AN ANALYSIS OF RECENT DEVELOPMENTS IN MALTA’S AIR CONNECTIVITY

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Policy Note

November 2020

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The views expressed in this paper are the authors’ own and do not necessarily reflect the views of the Central Bank of Malta.

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Abstract
In recent years, global air connectivity experienced an expansion unrivalled by any other form of transport, with considerable technological advancements making air travel increasingly efficient. Such connectivity improvements were also observed in Malta, with the country’s inherent geographical characteristics giving air travel a major advantage. Air connectivity is especially important to support the country’s economic sectors through various channels, especially those which are intrinsically directly dependent on air travel, such as the tourism and aircraft maintenance industries. This paper describes developments in Malta’s air connectivity since EU membership through the integration of various data sources such as Malta International Airport statistics and airline schedules, amongst others.
This analysis shows significant route development from the Maltese Islands between 2005 and 2019, heavily influenced by the introduction and increased operations of low-cost carriers. In fact, when analysing the airlines propelling such connectivity developments, a clear shift from network carriers to low-cost carriers have characterised recent years. The passenger flow analysis, however, shows that links to important hubs and large airports, often exclusively served by network carriers, remain central connections to Malta. In fact, although direct long-haul flights are lacking, almost every country across all continents is just two flights away through secondary connections, highlighting the importance of connectivity to these large hubs. While COVID-19 has wiped out a significant number of direct connections from Malta, including connections to important hubs, restoring such connections or establishing alternative ones, will be crucial for the economy to benefit from the eventual global recovery in a post-pandemic environment.

JEL Classification: Z3, Z30, Z32, Z38

Keywords: Connectivity, Air travel, Tourism, Airlines, Malta
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Executive Summary

Over the past years, air connectivity in Malta has been characterised by significant developments, mirroring similar growth experienced in global air connectivity. This development was further fuelled by the strong economic and population growth experienced in Malta during recent years. While the link between air connectivity and economic growth has long been studied and established, the COVID-19 pandemic is proving to be an unprecedented global shock on the air travel industry. Consequently, analysing the characteristics shaping Malta’s air connectivity in recent years provides policymakers with a sufficient background when trying to reinstate previous level of connectivity. This study focuses on data obtained through various sources from multiple stakeholders, including Malta International Airport statistics, statistics from multiple European airports, as well as airline schedules.

What is the relationship between air connectivity and the economy?

With aviation amounting to a significant fraction of global GDP, understanding the underlying relationship of air connectivity and the economy is key for policymakers, since it plays a fundamental role in unlocking the full economic potential of a country. The extent of a nation’s air connectivity is largely influenced by four key characteristics, namely; (1) geographical location; (2) airport infrastructures; (3) airlines; and (4) the regulatory/economic frameworks adopted by nations. In turn, the link between GDP growth and air connectivity is bi-directional. Air connectivity plays a key role in facilitating economic development through various channels including: direct, indirect, induced and catalytic impacts. On the other hand, a country’s economic growth can also have significant effects on air connectivity. For example, the development of infrastructure such as airports provides an opportunity to promote exports (such as tourism), enhance business operations and productivity as well as influence company location and investment decisions.

How has Malta’s air connectivity changed in recent years?

In 2016, Malta International Airport registered 4.7 million total passenger movements, almost a 2 million increase from that registered in 2005. In both years, the largest share in passenger movements relates to UK & Ireland, followed by Germany, Austria & Switzerland, Italy and France & the Benelux. Eastern Europe and South-eastern Europe & the Levant experience strong improvements, with Northern Africa experiencing the worst regression. In 2005, Malta had 84 direct air connections, with 60 of these analysed due to data limitations. In 2019, route connectivity from Malta improved drastically to 125. This meant that in 2019, Malta was directly connected to 40 countries, in contrast to 27 direct country connections in
2005. This is a result of connections established to 14 new countries, with Libya being the sole country to drop out between the two years. Notable improvements in Eastern European and Middle Eastern connectivity is noted, including countries such as the Baltic states, Poland, Ukraine, Slovakia, Romania, Serbia, Northern Macedonia, Jordan, and Qatar. Airports served by network carriers exhibit stronger passenger flows than airports served exclusively by low-cost carriers. Hence, large European hubs such as London Gatwick, London Heathrow, Rome Fiumicino, Frankfurt and Munich airports amongst others are intrinsically more important as a connection to the Maltese Islands than other low-cost connections across Europe. The distance analysis shows that long-haul flights, which are commonly defined as flights longer than six hours or more than 4100 kilometres of distance are still lacking, with no direct connections within such criteria in both years. However, if we expand the analysis to include indirect connectivity, the picture is extremely different. In fact, the secondary route analysis shows that while limited trans-continental flights are directly available from the Maltese Islands, flights to all continents are amply available via connections offered from large hubs directly connected to Malta.

**Which airlines are responsible for recent air connection improvements in Malta?**

In 2005, Air Malta was by far the most dominant airline operating from the Maltese Islands, responsible for 57% of all total passenger movements to and from Malta during the year. Upon the introduction of low-cost carriers in 2006, Air Malta’s share in passenger flows decreased significantly over time, standing at 28% in 2017. For Ryanair, total passenger movements rose from just 1% upon the airline’s commencement of operations from Malta in 2006 to 36% in 2017. Easyjet has not experienced the same growth that Ryanair has shown, seeing its share decline to 5% in 2017. Wizzair on the other hand commenced operations to and from the Maltese Islands in 2013 and has increased its passenger movement share consistently, reaching 5% in 2017. Against this background, analysing the routes of the top five airlines operating from Malta over time provides an interesting verdict. Air Malta and Lufthansa have seen minimal change to their destination offering. Mirroring the significant improvement in total passenger movement share, Ryanair went from having two connections in 2006 to over sixty connections in 2019. In 2019, Easyjet operated to five additional connections, with services now focusing on Italy and Switzerland in addition to its long-standing British routes. In 2013, Wizzair commenced operations with a single route to Budapest. With consistent yearly improvements, the airline offered 10 destinations in 2019, connecting Malta to seven countries.
**What are the policy implications of air connectivity in Malta?**

