindustrial forms during the suburban decentralization period of the 1940s (U.S. Government Printing Office, 1952). However, in the 1950s, despite recognizing the significant potential of aviation in national development, concerns about airports arose at both local and national levels. There was a belief that the physical proximity of airports to urban areas was not vital, and future development would fall under some form of metropolitan government (Meier, 1974).

In 1974, Meier, an advocate for sustainable development, observed that airports served as new suburban centers connecting various actors, such as manufacturers and suppliers, companies and customers (Urry, 2007). At the beginning of the 20th century, major airports were seen as representatives of a network society, where the evolution of multimodal transportation and multifunctional hubs highlighted their role as agents of globalization (Doganis, 2006).

Traditionally, airports were considered as infrastructures where aircraft could operate, and goods and people could move to satisfy the basic need for national mobility in a highly regulated aviation industry. However, since the 1990s, new liberalization policies around the world have made the industry more competitive, fundamentally transforming the perception and functions of airport infrastructure (Graham, 2010; Freestone, 2009).

Airports have evolved from transportation hubs to centers fostering the growth of urban areas and regional economies, leading to the spontaneous development of new urban forms in the surrounding areas (Button, 2011). This development has significant economic impacts on the surrounding areas, with airport terminals functioning as commercial centers and business and leisure areas.

Consequently, other economic entities have emerged, such as hotels, office complexes, logistics centers, and trade areas in close proximity to the airport terminals. Additionally, airports generate revenue from ancillary activities such as advertising and parking fees (Graham, 2010).

Financial analyses of airport budgets have shown that airports earn more revenue from additional sources, such as taxes, airport and passenger traffic control service fees, than from air services alone. These results provide an incentive for the development of airport cities in and around the airport. Such developments are significant on an international scale, as airports have evolved into engines of spatial development and economic incubators that can influence the labor market (Kasarda, 2011a).

This new urban form must consider both risks and costs from economic, environmental, and cultural perspectives. While economic development showcases the success of mega-airports, it also presents planning challenges, especially related to sustainability (Button, 2011).

The rethinking of airports and their surrounding areas had already emerged in the late 20th century in the United States, creating substantial impacts on both the movement of people and freight and developing the concept of airport cities (Kasarda, 2011b). Currently, several areas worldwide can be classified as part of this category, and they are not just the most important passenger traffic hubs but also major cargo shipping hubs.

The economic impact of airport infrastructure extends beyond its immediate surroundings and has a significant positive effect on the local economy. Properly sized and interconnected airport terminals can generate employment, added value, and increase GDP (Brueckner, 2003).

This new urban form should be viewed as a contemporary model that aligns with metropolitan development trends, driven by the need to provide better job opportunities, improved quality of life, and enhanced accessibility in response to suburban depopulation. This has led metropolises to become some of the most populated areas in the world.

As metropolises continue to grow and develop, they require increasingly efficient transportation infrastructure, often resulting in the transformation of areas near airports into what are known as airport cities. These territories serve the purpose of supporting and benefiting from airport development and are situated within the airport's boundaries, encompassing both airport and on-airport businesses. This trend is driven by a strong correlation between metropolitan growth and the aviation industry (Doganis, 2010).

To create a functional and seamless connection between air travel and urban living, the concept of an airport city integrates an airport with its surrounding area into a single urban environment. These cities serve as vital hubs for international commerce and tourism, attracting businesses and visitors from around the world (Brueckner, 2003).

The concept of airport cities aims to harness the economic potential of airports and their surrounding areas. The objective is to create dynamic and functional urban centers that attract more businesses, increase passenger traffic, generate employment opportunities, and promote the development of new industries. These cities often offer a wide range of amenities, including hotels, restaurants, shopping centers, and entertainment facilities, while also being well-connected with excellent transport links to facilitate easy travel for passengers (Burghouwt et al., 2016).

Airport cities offer various advantages, including their potential to attract international businesses seeking access to global markets. These cities have business parks and office buildings tailored to the needs of international companies, often providing incentives and benefits to attract investment.

Additionally, airport cities can promote tourism by serving as gateways to nearby cultural and natural attractions, leading to a boost in the local economy.

Typically, the development of airport cities focuses on the immediate surroundings of the airport, emphasizing the construction of hotels, offices, and commercial buildings (Graham and Papatheodorou, 2015).

The concept of airport cities has been of interest since the 1970s when it first appeared in the United States. Initially, it referred to the development of industrial and business

parks in the vicinity of airfields. However, over time, the term has come to encompass the growth of aeronautical and non-aeronautical land developments at airports worldwide (Graham, 2023; Appold and Kasarda, 2013).

The idea of the airport city has been acknowledged by some experts in urban planning and architecture as a new urban form, while others have not fully accepted it as having urban characteristics. Nevertheless, the concept has evolved over time and is now recognized as an important driver of economic growth and development. Regardless of debates on its classification as a new urban form, there is no denying the impact of airport cities on the surrounding areas and the economy as a whole (Schaafsma, 2014). The airport city has emerged as a planned and integrated real estate development between cities and airports, driven by interactions between global flows and local conditions. It involves linear urban development occurring alongside major surface infrastructure in previously underdeveloped areas between airports and the major cities they serve.

This new urban form lies at the core of the aerotropolis, also known as the airport economic region, a growth model that focuses on building an entire city or urban area around an airport, encompassing all airport-related developments (Aguiar Peneda et al., 2010). The aerotropolis acts as a hub of economic growth, competitiveness, and development, centering its economy on the airport, becoming the community's economic engine.

The concept of the aerotropolis seeks to capitalize on the economic benefits of airports and create a dynamic urban environment that attracts businesses, investments, and people. By leveraging the airport's unique assets, it fosters economic growth and improves the quality of life for local residents. The aerotropolis achieves this by integrating a range of amenities and services into the city's design, thus creating a self-sustaining economic ecosystem that supports businesses, workers, and residents (Banai, 2017).

The design of an aerotropolis includes state-of-the-art features that support economic growth and development. It offers a variety of amenities and services catering to the needs of companies, creating a favorable business environment that encourages investment and growth. Additionally, it provides a platform for international trade and commerce, stimulating local economic activity and generating jobs. Moreover, the aerotropolis can enhance the quality of life for local residents by incorporating public amenities and services into the city's design. This can involve the inclusion of parks, green spaces, and public transit, improving the health and well-being of residents while reducing environmental impacts.

Reflecting the demands of the new economy for connectivity, speed, and agility, the aerotropolis is optimized through corridor and cluster development, wide lanes, and efficient transportation. In other words, form follows function (figure 1). Airport expressways (aerolanes) are complemented by airport express trains (aerotrans) to seamlessly integrate cars, taxis, buses, trucks, and rail services with the air infrastructure at the multimodal commercial core, known as the airport city. Aviation-linked business clusters and associated residential developments radiate outward from the airport city, forming the greater aerotropolis (Kasarda and Appold, 2014).

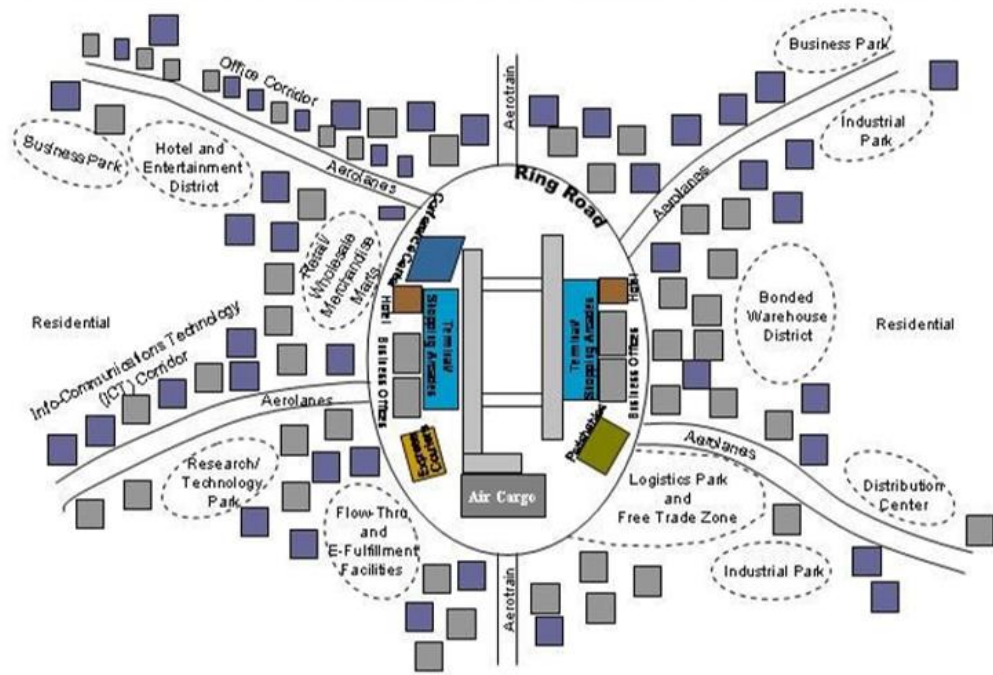


Figure 1. Aerotropolis Schematic

Source: Kasarda and Appold, 2014.

In conclusion, the aerotropolis is an innovative urban development concept centered around the airport as a hub of economic growth and development. Its integration of amenities and services into the city's design creates a self-sustaining economic ecosystem that supports businesses, workers, and residents, while also enhancing the quality of life for local residents. The terms "airport city" and "aerotropolis" are often used interchangeably due to their similarities. Both concepts aim to optimize the economic potential of airports and their surrounding areas by providing various amenities and services, such as hotels, restaurants, shopping centers, and entertainment facilities, for passengers and local residents. Connectivity is also a shared feature, with excellent transport links and good road and rail connections for easy access.

The main goal of airport cities and aerotropolises is to create vibrant, self-sustaining urban environments that support economic growth and development while offering a high quality of life for residents and visitors. In summary, airport cities and aerotropolises are closely related concepts with similar features, both of which are essential for the advancement of air travel and urban planning (Brueckner, 2003).

5. Case studies

Aerotropolises have appeared in different cities worldwide, either as a result of natural growth or planned development with the aim of creating a global city.

As of the end of the 2010s, there were over 80 aerotropolises either operational or in development globally; nowadays many others are developing (Kasarda and Appold, 2014).

The aerotropolis phenomenon responds to the global market by developing a city with the airport at its center. A successful aerotropolis aims to better serve workers, suppliers, executives, and goods by responding to the growing demand for air travel

and global business networks. Kasarda and Appold (2014) suggest that the faster a city can provide ground access to jobs and industry near airports, the greater share of global economic activity it can attract (Yin, 2014).

Many cities have established their own versions of aerotropolises, and the following case studies examples demonstrate different cities around the world, despite limitations in terms of land or other resources, are developing aerotropolises, changing the territory, to compete in the global marketplace. any cities intend to develop an aerotropolis (Yangmin et al., 2021).

Incheon International Airport, located in Seoul, South Korea, is one of the world's busiest airport hubs, serving as a vital connection point for passengers traveling between Asia and other parts of the world.

Incheon Airport was opened in 2001 with the goal of establishing trade and travel with China, a strategic location as it is just two hours flying time from Shanghai and Beijing, and four hours from many other large Chinese cities. This has allowed for new markets to open up to billions of people.

In conjunction with the airport, in order to boost its economic potential, an aerotropolis development, called Songdo International Business District, was planned. This global business hub opened in 2009 and is designated as a Free Economic Zone, providing tax benefits and a simpler regulatory regime for foreign firms and foreigners. It offers office and convention space, hotels, residential and retail developments, schools, health care facilities, and recreation space, and is just 20 minutes from Incheon and one hour from Seoul. Songdo is one of the leaders in the high-tech industry and already hosts large offices for Samsung, Cisco, and IBM.

Incheon Airport is known for its modern and easy facilities and state-of-the-art technology. It offers a wide range of services and amenities, including free Wi-Fi, airport lounges, duty-free shops, restaurants, and cafes. The airport has won several awards for its excellence in customer service and efficiency, making it a top choice for many travelers.

In addition to its passenger services, Incheon Airport is also an important hub for air cargo. It has a dedicated cargo terminal with advanced facilities and state-of-the-art equipment, making it one of the most efficient and reliable cargo hubs in the world. This has helped to drive the growth of the South Korean economy, with Incheon Airport contributing significantly to the country's GDP.

Overall, Incheon International Airport is an important player in the global aviation industry, serving as a crucial connection point between Asia and the rest of the world. Its strategic location, modern facilities, and efficient services have made it a top choice for many travelers and businesses alike (Kim and Baum, 2016).

Similarly, Dallas-Fort Worth International Airport has become a major economic engine in North Texas, as a true example of an aerotropolis.

It is located in the Dallas-Fort Worth Metropolitan Area (DFW Metro Area), covering a 12-county region in North Central Texas, and it is one of the busiest airports in the world. DFW Airport has played a vital role in North Texas' economic growth and is credited with being a major economic engine of the metro area.

The establishment of DFW Airport required collaboration and cooperation with all of the 12 counties in the region, and it was not an easy task. However, the airport has become a critical component of the North Texas economy. Business activities supported by air cargo moving through DFW Airport generate more than \$30 billion directly or indirectly and support employment in the area.

DFW Airport's success story has spurred significant development in the region. The airport's location has attracted businesses from various industries, including technology, finance, and healthcare, which has led to the creation of new jobs and economic opportunities.

Additionally, DFW Airport has several thousand acres of property available for future aerotropolis-related development, which will further contribute to the growth of the region.

Overall, DFW Airport is a model for how airports can transform surrounding areas into thriving economic hubs. Its success has shown that airports can play a vital role in the growth and development of a region and serve as a catalyst for economic growth (Jones, 2017).

Finally, Amsterdam's Schiphol International Airport is an excellent example of how an airport can transform into a thriving aerotropolis. Located just six miles from the largest flower auction in the Netherlands, Schiphol airport plays a vital role in the global economic market.

The airport has been a major hub for international trade and commerce, especially in the floral industry, which has been around for centuries in the Netherlands. The country is one of the world's major growers and exporters of flowers, and the airport has been instrumental in facilitating the export of these goods to markets around the world. In fact, KLM, the flag-carrier airline of the Netherlands, invented the perishables business in 1928 by airlifting 7,500 hundred tons of flowers, fruits, and vegetables to London in that year alone (Bertolini and Spit, 2018).

Schiphol airport is also strategically located near the Amsterdam District Zuidas, a 670-acre aerotropolis that has been planned to take advantage of Amsterdam's global economic importance. This airport city is a thriving business hub that offers office space, restaurants, residential units, a university, a medical center, and the Netherlands' largest convention center located just six minutes from the airport.

The airport has played a significant role in transforming the surrounding territory into a thriving aerotropolis. With its strategic location and excellent connectivity to major cities around the world, the airport has attracted several multinational corporations to set up offices in the Amsterdam District Zuidas. The area is now a bustling economic center that generates significant employment opportunities and drives economic growth in the region.

In conclusion, Schiphol International Airport is an excellent example of how an airport can be transformed into a thriving aerotropolis.

Its strategic location, excellent connectivity, and proximity to other economic centers have made it a vital link in the global supply chain.

The Amsterdam District Zuidas is a testament to how the airport has transformed the surrounding territory into a thriving business hub. With its ongoing development and growth, Schiphol airport is likely to continue driving economic growth and development in the region for many years to come (Maat and van Wee, 2013).

5. Conclusions and further research

As seen, transportation is a derived demand that serves as an intermediate service to fulfill the direct demand for accessibility to places and services.

Although people travel to reach specific destinations, the most effective way to make a transportation forecast is to observe the land-use pattern of a given area to define the

origin and destination of these trips. While in rare cases, travel may be considered an end in itself, the vast majority of travel time is seen as a cost rather than a benefit.

Therefore, it is necessary to consider the negative externalities of travel, such as road congestion, psychological stress, noise, and air pollution, and strike a balance between investing in fast travel options and promoting environmental sustainability and accessibility. In this way, transportation can be used to improve mobility and provide better accessibility to places and services, making them more appealing to people.

Airline deregulation, route liberalization, and the continuous increase in demand for air travel have led to significant changes in aviation, mobility, and accessibility, all seeking to enhance attractiveness.

As a consequence, airports have undergone a transformation from mere transportation hubs to become urban centers that drive regional economic growth. This shift has resulted in the emergence of new urban models such as airport cities and aerotropolis, which have a substantial economic impact on surrounding areas, creating job opportunities, increasing GDP, and generating added value.

However, these new urban forms also carry risks and costs from economic, environmental, and cultural perspectives, which must be taken into account.

The appropriate sizing and interconnection of airport terminals can lead to better job opportunities, improved quality of life, and greater accessibility, particularly in response to suburban depopulation, aligning with metropolitan development trends. Consequently, studying aviation's impact on accessibility is essential in today's world. Aerotropolises, which aim to better serve citizens, travelers, workers, suppliers, executives, and freight in response to the growing demand for air travel and global trade networks, have emerged globally as a result of either natural growth or planned development aimed at creating a global city.

By the late 2010s, more than 80 aerotropolises were operating or under development worldwide, and this number continues to rise. Examples like Incheon International Airport, Dallas-Fort Worth International Airport, and Amsterdam Schiphol International Airport illustrate how airports can transform surrounding areas into thriving economic hubs, competing in the global marketplace by attracting a greater share of global economic activity through improved overland access to jobs and industries near airports.

The study was solely centered on the emergence of these new forms of urbanization. However, future research could explore aspects related to sustainability in all its forms, building upon the three case studies that were identified.

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GAINERS AND LOSERS FROM A FLAT TAX: AN INTERREGIONAL PERSPECTIVE

Caterina Ferrario*

Abstract

Personal income taxation in Italy contributes significantly to public revenues, it is progressive and attains a good degree of income redistribution across individuals. It has also significant interregional redistributive effects, which contribute to reduce interregional income disparities. However, personal income taxation has some important drawbacks, primarily as regards equity and excess burden of taxation. Since 1994 there have been proposals to introduce a flat income tax. Such a reform would impact on the tax system equity and efficiency, but would also affect interregional income redistribution, an issue rather disregarded in the current debate on personal income tax reform.

Keywords: personal income tax, efficiency, equity, progressivity, income redistribution.

JEL classification: E62, H20, H23, H24, H70.

1. Introduction

Personal income taxation in Italy is a primary source of public revenues. IRPEF, the personal income tax, generates approximately 40% of total tax revenues and contributes to income redistribution across individuals thanks to its progressive structure. In addition, IRPEF has also relevant interregional redistributive effects, which contribute to reducing the relevant interregional income disparities that characterise Italy. Since 1994, proposals to introduce a flat income tax have been put forward as a way to address some important IRPEF drawbacks, primarily concerning its equity and efficiency. Such a reform would affect the tax system equity and efficiency, but would also impact on interregional income redistribution, with potentially undesirable effects in terms of interregional equity and regional economic convergence.

This paper describes the main features of the Italian personal income tax and analyses the potential effect on interregional income redistribution from the introduction of a flat tax. Section 2 briefly reviews issues of tax equity, efficiency and redistribution and section 3 describes the Italian personal income tax. IRPEF progressivity and its redistributive effects are presented in section 4, while section 5 focuses on IRPEF equity and efficiency.

