

**AN ANALYSIS OF THE DETERMINANTS
INFLUENCING LABOUR MIGRATION – A
GRAVITY MODEL APPROACH: MALTA’S CASE**



Adonia Dalli

Dissertation submitted in partial fulfilment of the award of the
Degree of Master of Science in Economics, M.Sc. (Melit.)

April 2020



University of Malta Library – Electronic Thesis & Dissertations (ETD) Repository

The copyright of this thesis/dissertation belongs to the author. The author's rights in respect of this work are as defined by the Copyright Act (Chapter 415) of the Laws of Malta or as modified by any successive legislation.

Users may access this full-text thesis/dissertation and can make use of the information contained in accordance with the Copyright Act provided that the author must be properly acknowledged. Further distribution or reproduction in any format is prohibited without the prior permission of the copyright holder.

“Migrants make significant and essential
contributions to the economic,
social and cultural development of
their host countries and their communities back home.
But too often these contributions go unrecognized...”

Guy Ryder, ILO Director-General

DECLARATION OF AUTHENTICITY



L-Università
ta' Malta

FACULTY/INSTITUTE/CENTRE/SCHOOL FEMA

DECLARATIONS BY POSTGRADUATE STUDENTS

Student's Code 363988(m)

Student's Name & Surname ADONIA DALLI

Course MSc. ECONOMICS

Title of Dissertation

AN ANALYSIS OF THE DETERMINANTS
INFLUENCING LABOUR MIGRATION - A
GRAVITY MODEL APPROACH: MALTA'S CASE

(a) Authenticity of Dissertation

I hereby declare that I am the legitimate author of this Dissertation and that it is my original work.

No portion of this work has been submitted in support of an application for another degree or qualification of this or any other university or institution of higher education.

I hold the University of Malta harmless against any third party claims with regard to copyright violation, breach of confidentiality, defamation and any other third party right infringement.

(b) Research Code of Practice and Ethics Review Procedures

I declare that I have abided by the University's Research Ethics Review Procedures. Research Ethics & Data Protection form code 5071.

As a Master's student, as per Regulation 58 of the General Regulations for University Postgraduate Awards, I accept that should my dissertation be awarded a Grade A, it will be made publicly available on the University of Malta Institutional Repository.

ADalli
Signature of Student

ADONIA DALLI
Name of Student (in Caps)

24/04/2020
Date

Dedicated to my late father, Alessio.

ABSTRACT

Migration, without a doubt, is a crucial social and political debate across the globe. Particularly, increased migration during recent years has mainly pertained to labour migration, both temporary and permanent. As a matter of fact, the influx of foreign workers in Malta has increased significantly in recent years, rising over 55,000 in 2018 - equivalent to 22.5 per cent of employment in the country. The core objective of this research is to focus on identifying the main determinants in attracting such labour migration flows to Malta. Specifically, this research is primarily aimed at addressing relevant research questions currently of major interest in the country: (i) what are the key determinants that are attracting foreign workers to Malta, (ii) has the significance of such determinants changed over the years, and (iii) do such determinants vary depending on the country of origin of migrant workers.

A total of 60 countries were included in the sample population and the study was carried out using data that spanned over seven years (2012 - 2018). An augmented gravity model approach using pooled OLS estimation was run. In an effort to meet the research objectives, a number of specifications were estimated for different time periods (2012 – 2018, 2012 – 2014 and 2015 – 2018) and distinct migrant groups (all countries, EU nations and third countries). The overall findings correspond to literature in this field, with economic factors being indeed influential in the decision to migrate. Differences across years were also observed and variances in behaviours between EU nationals and TCNs were similarly established.

Keywords: *Labour migration, key determinants, gravity model*

ACKNOWLEDGEMENTS

I would like to show my sincere gratitude to my tutor, Mr. Clyde Caruana, for his guidance and contribution in the realisation of this work. This undertaking could have never been completed without the unconditional support of my loved ones, especially my mother Helen, my family, friends and colleagues, who have given me continuous encouragement during this time.

TABLE OF CONTENTS

DECLARATION OF AUTHENTICITY	iii
ABSTRACT	v
ACKNOWLEDGEMENTS	vi
LIST OF FIGURES	ix
LIST OF TABLES	x
LIST OF ACRONYMS	xi
 CHAPTER 1: INTRODUCTION.....	2
1.1 RESEARCH TOPIC	2
1.2 STUDY OBJECTIVE AND RESEARCH QUESTIONS	6
1.3 DISSERTATION STRUCTURE	7
 CHAPTER 2: LITERATURE REVIEW.....	10
2.1 INTRODUCTION	10
2.2 OVERVIEW OF THEORETICAL UNDERPINNINGS	11
2.3 EMPIRICAL EVIDENCE ON THE DETERMINANTS OF MIGRATION	17
2.3 DISCUSSION ON SOME MODELS UTILISED FOR INVESTIGATING MIGRATION FLOWS	28
2.4 CONCLUSION.....	31
 CHAPTER 3: THE MALTESE LABOUR MARKET AND THE COMPOSITION OF FOREIGN WORKERS	34
3.1 EMPLOYMENT IN MALTA	35
3.2 UNEMPLOYMENT IN MALTA	38
3.3 FOREIGN WORKERS EMPLOYED IN MALTA	40
3.4 DEMOGRAPHICS OF FOREIGN WORKERS IN MALTA	42
3.5 FOREIGN WORKERS BY OCCUPATION AND ECONOMIC SECTOR.....	46

CHAPTER 4: METHODOLOGICAL APPROACH.....	56
4.1 GENERAL GRAVITY MODEL	56
4.2 MODEL SPECIFICATIONS	59
4.3 DATA SOURCES	63
4.4 ETHICAL CONSIDERATIONS.....	67
4.5 ESTIMATION METHODS	67
CHAPTER 5: RESULTS AND DISCUSSION	74
5.1 MODEL TESTING.....	74
5.2 ESTIMATION RESULTS.....	77
5.2.1 Estimation results of overall labour migration.....	77
5.2.2 Estimation results for EU and TCN labour migration.....	82
5.3 CONCLUDING REMARKS.....	88
CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS	91
6.1 LIMITATIONS.....	93
6.2 FUTURE WORK.....	93
REFERENCES	96
APPENDIX A	106
APPENDIX B.....	107

LIST OF FIGURES

FIGURE 3.1.1: TOTAL EMPLOYMENT IN MALTA	35
FIGURE 3.1.2: EMPLOYMENT BY AGE COHORT (2018).....	36
FIGURE 3.1.3: EMPLOYMENT IN MALTA BY SECTOR (2018).....	37
FIGURE 3.2.1: NUMBER OF REGISTERED UNEMPLOYED PERSONS.....	38
FIGURE 3.3.1: TOTAL NUMBER OF FOREIGN WORKERS	40
FIGURE 3.3.2: EU NATIONALS BY TYPE OF EMPLOYMENT (2018)	41
FIGURE 3.3.3: TCNS BY TYPE OF EMPLOYMENT (2018)	41
FIGURE 3.4.1: FOREIGN WORKERS BY GENDER.....	42
FIGURE 3.4.2: FOREIGN WORKERS BY AGE GROUPS	43
FIGURE 3.4.3: TOP 20 EU NATIONALITIES (2018).....	44
FIGURE 3.4.4: TOP 20 TCN NATIONALITIES (2018).....	46
FIGURE 3.5.1: FOREIGN WORKERS BY MAJOR OCCUPATION GROUP (2018).....	48
FIGURE 3.5.2: DISTRIBUTION OF EU NATIONALS BY MAJOR ISCO GROUPS	50
FIGURE 3.5.3: DISTRIBUTION OF TCNS BY MAJOR ISCO GROUPS	51
FIGURE 3.5.4: SHARE OF FOREIGN WORKERS BY ECONOMIC SECTORS (2018) ...	52

LIST OF TABLES

TABLE 3.5.1: WORKFORCE BY NATIONALITY AND MAJOR ISCO GROUP (2018) ..	49
TABLE 3.5.2: SHARE OF FOREIGNERS EMPLOYED ACROSS DIFFERENT ECONOMIC SECTORS	53
TABLE 5.1.1: SPECIFICATION TEST RESULTS	74
TABLE 5.2.1.1: ESTIMATION RESULTS FOR AGGREGATE DATASET	78
TABLE 5.2.2.1: ESTIMATION RESULTS FOR EU COHORT	83
TABLE 5.2.2.2: ESTIMATION RESULTS FOR TCN COHORT	86

LIST OF ACRONYMS

AMECO	Annual Macro-Economic
EEA	European Economic Area
EFTA	European Free Trade Association
EU	European Union
GDP	Gross Domestic Product
ILO	International Labour Organisation
IOM	International Organisation for Migration
ISCO	International Standard Classification of Occupations
OLS	Ordinary Least Squares
PES	Public Employment Service
PPP	Purchasing Power Parity
RUM	Random Utility Maximisation
TCN	Third country national
UK	United Kingdom
USA	United States of America

CHAPTER 1: INTRODUCTION

CHAPTER 1: INTRODUCTION

“Certainly the biggest challenge for our businesses will be the recruitment of human resources. The state of ‘full-employment’ has led Malta’s private sector to experience large difficulties to fill vacancies that arise in order to meet the demand for goods and services.”

Frank V. Farrugia, President of the Malta Chamber of Commerce

1.1 RESEARCH TOPIC

Migration, the movement of people from one place to another, is a crucial social and political debate across the globe given its prominence in the formulation of a country’s population and labour market. In today’s world, the role of migration is not restricted to demographics, but rather, influences other aspects of social life, namely labour relations, politics, economics, and culture, amongst others (Ravlik, 2014). Different migrants, such as emigrants, immigrants, and refugees migrate for different reasons, which, in turn, are motivated by a number of multidimensional and interrelated factors. The process of migration has been further enhanced by the phenomenon of globalisation, which has made migratory patterns even more multifaceted. The European Union (EU) enlargement over the years has also given rise to this phenomenon, mainly through the right of free movement and residence for persons in the EU, and specifically, the fundamental principle of free movement of workers established in the Treaty on the Functioning of the European Union.

The increased eminence of migration during recent years has been mainly attributed to labour migration, both temporary and permanent. Rapid population ageing, decreasing fertility rates,

the refugee crisis, as well as expanding anti-immigration discourse have all contributed to pushing immigration related issues to the forefront of extensive political agendas. Whilst the impact of migration on the host country and country of origin is still widely deliberated, and without a doubt, tends to generate controversy especially in host countries, migration is also associated with positive impacts due the opportunities it can create. Migrant workers contribute to growth and development in destination countries by addressing labour market imbalances and contributing to taxes and social contributions, amongst other factors. In turn, the latter can help sustain pension systems for instance. Similarly, the countries of origin also benefit from emigration since a number of emigrants send remittances to family members in their home countries and make use of the skills acquired overseas upon their return. Notwithstanding, the migration process provokes complex challenges in terms of governance, infrastructure, migrant workers' protection, migration and development linkages, as well as international cooperation (International Labour Organisation, 2018).

Migration patterns tend to fluctuate substantially across time and countries, with a number of factors playing a key role in such trends. As a matter of fact, Malta was traditionally acknowledged as a negative net migrating country wherein a number of Maltese citizens left the country, primarily in pursuit of a better standard of living that, during such times, could only be attained in larger countries such as Australia, Canada, and the United States of America (USA). This situation was mainly observed after the Second World War and up to the early 1980s, with negative net migration in Malta nearing 30,000 individuals between 1950 and 1965, and decreasing to below 20,000 between 1965 and 1980 (Grech, 2015). However, over the years, this situation reversed. As Malta developed and its economy grew, it became a positive migrating country as robust demand for labour deterred incentives for emigration.

Economic growth in Malta has increased significantly over the past decade with real GDP growth rates reaching highs of 8.7 per cent and 10.8 per cent in 2014 and 2015 respectively, whilst fostering an average rate of 6.4 per cent between 2016 and 2018 (Eurostat, 2019a). The pace of growth has been amongst the highest in the EU, significantly exceeding the pre-crisis period (European Commission, 2017). Given the positive correlation between economic growth and job creation, employment levels have also experienced a rise during the same period. In fact, Malta was also at the forefront of its EU counterparts in this area, establishing the highest employment growth among member states in the third quarter of 2018 when compared to the previous quarter (+0.9 per cent) (Eurostat, 2018). Moreover, with female employment rates reaching record highs of 63.4 per cent in 2018 (Eurostat, 2019b), accompanied by record low unemployment levels, Malta has clearly exploited its human resources as demand is, by far, outstripping supply.