This in-depth analysis shows how air connectivity gives rise to a number of multifaceted economic benefits, mainly through direct, indirect, induced and catalytic impacts. Through the catalytic effects in particular, enhanced air connectivity is crucial in supporting various sectors and industries within the economy, especially those intrinsically dependent on air-travel, namely the tourism and aviation maintenance industries. Although no long-haul flights from Malta exist, the indirect connectivity analysis shows that Malta’s connections to large hubs enables connections to almost every country across all continents. Hence, policymakers should strive to retain and improve connectivity to these large hubs (such as the Doha route established in 2019). After surviving various exogenous shocks, air connectivity has suffered a significant blow in light of the COVID-19 pandemic. In fact, in 2020, over 50 direct connections were lost. While COVID-19 has wiped out a significant number of direct connections from Malta, including connections to important hubs, restoring such connections or establishing alternative ones, will be crucial for the economy to benefit from the eventual global recovery in a post-pandemic environment.
1) What is the relationship between air connectivity and the economy?

In recent years, global air connectivity has experienced significant developments. Ever since the first jet airliner took flight in the late 1940s, commercial aviation experienced more than seventy-fold growth (ATAG, 2005). This expansion is unrivalled by any other form of transport. With considerable technological advancements, air travel is becoming increasingly efficient, seemingly making the geographical distance between countries diminish. The International Civil Aviation Organisation (ICAO, 2020) defines air connectivity as “The movement of passengers, mail and cargo involving the minimum of transit points, which makes the trip as short as possible with optimal user satisfaction, at the minimum price possible”. Air connectivity is an essential part of meeting a country’s long-term economic growth objectives, since it facilitates international trade, investment and mobility and thus national and regional accessibility and development.

Notwithstanding the current economic downturn caused by the COVID-19 pandemic and its considerable effects on the aviation industry, long-term global air transportation is still expected to grow by 5% each year up to 2030 (European Commission, 2020). Across the European Union, aviation contributes significantly to the economy and labour market, supporting an estimated €300 billion, amounting to 2.1% of EU GDP (European Commission, 2020). Consequently, understanding the underlying relationship of air connectivity and the economy is key for policy makers since it plays a fundamental role in unlocking the full economic potential of a country.

The 4 pillars underpinning a nation’s air connectivity

The relationship between air connectivity and a nation’s economic prosperity is largely influenced by four key characteristics, namely (1) geographical location, (2) airport infrastructure, (3) airlines and (4) the regulatory/economic frameworks adopted by nations (Morphet & Bottini, 2014) (See Figure 1).

Figure 1 - The four pillars of air connectivity

Source: Author’s elaboration from (Morphet & Bottini, 2014)
Geographical location is an inherent characteristic, meaning that unlike other variables it cannot be changed. However, this can set the tone for a well-connected network. For example, various Middle Eastern and Asian countries such as the UAE, Qatar and Singapore lie within a radius reachable from a variety of continents. Consequently, these countries have exploited their geographical location to develop far reaching hubs, taking advantage of having a strong catchment area amidst major intercontinental air traffic flows. As an island in the middle of the Mediterranean, Malta lacks a physical connection to other countries. Other modes of transport that are available in other countries, such as railway or road travel, are absent. On average, between 2005 and 2016, almost all inbound tourists (98%) used air travel as their means of travel to Malta, with the remaining 2% travelling by sea (NSO, 2020). The country’s geographical location gives air travel a significant advantage in terms of avoiding substitution effects, while also intensifying the importance of air connectivity and its fundamental role in the economic development of Malta.

The second characteristic is airport infrastructure. Without proper infrastructure to exploit air connectivity, any latent air travel demand cannot be satisfied. Hence, good airport infrastructure is paramount for local businesses to take advantage of opportunities abroad and to facilitate the flow of tourists into a country. It is also essential for the importation of inputs into production and humanitarian needs.

Airlines and their related business model will also have a direct impact on air connectivity. Airlines operate in a highly competitive environment that is prone to various exogenous shocks. Examples of such shocks include terrorist attacks, natural disasters, fluctuating fuel prices, global recessions, and pandemics, such as the COVID-19 pandemic which has led air travel demand to plummet in 2020. In such a complex environment, airlines embrace different business models to survive. These can be generally categorized into three: network carriers, low-cost carriers (LCCs) and hybrid carriers. Network carriers usually operate around a main hub, providing a vast choice of destinations and consumer flexibility, to meet the demands of both leisure and business travellers. These carriers tend to offer crucial links and high frequencies to the global scene. In fact, various network carriers offer vital connections from the Maltese Islands, such as Emirates, Qatar Airways, Swiss and Lufthansa amongst several others. Low-cost carriers (LCCs) offer ‘no-frills’ air travel, aiming to generate demand by providing affordable airfares and by serving destinations previously unserved or only served indirectly via hubs. Their capacity to offer cheap airfares has opened the market to a wider group of consumers and has enhanced connectivity by establishing services to and from secondary airports. Within the Maltese context, the number of LCCs servicing Malta has increased significantly, with their presence providing cheap airfares to a number of new destinations that were previously not served directly. They have
also served to increase the frequency of flights to connections which were already established. With the increase in competition posed by LCCs and the various exogenous industry shocks, a number of network carriers have transitioned to the hybrid model. These airlines aim to provide an affordable service while still providing the flexibility and frequency to crucial connections that business travellers in particular desire. In fact, Air Malta has rebuilt its operations from a fully-fledged network carrier into a hybrid carrier (Air Malta, 2018). By combining the cost-saving methodologies of a pure low-cost airline with the route structure and service offering of a network carrier (Air Malta, 2018), Air Malta is aiming to provide the best of both worlds - offering affordable fares without sacrificing the level of service, flexibility and connectivity expected from a traditional network airline.