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Sections 6 and 7 describe the flat tax reform proposal and section 8 presents some considerations on the impact on interregional income redistribution of such a reform. Section 9 concludes.

2. Tax systems: equity, efficiency and redistribution

Modern tax systems pursue a multiplicity of purposes. First and fundamentally that of raising revenues to finance government expenditures for goods and services offered to citizens and businesses and for investments in infrastructures and human capital. In addition taxes may be designed to correct market failures and sustain growth (e.g.: externalities, incentives,...) or to reduce income distribution inequality and improve social welfare. Thus, both efficiency and equity purposes add to the primary objective of raising revenues. Tax design is not an easy task. Particularly because the many tax policy objectives may be conflicting and taxes themselves may produce unwanted distortions both under equity and efficiency perspectives. Further, there are often efficiency and equity trade-offs.

The economic literature on optimal taxation specifically addresses these issues by “tracing the implications of taxes and quantifying (analytically) the trade-offs between the various objects of tax policy” (Atkinson and Stiglitz, 1976, p. 55). This strand of studies has its roots in the seminal works of Ramsey (1927), Mirrlees (1971) and Atkinson and Stiglitz (1976) and has reached significant results on the desirable tax structure to reduce the excess burden of taxation (i.e., the efficiency costs imposed by taxation). For instance, it investigates the optimal tax mix, it also suggests that a broad tax base and low tax rates are less distortive than a narrow base coupled by high tax rates; that simplicity is efficient because it reduces tax administration and compliance costs and because it fosters transparency and accountability. Though, simplicity may come at the expenses of equity, while the pursuit of equity may hinder efficiency by generating distortions and disincentives to economic activity. Further, redistribution through income taxes may negatively affect economic efficiency, if it reduces incentives to produce income (Mirrlees, 1971; Okun, 1975), but there is no strong empirical evidence that progressivity is harmful to growth (IMF, 2017, p. 13). Conversely, there is evidence that inequality hinders growth (Persson and Tabellini, 1994).

One common feature of modern tax/benefit systems is that they pursue income redistribution, although at different degrees across countries, and progressive income taxes play a major role in this respect. Indeed, progressivity may be a necessity, because a proportional income tax may not provide sufficient revenue if the tax rate is low and may not be sustainable for the poor if the tax rate is high.

From an economic perspective, redistribution is desirable to prevent excessive inequality and income polarisation. Declining marginal utility justifies a higher tax levy for higher incomes. In addition, justice theories (Rawls, 1971) support progressivity and redistribution. Still, redistribution should guarantee vertical and horizontal equity. That is relative income position should not be reverted by taxation and the tax system should ensure an equal treatment of equals.

The degree of redistribution attained by a single tax can be measured using the Reynolds-Smolensky index, defined as the difference between the Gini index measured on income

distribution before the tax and the concentration index measured after the tax (Reynolds-Smolensky, 1970). Significantly, the Reynolds-Smolensky index is equal to the product of an index of progressivity (Kakwani index) times an index of incidence. That is redistribution depends both on the progressivity and on the level of taxation (Kakwani, 1977; Lambert, 1993). These results imply that a tax needs to be progressive in order attain redistribution. In addition, no redistribution may be attained by a proportional or regressive tax. Still, the degree of redistribution attained by the public budget is a combination of the effects of both taxes and transfers (either monetary or in kind).

3. The Italian personal income tax: a brief description

According to the Italian Constitution, public expenditure is financed on the basis of the ability to pay criterion² and the tax system shall be progressive³. This latter provision implies that the tax system, besides collecting revenues, also fulfils a redistributive function. Significantly, the Constitutional requirement for progressivity concerns the overall tax system and not one single tax. Therefore, each single tax may well be either progressive, proportional or even regressive.

At the time of its introduction, in 1974, the personal income tax (IRPEF – *imposta sul reddito delle persone fisiche*) was intended to be comprehensive and progressive. Over nearly 50 years since its institution, IRPEF has undergone many changes that altered the initial tax design. To understand the current income tax structure, it is therefore useful to review briefly its evolution over time within the more general Italian tax system.

The current Italian tax system mainly derives from the tax reform of 1974, inspired by the works of the Commission for the Study of Tax Reform (Commissione Cosciani-Visentini). The Commission report published in 1964 envisaged a comprehensive unitary reform, rooted in the economic theory of taxation, but at the same time consistent with the limits and constraints of the specific Italian institutional conditions. In 1971 the Italian Parliament delegated the government to issue tax reform decrees⁴, which were introduced in 1972-1974⁵. However, already during the implementation process, some alterations to the original design were introduced. These differences were partly due to the changed socio-economic conditions in 1974 compared to 1964. In 1974 the post-second world war economic boom was going to an end and the GDP growth rate had slowed down, inflation was soaring, international economic and financial conditions were less stable,

² Italian Constitution, art. 53, paragraph 1.

³ Italian Constitution, art. 53, paragraph 2.

⁴ Law 825/1971.

⁵ In 1972-1973 the tax reform was enacted through 19 decrees. Decrees n. 633 and n. 643 introduced, respectively, the value added tax and the municipal tax on increases of real estate value. Then there were changes to other taxes and levies, such as: registration fees (n. 634/1972), the inheritance tax (n. 637/1972), the mortgage tax and cadastral tax (n. 635/1972), the stamp duty (n. 642/1972), tax litigation fees, the municipal advertising tax and bill-posting duty (n. 639/1972), the amusement tax (n. 640/1972) and licence fees (n. 641/1972). New direct taxes came into force in 1974: the personal income tax (IRPEF – decree 597/1973), the corporate income tax (IRPEG – decree 598/1973) and the local income tax (ILOR – decree 599/1973). In addition the reform addressed income tax assessment (decree 600/1973), tax reliefs, (n. 601/1973), direct taxes collection (n. 602/1973) and related services (n. 603/1972). Finally, provisions for the revision of land and buildings cadastre and for the creation of a Tax registry were enacted.

international capital movements were liberalised. The resulting tax system, although inspired by the Commission report, was characterised by significant deviations from the report provisions.

Specifically, progressivity and redistribution were primarily pursued through the new personal income tax (IRPEF), which also contributed significantly to total tax revenues. The IRPEF tax base was inspired by the concept of taxpayer's total income⁶, and tax rates were increasing by brackets. However, there were deviations from the original design. The most significant concerned the personal income tax base: financial income was excluded. The tax base was further eroded over time and exemptions grew widespread: some types of income have been excluded and either subjected to an alternative proportional tax (e.g.: rental income, property income from second homes⁷, self-employment income below a certain threshold, for which it is possible to opt for the so-called "regime forfetario", literally *lump-sum scheme* – from now on – or totally exempted). In addition, property incomes are imputed and there are specific assessment criteria for corporate income. As a result, the tax base significantly shrank, to an extent that employment compensations (*employment income* from now on) and pension income are probably today the only incomes to be fully progressively taxed.

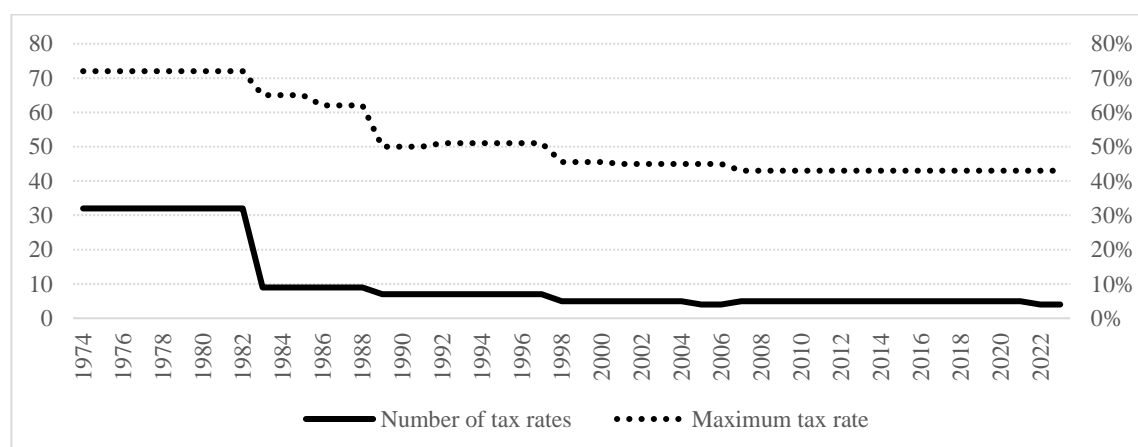


Figure 1: IRPEF, Number of tax rates and maximum tax rates, 1974-2022.

Source: Own elaboration.

Further, also the tax rate structure has been repeatedly revised. Since its introduction, IRPEF was progressive through tax rates increasing by brackets. In 1974 there were 32 brackets and the marginal tax rate ranged from 10% to 82%. Over time the number of tax brackets and the maximum marginal rate were reduced (figure 1), a trend common to most

⁶ As suggested by Schanz (1896), Haig (1921) and Simons (1938): a personal income tax base should be an individual's "comprehensive income", that is the value of what she could consume in the tax year, while keeping her wealth constant (this would include all sources of real income, net of expenses incurred to earn the income).

⁷ Second homes are exempted and taxed by a proportional local property tax, IMU. Main homes (i.e. where the taxpayer formally resides) benefit from income tax relief, but IMU is levied on primary residences classified as luxury properties (in the land registry, i.e. category A1, A8 or A9).

OECD countries. The most recent reform, in 2022, introduced 4 tax brackets as listed in table 1⁸. The current tax structure is characterised by relatively high marginal rates for rather low incomes, as compared to other EU countries (figure 2).

Finally, the number of tax expenditures (both tax allowances reducing the tax base and tax credits reducing the tax due) is very high and has grown consistently over time (MEF, 2011; Senato, 2017). Social security contributions are deductible and tax credits include those for specific sources of income (employment, pension, and self-employment income), family tax credits and tax credits for specific kind of expenditures (such as mortgage interest, medical expenses, education expenses, life and accident insurance, sport association's fees, rental fees). Tax credits for source of income and family are declining with gross income, thus enhancing progressivity. The former also define a minimum level of exempted income (no-tax area) for taxpayers earning employment, pension, or self-employment income. The no-tax area was recently introduced to reduce the tax burden on low incomes, and is common to many OECD countries (Baldini, 2021).

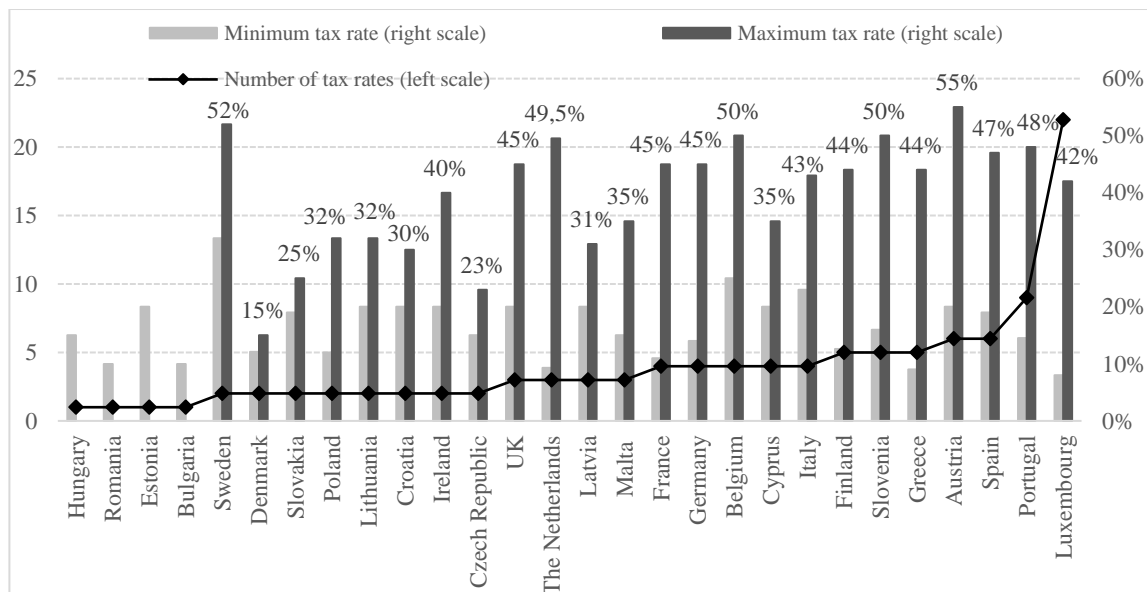


Figure 2: personal income tax in EU countries and UK.
 Number of tax rates and minimum/maximum tax rate, 2022.
 Source: Own elaboration on Eurostat data.

⁸ A Regional and a municipal income tax are also applied. For both, the tax rate varies according to the taxpayer's place of residence. The regional income tax rate ranges from 1.23% to 3.33% and the municipal one from 0% to 0.8% (0.9% for Rome). Municipal tax rates can be progressive, but they should conform to national income tax brackets.

Tax brackets (gross annual taxable income) euro	Marginal tax rate	% of taxpayers (2020) ⁹
< 15.000	23%	44,5%
15.000-28.000	25%	32,8% *
28.000-50.000	35%	17,1% *
> 50.000	43%	5,5%

Table 1: IRPEF 2022, tax brackets, tax rates, distribution of taxpayers, fiscal year 2020.
Source: Own elaboration on MEF data.

Today IRPEF is the main tax in the Italian tax system as regards both the number of taxpayers and total revenue. In 2021, IRPEF tax forms were filed by 41.2 million taxpayers. 84.5% of them had primarily employment (51.4%) or pension income (33.1%), while for only 6.3% the primary income was individual company income or self-employed income (including taxpayer under the lump-sum scheme) (figure 3). Total declared income amounts to 865.1 billion euro, of which 50.9% employment income and 33% pension income (MEF, 2023). Average income is 21,570 euro, but this figure displays a relevant variability across regions, with higher values in the North of the country compared to the South.

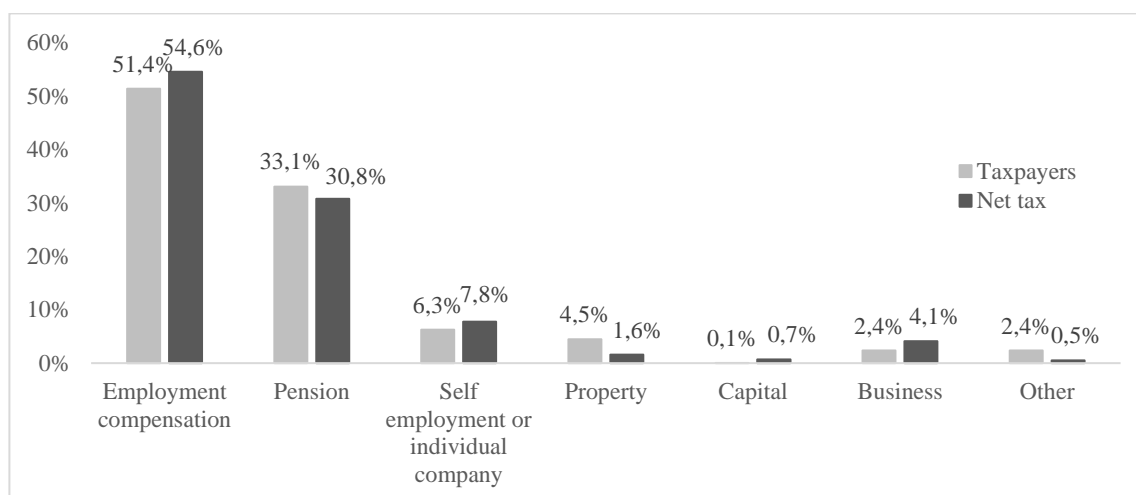


Figure 3: IRPEF, distribution of taxpayers and of net tax by main income source 2020.
Source: Own elaboration on MEF data.

⁹ The distribution of taxpayers across brackets is based on data published by the Minister of the Economy and Finance (MEF). In the MEF dataset, total taxpayers are divided in many income classes, from 0 to above 300.000 euro. To complete table 1, data from different MEF classes were grouped, in order to reproduce IRPEF tax brackets' structure. However, in the MEF dataset, there is one class of income that includes taxpayers that fall in two different brackets. Taxpayers in MEF income class 26.000-29.000 euro needed to be divided between the second and the third brackets. This was done using the rule of thumb of apportioning two thirds of taxpayers in this class to the second bracket and one third to the third bracket. Therefore, data for the second and third brackets are estimates of actual data.

The region with the highest average income is Lombardia in the North (25,330 euro), while that with the lowest value is Calabria in the South (15,630 euro). Total revenue from IRPEF amounted to 198 billion euro, approximately 40% of total tax revenues (496 billion euro), 22% of total public revenues and approximately 11% of GDP (MER, 2023). Employment and pension income contribute to total IRPEF revenues by 85.4%, while other sources of income contribute only marginally to total IRPEF revenues (figure 4). Due to the many changes introduced over time, the current tax structure is rather different from the one designed by the Commission for fiscal reform in 1964. Alterations affected every aspect of the tax structure, from the tax base to tax brackets and tax rates, to tax expenditures. Already a few years after its introduction, it was Cosciani himself who complained that the changes introduced had worsened the initial tax structure (Cosciani, 1983, p. 967): “our personal income tax (...) resembles an old mosaic, where some of the most important pieces have fallen and other are damaged, so that the original design is deformed and worsened”¹⁰. As a result, today personal income taxation in Italy has strong and important drawbacks as regards progressivity and redistribution, equity and efficiency, not to mention revenue generation.

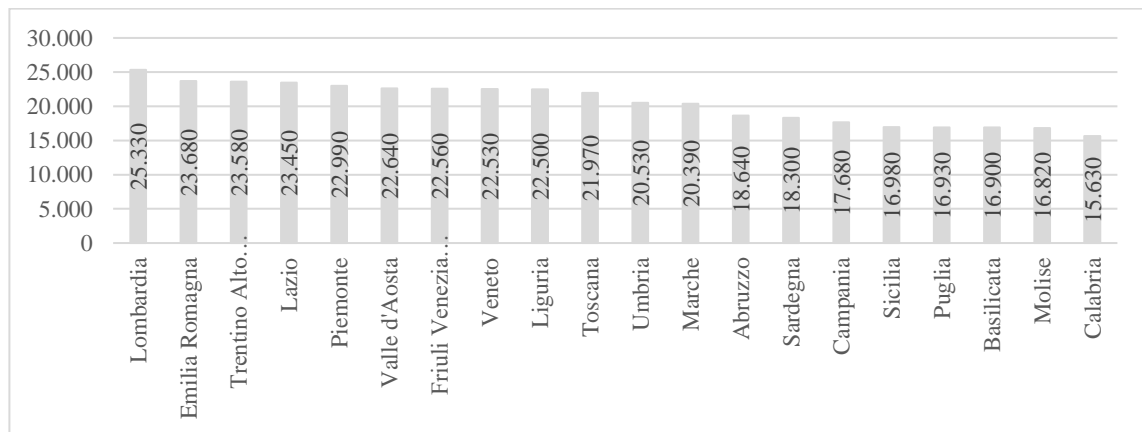


Figure 4: IRPEF, Average income by region, 2020 (thousand euro).
 Source: Own elaboration on ISTAT data.