Undoubtedly, Malta's robust economic growth coupled with an ageing population and decreased fertility rates has resulted in an increased reliance on foreign labour. Over the past years, Malta has experienced an influx of foreign workers, so much so that they have more than doubled in the past five (5) years with approximately 45 per cent of employers in the country employing at least one foreigner (Times of Malta, 2019). With Malta's Central Bank projections for the Maltese economy establishing further economic growth coupled with increased job creation hovering between five (5) per cent and three (3) per cent up to 2021, a further intensification of the current labour shortages resulting in increased pressure to import additional foreign labour is expected. As a matter of fact, according to the head of Jobsplus Clyde Caruana, it is estimated that Malta will require an additional 13,000 foreigners in 2019 if it is to maintain its economic growth (Times of Malta, 2019). In view of this, it is crucial for

Malta to remain attractive to foreign labour, especially in the light of the large turnover rates of migrant workers, with over 25 per cent of such workers leaving the island within one (1) year of engagement, and 45 per cent leaving up to two (2) years after being employed (Borg, 2019). This implies that Malta is subject to a dual occurrence in relation to this sphere, simultaneously encountering both large inflows and outflows of migrants, which necessitates policymaking aimed at the forefront of enhancing the attractiveness of the country, and the retention of workers.

Malta's current situation compares well with Singapore's experience related to labour shortages over the years. Similar to Malta, Singapore's limited land area and population size meant that industries and employers could not solely rely on the domestic market, but required diversification in global markets (Lim et al., 1986). With the Government's strategy of industrialisation in the 1960s, Singapore quickly evolved from a stagnant economy with increasing unemployment rates, to a fast-paced growing economy in the 1970s and early 1980s, resulting in large labour deficits and with the number of permanent residencies increasing from 9,295 in 1980, to 21,659 in 1994 (Chew et al., 1995). Similarly, Singapore adopted a number of policies in order to retain its competitive advantage and to encourage foreigners to settle there in an effort to maintain its economic performance. In this regard, Malta should view Singapore as an exemplary country given the similarities between the two, and adapt accordingly to any effective policies in this field to maintain its competitiveness.

1.2 STUDY OBJECTIVE AND RESEARCH QUESTIONS

Even though research has been undertaken to examine the macroeconomic impacts of foreign workers on the Maltese economy and the length of stay of such workers, research delving into the analysis of the key elements attracting foreign workers to the local labour market is still very limited. Henceforth, this study is aimed at addressing this gap in the literature with a core objective to focus on identifying the main determinants in attracting such labour migration flows to Malta. Specifically, this research is primarily aimed at addressing relevant research questions currently of major interest in the country: (i) what are the key determinants that are attracting foreign workers to Malta, (ii) has the significance of such determinants changed over the years, and (iii) do such determinants vary depending on the country of origin of migrant workers. As European countries and other third countries are recovering from the financial crisis by gaining pace in economic growth and development, Malta must remain attractive to potential labour migrants to meet its rising demands. In view of this, the results attained from this study should be of interest to policymakers given that the drivers of migration are key in fostering successful migration policies to ensure that Malta's competitive advantage is exploited accordingly. Along these lines, the main hypothesis of this research is that economic variables have a significant influence on labour migration. Moreover, this study also aims at assessing the hypothesis that EU nationals are more responsive to wage differentials than third country nationals (TCNs).

Conventional perceptions suggest that international migration is a result of global differences across countries, mainly in levels of development in terms of wealth, health, and so on (De Haas, 2010). A priori, and based on the literature reviewed in the upcoming chapter, the

researcher expects to find that although aspects of both the source and host country play a role in the decision of an individual to migrate, pull factors, that is, factors that generally relate to features of the country of destination, tend to be of a greater influence on such a decision. Particularly, economic aspects of both countries, such as the unemployment rate which is an indicator of the probability of finding employment, have the highest impact in attracting and/or repelling foreign labour. As the economies of countries across the EU gained pace following the financial crisis, one would expect the importance of determinants to shift. Rather than moving to a new country for the sole reason of seeking employment, migrant workers are expected to consider a more holistic picture, including the standard of living which tends to be proxied through a wage variable. Moreover, foreign labour from EU countries is expected to consider living standards as more influential than migrants from third countries, given that the latter individuals tend to migrate primarily in pursuit for employment in order to send remittances back home.

1.3 DISSERTATION STRUCTURE

This thesis is segmented into six chapters. Chapter 2 reviews the existing literature and empirical evidence regarding the relationship in question. This section sheds light on the theoretical underpinnings in this field whilst also incorporating a detailed analysis of the determinants of migration, where both push and pull factors are highlighted accordingly. Chapter 3 provides an overview of labour migration in Malta. Whilst initially setting the context of the Maltese labour market, the chapter clearly outlines the composition of foreign workers in the local labour market over the past years. Moreover, Chapter 4 explains the methodological approach implemented to analyse the evolution of factors attracting labour migrants to Malta

and proceeds to describe the data utilised in undertaking this study. Once the respective models are run, Chapter 5 discusses the results obtained and their implications, whilst Chapter 6 summarises the overall results and conclusions attained from the undertaken research study.

CHAPTER 2: LITERATURE REVIEW

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Economics is concerned with the study of scarce resources and one of the basic premises of economics is efficiency, essentially ensuring the optimal allocation of such scarce resources in a manner that meets the needs of the economy. Human capital is also recognised as a scarce resource, which consequently, needs to be distributed efficiently amongst the widespread labour markets. Literature acknowledges the presence of an ‘immigration market’ where host and source countries compete in attracting or restricting potential human capital gains or losses. Similar to the trading of goods in the international goods market, persons are ‘traded’ via comparable boundaries in the immigration market (Borjas, 1989). Host countries compete in this market through various channels such as development, economic growth, legal and environmental issues, and so on. On the other hand, source countries enter this equation by enforcing regulations that limit the departure of their citizens in an effort to lower emigration to more developed countries. Though such methods are very limited in the European Union (EU) due to the rights of free movement, such practices tend to be more common in African, Asian, and South American countries. As a result, countries must compete in this immigration market via migration policies for potential human capital, thus implying that every country must exploit its competitive advantage to attract the relevant workers/migrants it requires.

Based on the International Organisation for Migration’s (IOM) definition, the term migrant *“should be understood as covering all cases where the decision to migrate is taken freely by the individual concerned, for reasons of 'personal convenience' and without intervention of an*

external compelling factor” (International Organisation for Migration, 2015). A number of interrelated dynamics play a crucial role in an individual’s decision to migrate to an external country other than his/her home country. Push factors, or rather, domestic forces, are conditions that act as stimuli for individuals to move away from their country of origin, whilst pull factors relate to aspects that attract people to a destination country. There are a number of interlinked factors involved with migration, which determine the size as well as the origin and destination countries of such migration. Empirical evidence suggests that the key determining factors associated with migration can be categorised into the following:

- I. Demographic factors: these reflect factors associated with the characteristics of the population in question; for example age, gender, and education level;
- II. Economic factors: these incorporate factors relating to the overall health of the economy such as the unemployment level, job opportunities, and economic growth;
- III. Political factors: such factors are associated with government policies and administrative practices such as immigration policies and corruption;
- IV. Cultural factors: these include factors which incorporate a set of beliefs or values of a nation such as the official language or religion;
- V. Environmental factors: these encompass factors that have an impact on the quality of life in the country in question which include climate conditions, food and water security, and so on.

2.2 OVERVIEW OF THEORETICAL UNDERPINNINGS

Acknowledging that international migration is influenced by various disciplines that include

economics, sociology, commerce, and law, amongst others, economists, demographers, and geographers across the globe analyse and evaluate migration in an effort to conceptualise theories to explain migration processes. A basic starting point is that migration is surely not a random process. It involves making a rational choice based on two crucial decisions; whether to migrate, or not, and if so, where to. The initial groundwork of analysing migration processes was set out by Ravenstein in the 1880s when he established the Laws of Migration. Based on his first paper in 1885, his laws can be summarised as follows:

- I. *“...migrants only proceed a short distance.”*
- II. Migration occurs in stages *“through a process of absorption.”*
- III. *“The process of dispersion is the inverse of that of absorption, and exhibits similar features.”*
- IV. *“Each main current of migration produces a compensating counter-current.”*
- V. Long distance migrants *“generally go by preference to one of the great centres of commerce or industry.”*
- VI. Urban dwellers migrate less *“than those of the rural parts of the country”*.
- VII. *“Females are more migratory than males.”*

The above-mentioned migration laws greatly influenced subsequent works in the field of modelling and conceptualising migratory processes (Gurieva et al., 2015). Although empirical evidence supports most of Ravenstein’s basic characteristics of such processes, the essential factors underpinning migration decisions are lacking in his findings. Thus, there is a need for more complex models that capture the different elements which play a role in migration developments.

Another ideology that dominates literature in this field is that migration is a function of spatial disequilibria, which forms the basis of the so-called 'push-pull' models (De Hass, 2010). In the mid-1960s, Everett S. Lee proposed a new approach aimed at developing a migration process framework. Although his approach has no official name, his econometric model is widely referred to as the Push-pull Factors Model and is generally connected to classical migratory theories. Lee (1966) suggested that the factors which play a role in the decision to migrate consist of positive factors which attract people to a country (+), negative factors that repel them from a country (-), and factors which people are essentially indifferent to (0). Furthermore, he categorised these factors into four aspects: (i) factors associated with the country of origin, (ii) factors associated with the destination country, (iii) intervening factors, and (iv) personal factors. Some of the factors outlined are expected to affect people in the same manner, whilst other factors affect particular people differently. Irrespective of how each factor varies across distinct individuals, for migration to occur, the balance in favour of the move must be larger than the natural inertia that is always present. Nonetheless, it is anticipated that a good climate is attractive whilst a bad climate is repulsive (Lee, 1966).

Michael J. Piore established the Dual-labour Market Theory in 1979, which moves away from the perspective that migration is a result of individuals' decisions, but rather implies that migration is a consequence of the intrinsic labour demands of developed countries. This theory suggests that migration is not brought about by push factors in source countries, but is rather an outcome of pull factors from the destination countries. This premise tends to be perceived as a limitation of this theory, as it does not capture the full picture of the migration process. It posits that demand for foreign labour stems from four fundamental features of industrialised economies, specifically: structural inflation, economic dualism, motivational problems, and

labour supply demography (Massey et al., 1994). An essential aspect underpinning this theory is the segmentation of labour markets, where the local workforce is expected to move to higher professional jobs, while immigrants take up lower-end jobs. This is explained by the fact that wages are not only perceived as the price of labour, but as a proxy to an individual's position in the social and occupational hierarchy (Bijak, 2006).

Moreover, the Neo-Classical Migration Theory is also a crucial foundation in the analysis of migration, perceived as one of the oldest and best theories of international migration. Essentially, it characterises the migratory process on two levels: the macro, and the micro level. This theory postulates that at the macro level, migration is driven by geographical labour market differences. Whilst countries of origin are dominated by excessive labour supply and lower wages, destination countries tend to be characterised by a higher demand and higher wages. This implies that migration can be viewed as a tool to reach equilibrium between countries since, as migration occurs, the supply of labour in source countries decreases and wages rise, as opposed to higher labour supply and restricted wages in destination countries (Massey et al., 1994).

Similarly, the micro level assumes that individuals make rational decisions with the aim of maximising one's utility. Hence, this implies that individuals are attracted to countries of residence that maximise their well-being. Such utility tends to be perceived by the increase in income attained when the individual migrates to a more developed country after accounting for the costs incurred. It is only rational for individuals to move from poorer to richer countries in search for higher wages and better employment opportunities. Thus, it is clear that a key factor in migration is the distinction in wage levels between territories of departure and arrival

(Gurieva and Dzhioev, 2015). In essence, based on this theory, migration can be viewed as a process that optimises the allocation of production factors as voluntary migration results in more efficient aggregate outcomes (De Haas, 2010).

According to this theory, the rational decision to migrate also features another important factor – employment level differences. The likelihood of whether or not an individual finds a job in the new destination country influences the decision of migrating. This reasoning was investigated by a number of scientists, with the Harris-Todaro Model being one of the most well-known methods of doing so. Based on this model, the rationality of migrating from rural to urban areas depends on net income rather than wage differentials (Harris and Todaro, 1970). Reinkowski and Mitze (2010) implied that the willingness to migrate is positive if the difference between the income in the destination country and any costs incurred to migrate is larger than the value of income in the country of origin.

Wages are viewed as the most important factor in shaping static macro level, Neo-classical migration modelling (Gurcinaite, 2014). Nonetheless, many researchers focus on a broader spectrum of migration's determining factors in an effort to bypass the limitations of this idea. As a matter of fact, Vujicic et al. (2004) investigated a sub-group of migrant workers, specifically health care professionals, and found that such individuals base their decisions to migrate on non-wage related factors rather than on wage differentials. Very often, actual empirical findings contradict key statements of the neo-classical theory. Notwithstanding, this theory is viewed as one of the critical starting points in evaluating migration processes.