With these three characteristics in mind, the regulatory and economic framework adopted by nations helps to facilitate or hinder the development of the country’s air connectivity. Given the nature of air travel, international cooperation is therefore key. For example, the EU has worked to remove several restrictions which had hindered air connectivity in the past, and is also aiming to further ease airport capacity constraints and reduce flight delays via its Single European Sky initiative (Coito & Blaser, 2020). Malta’s air connectivity regulatory framework and policy adoption has had a significant impact on the country’s connectivity development across the years. Since the late 1950s, tourism in Malta has always been a central tool towards developing the Maltese economy (Attard, 2019). With inbound tourism plateauing during the mid-2000s, dialogues on the introduction of low-cost carriers gained traction in Malta during 2005. Subsequently, the Maltese government notified the European Commission with its intention of establishing an aid scheme, targeting the creation of new air connections which were inexistent or under-served at the time (European Commission, 2006). Such incentives proved fruitful. In 2006, Ryanair established routes to Luton and Pisa, with the airline launching services to various other airports across different countries in mainland Europe. Later, between 2006 and 2008, several other LCCs, including Easyjet, Vueling, Clickair, Norwegian Air Shuttle and Germanwings also initiated flights (Graham & Dennis, 2010), creating novel connections to and from the Maltese Islands (Figure 2).
Air connectivity and economic growth

The link between GDP growth and air connectivity is bi-directional (Morphet & Bottini, 2014). Air connectivity plays a key role in facilitating economic development through various channels including: direct, indirect, induced and catalytic impacts (ATAG, 2005) (see Figure 3). In fact, it is estimated that a 10% increase in air connectivity results in a 0.5% increase in a nation’s GDP per capita (Intervistas, 2015; MIA, 2015). On the other hand, a country’s economic growth can also have significant effects on air connectivity (Brida, Lanzilotta, Brindis, & Rodríguez-Collazo, 2014). For example, the development of infrastructure such as airports provides an opportunity to promote exports (such as tourism), enhance business operations and productivity as well as influence company location and investment decisions (Halpern & Bråthen, 2011).

Figure 3 - Flow of Direct, Indirect, Induced and Catalytic Impacts of Air Connectivity

Source: Author's elaboration from (OEF)
Direct Impacts

The first channel through which air connectivity provides economic benefits is through those activities directly arising from air travel. This includes airline and airport operations, aircraft maintenance and other related direct services, such as ground-handling. Furthermore, the sale of aircraft and related components is also considered as a direct economic impact.

The economic impact brought about by airline operations has been subject to considerable interest over time. This is largely a consequence of the strong interdependence of the two: a strong economic environment allows airlines to thrive and improve connectivity, while sustainable airlines with strong connections have the capacity to take risks in creating new connections. In particular, many studies analyse the rise in popularity of low-cost carriers and their related impact on connectivity and the economy as a whole. Analysing new routes launched in California by Southwest Airlines during 1990, Bennett & Craun, (1993) find a 55% fall in fare prices and a six-fold rise in passengers travelling along the Oakland-Burbank route. Southwest Airlines’ entry was also studied by Windle, Robert J. & Dresner (1995), who similarly find a 48% drop in the average fare price and a 200% increase in passenger traffic. The same authors later extend this analysis by studying the impact on routes of a new low-cost carrier, ValuJet, within a hub of an established network carrier, Delta Airlines. They conclude that Delta Airlines decreased fares on competitive routes terminating in Atlanta, in response to the competition posed by ValuJet (Windle, Robert & Dresner 1999). A number of studies (Aydemir, 2012; Goolsbee & Syverson, 2008) find evidence that traditional network carriers in the US reduce fare prices not only upon actual entry of a low-cost carrier, but also when faced with a threat of entry. Dresner, Lin, & Windle (1996) and Aydemir & Haytural, (2016) find that the entry of low-cost carriers within a market led to a substantial increase in traffic levels and lower yields, since passengers exploit the concept of arbitrage to obtain the best possible price for their required destination or route. Meanwhile, in a cost-benefit analysis on the introduction of low-cost carriers at four Portuguese airports, Costa and Almeida (2018) find that it leads to a positive net impact, via direct job creation, increased consumption by tourists as well as indirectly via a demand increase in other sectors. The entry of low-cost carriers in southern Italy was investigated by Donzelli (2010). The results show that it has led to an improvement in economic development, especially by improving low-season tourist arrivals and via job creation. On the other hand, Pratt & Schuckert (2019) find minimal net economic contributions from low-cost carrier introduction within a mature transport market. A country with a saturated transport network may find the benefits usually associated with low-cost carrier introduction limited in scope. Hence, the development stage of the transport market is fundamental when considering strategy development or potential policy implications.
The role played by airport operations in sustaining economic benefits from enhanced connectivity is also documented. Coto-Millán et al. (2014) measures and compares the productive efficiency of 35 Spanish airports from 2009 to 2011, and in a second-stage regression, the authors find that airport size has a positive impact on technical and scale efficiency. Other studies (Costa & Almeida, 2018) note how airports are fundamental in driving economic activities of towns, cities and surrounding areas, with several other literature similarly showing the importance of airports as a driver of regional, economic and social development by boosting new public and private investment and increasing employment. However, not all regional airports deliver growth. For example, regional airports that provide connectivity to the economic core and which cater for business travel are associated with economic growth in remote areas, whilst those catering for private travel, especially outbound travel, may actually reduce economic activity in the region (Allroggen & Malina, 2014).