4. The Italian personal income tax: progressivity and redistribution

Italy is characterised by high income inequality, both interpersonal and interregional. In 2022 the Gini index¹¹ of personal income inequality in Italy was 0.33, above the EU27 average value of 0.3. In the EU, only Spain, Romania, Lithuania, Latvia and Bulgaria had a higher Gini index (figure 5). Interregional income inequality defines a clear North-South divide, which has its roots in historical socio-economic differences, with most Southern regions lagging behind the others (Daniele and Malanima, 2014). In Italy, the public budget has a significant redistributive power and produces a relevant reduction of income

¹⁰ Translation from Italian by the author.

¹¹ The Gini index of inequality is equal to 0 for maximum equality and 1 for maximum inequality.

inequality. According to recent estimates, family income inequality measured by the Gini index is reduced by nearly 17% in 2022 (Istat, 2022). Also, interregional income inequality is smoothed by the public budget redistributive power, which reduces average income differences across regions (Arachi et al., 2010). Most income redistribution is attained by public expenditure (12%), but also taxes contribute significantly (4.9%) (Istat, 2022).

On the revenue side, the Italian personal income tax currently represents the main source of income redistribution, despite the many alterations to its initial progressive structure (Causa and Hermansen, 2019, p. 50; Bosi and Guerra, 2023, p. 149), and in 2019 it contributed to the reduction of the Gini index of income inequality by 4% (Liaci, 2021). According to the decomposition of the Reynolds-Smolensky index, redistribution results from the combination of tax progressivity and tax incidence. Evidence on both these measures is provided for Italy by Baldini (2021). In 2019, the IRPEF average incidence on gross household income was 17% (significantly higher than in the 1970's when it amounted to approximately 12%). Tax incidence is rather low for the poorest taxpayers, mainly thanks to the no-tax area, then it increases for middle deciles of taxpayers and then decreases for top incomes. Over the years, the tax burden has increased to finance growing public expenditures.

As for progressivity, the Kakwani index was 0.208 in 2019, slightly higher than in 1979 when it was 0.188. Therefore, progressivity increased only marginally over time.

As a result of tax incidence and progressivity, the Reynolds-Smolensky index of redistributions in 2019 shows a redistributive impact of IRPEF equal to 0,0432 (Baldini, 2021). Similar results, although for earlier years and with different methodologies, are provided by Wagstaff et al. (1999) and Verbist and Figari (2014).

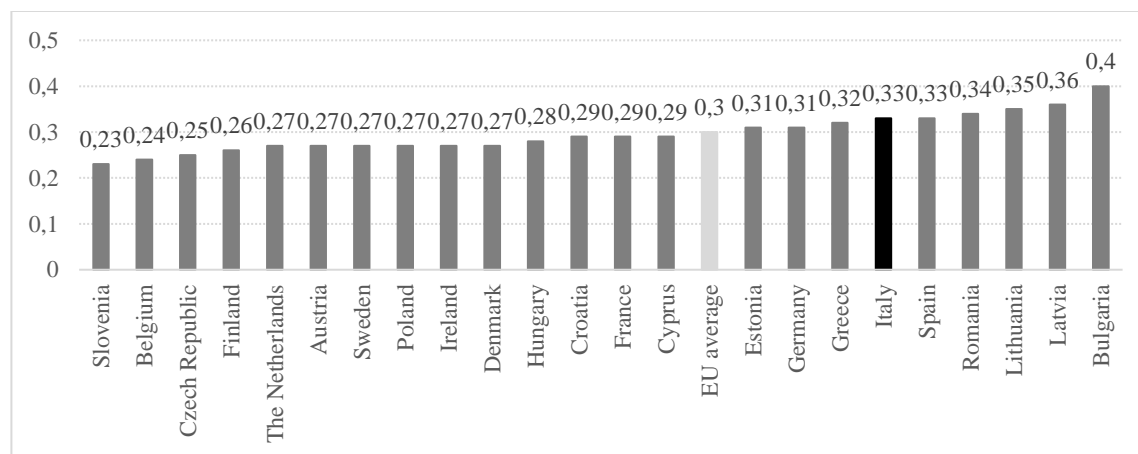


Figure 5: Gini index of inequality in EU countries, 2020.

Source: Own elaboration on Istat data.

Although IRPEF has a significant redistributive effect, its tax base is far from including all sources of personal income and this obviously has important distributional (and revenue) effects and implies significant problems of horizontal equity (Bises and Scialà,

2014). Redistribution by overall personal income taxation may be significantly different. Some incomes exempted from IRPEF (capital income, self-employment income under the lump-sum scheme, rental income) are generally taxed proportionally, with low tax rates, and they are mostly concentrated among high-income earners. Therefore, taxes levied on these incomes may produce negative redistributive effects.

5. The Italian personal income tax: equity and efficiency

Despite its progressivity, the many changes introduced over time have constrained both personal income tax equity (horizontal and vertical) and efficiency.

First, many sources of revenues are excluded from the tax base and either exempted or subject to substitute proportional taxes. Second, tax expenditures pursue both tax progressivity and other purposes (such as sustaining economic activity), but they cause substantial revenue reduction (Senato, 2017). In addition, exempted incomes and tax expenditures are generally concentrated on higher income earners (e.g., tax credits for building renovations or for corporate welfare, exemptions for second homes) and therefore produce a regressive effect. For instance, a significant regressive impact is caused by the exclusion from taxable income of capital and rental income, and their proportional taxation at, respectively, 26% (with some exceptions, mainly government's bonds taxed at 12.5%) and 21% (this latter rate is below the minimum IRPEF rate of 23%). The regressive effect is due to the concentration among higher incomes of both these sources of revenue. The exclusion of specific incomes to be taxed progressively has increased in recent years. Since 2012, real estate at disposal is taxed by IMU and not by IRPEF, productivity bonuses below 3,000 euro are taxed at a flat rate of 10% for taxpayers with a gross income below 80,000 euro. The lump-sum scheme, initially introduced in 2008¹² but then revised, allows self-employed or small company owners with a gross income below 65.000 euro (85.000 from 2023¹³) to opt for a flat tax at 15% on gross turnover multiplied by an economic activity-specific coefficient (which accounts for incurred costs in a lump-sum way).

In addition to the significant tax base erosion, tax evasion is estimated to be considerable (figure 6). The relevant difference in the propensity to evade by different income groups further increases the negative impact on equity. Tax evasion is mainly concentrated in self-employment income. In 2019 the IRPEF tax gap reached approximately 37 billion euro. Yet, the tax gap for employment and pension income was approximately 4% of its potential value, while the tax gap for self-employed reached 68% (MEF, 2022). The actual tax base is therefore characterised by an excessive weight of employment and pension income (85% of total declared income). Tax evasion, therefore, violates horizontal equity, both among taxpayers with different sources of income and also among taxpayers with the same source of income but with different tax compliance attitudes (in this case tax evasion is also inefficient, because it affects the relative competitiveness of self-employed or companies).

¹² Law 244/2007.

¹³ Law 197/2022.

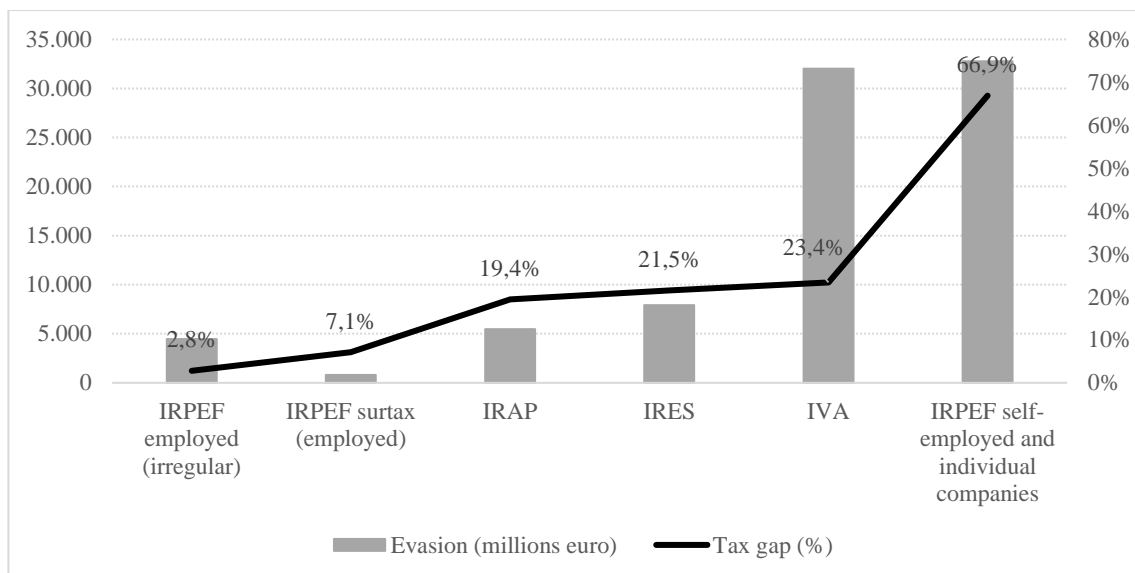


Figure 6: Italy, Tax evasion (left scale) and tax gap (right scale) for selected central government taxes, 2020.

Source: Own elaboration on MEF data.

Last, also due to tax evasion, employment income is the most heavily taxed by IRPEF and is also penalised, because other sources of income are often taxed according to lighter substitutive schemes. Baldini and Rizzo (2020, pp. 115-116) show that personal income tax incidence on average and above-average employment income in Italy is the highest among a selection of European countries. Once horizontal equity is lost, also vertical equity is therefore declining, because progressivity and redistribution necessarily concern only a subset of taxpayers. Therefore, as it stands now, IRPEF redistributive power is constrained and its contribution to public finances limited with respect to its potential.

Despite IRPEF progressivity, the overall tax system is not as much progressive, due to high evasion by self-employed incomes, exemption of many other sources of income, tax expenditures, mostly at the advantage of richer taxpayers. Progressivity therefore mostly concerns earned incomes, while taxation on other incomes is generally lower and proportional. Both horizontal and vertical equity are far from being attained.

Despite its original design as a comprehensive and progressive tax, IRPEF's structure today has therefore some undesirable characteristics, which undermine overall tax progressivity and violate the horizontal equity criterion. Nonetheless, on the tax side, it is the primary source of income redistribution, albeit this is mostly attained by taxing employed and pension income recipients.

6. The personal income tax: towards a reform?

There is wide consensus that the current tax system needs a reform, after nearly 50 years from its institution and after all the changes introduced, often in an uncoordinated and disordered way. Changes to the personal income tax, in particular, significantly altered the tax nature and structure, made it excessively complex, reduced revenues and

constrained redistribution (Galli and Profeta, 2020, p.7). The reform should therefore primarily aim to improve this tax efficiency and equity.

Quite surprisingly, however, in Italy since the early 1990s the debate on tax reform has mostly claimed for a reduction of the tax burden, rather than for improvements of the tax system progressivity and equity. Arguably, the same reasons beneath all the distortions to the original personal income tax design, contribute to explain this attitude. Among them, widespread aversion for tax levies, dissatisfaction for public services and discontent for public sector inefficiency and excessive bureaucratic burdens and slowness have surely contributed to exacerbate anti-taxation attitudes and have resulted in significant political support for tax reforms focused on tax rate reductions. In addition, the flaws of the current progressive income tax are often deemed unsolvable and therefore a reduction of marginal rates' number and level is deemed the only way to restore equity, reduce complexity and improve transparency of taxation. Under this perspective, lower tax rates would reduce propensity to evade and would grant the same treatment to different sources of income, by taxing labour income at levels similar to those currently applied to other incomes.

A tax scheme that could respond to all these requirements is a flat income tax, as was first proposed by Friedman (1962): a proportional tax applied to total gross personal income (with a no-tax area to exempt lower incomes and tax credits limited only to those expenses that are necessary to produce income). A flat tax has some advantages under an efficiency perspective if compared to a tax progressive by brackets. It is simpler and more transparent, it reduces taxpayers' compliance costs, it does not create disincentives to produce income (because marginal income is always taxed at the same rate), it does not create any incentive to shift income from one source to another (as all incomes are treated the same), finally, if the single rate is sufficiently low, fiscal pressure is reduced (and thus also incentives to evade). As for horizontal equity, a flat tax applies the same rate to all, thus guarantees equal treatment to all taxpayers (although it is debatable whether this is truly equitable and desirable).

A flat tax has been introduced in the 1990s and early 2000s in many Eastern European countries (characterised by low economic development, low public expenditures, less developed democratic systems, and by the need to restore trust in the political system after the fall of Communist regimes). However, most of these countries abandoned the flat tax and increased the number of income tax rates during the second decade of the 21st century¹⁴, when their democratic systems consolidated, and welfare systems developed (causing increased public expenditures that needed to be financed). In these countries, the introduction of a flat tax resembles the initial stage in the development of modern tax systems (similarly to what happened in western countries in the late nineteenth century, at the dawn of western tax systems, when proportional income taxes were first introduced).

¹⁴ The following European countries introduced a flat tax: Estonia (1994), Lithuania (1994-2019), Latvia (1997-2018), Russia (2001), Serbia (2003-2010), Slovakia (2004-2013), Ukraine (2004), Georgia and Romania (2005), Albania (2007-2014), Macedonia (2007-2023), Czech Republic (2008-2013), Bulgaria (2008), Bosnia-Herzegovina and Byelorussia (2009), Hungary (2013). Currently in Europe only eight countries have a flat tax, of which four in the EU: Bulgaria, Estonia, Hungary, Romania (figure 2).

A proposal for a flat income tax in Italy was first put forward during the 1994 political elections campaign. Since then, slightly different flat tax schemes have been repeatedly proposed by centre-left political parties or think tanks, generally coupled by a reduction of marginal income tax rates. The most striking feature of these proposals, the widespread favour they receive and the related political debate, is that important issues are overlooked, such as guaranteeing the Constitutional requirement of tax system progressivity and ensuring sufficient revenues to finance public expenditure.

Although none of the flat tax proposal put forward since 1994 has ever got close to implementation, some of the income tax changes introduced over time are consistent with this idea of the tax system. For instance, the lump-sum scheme is essentially a flat tax at 15% for a subset of taxpayers (i.e., self-employed with a gross income below 85.000 euro).

7. Plans for the introduction of a flat personal income tax

The current Italian government, in power since 22 October 2022, has clearly stated that it intends to implement a personal income flat tax, although gradually and respecting the progressivity principle. The first steps have been the extension of the lump-sum scheme to a wider share of self-employed (up to 85.000 euro of gross revenues), the incremental flat tax for self-employed who don't opt for the lump-sum scheme, the planned increase of the no-tax area for pension income up to the same threshold currently applied to employment income (8.500 euro), a revision of tax expenditures, and a planned reduction of IRPEF tax brackets from 4 to 3. At the time of writing, there is no final decision on the new tax rate structure, but only an enabling bill that delegates government to reduce the number of tax brackets. According to the current political debate, one of the most feasible outcomes could be an extension of the first rate (23%) to both the current first and second income brackets and unchanged rate/brackets for higher incomes. Such a change would obviously benefit all taxpayers above the lower threshold of the current second bracket. They would all pay lower taxes on their income between 15.000 and 28.000 euro.¹⁵ Obviously the tax savings in monetary terms would be the same for all taxpayers with an income above 28.000, but it would be declining as a percentage of total income when total income increases. Progressivity would apparently be preserved, although with an altered structure.

Clearly, the overall impact on progressivity and redistribution will depend on how this reform will be financed, because both public revenue and expenditure contribute to total redistribution. A reduction of tax revenues can be expected, both due to the new tax rate structure and to other measures.

Proponents of the reform trivially solve the problem of revenues, by theorising tax revenues' increases incentivated by tax rate cuts. The reasoning goes that tax rate cuts will foster a sudden rise in economic activity and will prompt tax evasion vanishing – a simplistic Laffer curve argument with no solid empirical or theoretical foundations. In particular, it is highly unlikely that IRPEF evasion will spontaneously and significantly reduce thanks to this reform. First, tax evasion from employment and pension income is

¹⁵ Those below 15.000 euro would not benefit, but their tax burden is very limited or null, thanks to the no-tax area and other tax expenditures.

already very low (figure 6), and second, tax savings from this reform are very limited for most taxpayers. Therefore, there are no significant incentives to comply with tax legislation for those who currently evade. Similarly, targeted measures to reduce tax evasion have already been implemented in the past, but contrasting tax evasion cannot be a short-term solution to ensure increased public revenues or to finance tax reforms (Liberati 2021, p. 36). Most significantly, among the measures to reduce tax evasion, an important role can be played by actions directed to change taxpayers' incentives and their expectations that tax administration will implement strict contrasting policies. However, the current government is providing no strong signal that this will happen. The statement that "evasion by necessity"¹⁶ will be tolerated is surely not the right way to reduce the propensity to evade. Even less effective is comparing taxes on small shopkeepers with protection money paid to Mafia.¹⁷

Nonetheless, the issue of financing revenue contraction is relevant, because a balanced public budget is a necessity, especially in a country with a high public debt such as Italy (about 145% of gross domestic product in 2022). Thus, deficit spending not being a feasible option, the only foreseeable measure to counterbalance eventual revenue reductions (if the magic of tax evasion waning does not come true) are tax expenditures' cuts or public expenditure restructuring. Unfortunately, such measures would further negatively impact on the progressivity of the tax/benefits system. As for tax expenditures, together with tax rate by brackets, they contribute to make the income tax progressive. Therefore, their reduction would reduce progressivity. Further, as the income tax is currently primarily levied on employment and pension income, these taxpayers would carry most of the burden caused by reduced revenues, with undesirable effects in terms of horizontal equity. Finally, although improving public expenditure efficiency and effectiveness is desirable (Bulman, 2021), the savings and progressivity impact of expenditure restructuring is unclear, because the Italian government has so far provided no details on the measures to be implemented. However, any reform on the expenditure side needs to be carefully designed, because in Italy, as well as in most western economies, public expenditure is the primary source of redistribution (Causa and Hermansen, 2019). In conclusion, there is no solid evidence that the reform implemented so far will not negatively affect progressivity and redistribution.

Whatever will happen to this reform, the Government has declared that it is only an intermediate step towards the introduction of a personal income proportional tax for all. Therefore, this latter reform is the most interesting one to analyse. However, it is worth noticing here that, if the plans to introduce a flat tax won't come into effect, mainly for the lack of sufficient resources, personal income taxation will have to cope with the effects of the interim measures introduced (extensions of the lump-sum scheme, incremental flat

¹⁶ Vice minister for the economy Maurizio Leo, press declaration on 17 March 2023 (https://www.ansa.it/sito/notizie/topnews/2023/03/17/fiscoleo-penale-per-casi-gravi-non-per-evasione-necessita_6b195aba-4402-4b95-acc1-83f2fbe4ed29.html, last accessed 18/3/2023)

¹⁷ The Italian President of the Council of Ministers, Giorgia Meloni, on 26/5/2023 declared: "L'evasione devi combatterla dove sta (...) non sul piccolo commerciante a cui chiedi il pizzo di Stato solo perché devi fare caccia al gettito più che all'evasione fiscale" (https://www.corriere.it/politica/23_maggio_26/meloni-dare-caccia-piccoli-evasori-pizzo-stato-fe20165e-fbf4-11ed-a01c-bd767ff4b328.shtml, last accessed 30/5/23).

tax for self-employed, reduction of tax rates,...), which reduce both horizontal and vertical equity.