The Keynesian Economic Theory is a critical viewpoint of the Neo-classical migration theory. Although it supports the Neo-classical theory's premise that labour supply is a function of wages, the two theories conflict each other in terms of wages. The Keynesian theory proposes that migration decisions are based on nominal wages rather than real wages. This difference is mainly attributed to the role of money in the economy. Whilst in the Neo-classical aspect money is merely a medium of exchange, in the Keynesian perspective, money is additionally perceived as a medium of saving. Given this difference in the function of money, the latter theory goes a step further since it proposes that potential migrants are also attracted to high nominal wage regions. Furthermore, intentions to return to the source country or to send remittances to family members also vary with the nominal wage when compared to the real wage. As a result, there may not be a new international equilibrium, as suggested by the Neo-classical economic theory (Jennissen, 2004). Nonetheless, Keynesian theory predicts that migration is still an equilibrium recovering mechanism as it removes unemployment differences across countries, rather than real wage differences.

Another complementary approach, which is perceived as combining some of the approaches highlighted above, is the Gravity Model for Migration. This model is founded on Newton's Law of Gravity and was initially utilised to estimate patterns of international trade. However, its use has recently been extended to examine and explain migration flows. Gravity models imply that flows between two countries are directly proportional to their size, generally measured by population, and inversely proportional to the distance between them, a factor which is typically used as a proxy for travelling costs (Ramos, 2016). Notwithstanding, in an effort to capture more factors that influence migration, gravity models tend to be augmented by other crucial push and pull factors. Although some perceive the results attained from these

models as not so straightforward, such models are deemed useful as they are conveniently derived from theoretical models like the random utility maximisation (RUM) model. RUM models portray the utility an individual gains from moving to one country, as compared to the expected utility gained if s/he moved to alternative countries. This understanding clearly provides a strong theoretical foundation for the model in question.

There are more theories in relation to migration, in terms of both its processes and decisions, in existence. However, the afore-mentioned theoretical underpinnings are perceived as the most useful in the light of the research evaluated in this dissertation. Other foundations, such as the ‘new economics of migration’, have not been explored as they solely focus on micro level decisions (i.e. individuals or households). Given that the present inquiry focuses on migration at the aggregate level, it is only reasonable for theories in this respect to be highlighted. In particular, it is clear that in the economic analyses of the determinants of migration, differential economic opportunity plays a fundamental role (Greenwood and McDowell, 1992). The following sub-section outlines empirical evidence on the determining factors of migration, using, amongst others, the econometric models as described above.

2.3 EMPIRICAL EVIDENCE ON THE DETERMINANTS OF MIGRATION

Existing literature on migration demonstrates that this field has been analysed from a number of different perspectives including internal or regional versus international migration, micro versus macro (aggregate) analyses, and so on. Despite the different viewpoints studied and varying methodological underpinnings, there seems to be a consensus that economic variables are the most significant and influential in the decision to migrate. Indeed, the majority of the

empirical evidence examined portrays this trend, specifically, that better economic conditions are the main reason for migration. However, it is worth noting that in spite of the extensive literature within this field, studies attempting to test the distinctive migration theories is rather limited.

Most historical studies on migration focus on immigration from Europe to other large countries such as the United States of America (USA) and Australia due to the long swings observed in this pattern. One of the first studies conducted by Jerome (1926) examined this relationship over a 100 year period preceding the implementation of the USA's immigration quotas in the 1920s. In line with Piore's (1979) declarations, he concluded that cyclical fluctuations in immigration from Europe were, to a large extent, a reflex of industrial conditions in the USA. Kuznets and Rubin (1954) further support Jerome's conclusions, in that short-cycle movements of European emigration to the USA is primarily attributed to economic conditions in the destination country. Similarly, Kelley (1965) studied migration into Australia over a 70-year period between 1865 and 1935. The author concluded that *"in the context of the push-pull controversy, another observation is thus added in support of the pull hypothesis"*, as unemployment rates in the host country proved to be a consistent key factor in explaining migration flows across the various models implied.

Literature on the subject also features a number of studies that examined Swedish migration to the USA during the late nineteenth and early twentieth centuries. Research delving into this relationship between Sweden and the USA has some contradicting findings. Whilst Thomas (1941) established that economic conditions in the source country (i.e. Sweden) are relatively more important than economic conditions in the host country, Wilkinson (1967) concluded that

fluctuations in the labour demand of the host country were more significant than those in Sweden. Quigley (1972) implemented a more sectoral approach by examining migration between 1867 and 1908 from the agricultural and non-agricultural sectors of Sweden to the USA. His regression analysis indicates that conditions in the specific sectors of both host and source countries are equally important. More precisely, Quigley's findings advocate that emigration in the agricultural sector is sensitive to agricultural wages in both Sweden and the USA. Moreover, industrial sector migration was more sensitive to wages in the source country rather than wages in the host country. Although the coefficients of wages in both sectors in the destination country were indeed significant, they were lower than the coefficients of their counterparts in Sweden.

Gallaway and Vedder (1971) used British data on annual migration flows from the United Kingdom (UK) to the USA, Canada, Australia, and South Africa during the period between 1860 - 1913. In summary, the authors concluded that both push and pull forces played a vital role in the transatlantic migration process, however the pull forces were deemed to be more dominant in certain aspects. Specifically, their regression results imply that changes in wage levels in the USA were not significant, whilst higher unemployment rates in the UK were marginally significant in explaining migration between the two countries. The author also accounts for periods of 'panic' in the USA by incorporating a set of dummy variables. Results in this area indicated that business conditions in the USA were crucial, as the dummy variables were negative and highly significant.

Authors, such as Berger and Webb (1987) have criticised literature on international migration since most of the empirical evidence focuses on actual numbers of admitted migrants rather

than taking into consideration numbers of applicants. This implies that two important aspects are neglected in the analysis: firstly, individuals who fail to qualify, and secondly, delays in the approval process. Although the first issue might create problems related to selectivity, the second issue might be of more concern given that there could be instances where economic conditions vary between application stage and acceptance stage. The second issue highlighted above is more complex to investigate and evaluate due to the limited data available and the multifaceted nature of the variables differing between the two stages. On the other hand, the first concern can be tackled by examining applications data rather than admissions data. Lucas (1975) analysed migration's determining factors by utilising aggregated data on applications for labour certificates of men rather than observed migration movements. Even though the author fails to include any element relating to job opportunities in the USA, he established that average wages for specific occupations significantly attracted migrant workers.

Differential economic advantage has also been explored in the literature through cross-sectional analyses of emigration, rather than immigration. Such studies focus on one specific country of emigration and investigate the determining factors of migration flows from the respective country to a number of other countries. Greenwood and McDowell (1982) examine both sides of the coin – immigration, as well as emigration. With reference to emigration, the authors analyse emigration from 23 countries listing the USA as a country of destination. The emigration model, containing cross-sectional data for the years 1970 and 1971 incorporated three main explanatory variables: distance between the two countries, average weekly earnings in the manufacturing sector of the destination country, and population. A log-log regression model was run for each of the 23 countries where the absolute majority (19 out of 23) of the coefficients of the wage variable were positive, and significant at the 95 per cent confidence

level. Such findings give rise to the highlighted importance of the differential economic advantage in migration processes and decisions.

Another perspective in migration analyses is the study of bilateral flows between two specific countries over a number of years. Walsh (1974) investigated immigration between Ireland and Britain during the period between 1951 and 1971. He concluded that economic conditions, namely the average weekly wages of industrial workers in both countries, played a crucial role in determining migration flows. The author also tested the hypothesis that corresponding variables for the two countries in question have equal coefficients in absolute values. Unable to reject this hypothesis, Walsh (1974) established that both push and pull forces play an equal role in the decision to migrate. This study also established that economic conditions up to three or more years prior to the year of migration have nearly no impact on migration flows.

Although most research dealing with bilateral migration flows indicates that differential economic opportunity plays a vital role, some contradicting results also feature in the literature, especially with regards to research on Canadian immigration. In fact, papers examining bilateral migration to Canada indicate that wage differentials between various source countries and the country in question are not significant in explaining migration flows to Canada. Green (1976) studied migration to Canada from a number of source countries between 1951 and 1969 in a temporal context. For some of the countries included in the analyses, the author finds minimal evidence that job opportunities in source and destination countries were key. However, there was evidence that real wages in either country acted as stimuli in the migration process. Needham (1968), who studied Canadian immigration during more or less the same period, further confirms such findings.

Rather than just focusing on temporal analyses, a subset of literature delves into migration from a contemporary perspective utilising pooled cross-section and time-series datasets. Through the use of these kind of datasets, researchers can yield more robust and essential results since the data tends to include richer sets of observations. Furthermore, such studies are believed to incorporate a wider range of theoretical underpinnings and allow the researchers to include more promising determinants, such as the inclusion of control variables to capture migration restrictions in countries. Studies of this kind include Lainos' (1972) research in which he examined migration from Greece to Australia, Canada, the USA, and West Germany during the period between 1959 to 1966. Similar to other studies, the wage differential variable was found to be statistically significant. A key finding in this investigation was the importance of lagged migration which constitutes a central, explanatory variable. Lainos (1972) confirms that migration flows may counteract monetary incentives with a lag, even though the data was too restrictive for the author to further confirm or deny this result by examining additional lagged structures in the model.

An additional strand in migration literature deals with specific groups of individuals such as skilled, versus non-skilled workers. Two well-known studies in this field, Hassan (1988) and DeVortez and Maki (1983), investigated the migration of technical workers and professionals to Canada and the USA from less developed countries. Whilst both studies used pooled cross-section and time series data, Hassan (1988) observed migration between 1972 and 1987 from eighteen (18) countries to Canada, whereas DeVortez and Maki (1983) examined migration during the period between 1972 – 1987 from sixteen (16) source countries to the United States. The results attained clearly illustrate that labour demand conditions in the country of destination are significant in explaining migration flows between countries, with Hassan (1988) arguing

that pull factors are much more crucial than pull factors for scientists and engineers.

Another interesting study in this same area was carried out by Davila (1983) who analysed migration flows of unskilled labour into the USA from Mexico. Using quarterly data for the period between 1873 to 1978, the author concludes that whilst economic conditions in both countries play a role in determining migration flows, push forces outweigh pull forces. An important inclusion in Davila's model is the devaluation of the Mexican Peso in 1976, which, in turn, affected real wage differences across borders. As a matter of fact, illegal migration increased significantly in both 1976 and 1977. Davila attributed such increases to the devalued currency as regression results indicated that such increases were significantly higher throughout the post-devaluation period. Similarly, Blejer, Johnson, and Porzecanski (1978) also investigated migration flows of unskilled labour between the two countries. They used illegal, legal, and total immigrants as dependent variables in their study and found that each type of migration between two different periods, the first being between 1960-1974, and the second being between 1950-1975, were influenced by the differential unemployment rate between the countries in question. On the other hand, the authors failed to find any significant effects of real wage difference on migration flows between the two countries.

Recent literature also reflects on the theoretical underpinnings, in that the situation of labour markets in potential host countries plays a vital role in attracting or repelling prospective migrant workers. In line with this premise, Buch et al. (2014) examined the determinants of migration balance of German cities between 2000 and 2007 via a basic regression model, which included both labour market variables as well as indicators for urban amenities, such as recreational areas. They concluded that mobility decisions tend to be mainly influenced by

labour market conditions where cities with relatively high wages, low unemployment rates, coupled with increasing job opportunities attracted the most labour. Jennissen (2003) used cross-sectional time series data to estimate the influence of economic determinants on international migration in Western Europe (for countries without a communist past) between 1960 and 1998. The author used GDP per capita, unemployment, and educational levels as variables to capture economic determinants. Although not all effects were significant, the results indicate that GDP per capita has a positive effect, whilst unemployment has a negative effect on migration. This finding persists even when gender-specific research is undertaken. Sultana and Fatima (2017) observed factors that affect Bangladeshi female migration flows across time and destinations. The specified model accounted for demographic factors, economic factors and other non-economic factors such as religion. In line with the theory, they established that the low development of a country instigates workers to migrate, whilst economic development in another country attracts the workers through economic opportunities and enhanced standards of living.