**Indirect and Induced impacts**

The second channel through which air connectivity derives economic benefits is via the indirect and induced impacts. Indirect impacts are activities generated by the suppliers of the air travel industry, such as construction firms, manufacturing firms, food and beverage producers and several other firms providing ancillary services to the air travel industry. Meanwhile, induced effects arise from the additional spending by individuals employed, either directly or indirectly, within the air travel industry.

**Catalytic impacts**

The direct, indirect, and induced impacts lead to a further third channel through which air connectivity impacts the economy. In a trickle-down manner, these impacts are believed to lead to wider and broader benefits to the economy as a whole. These include impacts on trade, tourism, investment and location decisions, the labour market, social welfare, productivity and business operations as well as innovation, amongst others.

A fundamental economic benefit of enhanced air connectivity is its spin-off effect on international trade. International trade plays a fundamental role in promoting economic growth in countries, irrespective of their development stage. It enhances the global reach of firms, enabling them to get products to markets rapidly, responding to customer needs in a timely manner and thereby contributing to improved living standards (ATAG, 2005). Enhanced connectivity also encourages nations to specialise in industries in which they possess a comparative advantage. Consequently, improved air connectivity has resulted in significant reduction in barriers to international trade, increased specialisation, globalisation and faster technological advancements.
A crucial catalytic effect of air connectivity is undoubtedly its impact on tourism. Air transport is indispensable for tourism, particularly for remote and island destinations. It has contributed to expanding the range of tourist destinations available to individuals, thereby playing a major role in reshaping the scale and diversity of worldwide tourism. Tourism directly supports jobs in airlines and airports, with the expenditure of visitors creating a vast number of jobs within the tourism industry. The tourism industry is characterised by strong ties with other industries, including agriculture, fishing and construction amongst others. Hence, particularly in developing countries, it is a major contributor to the balance of payments as well as being a significant source of foreign exchange (ATAG, 2005).

Strong connectivity is also an enabler of investment, both into and out of countries. Practicable air connections are one of the fundamental considerations which influence where international companies invest. Healey and Baker (2003) find that 56% of companies consider international transport links to be an essential factor for locating business in Europe. Similarly IATA (2005) show that 18% of businesses' past investment decisions were directly influenced by the absence of good air transport links, especially in high tech sectors. Furthermore, 28% of firms believe that innovation and investment in R&D would be negatively impacted by limited air connectivity.

The labour market is heavily influenced by the extent of air connectivity. In the direct sense, the air transport industry is one of the most efficient sectors when measured in terms of GDP per worker, since the industry is highly capital-intensive and usually concentrated in developed economies. Consequently, it contributes to a higher-than-average contribution to the global economy since GDP per worker is generally higher. Employees employed directly within the air transport industry also tend to be highly skilled, trained and experienced. However, air connectivity is even more important to the labour market in the broader sense: making it easier for firms to attract high quality employees around the world. This is crucial for employees and professionals, with over 43% of individuals (IATA, 2005) stating that good air connectivity influences their decision on where to live and work. The link between enhanced connectivity and the labour market is well documented. Sheard (2019) find significant increases in employment shares in tradable services, with some effects on local employment levels, with the airport expansion creating jobs for both existing residents and migrants to the area. Meanwhile, McGraw (2015) find strong employment effects in non-tradable businesses and the professional services sector, but no growth in wages. This suggests that the gains through aviation accrued to employers and businesses but not to employees. Blonigen & Cristea, (2015) provide a quasi-natural experiment by exploiting the 1978 Airline Deregulation Act in the US to study the effects of air traffic changes to local population, income and employment. While authors find significant income impacts, the
deregulation could arguably have had uniform effects on all metropolitan areas (Wong, 2018). Ram, Reeves, & James (2002) focus on small island nations in the Caribbean. By applying a modified gravity model, the authors estimate the impact of connectivity improvements, both in terms of air traffic and for the wider economy. The authors find that high entry costs were the main barriers to weak intra-regional air connectivity, but policies to remedy such costs can lead to an increase of 288,000 long-term jobs as well as a $4.4 billion increase in GDP across the Caribbean. Whilst there are mixed findings on the impact of airports there seems to be a consensus in the literature that airports in the peripheral regions have some stimulating effect on employment and population growth. It is likely that these population changes and employment effects are largely re-distributive, that is, economic activity shifts to locations with air accessibility from locations which are less accessible. Specifically, econometric tests indicate that increasing air services leads to economic growth in peripheral regions in the US (Mukkala & Tervo, 2013) and in remote, rural or regional areas in Australia (Baker, Merkert, & Kamruzzaman, 2015). An often-quoted finding is that a 10% increase in air traffic passengers causes a 1% increase in service sector employment (Brueckner, 2003).

An often disregarded spin-off effect arising from enhanced air connectivity is the social welfare improvement it provides to citizens through a wider choice of destinations around the world, hence improving their leisure time and cultural experiences, as well as providing an affordable means to visit distant friends and family. In economic terms, the enhanced connectivity enters as a positive factor in an individual’s utility function (Wong, 2018).