8. Redistributive effects of a flat tax: an interregional perspective

A flat tax has some desirable properties under an efficiency perspective (Friedman, 1962). Though, its introduction in Italy could reduce both revenues and progressivity, thus negatively impacting on redistribution, equity, and public finances (Baldini and Rizzo, 2020). These are exactly the reasons why such a system is generally not implemented in modern developed countries.

Revenue reduction could be avoided by setting a very high tax rate. Still, this is not desirable under an efficiency perspective, because of its negative impact on incentives and economic activity. Incidentally, a high rate also does not seem to be consistent with the current Italian government vision for tax reform.

Further, the main way tax policy can reduce income inequality is through progressive income taxation (Gerber et al., 2018), but, by definition, progressivity is lost with a flat tax. This issue is overlooked by proponents of the reform, and simply solved by planning tax allowances or credits for lower incomes, which are intended to restore progressivity. Though, economic theory is clear that a proportional tax with tax credits or allowances is progressive for lower incomes and then rapidly becomes proportional for middle-high incomes (Bosi, 2015, p. 143). To extend progressivity to wider groups of taxpayers, the marginal tax rate would need to be set at higher levels, but as seen before, this is undesirable under an efficiency perspective. Given that IRPEF is the only progressive tax, it is not clear whether limited progressivity and exclusively for the very low incomes would satisfy the Italian Constitutional requirement for the tax system to be progressive. In addition, besides progressivity and interpersonal redistribution, in Italy there is another dimension of equity that is significant, that of interregional equity. Italy is characterised by significant territorial economic disparities and income is highly unevenly distributed across regions. The public budget significantly contributes to smoothing these differences by redistributing income and thus it fosters interregional equity (Arachi et al., 2010). Therefore, any tax reform should be evaluated also for its territorial impact. On the revenue side, territorial redistribution is the result of tax incidence and tax progressivity. Both would reduce with a flat tax set at a relatively low rate. Southern Italy is characterised by relatively lower incomes and therefore most of the tax reduction would accrue to residents of Northern regions. As described in table 2, the percentage of taxpayers that would benefit from a flat tax would differ significantly across geographical areas.

However, no definitive conclusions can be drawn on the reform effects, until the level of the unique tax rate will be chosen. As described in table 2, if the tax rate is set at 23%, taxpayers in the first bracket would not get any benefit, and in Southern regions they are definitely a higher percentage of total taxpayers, 57% against 38% in the Northern regions. Similarly, if the tax rate is set at 25%, taxpayers in the first and second brackets would not get any benefit, and again they are a higher percentage in Southern regions, 85% against 76% in the Northern regions. The richer Northern regions would therefore benefit more than the poorer Southern ones, thus squeezing redistribution from taxation.

Interestingly, also the number of self-employed is higher in the Centre and North of the country (respectively 30% and 20% more taxpayers than in the South, table 2), so any measure that lowers the tax burden on this category potentially further reduces redistribution.

The extension of the lump-sum regime has already benefited the Northern regions more, because of the higher concentration of taxpayers falling into this scheme. A flat tax would further positively impact on these same regions, because of income differentials across regions: lower incomes who will not benefit are more concentrated in the South, and higher incomes in the North.

Although with tax evasion and tax base erosion a progressive tax may not attain the desired redistributive effects, abandoning progressivity may produce worse equity outcomes, both in an interpersonal and interregional perspective.

Tax brackets (gross annual taxable income), euro	Marginal tax rate	Distribution of taxpayers by brackets, Italy and geographical areas ¹⁸			
		Italy	North	Centre	South
		<i>Number</i>			
< 15.000	23%	18.333.158	7.739.450	4.114.082	6.479.626
15.000-28.000	25%	13.503.061	7.487.532	2.964.206	3.051.323
28.000-50.000	35%	7.056.268	3.919.841	1.616.265	1.520.162
> 50.000	43%	2.283.295	1.348.591	554.608	380.096
Total		41.175.782	20.495.414	9.249.161	11.431.207
		<i>Percentage</i>			
< 15.000	23%	44,5%	37,8%	44,5%	56,7%
15.000-28.000	25%	32,8%	36,5%	32,0%	26,7%
28.000-50.000	35%	17,1%	19,1%	17,5%	13,3%
> 50.000	43%	5,5%	6,6%	6,0%	3,3%
Total		100,0%	100,0%	100,0%	100,0%
Self-employed on total taxpayers			1,28%	1,41%	1,09%

Table 2: Distribution of taxpayers by brackets and geographical area using current brackets (2023) and last available data from 2021 tax declarations (fiscal year 2020).

Source: own elaboration on MEF data.

¹⁸ Data for the second and third brackets are estimates. For reasons and methodology, see footnote 8.

9. Conclusions

The current structure of the Italian personal income tax has many and relevant flaws. Both horizontal and vertical equity are restricted by tax base erosion, tax evasion, and tax expenditures. Thus, the need for a comprehensive reform of personal income taxation in Italy is widely acknowledged. However, any reform proposal needs to take into account the significant role of IRPEF in the Italian tax system, both as concerns revenue and redistribution, and should be evaluated for its efficiency, equity and revenue impact.

The proposal to substitute IRPEF with a flat tax (with a marginal tax rate yet to be decided) implies a radical transformation of personal income taxation. This reform could yet have a positive effect on horizontal equity, because all taxpayers would be taxed under the same regime, instead of under the current diversified system. However, such a reform would produce significant problems, primarily a reduction of tax revenues, of vertical equity and progressivity.

It would thus have a significant impact on the Italian tax/benefit system and would need to be evaluated with reference to the Constitutional requirement of progressivity of the tax system. Significantly, a reduction of tax progressivity would have relevant effects on redistribution, both interpersonal and interregional.

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TOURISM AND THE PANDEMICS: ONLY THREATS OR (A FEW) OPPORTUNITIES?

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Abstract

The COVID-19 pandemic had a profound impact on the tourism industry, and Italy was no exception to its effects. Despite the uncertainties surrounding the sanitary situation, Italian travelers did not entirely forego vacations. However, the pandemic altered and complicated their choices compared to previous times. This study presents the results of two surveys designed to delve into how tourists' preferences and choices evolved during the pandemic. Our findings highlight emerging trends that offer opportunities for intermediaries and the development of lesser-known regions. Notably, travelers expressed a growing need for establishing trust either with the host or intermediary, with a clear preference for direct human contact. Furthermore, an increasing inclination towards smaller, less crowded destinations characterized the demands of pandemic-era tourism. The long-term sustainability of these new trends as sources of value creation will depend significantly on the willingness and capability of tourism companies and institutions to invest and adapt.

Keywords: Airports; Geography of transport, Aerotropolis, Airport city.

1. Introduction

The COVID-19 pandemic has had a profound impact on the tourism sector. While the industry's vulnerability to the pandemic is contingent upon various factors and exhibits geographical variations, as demonstrated by Duro et al. (2021) in the case of Spain, it is a shared reality that the global tourism sector has endured significant setbacks. Furthermore, the estimated recovery period has been predicted to be particularly protracted (Škare et al., 2021).

The pandemic has fundamentally affected consumer perceptions regarding travel risks and management (Rahman et al., 2021). This disruption has led to a departure from established industry trends and prompted the development of novel forecasting models for potential recovery, as evidenced by studies such as Fotiadis et al. (2021) and Zhang et al. (2021). In addition, residents of tourist destinations find themselves grappling

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with a challenging dilemma, balancing the economic benefits derived from tourist inflows against concerns over infection risks (Kamata, 2022).

Italy is globally renowned for its robust tourism sector, yet the pandemic has inflicted significant losses across the entire tourism supply chain (Angeloni, 2021).

A report by Istat (2022) underscores that the decade preceding the pandemic crisis witnessed a consistent growth in tourism flows, with an average annual increase of 1.5%. This growth culminated in 2019, with 131.4 million arrivals and 436.7 million overnight stays. It's within this context that the COVID-19 pandemic and the subsequent lockdowns, travel restrictions, and mobility limitations, especially across international borders, had a profoundly adverse impact on the tourism sector.

Notably, in 2020, international tourism flows declined by a staggering 70.9%. Among various types of accommodations, hotels experienced more substantial losses. In 2021, there was a modest recovery within the industry, surpassing the European average. However, the situation remained far from a complete resolution. It was only in 2022 that a substantial recovery began to materialize. Nevertheless, upon examination of data from the first nine months of 2022, it becomes evident that pre-pandemic business levels have yet to be restored. This is particularly true for hotels, which still lag behind by -13.8% and -6.7% in foreign and domestic flows, respectively, when compared to 2019 data. In contrast, other accommodation options have nearly fully recovered.

Interestingly, the same report highlights that during the summer periods of 2020 and 2021, the decline in domestic tourism was relatively moderate. Even during the years most severely impacted by the pandemic, Italian tourists appeared to seldom forgo vacationing within their home country.

The pandemic period also served as a time for reflection. While the emergency was undeniably perceived as a dire threat, it also presented certain, perhaps somewhat concealed, opportunities for reshaping the tourism landscape in Italy. It prompted a reevaluation of how tourism is offered and experienced, addressing long-standing needs for a more sustainable and competitive industry (Adamo, 2020) and fostering renewed connections between guest and host communities (Corbisiero, 2020).

This transformation was not solely driven by changes in the offerings; the entire hospitality industry had to adapt its services to comply with legal and sanitary norms. Additionally, from the demand side, new trends emerged, such as the embrace of "slow tourism" or rediscovering it (Mini, 2020), along with the concept of "proximity tourism," involving travel activities over short distances. These trends not only accommodated the constraints posed by health regulations but also led to a redistribution of tourism flows toward more remote and marginalized areas, consistently with sustainability principles (Corbisiero, 2020).

Furthermore, the pervasive uncertainty induced by the pandemic is likely to influence the behavior of potential tourists in various phases beyond just destination selection. Some scholars emphasize that uncertainty avoidance is associated with information-seeking behavior (Quintal et al., 2010), while others underscore the significance of trust in the context of tourism (Williams and Baláž, 2021). These observations prompt consideration of choices related to accommodation types and the potential reliance on informed intermediaries, such as travel agencies.

Consequently, the objective of this study is to investigate the impact of the pandemic on the preferences of potential tourists concerning their destination choices, accommodation, and reservation methods. We analyze the findings from two questionnaires distributed in different moments during the emergency period to better

understand how these changes are reshaping the roles of various stakeholders in the industry.

2. Tourism and uncertainty during the pandemics

2.1 Pandemics, uncertainty and short distances

As previously discussed, the summer seasons of 2020 and 2021 in Italy exhibited a notable trend—an only modest reduction in domestic tourism flows. Italian travelers did not refrain from embarking on, albeit relatively brief, vacation periods when circumstances allowed, even during the pandemic. However, these vacations assumed distinct forms from the past. One noteworthy trend that emerged during this period was labeled "proximity tourism," characterized by travel over short distances, primarily by car. This trend led to the exploration of villages, natural attractions, or places boasting landscapes of exceptional beauty located just a few kilometers from home. At times, these short-distance travels are described as "staycations" (Angeloni, 2021).

This trend was not unique to Italy; Lebrun et al. (2022) discovered that the French tourists also sought proximity in their vacation planning during the summer of 2020 (among those who planned to travel). According to the authors, this choice was influenced by the anxiety stemming from the Covid-19 outbreak, which encouraged a preference for shorter distances. It was also driven by the desire to remain in familiar settings, surrounded by familiar individuals, and in regions with fewer health-related constraints.

This mode of enjoying the tourism experience, which aligns with mobility restrictions and the prevailing climate of uncertainty—stemming from the risk of contagion and the often abrupt yet necessary changes in mobility regulations during the pandemic—has historical roots. It resembles the practices prevalent in the 1950s and 1960s, especially among families with limited financial means. Subsequently, the decline in air travel costs and the emergence of high-speed travel alternatives made long-distance travel more accessible and cost-effective. However, the uncertainty and limitations brought about by the pandemic have led to a revival of "proximity tourism," offering a new avenue for development, provided that this trend's effects can be translated into lasting impacts at the local level. This potential for development in marginal and under-explored areas has been discussed by Cresta (2021) in the context of the Irpinia region.

This manner of vacationing is further characterized by its low tourist "density," aligning with the concurrent necessity for physical distancing, particularly in terms of safeguarding the health of local communities. This imperative could not be disregarded, especially when considering that, in the initial stages of the pandemic, certain outbreak clusters appeared in highly touristic areas (Bernardini, 2020).

Moreover, this approach appears to offer a means of reconciling the urgency for a swift industry recovery with the increasingly pronounced emphasis on sustainability (Higgins-Desbiolles, 2020).

Building on the insights from Lebrun et al. (2022), the value of proximity tourism can be further enhanced when implemented in the form of ecotourism or through unique experiences geared towards exploring the potential of local attractions. This can be facilitated by engaging local guides to provide authentic and enriching experiences.

Additionally, the authors advocate for the utilization of innovative communication methods based on social media. These methods not only reduce the necessity for in-person interactions but also generate a significant word-of-mouth effect.

2.2 Uncertainty and transaction costs: the role of travel agencies

In recent decades, the tourism industry has undergone a significant disintermediation process, as highlighted by Law et al. (2015). Numerous customer segments have found it more convenient, faster, or cost-effective to directly engage with tourism service providers through the internet or internet platforms. Traditional brick-and-mortar travel agencies have progressively seen their central role as intermediaries diminish, although some have adapted by focusing on specific niche markets (Abrate et al., 2020).

In a perfectly competitive market, there would theoretically be no need for intermediaries, and transactions would occur directly through the market itself, guided by information conveyed through pricing mechanisms. However, in less than perfectly competitive markets, direct exchange of goods and services can be accompanied by substantial costs. These costs encompass efforts to identify suitable counterparts, gather information about their reliability, assess product quality, negotiate and establish contracts, and even potentially engage in litigation. These additional costs, beyond the core exchange itself, are referred to as transaction costs (Coase, 1937; Williamson, 1985). Transaction costs tend to increase in situations where the product is non-standardized, the purchase is perceived as significant, the purchaser lacks experience with the product, information is asymmetric, or uncertainty prevails. When transaction costs associated with market-based exchanges become prohibitively high, opting for a different organizational structure that employs intermediaries can result as more advantageous (Clerico, Novarese, and Rizzello, 2007).

Travel agencies serve as intermediaries primarily aimed at mitigating transaction costs, including search costs, quality uncertainty, and coordination costs (Calveras, 2007). These are transaction costs, as they serve the need to use the market.

Tourism services inherently encompass a significant level of uncertainty, as they are considered experience goods (Nelson, 1974). The quality of these services can often only be assessed during or after consumption. For this reason, travel agencies played a crucial role in the tourism industry for an extended period. Despite their services not being provided free of charge, they were frequently deemed more convenient than direct market exchanges. Using the service of a travel agent, consumers reduce their transaction cost (travel agents charge a fee that is an explicit transaction cost, reducing other implicit costs).

However, with the advent of internet services and the aforementioned disintermediation process, the role of travel agencies has markedly diminished (Calveras and Orfila-Sintes, 2019).

The pandemic crisis, however, through its amplification of uncertainty in the purchase of tourism services, may have given rise to new opportunities for traditional tourism intermediaries. The information provided by internet platforms or Online Travel Agencies (OTAs) was no longer deemed sufficient, and tourists began to seek additional information and reassurance, which could only be acquired through direct contact with dedicated personnel. The subsequent section aims to provide empirical evidence supporting this point.

3. Empirical analysis

3.1 *Travel intentions in Spring 2020*

This section of the empirical analysis is grounded in a survey conducted during the final week of May 2020. The survey was disseminated by sharing the relevant link on social media platforms and on the website of the newspaper "La Stampa." The project was undertaken within the framework of the Master's program in "Economia, Innovazione, Comunicazione e Accoglienza per l'Impresa Turistica" at the University of Piemonte Orientale. We are grateful to the students for their invaluable support in data collection.

For this study, we have focused on a cohort of individuals who have a history of taking vacations in the past and expressed an intention to do so in 2020. The total number of respondents in this category amounts to 551, with 61% being female. The average age of the respondents is 31 years, with a median age of 25.

Participants were queried about their past vacation booking practices and how they intended to make reservations in 2020. Regarding their reservation preferences, respondents were presented with the following options:

- Utilizing the services of travel agencies.
- Making reservations once they had arrived at their destination.
- Establishing direct contact with the hotel or hospitality establishment.
- Generally not making any advance reservations.
- Utilizing booking websites.

For past reservations, respondents had the option to select more than one choice (resulting in several combinations of choices). However, for the current year (2020), respondents were instructed to select only the option they intended to use.

The responses are presented in Table 1. Regarding reservation habits in the past, we have categorized the responses into four groups, considering situations where multiple options were chosen:

- Travel agencies: Individuals who exclusively relied on travel agencies for reservations in the past or combined travel agencies with other options.
- Self-made on-site reservations: Individuals who did not make prior reservations or opted to reserve once they had reached their destination, without declaring any other options involving prior arrangements.
- Contacting the host: Individuals who indicated reserving by directly contacting the host, possibly in conjunction with other options, but without the involvement of travel agencies or online platforms.
- Booking websites: Individuals who exclusively relied on booking websites for reservations or used booking websites in conjunction with other options, excluding travel agencies.

The same categorization was applied to reservation intentions for the year 2020. However, in this instance, respondents were instructed to select only one option. It's important to note that the "Self-made on-site reservations" group for 2020 includes only the choice of reserving once arrived at the destination.

Furthermore, it's crucial to recognize that these responses pertain to stated intentions, and the actual choices made by the respondents afterward remain undisclosed.

	How will you book this year?				
How did you booked your holiday in the past?	Travel agencies	Self-made on-site reservations	Contacting the host	Booking websites	Total
Travel agencies	73	1	11	15	100
Self-made on-site reservations	5	4	10	9	28
Contacting the host	6	1	41	3	51
Booking websites	38	4	111	219	372
Total	122	10	173	246	551

Table 1: Reservation habits and intentions for 2020.

Source: our elaboration

The trends in holiday reservations saw significant shifts in 2020. Previously, 100 respondents had declared using travel agencies for their reservations in the past, although often alongside other options. In 2020, 122 respondents (a 22% increase) expressed an intention to rely on a travel agency. Existing loyal customers of travel agencies appear inclined to persist with this choice, while other customers from different segments seem inclined to "migrate" towards using travel agencies.

Additionally, there was a notable change in the intention to make direct contact with the host. In the past, only 51 respondents had chosen this approach without combining it with intermediary options. However, in 2020, 173 respondents are inclined to opt for direct contact.

Conversely, "impersonal" intermediation through booking websites seems to be less favored compared to the past, with preferences declining from 372 to 246 respondents. Many of these respondents now prefer direct contact with the host or relying on travel agencies for their 2020 reservations. There is also a decrease in the preference for the "riskier" alternative represented by self-made on-site reservations, declining from 28 to 10 preferences.