Gurcinaite (2014) observed migration policy changes in the EU and analysed intra-EU migration in the period between 2000 and 2011. Similar to other research, the attained results suggest that labour market characteristics, namely unemployment and average wages, are significant drivers in intra-EU migration patterns and that host country features have higher influences than source country aspects. A crucial finding of this research is that there are significant differences in the prominence of migration drivers across distinct EU regions. This implies that policy decisions should be adapted to the regions according to the nature of the labour force in each region. When accounting for migration policies in the econometric model used, the results indicate asymmetries between push and pull factors. Even though, as expected,

pull factors significantly increase emigration whilst push factors have a negative effect, the effect of push factors is smaller than that for pull factors, and is often insignificant (Mayda, 2010). Given the findings, the author concludes that “*push effects suggest that migration quotas are more binding than pull effects*”. The effects vary with the degree of restriction of migration policies, as the author further discovers that pull effects become more positive during the years when the source country’s immigration laws are less restrictive. Even when considering alternative approaches, it is clear that economic migrants travel, first and foremost, in an effort to upgrade their living standards. Thet (2004) implemented a factor analysis approach to determine the decisive push and pull factors of migration in Monywa Township, Myanmar. Better living standards were established as the most significant factor for migration in this rural area, which accounted for over nineteen (19) per cent of the total variance.

The use of gravity models in migration analyses has increased rapidly in recent years, with many authors opting for such a model as the basis of their research. As previously explained, most econometric models in this field tend to be augmented to incorporate the push-pull model aspect to acquire an overarching view. Gallardo-Sejas et al. (2006) utilised an augmented gravity model to investigate the determinants of international migration in thirteen (13) European countries as destination countries. The resulting conclusion was that both push and pull factors were equally crucial explanatory variables. Cuaresma et al. (2013) established that migration flows tend to be explained by core variables included in the basic gravity model, particularly GDP differences, population, and distance. The results clearly indicate that higher GDP per capita in destination countries increases migration flows (+0.4 per cent), whilst better economic conditions in source countries reduces them by approximately 0.3 per cent.

Regional studies using the gravity model approach further complement the overall importance of economic variables. Pietrzak et al. (2013) also used the gravity model approach to analyse internal migration in Poland between 2004 and 2010. It is clear that regional economic indicators influence migration directions whilst the overall economic situation in Poland affects the intensity of migration flows. The results imply that regions with worsening economic situations act as demographic resources for the more developed regions within a country.

Whilst augmented gravity models are viewed as essential in capturing all the different viewpoints affecting the migration decision, literature also suggests that the basic underlying dynamics of such models have significant influences. Ramos and Surinach (2013) prove that small geographical differences significantly influence the decision to migrate by finding that the main source of migration, both legal and illegal, is neighbouring countries. Moreover, Karemera et al. (2000) analysed migration flows from Canada to the USA between 1976 and 1986, covering a total of 70 countries. The authors find that the two major determinants in influencing migration were, firstly, the population of the country of origin, with highly populated areas such as Asia and Latin America supplying large shares of migrants, and, secondly, the income of destination countries.

Based on the assumption that the decision to migrate is rather complex, recent literature on migration processes features a new role for indexes developed in this area in an effort to capture the broad range of factors that influence such processes. Incaltarau et al. (2014) developed an Index of Attraction for EU states by taking into account five key areas: (i) attractiveness in the labour market, (ii) attractiveness of the business environment, (iii) quality of institutions, (iv) quality and accessibility of social services, and (v) quality of infrastructure. The established

index was utilised as a basis to explain why certain countries are source countries, such as Romania, whilst others are host countries, such as Scandinavian countries. The analyses clearly conclude that migration flows are very responsive to changes in the level of attractiveness of EU states. As a state becomes more attractive, net migration increases, where the country transitions from an emigration, to an immigration state. Notwithstanding, the evolution and process is not irreversible, but rather depends on the ability of the country to remain attractive in comparison to other countries.

Similarly, a Migration Attractiveness Index has also been developed by the Kulczyk Research Institute where a number of economic, political, and social indicators are incorporated. Such an index was developed from the perspective of an individual seeking permanent employment in a country other than his/her current state of play. The fourteen (14) variables featured in the index were all weighed accordingly, with the exception of three (3) indicators: GDP per capita, median net annual income, and severe material deprivation; which were granted a double score. All in all, the conclusions attained here further enhance the importance of economic indicators in an individual's decision to migrate. In fact, for the year 2017, Austria ranked the most attractive country for economic migrants mainly due to the low rates of unemployment and high median earnings accompanied by a high level of funding for families with children.

Above all, although there seem to be some challenging views in historical studies of migration flows, economic conditions in destination countries prove to be attractive. In particular, high wage rates complemented by employment opportunities are the main forces that drive migration. It seems that economic environments in destination countries explain migration flows more than source countries' economic situations. Nonetheless, divergent views and

exceptions persist.

2.3 DISCUSSION ON SOME MODELS UTILISED FOR INVESTIGATING MIGRATION FLOWS

In economic analysis, there are different types of models which include empirical models, mathematical models, and simulation models, amongst others. Each model serves a different purpose depending on the study being undertaken. Amongst the distinct models applied in order to investigate labour migration are the Gravity models, the Markov Chains and the Harris-Todaro models.

Whilst the aim of the research study in question is crucial in determining the type of model, data availability may also influence the type of study a researcher may opt for when investigating migration flows, which, in turn, plays a crucial role in determining the kind of model to be used for the specific analysis. Published data on international migration tends to be viewed as quite risky in order to make cross-country comparisons due to measurement issues (Greenwood and McDowell, 1992). Although sources of information may be similar, such as national sources, certain definitions may differ in practice, making intertemporal studies even harder. Administrative records are a very common source of data when evaluating international migration. Such sources include employment registers, population registers, and work permit applications. Moreover, other researchers sometimes opt for specific surveys or censuses to gather the required information. The crux of any database compiled for specific analyses is that good quality, reliable, and robust data is gathered. This is a fundamental basis for any research being undertaken. Data compilation is also reliant on the type of model the researcher opts for,

as the two components of any investigation, data, and model, go hand in hand.

The use of gravity models for analysing migration flows has gained pace in recent years and is a method that is becoming even more popular. One of the main reasons for its popularity is that its intuition and underlying theory result in the model being consistent and dependable. Subsequently, this model easily fits some stylised facts in the literature, which makes it more homogenous in projecting real-life scenarios, for example, the underlying basis that the further away two countries are, the lower the migration flows between them. Furthermore, such models are intuitively appealing given that they are estimated using ordinary least squares (OLS) without the need to involve too many complex computations. These kinds of models are also useful as they incorporate both push and pull factors, thus allowing researchers to establish countries' comparative advantages in attracting migrant workers, that is, pull factor influences. Nonetheless, there are some issues that researchers may encounter when applying models in this spatial arena and must be aware of in order to address them accordingly, thus ensuring the robustness of results.

For instance, defining the 'country of origin' is not always so straightforward as the researcher must decide whether this refers to the last country of residence, country of birth, or country of citizenship (Beine et al., 2016). Hence, it is important that the definition of this term is clearly laid out prior to the undertaking of any study. Another matter that the investigator must keep in mind is that the model in question is likely to suffer from omitted variable bias since it would be too burdensome to include all the possible factors influencing the migration decision in the model. Additionally, some elements which influence migratory decisions, such as personal drive, are not observable and may be hard to find an appropriate proxy or instrument to be

included in the underlying model. The highlighted concerns may affect the results attained if untreated and may consequently downplay the choice of such model. However, recent literature suggests that academics are increasingly aware of these challenges and as long as they are addressed accordingly, the concerns are rather minimal.

Another model that is also widely used to evaluate migration processes and decisions is the Harris-Todaro model. In general, this model is based on the premise that individuals migrate from rural to urban areas in pursuit of better employment opportunities and higher wages. Specifically, this model implies that individuals move from low income and low productive traditional agriculture sectors to higher income and higher productive manufacturing sectors. The Harris-Todaro model has been criticised on a number of its aspects and its resulting policy implications, particularly since it restricts its analysis to rural to urban migration (Lall et al., 2006). The underlying framework of this model describes migration as a static phenomenon rather than dynamic in nature. Moreover, it fails to incorporate crucial aspects, such as the probable fact that migrants are heterogeneous, as well as the possibility of return migration, which in reality, both have an influence on migration incentives and thus, the resulting decisions. Given that the model focuses on rural to urban migration, it fails to evaluate employment in rural areas and only considers the urban areas. The model is assumed to have foundations which are too simplistic and where urban workers are considered to be either in employment within the manufacturing sector, or unemployed. Some critics argue that migration flows in the Harris-Todaro model are overestimated due to the assumption that wages in the urban area are fixed, ignoring any expected earnings differentials which migrants tend to consider prior to migrating.

Some studies have also incorporated indexes as a framework to carry out evaluations on the attractiveness of states/countries to foreign labour. Whilst such composite indicators are useful in gathering information on multi-dimensional issues involving a number of variables, results emanating from them must be interpreted with caution since they may indicate misleading policy messages if constructed in a poor manner. Even though such indexes are deemed helpful in that they facilitate cross-country comparisons by ranking countries, they may lead politicians to draw policy conclusions which are too simplistic (European Commission, 2015). Therefore, they must be used in combination with other indicators for a complete picture and to infer robust policy conclusions. The construction of indexes involves a number of different stages wherein both subjectivity and judgement play a crucial role. This process includes weighting, choosing indicators, selecting an appropriate model, and dealing with missing values. For results to be plausible and reliable, the researchers must be transparent in all judgements adopted during each stage and ensure that such choices are based on sound statistical principles.

2.4 CONCLUSION

Migration has become an area of popular research. With its complex and multifaceted dynamics, it is difficult to identify a single theory or methodology as the best one to be applied in this field. Various theories and methodological approaches explore different dimensions of the migration phenomenon. No single theory or model is comprehensive enough to explain the entire migration process, or forecast the exact dimension of migration flows. Nonetheless, researchers tend to opt for a specific model over another depending on the particular facet under investigation. Based on the evaluation of the different theoretical underpinnings and methods applied in analysing labour migration, as well as in view of data availability in Malta in this

field, the Gravity model is selected for application within the present inquiry. Furthermore, in the light of the literature review above, a priori, one would expect that the main economic variables included in the model undertaken in this study would have the highest impact on attracting foreign labour to the local labour market. Moreover, as implied by a typical micro-founded gravity model, one would expect the elasticities of variables related to economic conditions at the destination country to be larger than the ones associated with the economic conditions of the origin country (Moraga and Molina, 2018).

CHAPTER 3:
THE MALTESE LABOUR MARKET
AND THE
COMPOSITION OF FOREIGN WORKERS

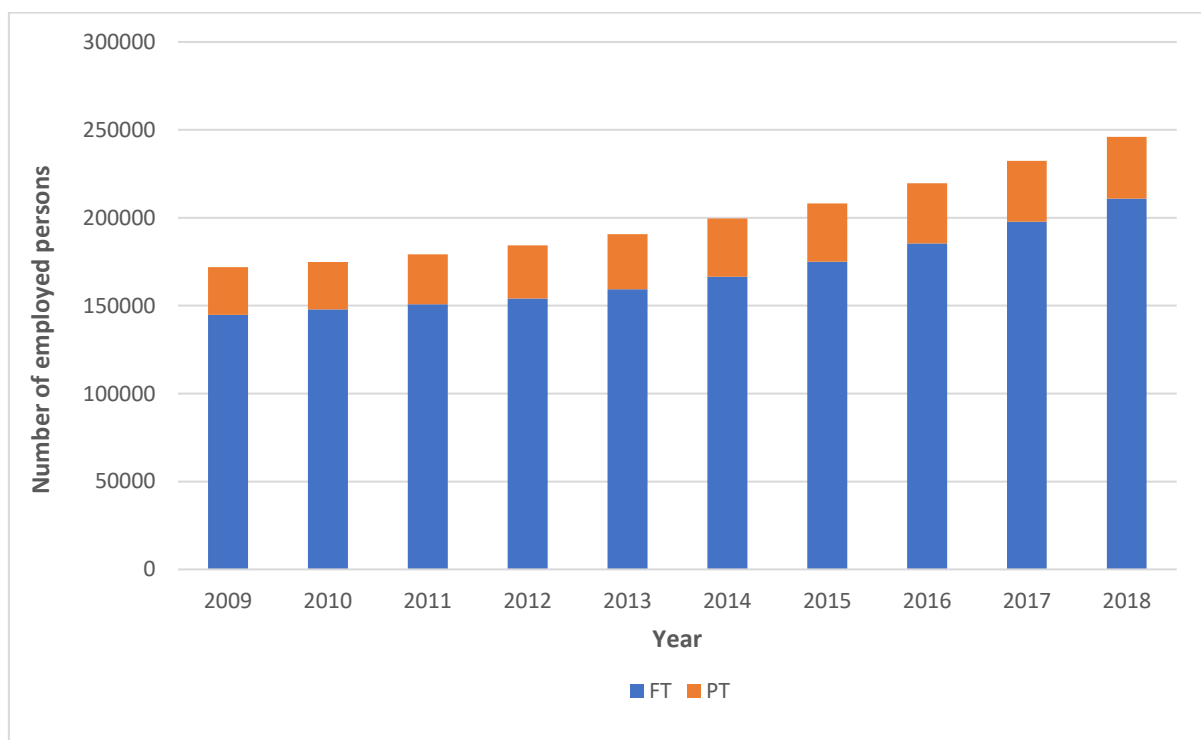
CHAPTER 3: THE MALTESE LABOUR MARKET AND THE COMPOSITION OF FOREIGN WORKERS

Labour migration is a subset of migration which has evolved into a preeminent subject matter in economic policymaking. As a matter of fact, the International Labour Organisation's statistics for the year 2017 indicate that over 60 per cent of the world's migration population was comprised of migrant workers (International Labour Organisation, 2018). Understanding the determining factors in attracting foreign labour to the local labour market and establishing the underlying economic theories of such migration processes is key. However, examining the context of the Maltese labour market, as well as the structure of foreign workers in Malta across the past years is equally important. In view of this, the present chapter sheds light on the local workforce and the composition of foreign workers in Malta using Jobsplus' administrative data available on their web portal. Unless otherwise stated, all figures represented in the below analysis are stock figures as at the end of each respective year and include individuals employed on a full-time and part-time (as a primary job) basis registered with Jobsplus as per legal obligations. Thus, the figures represent a unique numbers of individuals. It is essential to note that when quoting figures relating to European Union (EU) Nationals, such data also includes EU dependents and individuals hailing from countries in the European Economic Area (EEA), as well as the European Free Trade Association (EFTA), which include nationals of Iceland, Liechtenstein, Norway, and Switzerland. At the time when the present analysis was commissioned, the United Kingdom (UK) was still part of the EU and thus, individuals hailing from this country are included in the figures utilised hereunder.