Productivity and business operations benefit significantly from improved air connections. Air services permit better contact and communication between buyers and sellers, hence enabling companies to make new sales and to meet the needs of existing and new customers. Furthermore, the global supply chain is becoming increasingly dependent on the rapid and reliable movement of high-value, low-weight goods. Air connectivity facilitates such movements by providing fast and reliable delivery, improving companies’ handling of returns and complaints, facilitating the development of e-commerce and improving stock-management and production techniques. The proximity of an airport was ranked second in location-specific factors for businesses in remote regions, with businesses in the service sectors with offices or departments abroad valuing it the most (Halpern & Bråthen, 2011). Furthermore, it decreases the cost of interaction between people, hence improving the human capital stock, levels of interactions and exchange and most importantly, technology and knowledge diffusion.
In fact, innovation and knowledge spill-overs are important catalytic effects arising from improved connectivity. Very few studies have extended the analysis of aviation infrastructure and regional economies to investigate potential knowledge spill-overs and innovation. Catalini, Fons-Rosen, & Gaulé (2016), via a difference-in-difference framework, analyse the impact of Southwest Airlines’ entry on chemistry research collaborations. The authors find a 50% increase in collaboration between scientists residing in these connected city-pairs. Meanwhile (Wong, 2018) show that a 100-point increase in connectivity brings about 6 new inventors getting patented and 2 unique, first-inventor level, patents. This provides evidence on the innovation impact of air connectivity, enabling interactions that otherwise would not have taken place, or would have been much more costly.

Crucially, enhanced air connectivity is also vital for citizens seeking medical treatment abroad. In fact, according to the Maltese government, every year there are over 800 cases requiring treatment abroad, including around 150 children (Malta Independent, 2018). Similarly, increased air connectivity also provides an easier platform for Maltese students looking to farther their studies abroad, making connections between Malta and other countries less cumbersome. This is especially important for countries with small economies like Malta, with such factors enhancing the quality of the Maltese labour force and educational attainment of individuals, as well as enhanced quality of life through improved healthcare offering.
2) How has Malta’s air connectivity changed in recent years?

This section analyses in detail how air connectivity between Malta and other countries has developed in recent years. In 2016\(^2\), Malta International Airport registered 4.7 million total passenger movements, almost a 2 million increase from that registered in 2005 (Figure 4). In both years, the largest share in passenger movements relates to UK & Ireland, followed by Germany, Austria & Switzerland, Italy and France & the Benelux, with Italy rising to second in 2016. Significant improvements are noted in Eastern Europe and South-eastern Europe & the Levant, both surpassing Nordic countries in 2016. Similarly, passenger movements from the Iberian and Arabian peninsulas improved their ranking between the two years, with Russia seeing its ranking fall when compared to 2005. The Baltic region is a new entry within the ranking when compared to 2005, while Northern Africa lost both in terms of absolute passengers and in terms of ranking.

\(^2\) Disaggregated data is available up to 2016. Hence this section compares 2005 with 2016, rather than 2019.
**Mapping the change**

Due to data availability, the previous section compared total passenger movements between 2005 and 2016. The following analysis however extends the analysis to 2019, given data on this year is available. By illustrating all the airports with a direct flight connection\(^3\) at any point in time during 2005 and 2019, we can graphically analyse the improvements in connectivity between the two years. The figures for 2005 depict connections by network carriers since low-cost carriers were not operational until 2006. On the other hand, figures for 2019 depict connections by both network carriers and low-cost carriers. Connections served exclusively by traditional network carriers are illustrated by a red marker in Figure 5 below, while any connections served exclusively by a low-cost carrier or by both network carriers and low-cost carriers are illustrated by a blue marker (Figure 5). In the region-by-region analysis (Figures 7-17) these are replaced by square and diamond icons, respectively. It is important to qualify that between 2005 and 2019, some connections have since been introduced and subsequently scrapped. The following analysis compares exclusively the two years in question. Chartered flights are excluded.

In 2005, Malta had 84 direct air connections. Due to limitations in data availability, only 60 of these direct air connections are analysed\(^4\) (Figure 5, Panel A). 54 of these destinations connected Malta with mainland Europe (including West Russia and Turkey), while 5 connections connected Malta with Northern Africa. The remaining connections linked Malta with Dubai, a popular international hub in the Middle East.

In 2019, route connectivity from Malta improved drastically to 125 (Figure 5, Panel B). The number of connections to mainland Europe increased to 118, while the Middle East saw an increase of 3 connections. Meanwhile, mirroring the decrease in passenger movements as shown in Figure 4, Northern Africa was the only region to register a drop in connectivity.

This means that in 2019, 90 of the 125 connections are now served, either exclusively or in part by low-cost carriers. Meanwhile, connections served solely by network carriers add up to only 37 of the 125 connections, hence responsible for less than a third of total connections from Malta in 2019.

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\(^3\) Following Malta International Airport’s definition of connectivity (i.e. \(>= 20\) aircraft movements in a year)

\(^4\) The remaining 24 connections in 2005 amount to a negligible amount of total passenger movements: approximately 5% of total passenger movements for all the 24 airports together.
Figure 5 - Direct Connections from Malta (2005 vs 2019)

Panel A: 2005

Panel B: 2019

Source: Author
Air connectivity improvements between the two years meant that in 2019, the Maltese Islands were directly connected to 40 countries (Figure 6, right), in contrast to 27 countries in 2005 (Figure 6, left). This is a result of connections established to 14 new countries, with Libya being the sole country to have a direct connection in 2005, but not in 2019. Figure 6 illustrates this progress clearly, with a notable improvement in Eastern European connectivity. This includes the Baltic states, Poland, Ukraine, Slovakia, Romania, Serbia and Northern Macedonia. The Middle East also highlights important connectivity improvements, with Israel, Jordan and Qatar now also directly connected to the Maltese Islands.