In summary, the shifts in tourist preferences induced by the pandemic underscore a preference for direct contact and a moderate "resurgence" in the popularity of travel agencies.

The concept of transaction costs, previously mentioned, serves as a valuable framework for understanding this phenomenon. The pandemic created a situation characterized by heightened uncertainty. This included concerns about the risk of contagion, frequent alterations in social distancing and mobility regulations, as well as challenges in information retrieval and reservations.

While relying on a travel agency involves a transaction cost for the tourist, this intermediary serves the crucial role of managing the complexities associated with the reservation phase. Although the internet has significantly reduced such complexities, prompting some customers to forego agency services, the pandemic introduced new layers of uncertainty. Consequently, it has the

potential to create fresh market opportunities for travel agencies, particularly those equipped with the capabilities to effectively navigate uncertainty on behalf of their customers.

A similar rationale applies to the concept of direct contact. Directly reaching out to the host is undeniably costly, at least in terms of the opportunity cost of time. Under normal circumstances, this activity is perceived as unnecessary, thanks to the internet, which is assumed to provide sufficiently reliable information. However, during uncertain periods like the pandemic, the required information for customers is likely to be different and accessible only through direct human contact, potentially mediated by phone communication. Online communication, particularly when based on booking websites or platforms, does not seem to suffice. Furthermore, during the pandemic and in the period leading up to the summer of 2020, individuals likely had more available time, thereby reducing the opportunity cost associated with making phone calls.

These findings imply a specific focus for travel agencies in maintaining their relevance. To sustain their role, travel agencies should concentrate on highly professional and specialized services, or catering to consumer groups with unique needs, such as those related to health conditions. They should also prioritize destinations that pose greater uncertainties. They should clearly understand their role as uncertainty managers.

3.2 Travel choices during the pandemics

A second survey was administered to students at the University of Piemonte Orientale and distributed through social media channels between November 2nd and November 12th, 2021. The survey garnered a total of 1,109 responses, with the majority of respondents being young (18-25 years old) and female (76%). The geographic distribution of respondents reveals that a significant portion resides in the regions of Piemonte and Lombardy.

The respondents were queried about the following aspects:

- Their travel patterns prior to the pandemic.
- Their decision-making processes concerning travel and vacations during the pandemic (it's important to note that this questionnaire was distributed during the ongoing emergency).
- The specific features of hotels and other accommodations that held the highest value for the respondents.
- The significance of proximity tourism during the pandemic.

In relation to the first two points, intriguing comparisons can be drawn. Firstly, it is noteworthy to compare (as presented in Table 2) the number of respondents who were regular travelers before the Covid-19 pandemic with those who undertook travel, even if just for a one-day journey, in 2020 and 2021, during the ongoing emergency.

Remarkably, the number of individuals traveling during the pandemic increased in comparison to the preceding period, with 965 respondents as opposed to 887. Moreover, Table 2 reveals that the number of individuals who had not been travellers previously but chose to embark on journeys in 2020-2021 (180) surpasses the count of respondents who were accustomed to traveling but abstained from doing so during the outbreak (102). This higher propensity to travel during the pandemic could be attributed to reactions toward prolonged restrictions for health reasons. An additional factor could be linked to increased budget allocation for travel, particularly among

households that continued working during lockdowns, as leisure activities were curtailed in various phases of the emergency.

However, the largest proportion of respondents consisted of those who were accustomed to traveling before the pandemic and did not forgo vacation opportunities in 2020-2021, totaling 785 respondents.

Moreover, prior to the pandemic, the primary motivation for travel among our sample was leisure (accounting for 91.5% of responses). Respondents exhibited a predilection for Italian destinations (59.1%) as opposed to foreign ones (40.9%). Notably, among Italian regions, Liguria emerged as the favoured choice for travel, which aligns with the geographical distribution of our respondents, the majority of whom reside in Piemonte and Lombardy.

For those respondents primarily traveling abroad, European destinations held the upper hand (76.9%) over destinations beyond Europe (23.1%). The most prevalent duration of stay ranged from 3 to 5 nights. In terms of transportation, the most common choices were by car (45.9%) and by plane (40%). A substantial segment of respondents opted to stay in hotels (46.8%) and travelled with their partners, family members (73.5%), or friends (19.4%). Prior to the pandemic, the primary reasons cited for not traveling were associated with economic constraints (51.8%) and time limitations (34.2%).

Did you usually travel before the pandemics?	Did you travel in 2020 and 2021?		
	No	Yes	Total
No	42	180	222
Yes	102	785	887
Total	144	965	1109

Table 2: The choice of travelling before and during the pandemics.

Source: our elaboration.

During the pandemic, leisure remained the primary motivation for travel within our sample, accounting for 91.4% of responses. There was a notable inclination towards domestic destinations, with a substantial preference for Italian destinations (86.5%), a trend that aligned with the challenges associated with international travel.

Among the Italian regions, Piemonte held the largest preference share within our sample, albeit by a slight margin over Liguria. This initial observation suggests a tendency for staying very close to home while traveling. It's likely a consequence of the restrictions that, in certain phases of the emergency, limited movement within one's own region of residence.

Once again, the most prevalent duration of stay fell within the range of 3 to 5 nights (36.2%), and the preferred mode of transport was overwhelmingly by car (60.7%). This choice is likely driven by the perception of safety from a health perspective. Nevertheless, plane travel also had a notable presence (19.3%).

Regarding accommodation preferences, hotels remained the top choice, albeit with a noticeable reduction in their share (35.6%). Similarly, B&Bs saw a decline, while holiday homes and staying at friends' homes increased their combined share (reaching a total of 33.1%). Before the pandemic, their combined share was below 22%. Additionally, the use of "second homes" also saw an increase.

The majority of respondents continued to favor traveling with partners and family (62%) or friends (30.4%), which remained the predominant choice. While the percentage of individuals traveling alone remained relatively low, there was a slight increase from 3.4% to 5.1%.

Notably, 68.5% of respondents indicated that the pandemic influenced their decisions regarding destination, mode of transportation, accommodation, and travel companions.

The primary reason for refraining from travel in 2020-2021 was, unsurprisingly, the pandemic itself (69.4%), followed by economic constraints (16.7%).

Certain attributes, such as cleanliness, options for free cancellation and refunds, and positive reviews, were consistently rated as highly important by respondents (with a majority indicating a value of 4 or 5 on a five-point scale). These considerations held particular significance in light of the prevailing emergency conditions.

Regarding the prospects of proximity tourism, 64.1% of respondents reported having discovered or rediscovered attractions and landmarks within their region or province. This emerging trend, driven by the necessity of short-distance travel, was primarily facilitated through information disseminated via social media. However, traditional media outlets such as newspapers, magazines, television, and word of mouth also played substantial roles. Figure 1 illustrates how respondents discovered previously unknown attractions in their local areas.

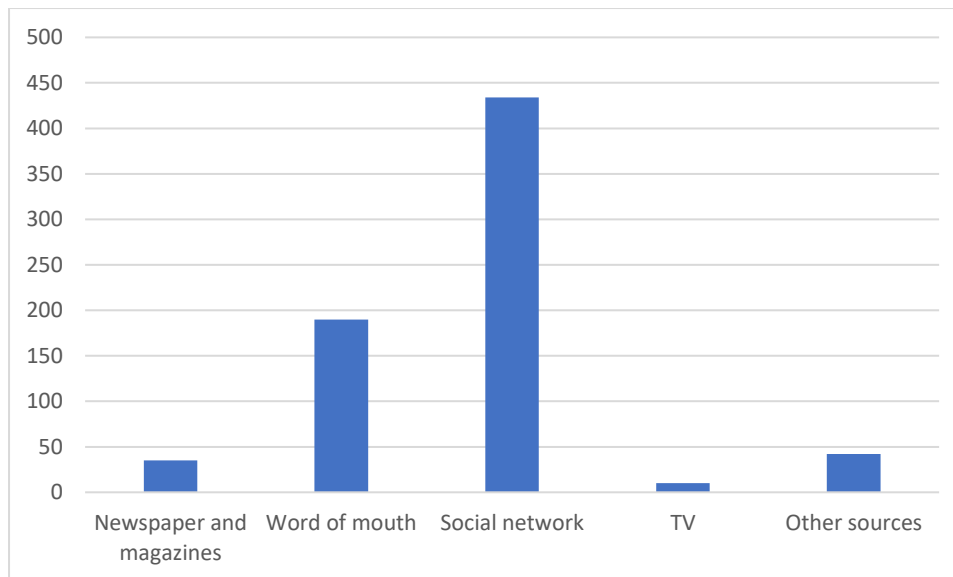


Figure 1. How respondent discover unknown attraction in their area.

Source: our elaboration.

Furthermore, within our sample, the Covid-19 emergency has instilled a heightened awareness of several issues, with 82.9% of respondents expressing greater attentiveness to aspects that were previously given less consideration. Notably, social concerns, such as supporting local businesses and operators, as well as environmental sustainability, have garnered significant importance.

Additionally, it's noteworthy to highlight that approximately half of the sample has shown an increased inclination toward engaging in new outdoor activities.

Finally, a consensus emerges among most respondents regarding the potential for proximity tourism to become a future opportunity for their respective areas. However, they also concur on the pivotal role of transportation and communication infrastructure, which is not consistently perceived as being of a high standard.

In summary, the pandemic period did not diminish the inherent desire for holidays within our sample. However, the constraints and the pursuit of the safest possible accommodations and modes of travel altered travellers' preferences, resulting in the discovery or rediscovery of less-frequented vacation destinations. This development presents new opportunities for these sites, with the potential to evolve into enduring sources of growth in the future, contingent upon the provision of adequate infrastructure.

4. Conclusions

The Covid-19 pandemic constituted an enormous shock for numerous industries, with the tourism sector experiencing exceptionally severe consequences. However, Italian tourism is demonstrating a promising trajectory towards continuous recovery. Remarkably, even amid the pandemic, Italian citizens did not entirely forgo the opportunity for holidays. In fact, one of our questionnaires revealed that individuals who were not accustomed to traveling previously embarked on short journeys in 2020-2021. Nonetheless, the pervasive uncertainty surrounding the public health situation and the swiftly evolving containment measures substantially complicated and altered travellers' choices compared to the past.

Within the overarching context of the tourism industry's challenges, these shifts in choice patterns have presented unique opportunities for value creation. From a distribution perspective, tourists have reevaluated the significance of "physical" intermediaries, such as travel agencies, in providing professional assistance in the reservation process, which has become increasingly intricate. Generally, there has been a renewed tendency towards the preference for direct contact with service providers (even via phone, without online mediation).

Conversely, mobility restrictions and the heightened desire to remain in close proximity to one's residence have increased the demand for proximity tourism. Individuals have discovered (or re-discovered), often through media channels, attractions situated in close proximity to their place of residence. The consensus among interviewees is that proximity tourism may emerge as a future opportunity for their respective regions. However, realizing this potential would likely necessitate improvements in transportation and communication infrastructure, particularly toward peripheral destinations. These aspects share a common characteristic that emerges as crucial for traveling during the pandemic: an increasing emphasis on the element of trust. The preference for human interaction with intermediaries, leading to a renewed interest in "traditional" travel agencies, the inclination to directly engage with hospitality establishments, the favoring of smaller, less crowded destinations, and the preference for staying in one's own or friends' homes all indicate a heightened need for familiar and secure vacation experiences. This particular aspect can potentially serve as a long-term source of competitive advantage. Businesses such as travel agencies and hotels could accentuate their expertise in providing solutions and addressing issues, emphasizing their commitment to meeting the unique needs of their customers and delivering tailored services. This approach becomes especially relevant when dealing with destinations perceived as "riskier" or providing services to consumer

groups characterized by high risk aversion or specific requirements, such as health considerations.

Additionally, the discovery of smaller, less crowded destinations has the potential to evolve into a long-term trend, provided that the word-of-mouth promotion initiated during the pandemic is sustained and reinforced through effective territorial marketing efforts. Social networks have demonstrated their considerable influence, particularly among young travelers. However, the condition of roads and infrastructure remains crucial in determining the attractiveness of a destination. Consequently, local and national authorities must consider investing in peripheral regions as a vital starting point for enhancing their appeal.

Lastly, a synergistic approach could be considered, where travel agencies, in crafting tailor-made services for their customers, actively participate in promoting lesser-known destinations to target segments of tourists who have the potential interest but may not be easily reached through social media alone.

In conclusion, the COVID-19 pandemic has stimulated innovative ideas for value creation within the tourism industry, even rejuvenating declining professions and destinations, or introducing unknown ones. Whether these emerging trends will solidify into enduring sources of value will largely hinge on the capabilities and investment readiness of tourism firms and institutions. However, the elements we have described offer a promising foundation for the development of a more socially and environmentally sustainable tourism sector.

In preparing this work the authors used ChatGPT in order to improve readability and language. After using ChatGPT, the authors carefully reviewed the content of the publication and take full responsibility for it.

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THE TOURISTISATION AND COMPROMISE OF ITALY'S UNESCO RURAL LANDSCAPES

Fabrizio Aimar¹

Abstract

Overtourism and the agricultural landscape form a combination around which one of the debates for the long-term future of Italian cultural landscapes unfolds. Amidst exogenous and endogenous pressures, this phenomenon risks altering the essence of places and compromising their social structure, which is vital for their continuity. With both positive and negative aspects, including the acknowledgment of past and ongoing political-administrative and managerial responsibilities, the article aims to pose relevant questions in order to provide practical suggestions. A paragraph also explores considerations regarding the ongoing changes in the perception and aesthetics of these landscapes, as well as the layout of the agricultural mosaic.

Keywords: overtourism, Italian rural landscapes, UNESCO cultural landscapes, local communities, integrated management plan.

1. Introduction

The discussion surrounding the connection between changes in the Italian agricultural landscape, particularly the culturally recognised landscape by the United Nations Educational, Scientific and Cultural Organization, and tourist exploitation is a difficult, controversial, and long-standing issue (Terkenli et al., 2019; Panzera et al., 2021; Boháč & Drápela, 2022).

The "List of Factors Influencing the Properties", compiled by UNESCO (2008), recognises tourism as one of the secondary factors that compromise the Outstanding Universal Value of World Heritage properties, both in tangible and intangible terms. In terms of tangible factors, tourism impacts the "Buildings and Development" aspect due to "Major visitor accommodation and associated infrastructure" (ibid.). Regarding intangible factors, it affects the "Social/cultural uses of heritage" through "inappropriate/non-existent interpretation", "High levels of visitation", and "Increase of vendors inside/outside the site" (ibid.).

According to the State of Conservation (SoC) Information System and its reports produced by the States Parties as of June 28, 2023, 6 world cultural landscapes suffer from "Major visitor accommodation and associated infrastructure", with half of them located in Europe (3 out of 6, i.e., 50%) (UNESCO, n.d.). Similarly, 13 international cultural landscapes are affected by the "impacts of tourism/visitor/recreation", with most of them being located in the European Union (5 out of 13, i.e., 38%) (ibid.).

Similarly, the Reflection Period (2015-2017) after the Second Cycle of Periodic Reporting identified the "Impacts of tourism/visitor/recreation" among the main threats in the Mediterranean Europe sub-region in which Italy is part of, with an impact

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of “23%” (UNESCO, 2015, p. 21). The same report concludes that the impacts of tourism can be considered as positive as well as negative factor, in the same sub-region (ibid., p. 48).

Therefore, the compromise of the agricultural landscape resulting from these issues seems to be one of the many facets of mature capitalism, neoliberalism (Estevens et al., 2023): when uniqueness becomes a business and a form of "neo-extractivism" in a broad sense (Chagnon et al., 2022; León-León & Rendón, 2022).

2. Mass tourism as a driving factor of change

To this day, many individuals are attributing uncontrolled mass tourism as the genuine adversary of Italian cities and productive cultural landscapes (Figure 1). Tourism now appears to be one of the significant culprits contributing to the extensive destruction of the environment, encompassing its various dimensions.

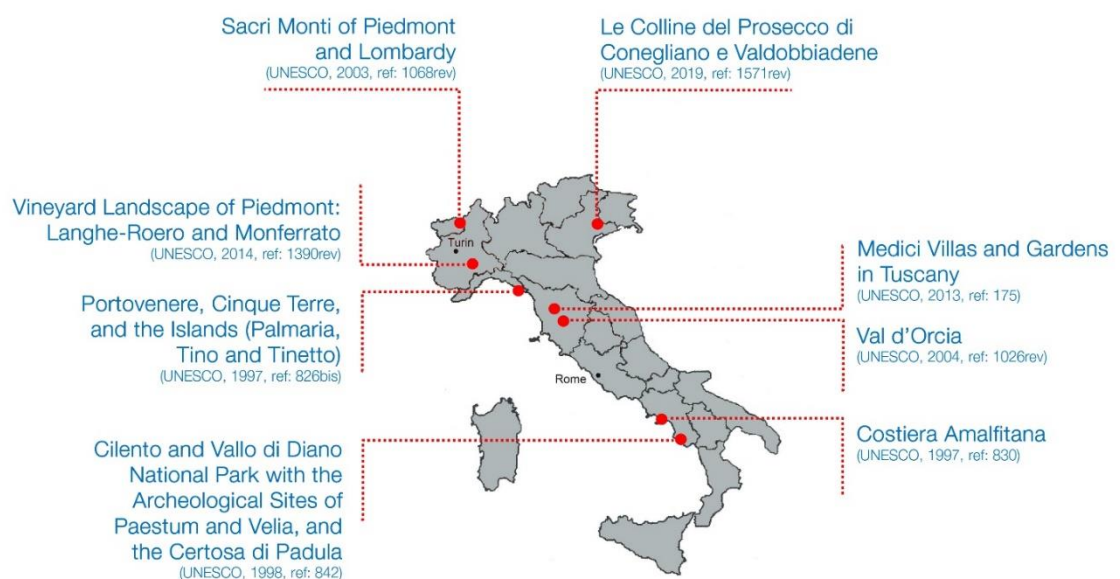


Figure 1. The 8 UNESCO cultural landscapes in Italy, as of June 29, 2023.

Source: UNESCO, n.d. Author's elaboration.

Mass tourism, characterised by significant economic resources, is often accused of transforming places into a kind of "amusement park" for foreigners. This mechanism is observed at different scales, both in the historic centres of many European art cities (García-Hernández et al., 2017; Porfido et al., 2023; Milano et al., 2023), and on a larger scale, involving an entire regional area (Jansen-Verbeke, 2009). Among the latter, one can find the rural landscapes of Tuscany, particularly the Val d'Orcia, which are highly sought after by tourists and consequently subject to significant external pressure on the system (UNESCO, 2004).

Opposing these trends is another type of mass tourism characterised by limited economic resources and a limited cultural demand, which seeks 'Instagrammable' moments. This form of tourism seeks quick and superficial experiences, with little interest in in-depth information. For them, so-called rural packaging is offered,

consisting of opportunities linked to postcard-perfect photos and simulated immersive activities. Among these activities is the continuous branding of various nature-related experiences, such as ‘forest bathing’ and ‘glamping’ (a combination of glamour and camping). These activities represent concrete steps towards commodifying something that should not be a commodity. Additionally, there are short and easily accessible educational activities that allow the certification and sale of these new products to a wide audience of consumers.