3.1 EMPLOYMENT IN MALTA

Figure 3.1.1 below illustrates employment trends in Malta between 2009 and 2018. Clearly, the total employment in Malta has increased over these years, rising from 171,930 in 2009, to 245,983 in 2018, equivalent to a 43.1 per cent increase. A similar trend is observable for both full-time and part-time employment as a primary job, increasing by approximately 45.6 per cent and 29.7 per cent respectively. According to Eurostat figures, Malta's employment rate as at 2018 stood at 75.5 per cent, surpassing both the national and EU Europe 2020 employment targets of 70, and 75 per cent respectively.

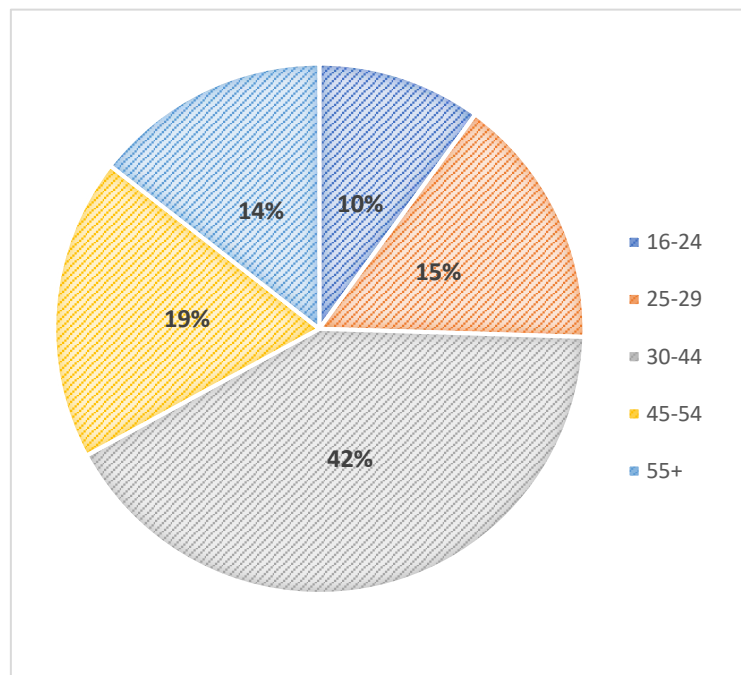
FIGURE 3.1.1: TOTAL EMPLOYMENT IN MALTA



As at the end of 2018, 58.5 per cent of the individuals employed were males whilst 41.5 per cent were females. With regards to the male cohort, 89.7 per cent were employed on a full-time

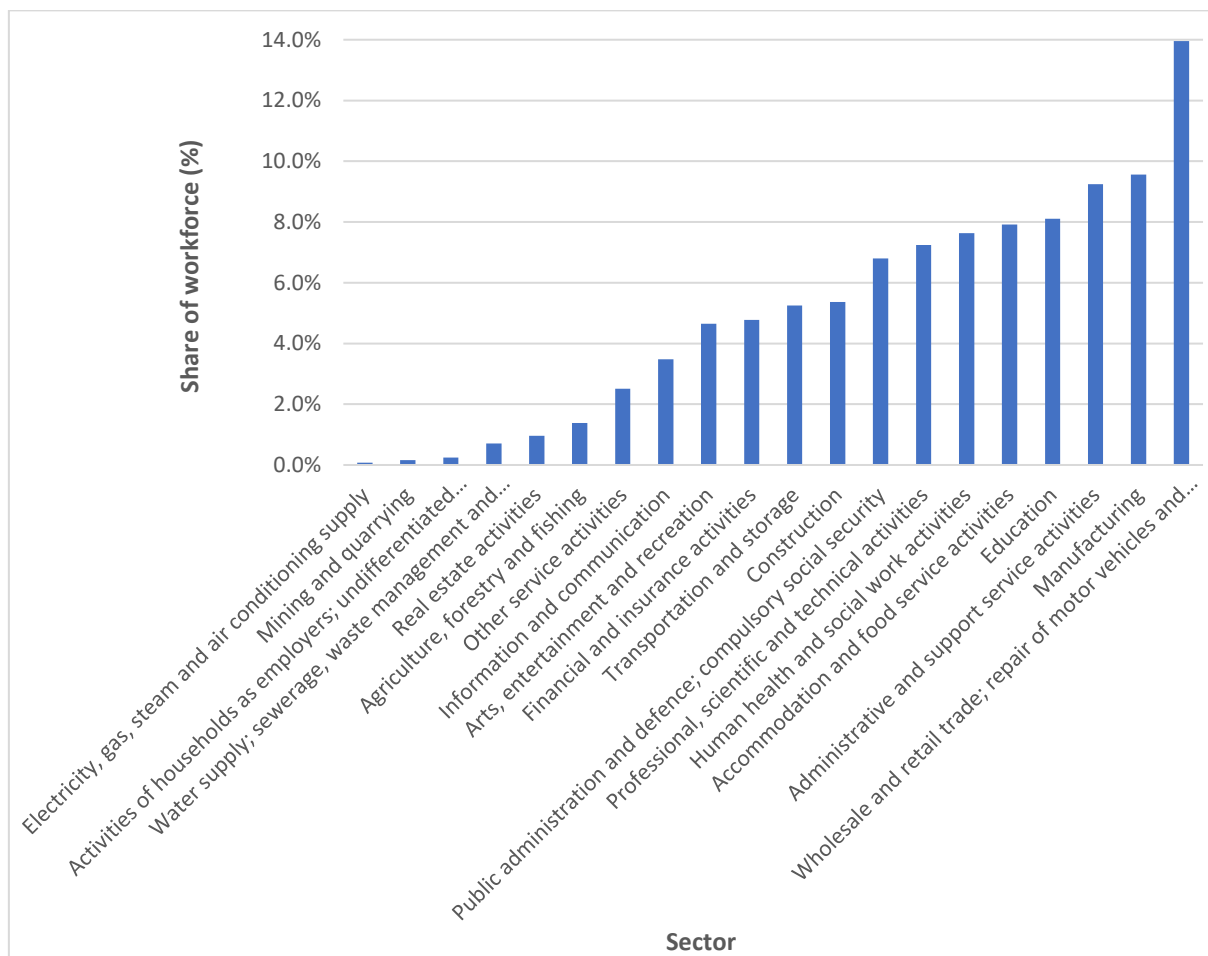
basis compared to 10.3 per cent employed on a part-time basis. Similarly, 80.1 per cent of females in employment were employed on a full-time basis whilst 19.9 per cent were employed on a part-time basis.

FIGURE 3.1.2: EMPLOYMENT BY AGE COHORT (2018)



As displayed in Figure 3.1.2 above, youth employment (16-24 years) accounted for approximately ten (10) per cent of employment whilst older workers (55+ years) equated to nearly nineteen (18.5) per cent. The majority of the workforce in employment as at the end of 2018 was aged between 30 and 44 years, with 41.6 per cent of the labour force falling within this age cohort.

FIGURE 3.1.3: EMPLOYMENT IN MALTA BY SECTOR (2018)

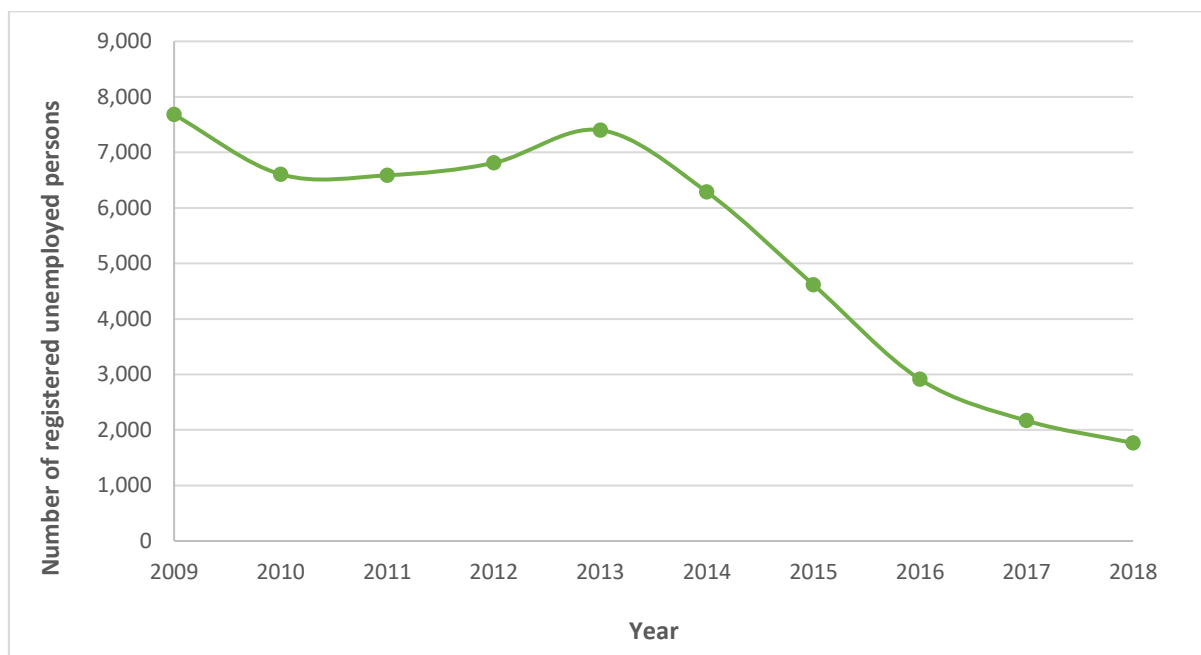


As at the end of 2018, the largest share of the Maltese workforce was employed in the *Wholesale and Retail Trade* sector (approximately 14.0 per cent), followed by the *Manufacturing* and the *Administrative and Support Services Activities* sectors, with 9.6 per cent and 9.2 per cent respectively. One should keep in mind that this does not necessarily imply that such sectors have been fuelling employment growth, or that they have been the largest growing sectors over recent years. As a matter of fact, the *Arts, Entertainment and Recreation* sector is one of the main sectors fuelling employment growth and one which has grown rapidly over the past five (5) years. Employment in the latter sector has almost doubled, which was mainly driven by the increase in iGaming businesses during the years under review.

3.2 UNEMPLOYMENT IN MALTA

On the contrary, but in line with economic growth experienced in Malta over recent years, unemployment has decreased drastically. Figure 3.2.1 below indicates the number of registered unemployed persons with the Maltese Public Employment Service (PES), which includes persons registered on Part 1 and Part 2 of the National Unemployment Register. As can be viewed, unemployment decreased from nearly 8,000 registered, unemployed individuals in 2009, to under 2,000 in 2018. Such a decrease is clearly evident between 2013 and 2018, and is mainly attributed to a number of *'Making Work Pay'* initiatives implemented by the Government. These include free childcare for working parents, in-work benefit, the tapering of social benefits aimed at increasing female employment, reducing dependency on social benefits, as well as nourishing economic and employment growth.