*Figure 6 - Direct Country Connectivity from Malta (2005 vs 2019)*

Source: Author
Region-by-region analysis

United Kingdom & Ireland

For the UK, connections increased from 15 in 2005 (Figure 7, left), to 19 in 2019 (Figure 7, right), with notable increases in connectivity to Scotland and Northern Ireland. Route connectivity did not experience a dramatic increase in England, showing that Malta has been long well-connected to this part of the United Kingdom due to historical ties between these two countries. However, the frequency of flights and airlines serving such routes has intensified. In fact, all airports, bar London Heathrow airport are now served by low-cost carriers. The Republic of Ireland shows an increase of a sole connection, with a connection to Cork coupling the established Dublin connection in 2019. Interestingly however, in 2019 Ireland was exclusively served by low cost carrier Ryanair.

Italy

Analysing connectivity development with Italy highlights the extensive route development between Malta and its nearest European neighbour. In 2005, Milan and Rome were the only two connections present to mainland Italy, with two further connections to Sicily (Figure 8, left). In 2019, the total number of connections soared to a total of 19, 16 of which pertain to mainland Italy (Figure 8, right). Interestingly, only 4 airports were exclusively served by network carriers in 2019. Sicily maintained two connections, while a new connection was established with the island of Sardinia. The impact of low-cost carriers on Malta’s connectivity with Italy is clear, with the market now exhibiting strong competition among several airlines and an increase in destination choice for passengers.
**Germany, Austria & Switzerland**

Germany is another country with numerous long-standing connections to the Maltese Islands. In fact, in 2005, 8 connections were present (Figure 9, left). Although this rose to 12 in 2019, traditional network carriers held their strong presence in the country, still having 8 connections served exclusively by such carriers.

Switzerland has maintained the same number of connections, with the Zurich connection remaining solely served by network carriers, and a connection to Geneva, also served by low-cost carriers.

Although Austria remained connected solely to Malta via Vienna airport, low-cost carriers also served this route in 2019, significantly improving frequency of service to this destination.

**France & Benelux**

France and the Benelux region have seen significant improvements. Malta’s connections to France have developed from 5 in 2005 (Figure 10, left) to 10 in 2019 (Figure 10, right), with low-cost carriers responsible for the new connections. Interestingly, network carriers, namely Air Malta, have managed to consolidate their route exclusivity in four of the five connections existing in 2005.

Meanwhile, the Benelux region now has 6 connections, including 4 new low-cost connections, including two new connections to the Netherlands, a sole new connection to Belgium and a new connection to Luxembourg, which was not present in 2005. As the case in France, network carriers have maintained their exclusivity to important and large airports: Brussels National and Amsterdam Schiphol.
While the most significant increase in connectivity to a single country was in Italy, Eastern Europe was the region that experienced the greatest improvement in connectivity (Figure 11). In 2019, Malta had connections to 5 countries in the region which had no direct flights back in 2005: Poland, Ukraine, Romania, Serbia and Slovakia. Poland, in particular, went from having no connections in 2005, to having 6 in 2019, all served by low-cost carriers. Only two connections in 2019 were solely served by network carriers: Prague and Kiev.

**Figure 11 - Eastern Europe (2005 vs 2019)**

In 2005, Greece, Turkey and Cyprus all had a sole direct connection to Malta (Figure 12, left). In 2019, new exclusive low-cost connections were established in both Cyprus and Greece (Figure 12, right). Turkey meanwhile consolidated its traditional Istanbul route, which serves as a popular hub for transit flights to several countries. The Levant region meanwhile had no direct connections to Malta in 2005. In 2019, there were two routes, connecting Malta with Israel and Jordan. While the former is served exclusively by Air Malta, the latter is solely served by low-cost carrier Ryanair.

**Figure 12 - South Eastern Europe & the Levant region (2005 vs 2019)**
**Nordic Countries**

Nordic countries have seen modest improvements in connectivity. While Finland consolidated its seasonal Helsinki route via its national carrier Finnair, Norway and Sweden have seen the introduction of low-cost carriers. While in 2005 Norway was exclusively connected via Oslo (Figure 13, left), in 2019 three connections to Norway can be noted, two of which are served by low-cost carriers (Figure 13, right). Sweden retained three direct connections, with two connections in 2019 being served exclusively by low-cost carriers, and network carriers serving the main Stockholm Arlanda airport. Denmark meanwhile is still served by the same two airports, with these being also served by low-cost carriers in 2019.

**Spain & Portugal**

When analysing the Iberian Peninsula, it is clear that the advent of low-cost carriers has significantly improved air connectivity to and from the Maltese Islands. While in 2005 only two connections - to Madrid and Barcelona – were established (Figure 14, left), in 2019 Malta had 8 connections in Spain and 2 further connections in Portugal (Figure 14, right). Of these, only two connections were exclusively served by non-low-cost carriers, with Air Malta operating to Malaga and Lisbon.

**Arabian Peninsula**

In addition to the connections in the above section within the Middle East, Malta is also connected to the Middle East via the Arabian Peninsula. The Arabian Peninsula is still served exclusively by traditional network carriers, with a new route to Doha in Qatar complementing the long-standing Dubai route in 2019 (Figure 15). These serve as popular hubs for transit flights to several countries.
**Baltic States & Russia**

Since 2005, a significant connectivity improvement can be noted across the Baltic States. While in 2005 no connections were present (Figure 16, left), in 2019 3 connections to Estonia, Latvia and Lithuania were available (Figure 16, right). These connections are also served by low-cost carriers. Russia is still solely served by traditional network carriers, with Air Malta increasing a connection to St. Petersburg to complement its Moscow route.

**Northern Africa**

Northern Africa is the only region registering a drop in connectivity. In 2005, Malta had five direct flights to this region, providing gateways to Morocco, Tunisia, Libya and Egypt (Figure 17, top). In 2019, Malta had connections to a single airport in Morocco, Tunisia and Egypt. Libya was the only country to completely drop off the list of connected countries between the two years (Figure 17, bottom). This situation is attributed to heightened political instability in that country.
**Analysis by passenger movements**

While the above analysis confirms the strong improvements in airport connectivity between the years under consideration, in part thanks to new routes established by LCCs, it is worthwhile to investigate those connections which exhibit strong passenger movements.