This split between two strands of tourist demands and offerings is governed by the market. Italy and its regions, which have relied on tourism for decades, are now facing a changing tourism landscape and evolving tourists. The resulting demands create pressures that require constant adjustments and changes in the management of these landscapes, sometimes at the expense of tradition.

The result is a changed landscape, standardised, commercialised, and sometimes even distorted, including in the gastronomic offerings catering to tourists. It is characterised by events such as ‘white dinners’ in vineyards at 6:30 pm or experiential perspectives, exemplified by the recurring presence of Big Benches in the municipalities of the UNESCO site "The Vineyard Landscape of Piedmont: Langhe-Roero and Monferrato" (Big Bench Community Project, n.d.). Under such pressures, this landscape undergoes transformation, running the risk of becoming a mere stage (Figure 2).



Figure 2. Notable architectural contributions in the form of authorial churches in the UNESCO cultural landscape "Vineyard Landscape of Piedmont: Langhe-Roero and Monferrato". On the left, the "Cappella delle Brunate" in La Morra, by Sol LeWitt and David Tremlett. On the right, the chapel of the "Blessed Virgin Mary of Mount Carmel" in Coazzolo, by David Tremlett.

Source: the author.

3. Communities and systemic pressures

According to estimates produced by The World Bank and the modelled International Labour Organization, the employment in agriculture (% of total employment) in Italy has decreased from approximately 8.5% in 1991 to just over 4% in 2021 (The World Bank, 2023a). Similarly, the rural population (% of total population) in Italy has declined from over 33% in 1991 to nearly 28% in 2022 (The World Bank, 2023b). Based on these figures, it appears that those engaged in subsistence farming or family-run agricultural activities constitute an increasingly smaller minority.

These recognised sustainable practices seem to contribute to the preservation of places "as they once were", although such a statement invokes concepts that are challenging to interpret, such as "authenticity" and "integrity" (UNESCO, 2021, articles 79-95; Jokilehto, 2006). In particular, the Operational Guidelines for the Implementation of the World Heritage Convention state that "... properties may be understood to meet the conditions of authenticity if their cultural values (as recognised in the nomination criteria proposed) are truthfully and credibly expressed through a variety of attributes including: ... spirit and feeling" (UNESCO, 2021, article 82). They further state that attributes such as spirit and feeling "... are important indicators of character and sense of place, for example, in communities maintaining tradition and cultural continuity" (ibid., article 83). Integrity, on the other hand, emphasises that "Relationships and dynamic functions present in cultural landscapes ... essential to their distinctive character should also be maintained" (ibid., article 89). Therefore, what kind of balance between the territory and human activities are we heading towards?

The demographic decline in rural areas of Italy is accompanied by a loss of local specialisations and their skilled artisans, including traditional craftsmanship. This leads to a weakening of the connection between the local population and their historical and cultural roots, in a longstanding process that has been ongoing for decades and is not solely related to tourism.

The detachment from one's roots, which leads to a loss over generations, opens up multiple possibilities for a nostalgic and backward-looking reinterpretation of what can be defined as "traditional" (Hugo, 2020). Often, this transformation becomes a staged performance for the benefit of tourists (Figueiredo & Raschi, 2011).

The artificiality of the concepts of authenticity and integrity further undermines the social component of the landscape. The tourist attraction in rural areas of excellence (e.g., those protected by UNESCO) and the foreign demand for ownership of material assets in these areas also prevent local people from accessing such assets due to the significant increase in costs, such as the purchase of residential properties. Local farmers are forced to resort to financial instruments such as loans in order to invest in an area where costs have risen, thereby facing a trend that makes it impossible for them to further invest in local businesses. Additionally, the remuneration for agricultural production per unit of agricultural measure is often not profitable in several cases. Given these factors, the combination of the aforementioned factors leads to a gradual transformation of valuable rural areas into tourist landscapes.

These pressures originate from both external and internal sources within the system, and both have an active and passive impact on the residents of these places. Considering that these individuals are primarily in search of employment and services, their availability and quality at the local and territorial levels need to be assessed. It is indeed challenging to persuade local people, who often have a high percentage of elderly individuals, to reside in an isolated area or in a location with limited bus services to neighbouring cities. In terms of services, these communities are more attentive than others to the issue of healthcare, such as the proximity of the nearest healthcare centres and the time required to reach them by car. Lastly, the issue of infrastructure connections, such as highways and railways, is also important for work purposes. Once again, the location and accessibility of these services prove to be central factors.

These potential limitations have led, over the decades from the 1960s to the present day, to the transfer of agricultural estates owned by residents to large investors. This

commercialisation process (Meini, 2004) involves the sale or rental of properties and the relocation of local inhabitants, often to urban areas, with a low percentage of them returning to these places in the short to medium term. Those who acquire these houses perceive them as investment assets, resulting in an increase in local market prices that encourages other families to emulate these sales or, in worse cases, to relocate to other contexts due to the rising cost of living generated in these areas.

However, while there appears to be a certain stability coupled with a slight inclination towards depopulation in the villages of the Val d'Orcia region during the period 2019-2022 (ISTAT, 2023), there is a concern regarding the age demographic of those returning. Additionally, the ability to attract new families to embrace a “new rurality” (Maduro et al., 2022; Kajdanek et al., 2022) should also be considered, whereby these families choose to live and work in these places and provide a future for their children. In general, it can be said that if predominantly older individuals or tourism workers are the ones returning, along with foreign investors purchasing hectares of land to cultivate high-value crops such as vines, the demographic decline becomes a tangible risk. These changes in the social structure threaten to transform the valleys, which constitute these productive landscapes, into the domain of a few privileged individuals who reside there for limited periods, along with their employees. If this were to occur in an even more pronounced manner, the territory would become a mere tool for financialisation, even for foreign investment funds, where large land ownership and related phenomena of land grabbing are already underway.

Therefore, more than the mere disappearance of the landscape itself, the problem of greater concern seems to be the loss of the indigenous people who, through the incessant work of generations, have created those landscapes that we now define as “cultural landscapes” (UNESCO, 2021, articles 47, 47bis, and 47ter). Indeed, without the vital and daily presence of residents, cities, towns, and the landscape are nothing more than images, devoid of value and destined to fade away over time.

4. Shortcomings and faults in the management of Italian agricultural landscapes

Potential shortcomings in the management of Italian agricultural landscapes are related to the political sphere, which should establish and disseminate a comprehensive and forward-looking vision.

Within this discourse, political authorities at the local level also bear culpability as they should create and/or implement existing regulations to plan for the preservation of heritage (Korstanje & George, 2020), both directly and indirectly. In terms of direct actions, Urban-Planning and Building Regulations (RUE) and/or Municipal Operational Plans (POC) should curb changes in land use from residential to commercial, as well as processes of deruralisation, including cases where agricultural industrialisation leads to monoculture (such as wine, rice, oil, etc.). In terms of indirect actions, there should be more careful planning to maintain existing agricultural activities and provide appropriate incentives.

The governance of a territory should also encompass the ability to balance tourism with the needs of residents, with the aim of encouraging the influx of new residents and not just additional tourists. In this sense, taking care of these agricultural landscapes also means monitoring whether conditions are being created that prevent them from being identified as productive and therefore transformable. Divergent

visions from different political parties, even in opposition to each other, can result in inaction or a lack of timely adoption of actions or strategies aimed at containing or limiting ongoing phenomena. Furthermore, it should be acknowledged that local politics often lack the strength and expertise to frame these issues and attempt to establish balanced solutions.

Among the potential shortcomings, there are also those attributable to the allocation of investments aimed at increasing the reach and quantity/quality of public transportation and services for residents, such as railway services. Placing greater emphasis on this service system, such as logistics, would have slowed down the process of spectaclising these landscapes or at least allowed for a local perspective to coexist, thanks to people's prolonged presence in these places. Butler also argues for the need to assess the state of existing infrastructure and services in a given area prior to prematurely exposing it to media promotion (Butler, 2020).

Clear imbalances within a dynamic equilibrium thus appear to be the result of liberal policies that endorse the notion that the market determines the tourism model, which, as already highlighted in this paper, is largely characterised by a mass tourism approach oriented towards exploitation. This can also give rise to other complementary issues, such as the increase in environmental pollution in terms of climate-altering emissions, whether they are of an airborne nature (e.g., CO₂, particulates) or perceptual in nature (e.g., excessive use of the outdoor artificial light during nighttime).

Lastly, others also attribute indirect blame to third-sector associations that claim to protect the territory. Territorial enhancement activities, especially in areas where visitor access should be restricted, often attract excessive numbers of people, promoting maximum visitation instead of focusing on the quality of the environment's visitation experience.

5. Will the landscape image change?

The agricultural landscape of the late twentieth century is primarily an expression and outcome of the post-war agricultural revitalisation and mechanisation, which increasingly altered the stratified landscape composed of Roman, medieval, Renaissance, and/or eighteenth-century elements. In the specific case of the Val d'Orcia, for example, during the post-World War II period, "New spaces for agriculture were gained by reshaping the hills, even through the use of dynamite. Sardinian shepherds arrived to tend the sheep, and Sicilian cereal farmers came to work the wheat. It was they who introduced mechanisation" (Calvi, 2023).

Since the 2000s, individuals from outside the region who sought these productive landscapes as a retreat from their working lives introduced new functions and elements that were previously foreign to the area. These include swimming pools, lawns, non-native tree species in unusual locations, and fences that detract from the open field character, even leading to the loss of inter-farm roads.

Today, mass tourism seems to merely amplify and generalise a trend that has been underway since the 1960s and 1970s.

Although the modifications to the landscape are often associated solely with construction activities, current building regulations appear to be quite stringent, making it difficult for significant visual alterations to occur. It is clear, therefore, that the rural landscape changes not only through construction, but also through variations in agricultural practices, which alter the pattern and colour of cultivated surfaces (Figure 3).



Figure 3. The distinct colour palettes of the viticultural rural landscape in Langhe-Roero and Monferrato (1.a, 1.b, 1.c) compared to the visual alterations observed in new buildings in the same area (1.d).

Source: 1.a, 1.b, 1.c the author, 1.d phhere.com under CC0 Public Domain. Author's elaboration using Adobe Color.)

As a result, the typological and morphological characteristics of the landscape are altered, as well as the underlying ideology and theoretical speculation. Even the minor components of these landscapes, such as dry-stone walls and drainage ditches, are at serious risk due to the progressive lack of maintenance. For instance, in Val d'Orcia, this phenomenon is evident in the deterioration of the perimeter walls along the Leopoldina road.

In Italian UNESCO cultural landscapes, the risk also manifests itself in the conversion of some fields located alongside roads into parking lots for cars, motorcycles, and

campers, catering to a type of occasional ‘hit-and-run’ tourism. Another ongoing trend is the consolidation of land ownership among small landowners to create large estates and land grabbing, as observed in some areas of the UNESCO site of Langhe-Roero and Monferrato (e.g., in Components 1390rev-001 "Langa of Barolo" and 1390rev-003 "Hills of Barbaresco") and in Val d'Orcia (e.g., Capalbio). In these cases, when the small farms that characterise the area cease to exist, the land associated with them is acquired by large entrepreneurs, thereby erasing its distinctive features and identity. With such actions, the very essence of a place changes, even to the point of disappearing. Thus, all that remains is to rely on our memories, having acknowledged a certain commodification of our cultural identity. Does it still make sense to refer to a cultural landscape in the light of these ongoing dynamics? Furthermore, considering what has been described, do these landscapes face the risk of being removed from UNESCO’s World Heritage List?

6. Possible solutions and strategies

Aware of the delicacy and fragility of such areas, as highlighted by the SWOT (strengths, weaknesses, opportunities, and threats) analysis conducted in the UNESCO site of Langhe-Roero and Monferrato (UNESCO, 2014, p. 58, fig. 12) and further elaborated in Figure 4, it is necessary to consider viable alternatives to this tourism-based development model.

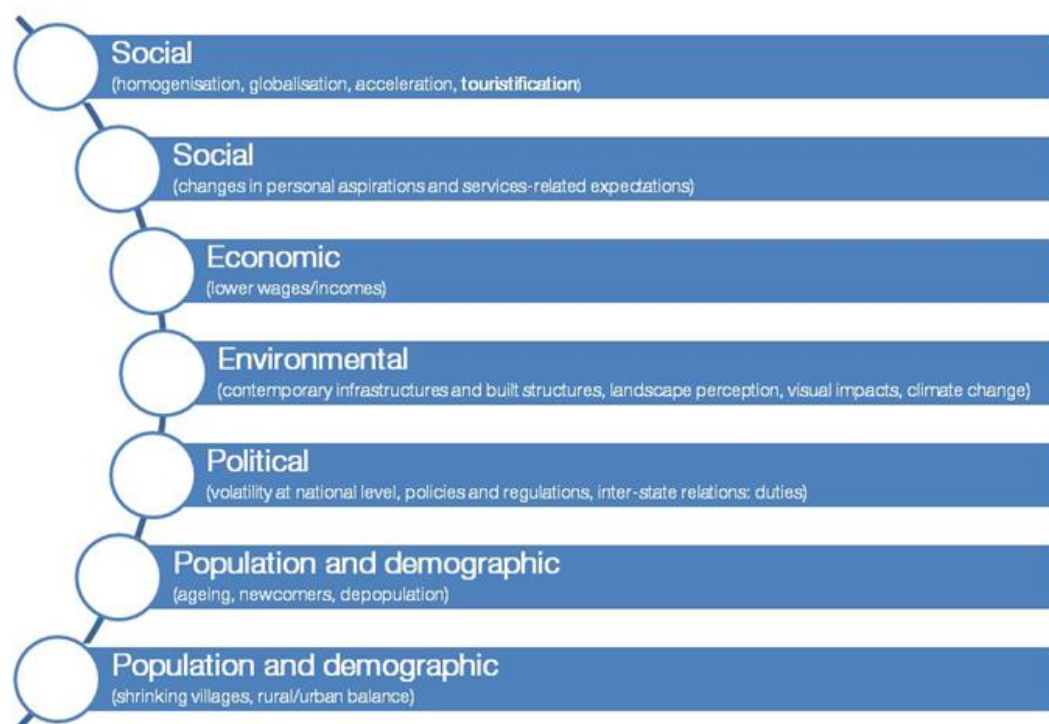


Figure 4. The current driving forces of change in the UNESCO site "Vineyard Landscape of Piedmont: Langhe-Roero and Monferrato".

Source: Author's elaboration.

Traditionally, development hypotheses have considered alternatives based on large commercial and/or industrial activities, either in opposition or in synergy with the offerings of the tourist park. The latter model seems to be more widely accepted as it is limited in time, occurring only between April and October, allowing the local population to enjoy the area during the rest of the year. On the other hand, industrial areas characterised by warehouses and large shopping centres with continuous motor vehicle traffic risk visually impacting the landscape, especially in the valley bottoms. This creates problems for the media image that the territory intends to convey. In this regard, an emblematic case was the 12th stage of the Giro d'Italia cycling race on May 22, 2014, which was diverted from the original route between Barbaresco and Barolo due to the excessive presence of warehouses in the valley bottom. The new route was designed to traverse the hilly areas between the two locations (The Editorial Board, 2013).

A third approach is that of the advocated sustainable tourism, especially for areas that have not yet been affected by mass tourism (Králiková & Kubát, 2022). However, despite proposing a slow, socially compatible, experiential, and empathetic tourism, the consequences of such premises are then the consequences described in the first paragraph of this paper. Often, 'sustainable' projects lack a holistic vision, thus failing to create a circuit that can foster the growth of a territory together with its population. Therefore, it is necessary for communities to assert their right to maintain a balance of spaces as places of life, as a sort of spaces of resistance. Public entities and governments should support them with stronger actions in the short term, introducing stringent measures aimed at protecting specific assets based on their carrying capacity (Seyhan & Russo, 2020). However, this should be agreed upon with the local people, giving greater space to a vision carried forward by the locals (Chang et al., 2018; Cerquetti & Romagnoli, 2022; Nemes & Tomay, 2022) and opening up more to bottom-up initiatives.

Nonetheless, some limitations may arise regarding the lack of consensus on how to address overtourism, in terms of strategies and methods (Yrigoy et al., 2023). Among these, one approach is the dynamic adoption of daily, monthly, or annual limits on the number of tourists allowed to access a given asset, identified based on studies on the carrying capacity of the so-called "tourism resources" (He et al., 2023), taking into account the socio-ecological, physical-instrumental, psycho-social, and economic dimensions. Such actions would allow for the gradual dispersion of tourist masses in the medium term, thus avoiding peaks of influx during specific annual periods (e.g., summer or agricultural harvest seasons) through the adoption of toll tickets at the entrances of villages included in the components of the UNESCO site. An example of the aforementioned is the villages within the World Heritage site "Cultural Landscape of Honghe Hani Rice Terraces" in China, where visitors need to pay a ticket of 30 yuan (as of 01/03/2023) to access the Azheke village within its component. On the other hand, the adoption of such practices raises questions about the fairness of a management system that regulates the freedom of access to a cultural asset and, therefore, the meaning of democracy. Moreover, "The implementation of monitoring programmes and the definition of indicators is a common difficulty and there is a need for guidance and capacity building according to many comments ... in large and complex cultural properties, for example historic cities and cultural landscapes" (UNESCO, 2015, p. 62) in the European sub-region.

Therefore, it is necessary to preserve and add culture to conservation, while also being open to accepting dynamism (Vaz & Soto, 2019) and landscape projects. For example, consider the Val d'Orcia and, specifically, the famous road with cypress trees near the La Foce estate in Monticchiello, a small urban centre southeast of Pienza. This was the work of landscape architect Cecil Pinsent and Marquise Iris Origo, who, in the 1940s, contributed to creating an image that still represents an archetype of the local Tuscan landscape in the collective imagination today.

On the other hand, it is also important to avoid a new type of tourism known as nostalgia tourism, which rejects any form of modernisation and seeks refuge in an idealised golden age of these landscapes, blaming them for having lost their authenticity in the face of contemporary changes.

Indeed, one possible action towards sustainable development is exemplified by Denmark, which aimed to prevent its coastal areas from being predominantly acquired by foreign tourists. To achieve this, Denmark implemented restrictions on the purchase of vacation homes, requiring a residency period of 5 years in the country before being eligible to buy such properties. In light of this, it would be worthwhile to explore compensatory systems that can strike a balance between conservation and development approaches (Iannucci et al., 2022).

In conclusion, this article deals with a review of the well-known topic of overtourism and its effects in its global significance, extending beyond Italy. For an effective examination and resolution, the matter should also address the core of the problem, namely, a broader reconsideration and reformulation of the prevailing economic model (Milano et al., 2019).

7. Other Italian cases at risk

Several productive landscapes and cities in Italy have been threatened by this phenomenon for several decades.