FIGURE 3.2.1: NUMBER OF REGISTERED UNEMPLOYED PERSONS



Administrative data indicates that 55.1 per cent, constituting over half of the individuals registered as unemployed as at the end of 2018, had an unemployment spell of less than one (1) year. This suggests that unemployment in Malta is rather frictional, where people easily transition from one job to another. Of such registrants, around eleven per cent (11.2) were youths, that is, persons under 25 years of age, whilst 52.1 per cent were individuals aged over 45 years. As at December 2018, Eurostat figures also indicated that at 3.8 per cent, Malta registered the fifth lowest unemployment rate, a statistic surpassed by Czech Republic (2.1 per cent), Germany (3.3 per cent), Poland (3.5 per cent), and Netherlands (3.6 per cent).

As the Maltese economy grew and job creation gained pace, it is clear that employment boomed, whilst unemployment shrank. With approximately 13,000 new jobs being created every year, the increase in female participation and new graduates entering the local workforce were not enough to sustain employment growth. Evidently, labour supply was outstripping labour demand by far; hence the unavoidable increase in reliance on foreign labour. The subsequent sections of this chapter portray the trend in imported labour and its respective characteristics.

3.3 FOREIGN WORKERS EMPLOYED IN MALTA

FIGURE 3.3.1: TOTAL NUMBER OF FOREIGN WORKERS

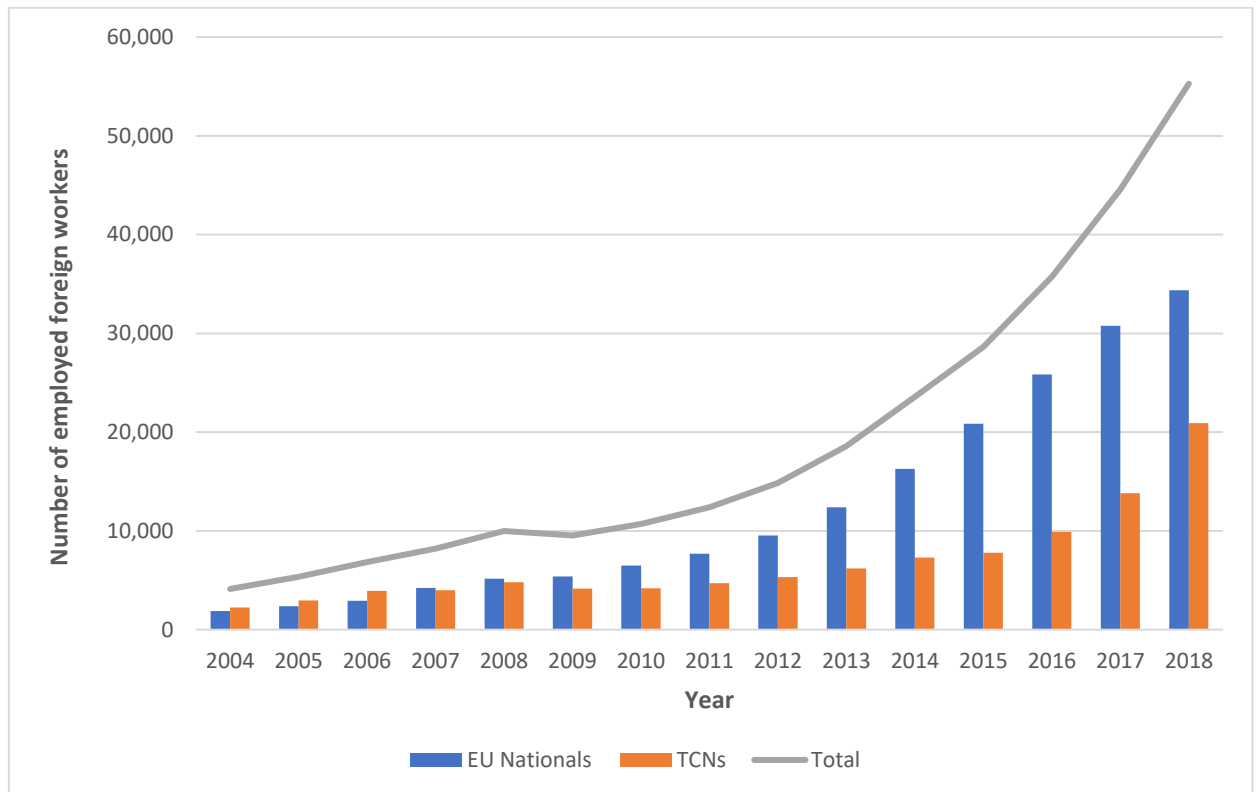


Figure 3.3.1 above portrays stock figures of the number of registered foreign workers in Malta since the country's accession into the EU in 2004. As can be viewed, the number of foreign workers increased significantly during the years being reviewed, particularly in recent times, with statistics more than doubling in the past five years. Foreign workers amounted to just over 4,000 in 2004, which increased to nearly 12,000 by 2011, and escalated to over 55,000 in December 2018. The major surges in the number of employed foreigners in Malta during such years mainly pertain to EU Nationals, with the number of such migrant workers increasing from just 1,887 in 2004, to 7,693 by 2011, and to over 34,000 in 2018. Clearly, the most influential factor is Malta's accession into the EU, with free movement of workers as a fundamental principle in the Treaty on the Functioning of the EU. Nonetheless, the number of Third Country

Nationals (TCNs) employed in Malta also rose during the same years, though to a much lower extent, rising from 2,231 in 2004, to 20,928 in 2018. Foreign workers accounted for approximately 22 (22.5) per cent of the total workforce in Malta in 2018 when taking into consideration full-time and part-time employment as a primary job.

FIGURE 3.3.2: EU NATIONALS BY TYPE OF EMPLOYMENT (2018)

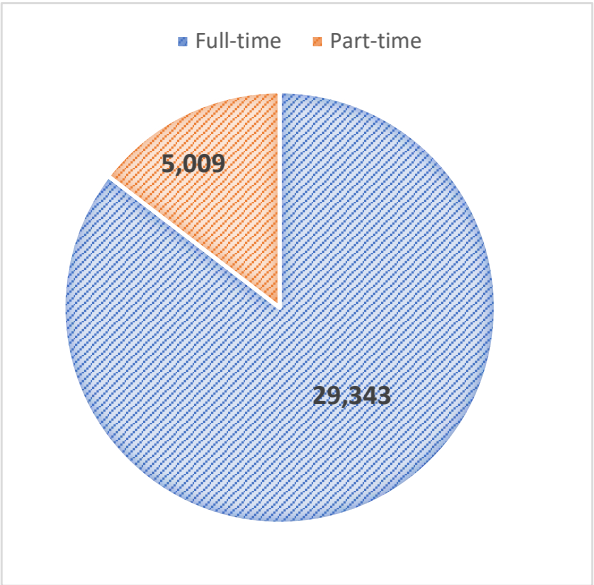
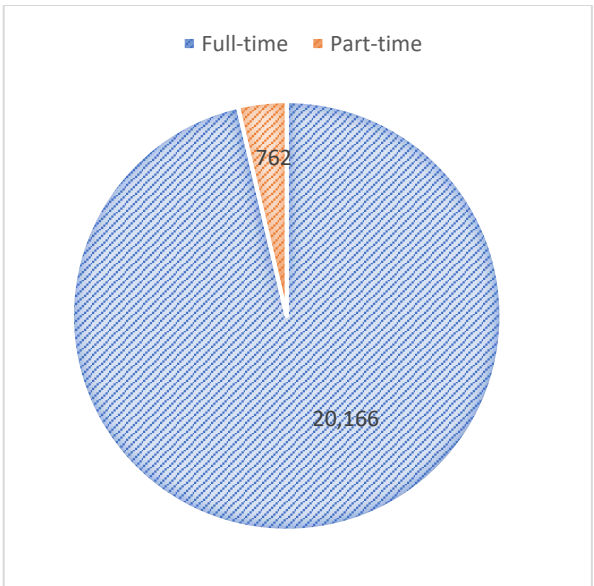


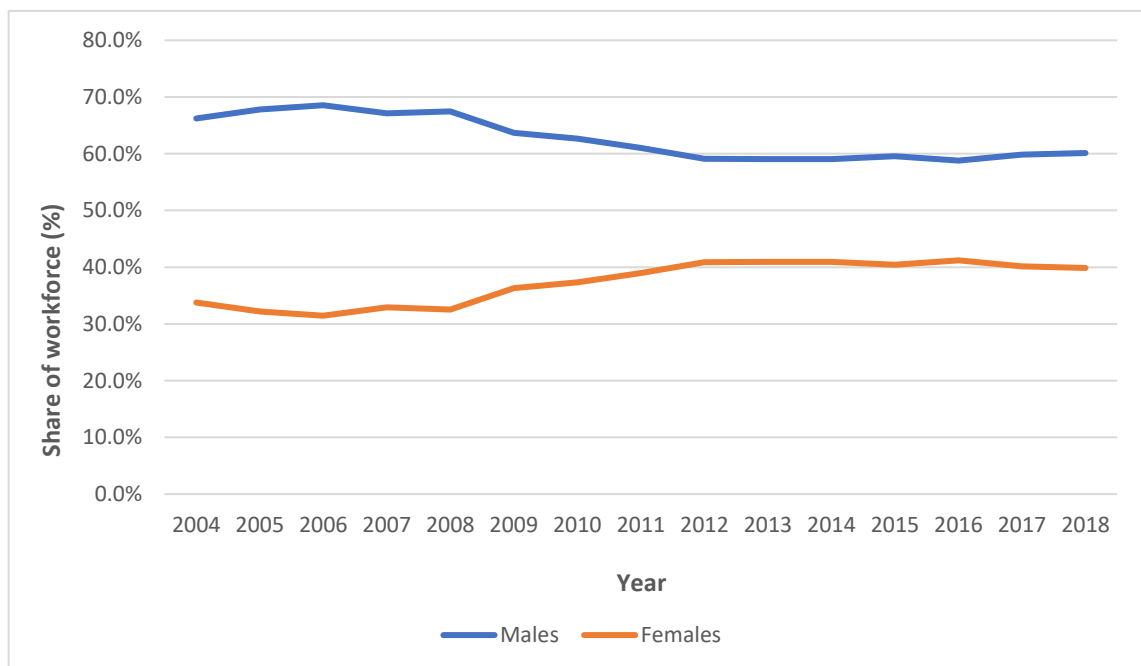
FIGURE 3.3.3: TCNS BY TYPE OF EMPLOYMENT (2018)



As can be viewed in Figures 3.3.2 and 3.3.3 above, it is clear that the vast majority of migrant workers employed in Malta were employed on a full-time basis. As at the end of 2018, around 85.4 per cent of EU Nationals were employed on a full-time basis, whilst just under fifteen (14.6) per cent were employed on a part-time basis. The situation is rather similar, yet more pronounced for TCN employees, where the absolute majority were employed on a full-time basis (96.4 per cent), with just over three (3.6) per cent employed on a part-time basis. Although in previous years the majority of foreign workers were also employed on a full-time basis, the share of part-time employment amongst such workers tended to be higher. For instance, part-time employment amongst TCN employees averaged ten (10) per cent between 2004 and 2017, reaching a peak of nearly twelve (12) per cent in 2013, nearly treble the share of part-time employment amongst such workers observed in 2018.