Figure 18 below maps out the concentration of total passenger movements to and from Malta for 2016\(^5\). Clearly, airports served by network carriers exhibit much stronger passenger flows than airports served solely by low-cost carriers. Hence, large European hubs such as London Gatwick, London Heathrow, Rome Fiumicino, Frankfurt and Munich airports amongst others are intrinsically more important as a connection to the Maltese Islands than other low-cost connections across Europe. This is principally due to the enhanced destination offering to several airports and countries across the globe, hence acting as a gateway to the world, consequently enabling an elevated level of passenger flows into the Maltese Islands.

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\(^5\) Exhibiting the top 75 airports connected to Malta in 2016. 2016 is used since it is the latest data available.
**Analysis by distance**

Figure 19 plots developments in routes by distance between 2005 and 2019. Only routes shorter than 500 kilometres registered a drop between the two years, a result of the connectivity loss to Libya. Improvements in connectivity to Southern and Central Italy meant that the 501-1000 kilometre range improved by 9 connections. Meanwhile, in 2005 the 2001-2500 kilometre flight range proved to be most popular, with around 32% of all connections falling in this category. This was followed by connections having 1001-1500 kilometre range and those between 1501-2000 kilometres respectively, both categories responsible for around 23% of all flight connections in 2005.

As a result of the significant connectivity improvements to various European countries, as explained in the previous section, in 2019 the largest category comprised those flights having a distance between 1501 and 2000 kilometres, now responsible for a total of 28% of connections to Malta. Notable increases are also noted in the 2501-3000 kilometre bracket, with an increase of 9 connections meaning that in 2019 this range was responsible for around 11% of all flights from Malta. Connectivity to more distant countries, located at least 4000 kilometres away, is minimal. Only two flights in 2019, as opposed to the sole Dubai flight in 2005 fall within this range. Interestingly, long-haul flights, which are commonly defined as flights longer than six hours or more than 4100 kilometres of distance (Moffitt, 2020) are still lacking, with no direct connections within such criteria in both years.

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6 Distance based on Great-circle distance calculation between Malta International Airport and respective airports.
Is the world just two flights away?

After an extensive analysis on direct connectivity, it is also noteworthy to explore indirect connectivity to/from the Maltese Islands. The distance analysis in the preceding section clearly shows a lack of long-haul connectivity, hence preventing any direct connectivity to countries or hubs geographically far away from Malta.

However, if we expand the analysis to include indirect connectivity, the picture is extremely different. Figure 20 below shows connections available from the largest twelve hubs (denoted in green) directly connected to Malta⁷. This clearly shows that while limited trans-continental flights are directly available from the Maltese Islands, by connecting via one of these twelve large hubs, flights to all continents are amply available.

Figure 20 - Secondary/Indirect connections (2019)

Source: Author

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⁷ The 12 hubs analysed are: London Gatwick, London Heathrow, Rome Fiumicino, Frankfurt, Munich, Amsterdam Schiphol, Manchester, Istanbul, Paris Charles-De-Gaulle, Dubai Int’l, Madrid Barajas and Doha Int’l. Map does not include airports directly connected to Malta or any small regional airports.
3) Which airlines are responsible for recent air connection improvements in Malta?

*Figure 21 - Share of Passenger Movement by Airline (% 2005-2017)*

In 2005, Air Malta was by far the most dominant airline operating from the Maltese Islands, responsible for 57% of all total passenger movements to and from Malta during the year (Figure 21). Lufthansa was responsible for 4% of total passenger movements, while the remaining passenger flows are attributable to other network carriers operating from Malta at the time. Interestingly, Lufthansa’s share remained quite constant since 2005, with its share hovering between 3% and 5%.

The impact of low-cost carriers on Air Malta’s share is evident from Figure 8. Following their introduction in 2006, Air Malta’s share in passenger flows began to decrease progressively, standing at 28% by 2017. For Ryanair, the total passenger movements rose from just 1% upon the airline’s commencement of operations from Malta in 2006 to 36% in 2017.
Upon its introduction in 2008, Easyjet managed to capture 5% of total passenger flows during that year and followed such result by obtaining modest growth up till 2011, reaching 10%. However, Easyjet has not experienced the same growth that Ryanair recorded. On the contrary, its share declined to 5% in 2017. Wizzair on the other hand commenced operations to and from the Maltese Islands in 2013 and has increased its passenger movement share consistently, reaching 5% in 2017.

Interestingly, although the advent of low-cost carriers is clear from this analysis, in total, the share of passenger movements by low-cost carriers amounts to 49.3% of total passenger movements for 2016\(^8\). Meanwhile, network carriers were responsible for 48.3% of total passenger movements for the same year, just 1 percentage point less than the share for low-cost carriers. The remaining passenger movements relate to other charter airlines operating to and from Malta.

**Analysing airline route developments**

This section looks at the routes of the top five airlines\(^9\) operating from Malta over time. Route comparison for long-standing carriers, namely Air Malta and Lufthansa, is carried out between 2004 and 2019. Comparison of low-cost carriers is carried between the year of their respective commencement of operations from the country and 2019.

**Air Malta**

![Air Malta routes (2004 vs 2019)](image)

The national airline of the Maltese Islands, Air Malta, has seen minimal change to its destination offering when comparing 2004 with 2019 (Figure 22). Although some specific route changes can be observed, such as the reduction in Nordic routes and an increase in Eastern European routes, it has overall remained constant.