In Sardinia, the National Parks have become attractive destinations for those arriving from cities (Battino et al., 2023), as well as a large part of South Tyrol, which is experiencing the effects of quantitative tourism that risks altering the quality of the landscape (Kreisel & Reeh, 2011). In Apulia, the Itria Valley shows some signs of ongoing changes, triggered by the construction of houses with different shapes and types from the traditional *trulli* houses since the 1970s. The area of Salento in the same region of Italy, on the other hand, is characterised by significant overtourism (Pasini, 2023), similarly to what is happening at the World Heritage sites “Portovenere, Cinque Terre, and the Islands (Palmaria, Tino and Tinetto)” in Liguria (UNESCO, 1997a) and the “Costiera Amalfitana” in Campania (UNESCO, 1997b).

Similar phenomena seem to be occurring in certain areas of the Langhe region in Piedmont, although with some mitigating factors at present (Fiori, 2021). Even in this UNESCO cultural landscape of productive type, the touristic transformation of the lower Langhe region began in the late 1990s to early 2000s. During this phase, various farm sales were concluded with citizens from the Netherlands, Switzerland, and Germany. On the other hand, the Langhe still has several less anthropised locations where a different form of tourism is still possible and developed sustainably, such as in the Alta Langa area (e.g., Bossolasco, Borgomale, Cortemilia, Loazzolo and Carpeneto, among other localities). However, even in these areas, which are outside the perimeter of the UNESCO site, the first signs of touristic transformation can be observed. As a serial site consisting of 101 municipalities and 6 Components, plus 2

Buffer zones, wine tourism in the Langhe-Roero and Monferrato macrozone is not characterised as mass tourism in every area, both due to cost factors and the niche product offered (i.e., wine). There is a significant portion of occasional Italian visitors who are low spenders and do not undertake investments that indirectly undermine the landscape. There are also cases of foreign tourists from Switzerland, Germany, the Netherlands, France, and the United States (Regione Piemonte, 2023, p. 5) who continue to purchase properties mostly as second homes or for retirement purposes, with limited or no interest in intensive vineyard cultivation. Even the large residential and winery structures seek to blend in with the surrounding context, aiming not to distort the experience for those who visit these areas with the intention of enjoying their nature and landscape.

Moving to the cities, almost all medium to large-sized Italian art cities suffer from this issue, including the historic centres of Bologna (Celata & Romano, 2020), Florence (Loda et al., 2020), Venice (Salerno, 2022), Matera (Iaffaldano et al., 2021), Rome (Celata & Romano, 2020), and Naples (Cerreto et al., 2020). Smaller-sized centres, on the other hand, are experiencing depopulation and transforming into scattered hotels also known as *Alberghi Diffusi* (Vallone et al., 2020), such as Pienza, Montalcino, Montepulciano, and San Gimignano in Tuscany, and Alberobello in Apulia.

8. Conclusions

In conclusion, the study highlights the intricate and contentious relationship between tourism and Italian agricultural landscapes, particularly UNESCO sites. The influx of tourists poses a significant challenge to maintaining the Outstanding Universal Value of these sites, impacting both tangible and intangible aspects. The transformation of these landscapes into tourist attractions often leads to homogenisation, commercialisation, and the loss of their authentic character.

Moreover, the local communities residing in these areas face numerous challenges stemming from tourism. Demographic decline, cultural dilution, and the erosion of traditional practices are among the key issues encountered, as the picturesque is not the harmless refuge we naturally think of. Preserving the unique identity and heritage of indigenous communities becomes imperative in mitigating these negative impacts. To address these challenges, effective management strategies need to be implemented. This necessitates a comprehensive political vision and regulatory framework that strikes a balance between tourism development and the preservation of residents' well-being and cultural roots. Failure to take decisive action can hinder the formulation of appropriate solutions and exacerbate the issues faced by these communities.

However, it is important to acknowledge the limitations of this study. The absence of quantitative data hampers a deeper understanding of the exact impacts and dynamics at play in a given case study. Therefore, further research should be conducted to gather empirical evidence and enhance the study's robustness.

Moving forward, several steps can be taken to promote sustainable tourism practices and mitigate the adverse effects on Italian agricultural landscapes. Engaging local stakeholders, including indigenous communities, in decision-making processes is crucial. Their insights and perspectives can inform the development of context-specific strategies that prioritise the preservation of cultural heritage and the well-being of residents.

Additionally, the study suggests the implementation of sustainable tourism initiatives that focus on responsible visitor management, education, and the promotion of authentic and sustainable experiences. These initiatives should be supported by policymakers, tourism organisations, and relevant stakeholders.

In summary, the study underscores the need for proactive measures to address the impact of tourism on Italian agricultural landscapes, particularly UNESCO sites. By considering the limitations of the study and embracing further research, engaging local communities, and implementing sustainable tourism strategies, it is possible to strike a balance between tourism development and the preservation of these valuable landscapes and cultural heritage.

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ECONOMIC IMPACT OF AGRICULTURAL INNOVATION: A LITERATURE REVIEW AND THE CONTRIBUTION OF THE PROSMALLAGRIMED PRIMA PROJECT

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Abstract

With the substantial water scarcity and recurrent food insecurity in Northern Africa's low-income and arid and semi-arid regions, there has been a continuing interest in the adoption of new technologies and its influence on productivity. In this context, the *ProSmallAgriMed* project funded in the frame of the *Partnership for Research and Innovation in the Mediterranean Area - PRIMA*, aims at improving the agronomic practices of North African small farmers by promoting the rational use of beneficial soil microbiota and their positive effects on productivity of intercropped perennial (cactus-pear) and short-term (field crops and winter-grown vegetables) species, as well as to support synergistic cooperation between farmers and the food-value chain. This article examines the economic literature on technology adoption in agriculture and its effects in terms of productivity and welfare, in order to identify similar results, inadequacies, and key outstanding challenges, as well as to offer an overview of the topic.

Keywords: agriculture innovation, cactus pear, conservation agriculture, impact evaluation, literature review.

JEL classification: D24, I32, L66, Q01, Q12, Q16, Q24, Q25.

1. Introduction

This paper offers a review of the most recent literature in the field of agriculture economics and namely of contributions concerning the assessment of the impact of agricultural innovations on social welfare and economic growth. We do so in reference to the *ProSmallAgriMed (Promoting soil fertility, yield and income in smallholder agriculture of semiarid and arid Mediterranean regions by management of beneficial soil microbiota, conservation agriculture and intercropping)* project, whose outcomes are expected to contribute to increasing farmer incomes, boosting economic activities, reaching higher social equity and a healthier environment for rural populations in arid and semiarid areas. The ProSmallAgriMed project is promoted by the Partnership for

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Research and Innovation in the Mediterranean Area (PRIMA) Foundation and carried on by a consortium of 11 units, distributed over 5 different countries, and led by an Italian one¹.

The project aims at improving North African small farmers' agronomic practices through the promotion of the rational use of beneficial soil microbiota and their positive effects on productivity of inter-cropped perennial and short-term species. The perennial species concerned by the project are cactus-pear and the short-term species are field crops and winter-grown vegetables. The cultivation of the cactus-pear, also known as prickly-pear, *Opuntia ficus-indica* or *Opuntia robusta*, spans thousands of years, since its beginnings and development are intimately related to those of the ancient Mesoamerican civilizations, particularly the Aztec culture (Kumar et al., 2018), that have first cultivated these succulent plants, according to archaeological evidence (Pimienta-Barrios, 1994). After being brought from Mexico to Spain, *O. ficus-indica* has quickly expanded throughout the Mediterranean basin (Barbera et al., 1992). Due to its capacity to flourish even in a water shortage and its significant nutritional benefits, *O. ficus-indica* demonstrates to be a plant of fundamental importance for agriculture and food in these desert places.² Indeed, it has proven to be a rather fruitful crop, since many of its parts can be used for different purposes; the most prized food resource is the fruit, which can be consumed fresh as well as used to make juices, liqueurs, jams (called *mustard* in the Italian region of Sicily), jellies, sweeteners, and more. The seeds can also be used for the extraction of the oil, a highly regarded cosmetic ingredient, because of its antioxidant, antimicrobial and hydrating properties (Alqurashi et al., 2022). Moreover, the blades, or more precisely the "*cladodes*," can also be consumed fresh, pickled, candied, and in the form of jam. They're also utilized as animal feed. Finally, a flour made from fruit peels can be as an ingredient in the preparation of baked goods (Bouazizi et al., 2020).

Cactus-growing countries are linked to a sizable portion of the world's arid and semi-arid regions, as the Northern Africa ones, and people living in these habitats look for plant species that can flourish there and offer resources like food and building materials (Kumar et al., 2018). The sustainable use of water resources is frequently a prerequisite for these regions' economic development: for instance, the lack of water resources continues to be a significant constraint on the agriculture in Tunisia (Foltz, 2003) and Algeria (Rouabhi, Mekhlouf, et al., 2016). In this context, *O. ficus-indica* is an intriguing crop choice for farmers in hard and desert locations, since it may guard against soil erosion and water loss (Alary et al., 2007). Therefore, the adoption of farming innovations, aimed at boosting the efficiency of water use and promoting soil conservation and fertility in arid and semiarid climates, is a relevant lever of economic growth not only in relation to the cultivation of *O. ficus-indica* but, more generally, in circumstances characterized by similar environmental and socio-economic conditions. In particular, innovations related to the so-called Conservation Agriculture (CA), like the ones proposed by the *ProSmallAgriMed* project, may be a sustainable alternative to intensive conventional agriculture, for the ability to limit, arrest or revert a number of problems such as soil erosion, soil organic matter decline, and excessive pesticide and fuel use (Azeiez, 2020; Kassam et al., 2012; Wall, 2007). Indeed, the scientific

¹ <http://www.primaprosmallagrimed.ovh>

² Cactus pear is an aridity-resistant plant that requires temperatures above 6 °C for an optimal development.

literature has shown that CA may increase productivity and, ultimately, augment crop output in arid Mediterranean regions (Chalak et al., 2017; Kassam et al., 2012), through the creation of new inventions, technology transfer, and capacity building (Jovanovic et al., 2020), that may help supporting smallholder farmers and rural communities' food security.

The literature in agricultural economics and economic development has thoroughly explored the impact of new agricultural technologies and innovations in terms of both direct and indirect effects, also considering technology combinations and the associated (direct and indirect) impact beyond the household level. However, evaluating the impact of innovations and technology adoption in a *causal way* requires controlling for potential selection bias and unobserved heterogeneity which in turn entails collecting appropriate data on socio-economic and agricultural variables and employ them in suitable methodologies.

The rest of the work is organised as follows. Section 2 describes the economic use of the cactus-pear, while Section 3 provides a review of the most recent economic literature on the adoption of innovation in agriculture. For each paper, we will highlight the methodology employed and the data used for the empirical investigation, as well as the implications in terms of economic policy. Section 4 describes the *ProSmallAgriMed* project and the challenges linked to the economic evaluation of its impact. Section 5 concludes.

2. Economic valorisation of cactus-pear industrial processing

The industrial processing of cactus-pear holds significant economic importance in arid and semi-arid regions around the globe. These areas are typically regarded as unsuitable environment for conventional crop production, due to the scarcity of water and the substantial amounts of additional nutrients required (Louhaichi et al., 2022). However, cactus pear thrives in such conditions, which makes it a promising alternative for local farmers and industries as nutrient food and input (Novoa et al., 2014)³: indeed, cactus pear yields sweet, nutrient-dense fruits that are edible; moreover, in arid and semi-arid areas, cactus cladodes are widely employed as a cheap supply of nutrients and water for animals, especially during severe droughts.

The key aspects concerning the economic importance of industrial processing based on cactus-pear fruits and cladodes may be found in the in following domains:

- *Food and beverages*: Cactus-pear fruits are high in crude protein, fibre, lipids, minerals, and carbohydrates but high in water, sugar, and calcium (Ben Salem et al., 1996; Abidi et al., 2009; El-Hawary et al., 2020). Thanks to their unique flavour profiles and potential health benefits, they can be processed into various food and beverage products such as juices, jams, jellies, candies, syrups, and alcoholic beverages, whose market demand represents an economic opportunity for growers, processors, and manufacturers.
- *Dietary supplements*: Cactus-pear products contain useful nutrients for regulating blood sugar levels, reducing cholesterol, and providing dietary fibre (Feugang et al., 2006). Extracts from the plant are used to produce dietary supplements

³ This plant belongs to the *Cactaceae* family and has a high water-use efficiency due to its *crassulacean acid metabolism* (CAM) photosynthetic pathway, making it ideal for arid-land production systems (Louhaichi et al., 2017, 2022).

such as capsules, powders, and extracts that cater to the growing demand for natural and functional health products. This segment presents promising economic prospects for dietary supplement manufacturers and pharmaceutical companies.

- *Cosmetics and personal care:* Cactus-pear oil extracted from the seeds of the fruit has gained popularity in the cosmetics industry for its nourishing properties (Andreu-Coll et al., 2020). It is rich in vitamin E and essential fatty acids, making it beneficial for skincare and haircare. Cactus-pear-based cosmetics, including moisturizers, serums, shampoos, and conditioners, represent a flourishing market niche especially for small cosmetic companies willing to create innovative products or to start a new brand.
- *Animal feed:* Cactus-pear pads, also known as *nopalitos*, can be processed into animal feed for livestock, including cattle, goats, and sheep (Abidi et al., 2009). Consequently, the cultivation and processing of cactus-pear generate a cost-effective alternative to traditional animal feed sources and, as such, an economic advantage for farmers and feed producers.
- *Pharmaceuticals:* Cactus-pear contains bioactive compounds such as betalains, flavonoids, and polysaccharide that have potential pharmaceutical applications for their antioxidant, anti-inflammatory, and anticancer properties. Pharmaceutical companies may explore the extraction and purification of these compounds for the development of new drugs (Feugang et al., 2006).
- *Sustainable agriculture and income generation:* Cactus-pear cultivation and processing have a positive impact on sustainable agriculture practices (Kumar et al., 2018). Being highly a resilient plant, apt to thrive in arid and semi-arid regions with minimal water requirements, its cultivation can contribute to soil conservation and erosion control. Additionally, the cultivation and processing of cactus-pear can generate income and employment opportunities, particularly in regions where suitable agricultural options are limited.

Overall, the industrial processing of cactus-pear provides diverse economic opportunities across various sectors, including food and beverages, dietary supplements, cosmetics, animal feed, pharmaceuticals, and sustainable agriculture. The wide range of products derived from cactus-pear contributes to regional economic growth, job creation, and the utilization of a natural resource that offers unique qualities and benefits.

3. The economic impact of innovative technology adoption in agriculture: a literature review

Agriculture is a dynamic and complex sector that is constantly evolving. The adoption of innovations is a critical component of this evolution, as it allows farmers to improve their productivity, efficiency, and profitability. However, the adoption of innovations is not always a straightforward process, and there are many factors that can influence whether or not farmers decide to adopt new technologies. One of the most important is the availability of information. Farmers need to be aware of new technologies and how they can benefit their operations before they can adopt them. Access to information can be a challenge in rural areas, where farmers may not have access to the internet or other sources of information. Another important factor is the cost of

adopting new technologies. Farmers may be reluctant to invest in new equipment or technologies if they are not confident that the benefits will outweigh the costs. In addition, there may be a lack of financing options available to farmers, which can further limit their ability to adopt new innovations. Social and cultural factors can also play a role in the adoption of innovations in agriculture. Farmers may be more likely to adopt new technologies if they are widely accepted by their peers or if they fit with their cultural or social values. On the other hand, farmers may be hesitant to adopt new technologies that are seen as threatening to traditional farming practices or cultural norms.

There are many different types of innovations that can be adopted in agriculture. One among them is precision agriculture, which involves using technology to optimize farming practices. This can include using sensors and other technologies to monitor soil moisture, temperature, and other factors, as well as using GPS and other tools to improve the precision of planting, fertilizing, and harvesting. Another important area of innovation is biotechnology, which involves using genetic engineering and other techniques to develop crops that are more resistant to pests and disease, or that have other desirable traits such as higher yields or improved nutritional content. However, biotechnology can also be controversial, with concerns about the safety and environmental impact of genetically modified crops. Finally, there is a growing interest in sustainable agriculture practices, which aim to minimize the environmental impact of farming while also improving yields and profitability. This can include practices such as conservation tillage, cover cropping, and integrated pest management.

Agriculture innovations have had a profound impact on human civilization, particularly in the areas of food production and distribution. Here are some of the most important scientific empirical papers on the impact of agriculture innovations. Each study provides valuable insights into the ways in which agricultural innovations can improve productivity, increase food security, and reduce poverty in developing countries.

Takahashi et al. (2020) provide a comprehensive review of the recent literature on technology adoption, impact on productivity, and extension in agriculture in developing countries, examining a wide range of studies that focus on different types of agricultural technologies, crop varieties, irrigation systems, and farm machinery, as well as different methods of technology dissemination, such as extension services, farmer field schools, and social networks. The paper finds that the adoption of technology is influenced by a variety of factors such as farmers' socioeconomic characteristics, access to credit and markets, and institutional support. Furthermore, it highlights the role of government policies in promoting technology adoption and extension services: in particular, policies are needed to support research for the development of appropriate technologies, to improve the access to credit and markets and to promote the development of rural infrastructure.

Likewise, Wossen, Alene, Feleke, Rabbi and Manyong (2019) provide a comprehensive analysis of the link between agricultural technology adoption and household welfare, with a focus on sub-Saharan Africa. The authors argue that while agricultural technology adoption has been widely promoted as a means of enhancing agricultural productivity and reducing poverty, empirical evidence on its impact on household welfare remains limited and inconclusive. In particular, the authors

highlight the need for rigorous empirical analysis that takes into account the potential endogeneity of technology adoption and the complex nature of household welfare.

The concern about welfare had previously been addressed by Lence and Hayes Dermot (2005), who explore the market and welfare impact of genetically modified (GM) crops and discuss the benefits of the latter, such as increased yields, reduced use of pesticides, and improved resistance to pests and diseases. These benefits can lead to lower costs for farmers and higher profits, as well as increased food production to meet the demands of a growing global population. However, the paper also discusses the potential drawbacks of GM crops, such as concerns over their safety and the potentially negative effects on biodiversity. The authors note that these concerns can lead to regulations limiting the adoption of GM crops, with substantial economic implications for farmers and consumers. Overall, the paper concludes that the market and welfare impact of GM crops are complex and depend on a variety of factors, including the specific traits of the GM crops and the regulatory environment in which they are grown. The authors suggest that a balanced approach to GM crop adoption, that takes into account both the potential benefits and risks, is needed, to ensure sustainable agricultural development.

By focusing on poverty reduction, Mendola (2007) investigates the impact of agricultural technology adoption in rural Bangladesh through propensity-score matching analysis, and find that farmers who adopted modern agricultural technologies, such as improved seeds, fertilizers, and irrigation, experienced higher agricultural productivity, income growth, and poverty reduction than non-adopters. Moreover, the study reveals that the impact of technology adoption on poverty reduction is stronger for smaller farmers and landless households, who are more likely to be poor. These findings suggest that agricultural technology adoption can be an effective strategy for poverty reduction in rural areas, particularly for smallholders and landless farmers. Likewise, the paper by Alene et al. (2009), leveraging on an economic surplus analysis, examines the economic and poverty impact of maize research in West and Central Africa, specifically focusing on the adoption of improved maize varieties. The authors conduct a survey of maize farmers in eight countries in the region, collecting data on the adoption of improved maize varieties, yields, and household characteristics. They show that the adoption of improved maize varieties has a positive impact on both farmers' income (with a 22% to 33% increase) and poverty levels. The authors note that these results vary somewhat across different countries in the region, with some countries seeing larger impacts than others. However, overall, the results suggest that investments in maize research in West and Central Africa have been effective in improving the livelihoods of smallholder farmers in the region, which is a promising conclusion for research on the economic impact of innovation in agriculture.