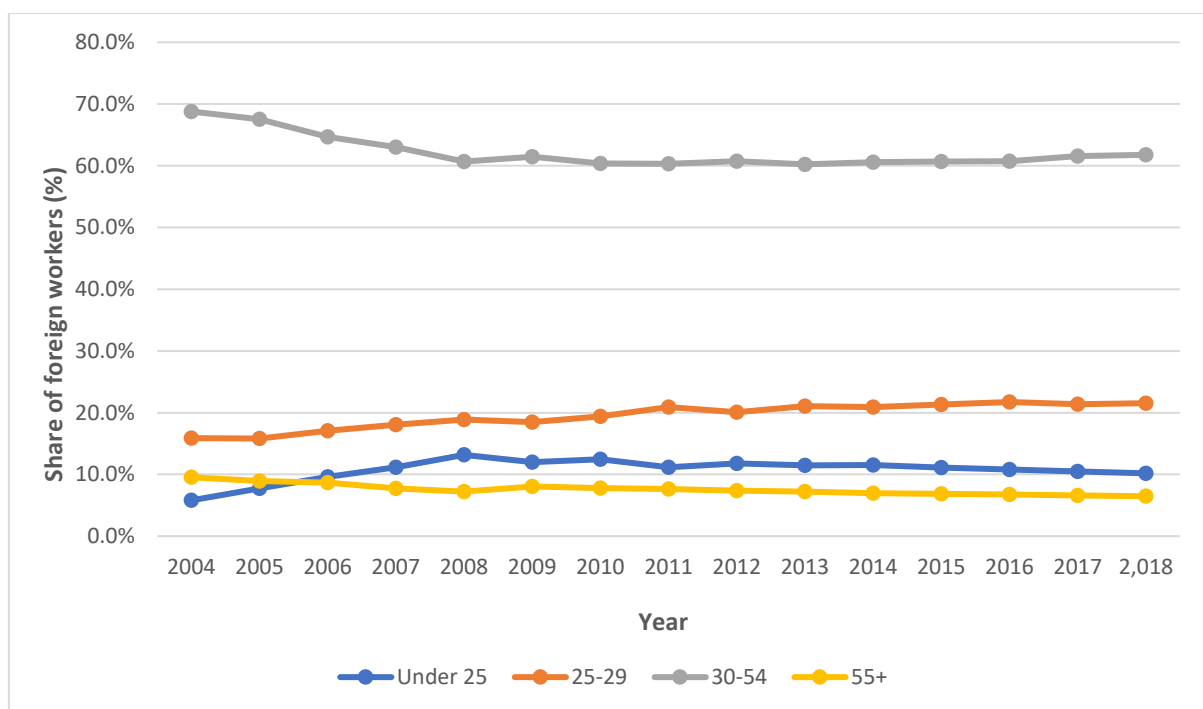
3.4 DEMOGRAPHICS OF FOREIGN WORKERS IN MALTA

FIGURE 3.4.1: FOREIGN WORKERS BY GENDER



As at December 2018, 60.2 per cent of foreign workers in Malta were males whereas 39.8 per cent were females, each cohort being equally reflected across both TCNs and EU Nationals. Whilst during the initial years under review the number of male foreign workers started increasing, averaging 67.4 per cent up to 2008, their share started decreasing thereafter, settling at an average of 60.3 per cent. Evidently, the situation is the opposite for females, where the share of female foreign workers decreased during the initial years being analysed, then increased to over 40 per cent from 2012 onwards. This phenomenon is a good reflection of a narrowing gender employment gap amongst foreigners employed in the Maltese labour market.

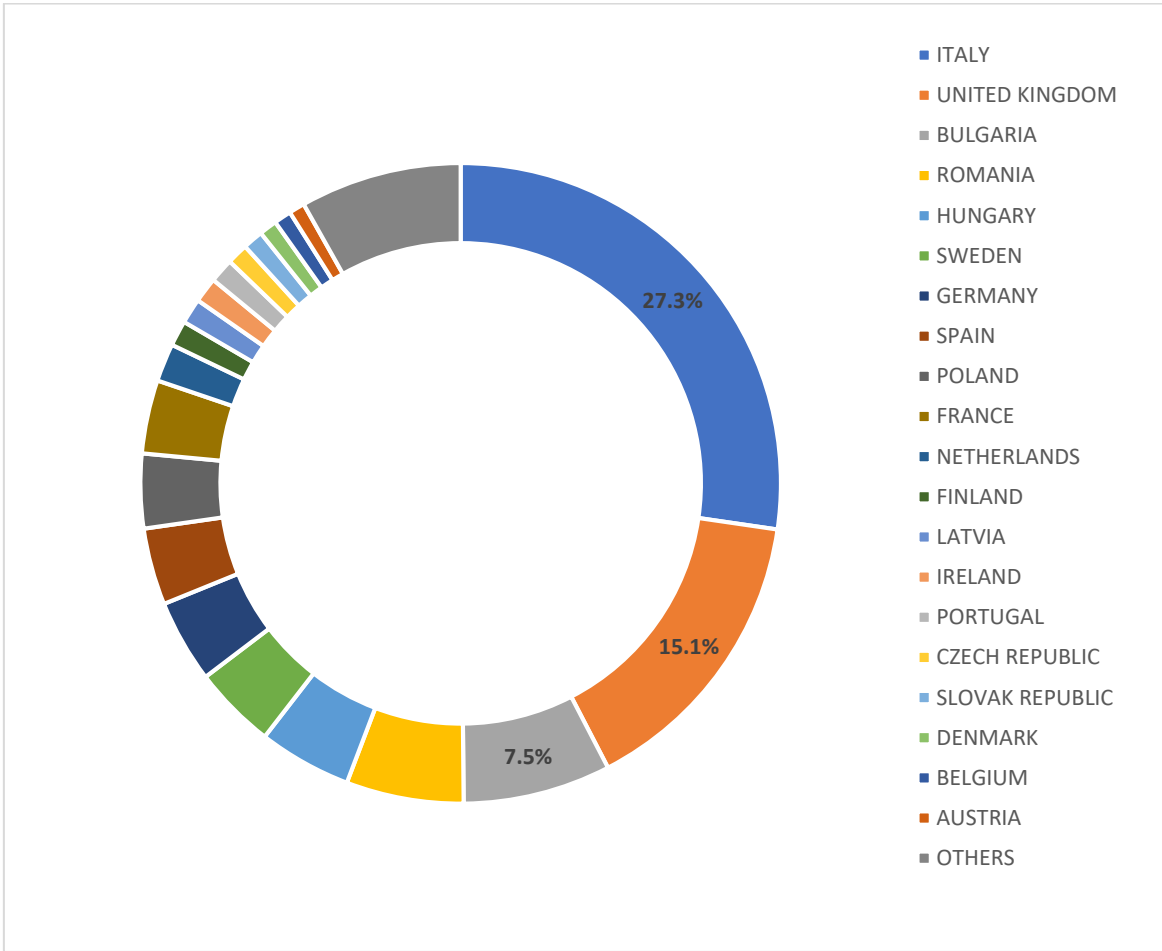
FIGURE 3.4.2: FOREIGN WORKERS BY AGE GROUPS



When examining foreign workers by the different age cohorts as displayed in Figure 3.4.2 above, it is clear that the vast majority of locally employed foreigners are aged between 30 and 54 years, with the share of individuals within this age cohort hovering between 70 per cent and

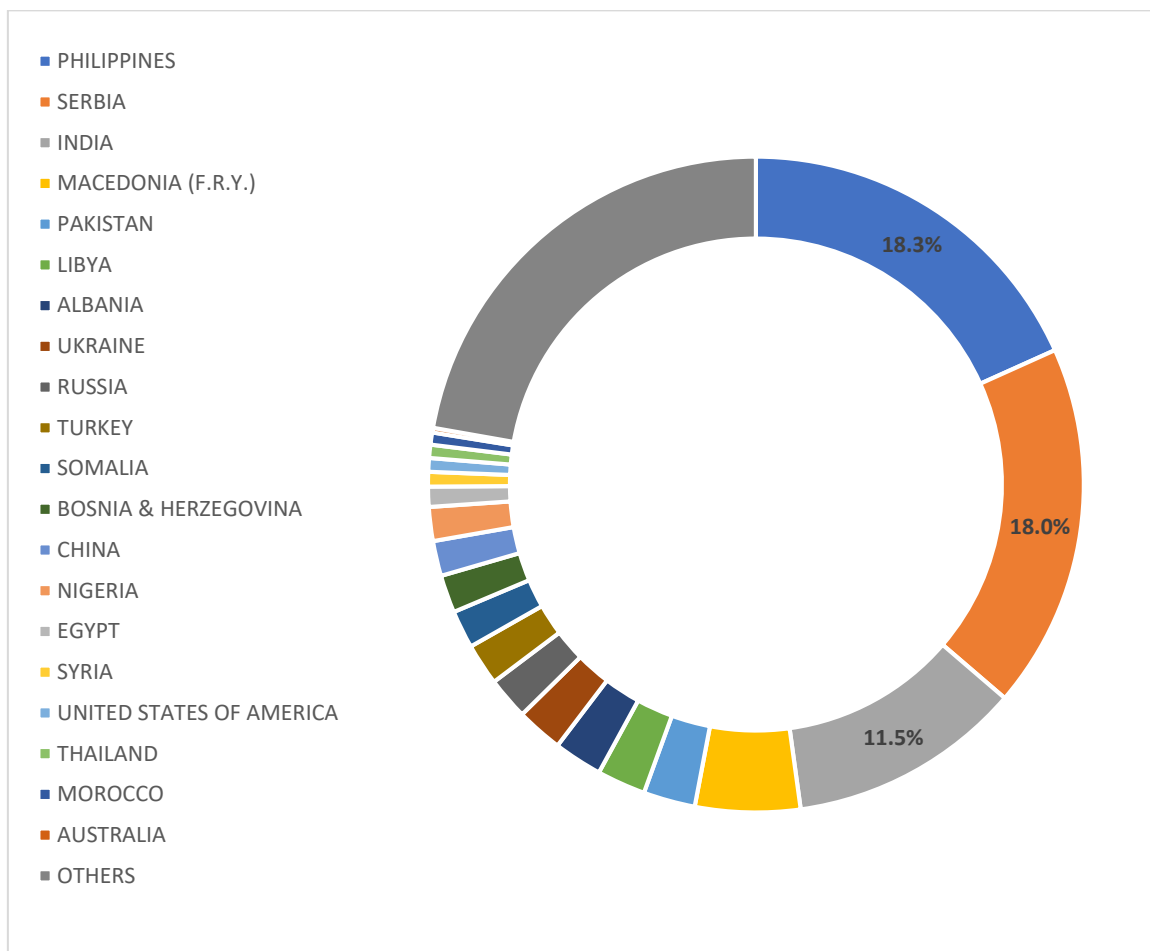
60 per cent during the years under review. The number of older workers aged 55 and over decreased by three (3) percentage points over the years, from nine (9.5) per cent in 2004 to six (6.5) per cent in 2018. As a matter of fact, this cohort had the lowest share of foreign workers as at December 2018. A contrasting trend can be observed for the 25-29 age cohort during the same period, where the share of such individuals increased from approximately fifteen (15.9) per cent in 2004 to around nineteen (19.4) per cent in 2010, and then peaked to around 21 (21.5) per cent in 2018. Similarly, the share of youths amongst foreign workers employed in the local labour market increased from approximately six (5.8) per cent in 2004, to approximately ten (10.2) per cent in 2018.

FIGURE 3.4.3: TOP 20 EU NATIONALITIES (2018)



Figures 3.4.3 and 3.4.4 illustrate the top twenty nationalities which had the highest shares of citizens employed in the local labour market for EU Nationals and TCNs respectively. As can be viewed, as at the end of December 2018, over a quarter of EU Nationals employed in Malta were Italians (27.3 per cent), whilst more than fifteen (15.1) per cent came from the United Kingdom and nearly eight (7.5) per cent hailed from Bulgaria. This status quo is reflective of the situation between 2015 and 2018, whereas prior to 2015, the majority of EU nationals originated from the United Kingdom, with over 44 per cent of EU migrant workers hailing from this nation in 2004. With respect to TCN employees, the majority of such individuals were Philippine natives (18.3 per cent), closely followed by Serbians (18.0 per cent). Between 2010 and 2018, this situation more or less prevailed with Chinese citizens having their fair share too. During earlier years, the sphere of TCNs was more unpredictable with Libyans and Indians having the largest share of migrant workers in the local labour market during some of the years examined.