\(^8\) Latest year for which such data is available

\(^9\) Top 5 airlines by total passenger flows as at 2017 (latest year available)
Similarly to Air Malta, Lufthansa has consolidated its two routes to Frankfurt and Munich airports (Figure 23), offering gateways to the two largest airports in Germany and offering easier and increased connections to other destinations served by these airports and not directly served from the Maltese Islands, both for the leisure and business traveller (The Malta Independent, 2005)

**Ryanair**

Mirroring the significant improvement in total passenger movement share as shown in Figure 19 above, Ryanair went from having two connections in 2006 (Figure 24, left), to over sixty connections in 2019 (Figure 24, right), providing connectivity from Malta to several countries.
Easyjet

Figure 25 - Easyjet routes (2008 vs 2019)

In 2008, Easyjet commenced operations in Malta by offering two flights to Gatwick and Manchester, hence flying exclusively to the United Kingdom (Figure 25, left). In 2019, the airline operated to five additional connections, with services now focusing on Italy and Switzerland in addition to the long-standing British routes (Figure 25, right).

Wizzair

Figure 26 - Wizzair routes (2013 vs 2019)

Wizzair commenced operations in Malta in 2013, with a single route to Budapest (Figure 26). With consistent yearly improvements, the airline offered 10 destinations in 2019, connecting Malta to seven countries.
4) What are the policy implications of air connectivity in Malta?

This in-depth analysis shows how air connectivity gives rise to a number of multifaceted economic benefits, mainly through direct, indirect, induced and catalytic impacts. Through the latter in particular, enhanced air connectivity is critical in supporting various sectors and industries within the economy, especially those intrinsically dependent on air-travel, namely the tourism and aviation maintenance industries. Hence for an island like Malta, which is highly dependent on trade and tourism, as well as having a sizeable aviation maintenance industry, enhanced air connectivity is fundamental.

The analysis clearly highlights that when compared to 2005, air connectivity with the Maltese Islands was significantly enhanced by 2019. A key contributor was the introduction of low-cost carriers in 2006 and their extension thereafter, as these linked the country to several new countries which were previously never, or scarcely ever, connected to Malta. This is especially clear across Eastern Europe and the Middle East. Furthermore, apart from increased destination availability, the increased frequency of flights, airlines and consequently improved fare prices due to heightened competition have all contributed to improving further Malta’s connectivity.

The flight distance evaluation shows clearly strong improvements across almost all distance categories. One key inference however is that longer-haul flights to and from Malta are still lacking. In fact, only two destinations connect Malta to destinations at around 4000 kilometres from Malta in 2019 (Doha, Qatar and Dubai, United Arab Emirates), while technically, no long-haul flights are established. The indirect connectivity analysis shows that large hubs connected to Malta enable connections to almost every country across all continents globally. Hence, this shows that it is even more important to retain connectivity to these large hubs or establishing new connections to large hubs (such as the Doha route established in 2019) to open up even further options. This enables most locations in the world to be just two flights away from Malta.

Untapped potential may exist in terms of fully exploiting our advantageous geographic position in Malta itself serving as a hub between different continents, namely Africa and Europe. This may be especially true if African countries experience further economic growth and development in the future, hence using our geographical location to our advantage to capture any future demand.

Enhanced connectivity does have its downsides, however. Several negative externalities may arise, such as elevated air pollution, noise pollution, traffic, and pressure on local infrastructures. Furthermore, the negative impacts of improved connectivity on climate change are also an important consideration. In fact, aviation accounts to more than 2.5% of
global carbon dioxide (CO$_2$) emissions (Ritchie, 2020). Although this figure may seem small for global emissions as a whole, when taking into consideration the fact that more than 80% of the global population have never boarded a flight (Muilenburg, 2017), a figure mainly attributable to large inequalities worldwide, air travel does in fact account to a very large share on the personal carbon footprint of those who actually fly.

Improved connectivity through low-cost connections may lead to a situation whereby policymakers prioritize quantity rather than quality. Hence, by focusing more on the quality, rather than the quantity, of the tourists coming to Malta, policymakers may enable enhanced tourist expenditure as well as prioritizing larger and more important airports over small, regional, low-cost connected airports. This will also ease some of the pressure on supply-side constraints which may arise from mass tourism. In this light, policymakers may also aim to enhance demand during off-peak seasons, hence promoting year-round tourism.

Notwithstanding various exogenous shocks that occurred throughout the years, such as the 2008 global financial crisis, various airline collapses and terrorist attacks at various airports around Europe, air connectivity in Malta has recently remained quite resilient. In fact, improvements in connectivity and increases in passenger movements have been consistently registered over the past decade up to the early months of 2020. However, with the COVID-19 pandemic resulting in the unprecedented closure of Malta International Airport for travellers and quarantine requirements, air connectivity to and from the island has experienced a significant blow. Since then, connectivity has significantly declined due to a combination of demand and supply factors, with various airlines downsizing their operations from Malta.

In fact, Figure 27 below shows that between 2019 (Panel A) and 2020 (Panel B), direct route connectivity fell by over 50 connections to around 70 connections$^{10}$. Connections which have remained present have also experienced a decline in flight frequency and airline competition, hence compounding the negative effects of COVID-19 on connectivity. Crucially, connections to important European hubs are still maintained. However, other connections to large hubs such as Doha and Dubai have dropped out, hence severely hindering indirect connectivity.

$^{10}$ According to the 2020 summer schedule published by Malta International Airport
Figure 27 - Direct Connections from Malta (2019 vs 2020)

Panel A: 2019

Panel B: 2020

Source: Author
In light of this, the importance of retaining strong air connectivity for Malta intensifies. While COVID-19 has wiped out a significant number of direct connections from Malta, including connections to important hubs, restoring such connections or establishing alternative ones, will be crucial for the economy to benefit from the eventual global recovery in a post-pandemic environment.
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