Also Kassie et al. (2011) and Zeng et al. (2015) focus on poverty reductions attainable through innovations in agriculture. Specifically, the former examines the impact of agricultural technologies on crop (namely, maize) income and poverty alleviation in Uganda. By leveraging on household survey data and a propensity score matching approach, the authors examine the factors that influence farmers' decisions to adopt these varieties, including access to credit, extension services, and social networks, and argue that the adoption of improved maize varieties has a significant positive impact on farmers' crop income, with adopters earning significantly more than non-adopters.

The study also finds that the adoption of improved maize varieties reduces the probability of being in poverty by about 7-9%.

Zeng et al. (2015) analyse instead the impact of improved maize varieties on poverty in rural Ethiopia; they also examine the factors that influence farmers' decisions to adopt these varieties, including access to credit, extension services, and social networks. The authors, leveraging on cross-sectional household survey data, suggest that the adoption of improved maize varieties have led to a 0.8–1.3 percentage drop of poverty headcount ratio and relative reductions of poverty depth and severity; such impact is larger for female-headed households and households with smaller landholdings. As a consequence, policies aimed at improving access to credit and extension services could help promoting the adoption of improved maize varieties among these groups. Similar results are reported by Manda et al. (2019), Wossen et al. (2019) and Tufa et al. (2019), who describe the impact of adopting improved crops varieties and agronomic practices in African countries in terms of poverty-reducing effects, improved soil fertility and reduced use of fertilizers, which has positive environmental implications. The authors agree that these effects are highest among female-headed households and households with low initial levels of asset ownership. Innovations aimed at improving crop resistance to pests also play a key role in improving crop yields and reducing pesticide use, with obvious health benefits and cost savings. Moyo et al. (2007) study the problem in Uganda, where peanut viruses have had a devastating impact on peanut yields and hence on the livelihoods of small-scale farmers. The authors find that the adoption of the new virus-resistant varieties results in a significant increase in peanut yields and household income and in a reduction in poverty among small-scale farmers. Similarly, Krishna and Qaim (2008) examine the potential impact of insect-resistant *Bacillus Thuringiensis* (BT) eggplant cultivation in India, on farmers' health and economic surplus, leveraging on a farm-level survey and economic surplus models. Their analysis suggests that BT eggplant has the potential to generate significant economic surplus gains (ranging from 27% to 52%) and to reduce the use of pesticide, which in turn can lead to a reduction in pesticide-related health problems, such as pesticide poisoning. However, the authors also caution that the success of BT eggplant cultivation will depend on various factors such as the availability of seeds, regulatory policies, and access to markets.

More recently, Midingoy et al. (2019) examine instead the impact of adopting integrated pest management (IPM) practices on farmer welfare and the environment in Kenya. By using a combination of survey data and environmental monitoring data, the authors find that farmers who adopt IPM practices achieve yields that are, on average, 33% higher than those of farmers' who do not adopt IPM practices, while also using 78% less pesticide. They also find that the adoption of IPM practices has a positive impact on farmer income, with IPM adopters earning, on average, 45% more than non-adopters. Additionally, the adoption of IPM practices is associated with a significant improvement in environmental quality, as measured by the reduction in pesticide residues in soil and water samples. The paper highlights the importance of promoting the adoption of IPM practices as a means of improving farmer welfare and reducing the environmental impact of pesticide use. Promotion may come from policies and programs that provide information and training on IPM practices as well as support for the development and dissemination of IPM technologies.

Very recently, Olagunju et al. (2020) evaluate the distributional impact of drought-tolerant maize varieties (DTMVs) on productivity and welfare outcomes among

smallholder farmers in Nigeria. They do so by leveraging on a panel dataset of 1,200 households, collected over three agricultural seasons. The authors show that DTMVs have a positive impact on maize yield and income, especially for households in the lower quantiles of the distribution. Moreover, DTMVs have a significant 10% poverty-reducing effect on the poorest households.

The number of empirical works on the economic impact of technology adoption and innovation in agriculture has constantly grown during the last five years. The paper by Kassie et al. (2018) evaluates the economic impact of improved maize production technologies, i.e. improved maize varieties, integrated soil fertility management (ISFM) and post-harvest management (PHM) practices, in Ethiopia, at both farm and market level, by leveraging on panel data from maize-producing households. The authors find that the adoption of these innovations significantly increase maize yields (by a minimum of 19% to a maximum of 32%) and income for farmers (with a 23% to 39% increment). At market level, the adoption of improved maize varieties has a significant positive impact on maize prices, suggesting the potential to not only increase incomes for farmers but also benefit other actors in the maize value chain, such as traders and processors. It follows that economic policies aimed at facilitating the access to these resources could help increasing the adoption of improved maize production technologies and further promote the agricultural development in the country. In another work, Kassie, Stage et al. (2018) evaluate the economic and social impact of the push-pull farming systems (i.e. combinations of intercropping, trap crops, and the use of insect pheromones) to control pests and improve crop yields. Authors rely on a randomized control trial that was conducted in Western Kenya (where maize is the main staple crop) and survey data from 930 households: they estimate that the adoption of the push-pull system increases household income by 44% and reduces the incidence of food insecurity by 50%. Moreover, the authors highlight a positive impact at social level, such as reduced child labour (by 9.3%) and increased women's empowerment (by 11.5%). Results show the importance of promoting the adoption of the push-pull system as a mean of improving economic and social welfare in rural communities in Kenya and other developing countries. The promotion may take place through development and dissemination of push-pull technology, support for access to credit, extension services, markets.

Multiple agricultural technologies are analysed also by Khonje et al. (2018), who analyses on the adoption of improved maize varieties, inorganic fertilizers, and herbicides in eastern Zambia. The authors find that the adoption of improved maize varieties and inorganic fertilizers is associated with a significant increase in per capita consumption expenditure, while the adoption of herbicides has a smaller but still positive impact. In addition to confirming that policies that improve access to credit and extension services could help promote technology adoption and ameliorate household welfare, they highlight the importance of considering the joint adoption of multiple technologies in agricultural development programs, as the impact of individual technologies can be influenced by complementary inputs and practices. The results also suggest that the welfare impact of technology adoption can vary across different technologies and contexts. Further research is needed to understand the mechanisms behind this result and to design effective policies and programs that can promote technology adoption and improve household welfare.

Differently from previous papers on the field, Wossen, Alene et al. (2019) present an empirical analysis using data from five African countries (Ethiopia, Malawi, Nigeria,

Tanzania, and Uganda), suggesting that agricultural technology adoption has a positive impact on household welfare, although the magnitude of the effect varies across countries, technologies, and welfare indicators. The authors also find evidence of heterogeneity in the impact of technology adoption, with the poorest households and female-headed households benefiting less from technology adoption than other households. Similar results can be found also in Biru et al. (2020), who argue that the adoption of agricultural technologies has a significant poverty-reducing impact on smallholder farmers in Ethiopia. Specifically, the authors estimate that the adoption of improved maize and wheat varieties, irrigation, and chemical fertilizers reduces the probability of being poor by 7.8, 6.5, and 5.1 percentage points, respectively.

Still on the Ethiopian side, Marennya et al. (2020) scrutinize the adoption and impact of sustainable intensification practices among smallholder maize farmers, finding that improved seed varieties, fertilizer use, and soil and water conservation practices, have a positive impact on maize yields and farm income. However, the authors note that the impact of sustainable intensification practices varies depending on the level of rainfall and unobserved heterogeneity, since the impact is higher under high rainfall conditions and for households with higher levels of education and access to credit.

Geffersa et al. (2022) also scrutinize the impact of improved maize adoption on farm household welfare in rural Ethiopia, and the likelihood of adoption. Paper's findings suggest that households that adopted improved maize varieties have higher income and are less likely to experience food shortages compared to households that did not adopt it. In addition, the study shows that the impact of improved maize adoption on income is larger for households with better access to credit, land, and extension services. The same factors (extension services, availability of credit, and market access) also affect the likelihood to adopt improved maize.

For the same country, Ethiopia, but concerning different technologies, namely climate-smart agricultural (CSA) technologies, Habtewold (2021) suggests that CSA technology adopters are 14% less likely to be in multidimensional poverty compared to non-adopters. By relying on household survey data, the authors find that the poverty-reducing impact of CSA technology adoption is highest among female-headed households and households with low initial levels of asset ownership. This suggests that CSA technologies have the potential to reduce gender and asset-based inequalities. Similar results can be found in Tesfaye et al. (2021), who confirms that innovation adopters in Ethiopia have significantly higher household income and expenditure compared to non-adopters. They also find that the innovation has a significant and positive impact on reducing the poverty incidence, depth, and severity. The study identifies several pathways through which technology adoption leads to poverty reduction, including increased productivity and income from agricultural activities, improved natural resource management, enhanced access to market opportunities, and increased resilience to climate shocks and stresses.

Antonelli et al. (2022) analyse instead the role of diversification of crop and of income-generating activities in rural adaptation to climate variability and change in Uganda⁴.

⁴ A substantial body of research in development economics has made significant strides in advocating for income diversification as a strategy to manage climate change-related risks. This trend is exemplified in studies such as Loison (2016). The rationale behind this approach is that the growing exposure to adverse climate risks can be alleviated by assembling a diverse portfolio of income-generating activities, thereby reducing the expected losses. In this context, rural households are inclined to diversify their income streams, often branching out into commerce, manufacturing, or other non-crop production

The authors use panel data collected from smallholder farmers over four years (2012-2015) and show that crop diversification has a positive and significant effect on household income, with each additional crop increasing income by about 6%. However, the diversification of income-generating activities does not have a significant impact on household income. Instead, diversification of both crop and income-generating activities have a positive and significant effect on household food security and poverty reduction, with each additional crop (income source) reducing the likelihood of food insecurity (of being poor) by about 5% (6%). The authors conclude that promoting crop diversification can be an effective strategy for improving household income, food security, and reducing poverty in rural areas of Uganda. However, policies that encourage the diversification of income-generating activities may not have significant effects on household welfare, depending on the specific context and characteristics of households, that must therefore be considered when designing policies to promote diversification for rural adaptation.

Still more recently, Kamara et al. (2022) analyse the impact of adopting improved soybean varieties on productivity and revenue among male and female-headed households in Nigeria by using a survey of 1,010 soybean farmers. The authors find that adoption of improved soybean varieties has a significant and positive impact on productivity and revenue among both male and female-headed households. However, the magnitude of the impact is higher for male-headed households, indicating a gender differential impact. The study identifies several factors that influence the adoption of improved soybean varieties, including access to credit, extension services, and market opportunities. The original contribution of the paper mainly consists in evidencing the importance of promoting gender equity in agricultural development programs and suggests that strategies that address the specific needs and constraints of female farmers could be effective in promoting their adoption of improved soybean varieties and improving their productivity and income.

Martey et al. (2022) assess the impact of *Striga*-resistant maize varieties and fertilizer use on maize yield and income in Ghana. The study used a panel data set of 600 maize farmers across three regions in Ghana for the 2016 and 2018 cropping seasons, showing that the adoption of such maize varieties and fertilizer use had a positive and significant impact on maize yield (with a 28% to 48% increase) and income (that increases by a minimum of 36% and a maximum of 60%). These findings emphasise the potential benefits of using integrated soil fertility management practices to address the challenges of soil degradation and low crop productivity in sub-Saharan Africa.

Finally, Oduniyi et al. (2022) examine the welfare impact of adopting conservation agriculture (CA) practices on smallholder maize farmers, based on a survey of 400 smallholder maize farmers in the KwaZulu-Natal province of South Africa. The study finds that smallholder maize farmers who adopted CA practices had on average 32% higher maize yields and 24% higher net farm income than non-adopters. Additionally, CA adoption led to improved food security and higher household consumption expenditure. The authors also acknowledge that access to credit and extension services are important drivers of CA adoption among smallholder maize farmers.

activities, as noted by Antonelli et al. (2022). Consequently, for farmers who rely primarily, or even exclusively, on a combination of rural assets including land, crops, livestock, and low-skilled family labor for income and sustenance, the decision to diversify their activities within such a volatile and weather-dependent environment becomes a crucial one.

4. The ProSmallAgriMed project

ProSmallAgriMed (Promoting soil fertility, yield and income in smallholder agriculture of semiarid and arid Mediterranean regions by management of beneficial soil microbiota, conservation agriculture and intercropping) is a project part of the *Partnership for Research and Innovation in the Mediterranean Area (PRIMA)* Joint Programme. *PRIMA*'s purpose is to generate creative solutions for enhancing the efficiency and sustainability of food productions and water quality/availability, in order to foster inclusive well-being and socioeconomic growth in the Mediterranean Region and contribute to the EU's climate change adaptation goals.⁵ In particular, the project is strictly related to the "Section 2 Call 2020 - Thematic Area 2 - Farming systems: Redesign agro-livelihood systems to guarantee resilience", which addresses fundamental aspects of sustainable intensification by implementing conservation agriculture systems, supporting the effective use of water, and boosting cultivated biodiversity in space and time, with relevant implications for natural and agriculture-associated biodiversity in both water-limited and non-water-limited socio-agro-ecosystems.

Strictly following the proposed masterplan, the *ProSmallAgriMed* project "aims to promote the rational use of beneficial soil microbiota and to improve small farmer agronomic practices to enhance the productivity of inter-cropped perennial (cactus pear) and short-term species (field crops and vegetables)", as well as "to promote synergistic cooperation between farmers and the value chain" (Era Learn, 2020). The project's results are likely to increase the farmers' chances of improving yield, yield stability, profit, and profit stability both within and between cropping seasons, by protecting soil from diminished fertility and erosion, as well as enhancing both functional and total biodiversity. In particular, "the optimization of such practices in water-limited environments will contribute to food security by (1) enhancing carbon sequestration and ensuring soil fertility; (2) expanding land coverage in space and time, thus supporting soil conservation and water use efficiency; (3) improving yields for consumption as food, feed, or industrial transformation; (4) increasing the nutritional quality of crop products; and (5) guaranteeing water and soil quality by decreasing chemical inputs. Such goals will be pursued by stimulating smallholder associations by increasing their expert knowledge and ability to interact each other and with various actors of the value chain, and by modulating new agronomic practices to be tested in real-life field conditions" (Era Learn, 2020).

The project stems from the need to promote the ability of small-scale farmers in arid and semi-arid Mediterranean areas to scale up the value chain with cropping systems that can combine sustainability and resilience. These fundamental objectives are being pursued also by studying the economics of their implementation and fostering the planting of beneficial microorganism production systems that can be reused on site or even used in other contexts. In fact, microorganisms from arid environments could play a crucial role in boosting yields in Mediterranean countries in the light of climate change. Conservation soil management also plays a key role in the project, since increasing the amount in organic matter while reducing or eliminating tillage will promote the soil's water holding capacity and reduce evaporation losses. This is critical

⁵ See <https://www.era-learn.eu/network-information/networks/prima>.

for both boosting yield and profit in arid and semi-arid environments, as well as in relatively humid environments (such as Northern-Central Italy, Southern France, and some Spanish areas). By integrating new biotechnologies, mixed *inocula* formulations containing AMF (*arbuscular mycorrhizal fungi*) and PGPB (*plant growth-promoting bacteria*) with intercropping practices, the project sets out to ensure soil fertility, reducing carbon emissions, expanding land cover in space and time, with beneficial effects on soil conservation and water use efficiency.

For the project, a consortium of 11 units from five different countries (Algeria, France, Italy, Morocco and Tunisia) was created, including members of different kinds, namely academies, research institutions, enterprises and associations. The consortium composition is aimed at guaranteeing that basic and applied knowledge, instruction and training, technological transfer, dissemination, socio-economic benefits will be provided. In addition, the different geographical provenience will allow to test the proposed methodology under different environmental conditions. The economic evaluation of the benefits of the innovative technologies will be made by comparing production costs as well as expected revenues of traditional and new methods. This requires collecting information about the socio-economic conditions of farmers from the different countries involved in the projects, the technical data concerning current and innovative production technologies as well as the macroeconomic and environmental conditions in which the farmers operate. Causal inference methodologies require retrieving data referred to a time span covering both the pre-adoption and the post-adoption periods, which requires establishing a solid cooperation with farmer and the local cooperatives supporting them.

The process of know-how transfers from Europe to North African countries in the improvement of crop water efficiency and in the development and production of beneficial microbial *inocula* is intended to provide farmers with a competitive edge and result in high-quality goods. This transfer will also encourage the creation of start-ups in the Maghreb that specialize in the manufacturing of tailored, high-added-value *inocula* based on indigenous beneficial soil bacteria. The project's findings, in addition to potentially giving a model for the sustainable cultivation of various crops in both water-limited and non-water-limited socio-agro-ecosystems, are meant to increase the food and by-product production per unit area and time, to support the ecological and agro-ecological conditions of semiarid and arid areas (by means of a rationalization in the employment of chemical inputs, a reduction of soil erosion and water loss, and an increased resilience to climate change), to improve the socio-economic conditions of both farmers and countries hosting new enterprises, as well as the absorptive capacity of local smallholder farmers.

5. Conclusions

There is a vast empirical literature in agricultural economics analysing the impact of innovative technologies in agriculture and the factor influencing the likelihood of adopting it. Despite the recent rise in contributions focusing on the welfare and economic growth consequences of agricultural innovation in sub-Saharan countries, scholars agree that rigorous empirical analysis is needed to address the potential endogeneity of technology adoption and the complex nature of household welfare, since the evidence on the subject remains limited and inconclusive.

This paper responds to this appeal by offering a review of the most recent articles on the subjects and an overview of the *ProSmallAgriMed* PRIMA project, whose goals

relate to the improvement of the socio-economic conditions of both farmers and countries adopting the technological innovation developed through the project itself. The project aims at providing a large-scale model for the use of beneficial microbiota and intercropping systems in the cultivation of intercropped perennial (cactus-pear) and short-term (field crops and winter-grown vegetables) species in semiarid and arid Mediterranean regions. By explicitly including, among its goals, the economic evaluation of benefits stemming from the innovative technologies developed through the project, *ProSmallAgriMed* aspires to offer both a state-of-the-art and an agenda for opening up avenues of research on the advantages, including the economic ones, of innovation in the production of crops in water-limited agro-ecosystems. As highlighted by the scientific literature on the impact of innovation in agricultural methodologies, the results of the project may inform policies that protect small farmers by supporting research for the development of appropriate technologies, improving farmers' access to credit and markets and promoting the development of rural infrastructure. Given the multifaceted nature of household welfare and potential endogeneity of technology adoption, more empirical research needs to be done to understand the impact of technology adoption on agricultural productivity, income, and poverty reduction.

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