FIGURE 3.4.4: TOP 20 TCN NATIONALITIES (2018)

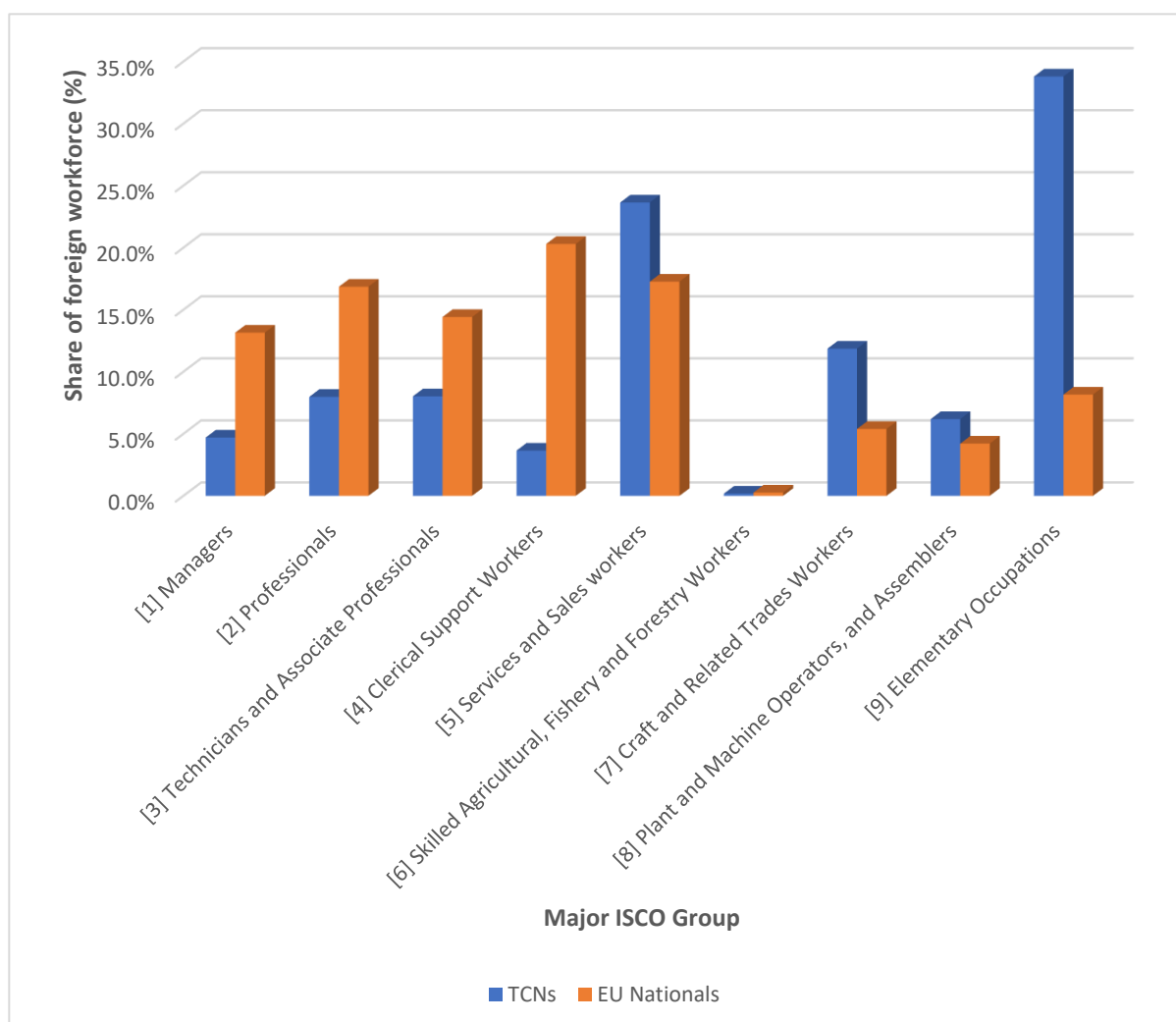


3.5 FOREIGN WORKERS BY OCCUPATION AND ECONOMIC SECTOR

Figure 3.5.1 below portrays the share of foreign workers employed across the different major occupation groups segregated by nationality. Occupations quoted in this part of the analysis are based on the International Standard Classification of Occupations (ISCO), with a list of the different major occupation groups and respective skill levels being quoted in Appendix A. As at the end of December 2018, the largest share of foreign workers at over nineteen (19.7) per cent, were employed as *Service and Sales Workers*. The latter category includes occupations such as *Care Workers*, *Waiters*, and *Salespersons*. The second largest share of foreigners were

employed in *Elementary Occupations*, with nearly eighteen (17.9) per cent of such workers employed in this job category, which, amongst others, include *Domestic Cleaners*, *Building Construction Labourers* and *Kitchen Helpers*. Nonetheless, when considering the two groups (EU Nationals and TCNs) separately, a different picture can be observed. For EU Nationals, one-fifth (20.3 per cent) of such workers were employed as *Clerical Support Workers*, just over seventeen (17.3) per cent were employed as *Service and Sales Workers*, whilst nearly seventeen (16.9) per cent were employed as *Professionals*. On the other hand, more than one third (33.8 per cent) of TCNs working in the Maltese labour market took up *Elementary Occupations*, nearly one-quarter (23.6 per cent) held *Service and Sales* jobs, whilst nearly twelve (11.9) per cent were employed as *Crafts and Related Trades Workers*.

FIGURE 3.5.1: FOREIGN WORKERS BY MAJOR OCCUPATION GROUP (2018)



Moreover, Table 3.5.1 hereunder provides a comparison of the share of the workforce¹ across different clusters² of major, occupational groups segregated by nationality. Whilst as at December 2018 over half (52.0 per cent) of TCN workers were employed in low-skilled jobs (major ISCO groups 6-9), the majority of EU Nationals (44.4 per cent), and Maltese Nationals (40.1 per cent), were employed in high-skilled jobs (major ISCO groups 1-3). Across all

¹ The share of the workforce quoted here excludes individuals employed in Armed Forces Occupations, given that all individuals employed in this category are Maltese nationals.

² Clusters are based on the skill level of jobs in each category outlined in Appendix A.

nationalities, the second highest share of workers were employed in medium-skilled jobs (major ISCO groups 4-5). The information displayed in the table below clearly indicates that whilst EU Nationals were being recruited to fill in labour shortages in higher end jobs TCNs were filling gaps in the lower end of the occupational spectrum.

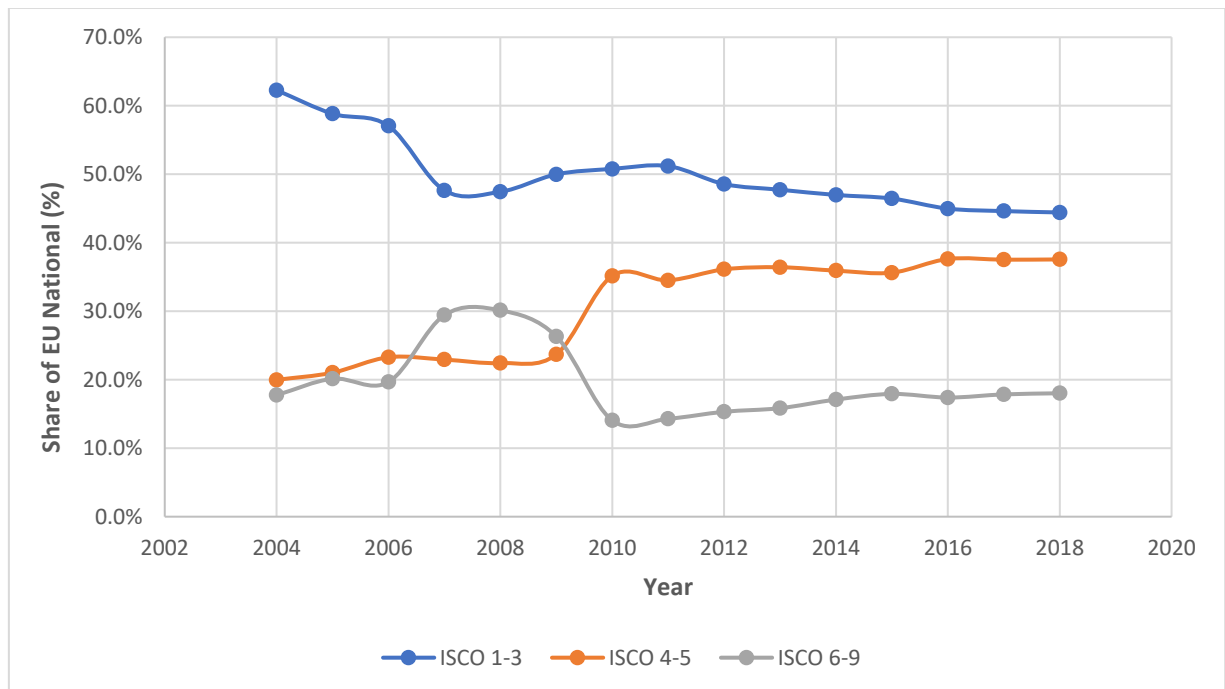
TABLE 3.5.1: WORKFORCE BY NATIONALITY AND MAJOR ISCO GROUP (2018)

Major ISCO Group	TCNs	EU Nationals	Maltese Nationals
1-3	20.7%	44.4%	40.1%
4-5	27.3%	37.6%	32.6%
6-9	52.0%	18.0%	27.4%

Figures 3.5.2 and 3.5.3 below indicate the distribution of foreign workers across the different major ISCO groups over the years being reviewed. Evidently, the majority of EU Nationals have always been employed in high skilled jobs (ISCO 1-3), although the share has decreased over the years from 62.3 per cent in 2004, to 44.4 per cent in 2018. On the other hand, the share of EU Nationals employed in medium skilled jobs has increased significantly during the same years, with their share rising by nearly eighteen (18.0) percentage points, from twenty (20.0) per cent in 2004 to 37.6 per cent in 2018. Conversely, the share of such individuals employed in lower skilled occupations was quite volatile, with the share standing at around eighteen (17.8) per cent in 2004, peaking to 30.1 per cent in 2008 (thus, overpassing the share of such workers

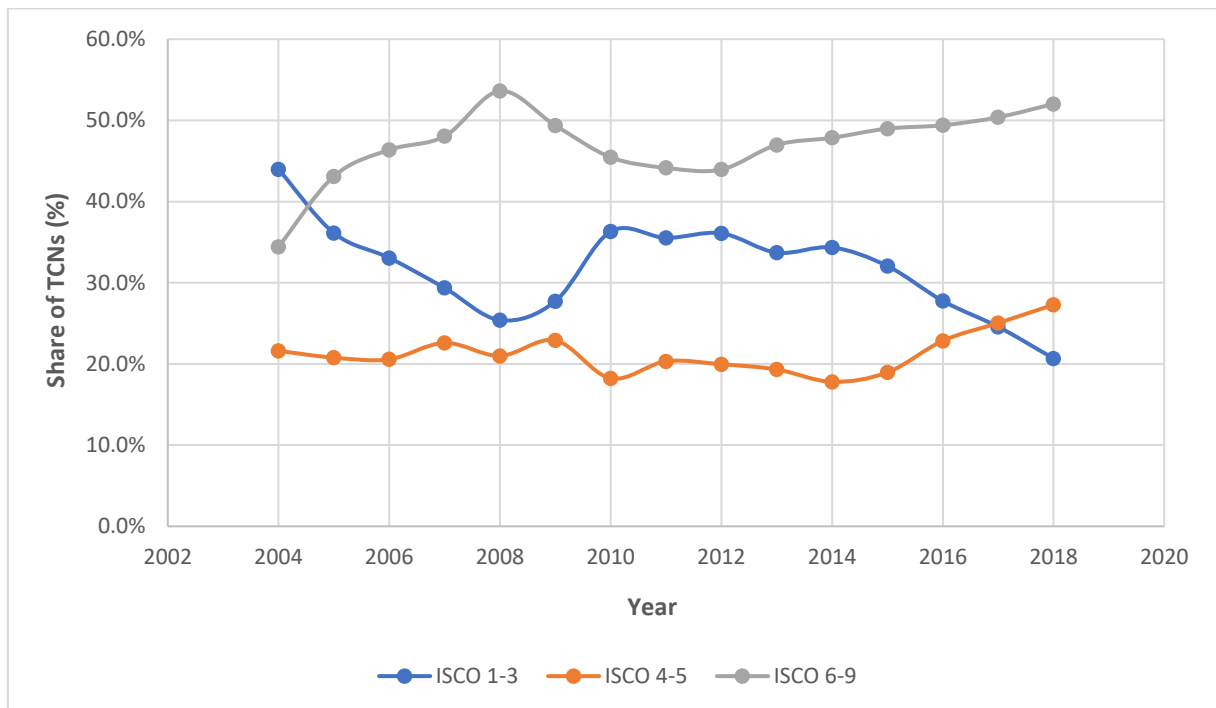
in medium skilled jobs), and then settling at an average of seventeen (17.0) per cent during the past five (5) years.

FIGURE 3.5.2: DISTRIBUTION OF EU NATIONALS BY MAJOR ISCO GROUPS



On the contrary, the situation for TCNs is very different from that of EU Nationals. The share of TCN employees in highly skilled jobs decreased drastically over the years, from 44.0 per cent to 20.7 per cent. However, the share of such individuals occupying low skilled jobs increased by over seventeen (17.6) percentage points – from 34.4 per cent in 2004, to 52.0 per cent in 2018. Moreover, the distribution of TCNs in medium skilled jobs was more stable with the share standing at 21.6 per cent in 2004, and 27.3 per cent in 2017, thus averaging 21.3 per cent across the years.

FIGURE 3.5.3: DISTRIBUTION OF TCNS BY MAJOR ISCO GROUPS



The figure below (Figure 3.5.4) represents the share of foreign workers employed across the different economic sectors segregated by TCNs and EU Nationals respectively. Clearly, the majority of foreigners were employed in the *Professional, Scientific, Technical, Administration and Support Service Activities* sector in 2018, with approximately a quarter of the total foreigners (25.2 per cent) employed within this sector. Sixteen (16.2) per cent of foreigners were employed in *Wholesale and Retail Trade, Transportation and Storage, and Information and Communication* sectors whilst nearly fifteen (14.6) per cent were employed in the *Accommodation and Food Service Activities* sector. More or less, the same trend prevails when examining the employment of TCNs and EU Nationals distinctly across the different economic sectors, with the exception that a high concentration of EU Nationals (17.9 per cent) were employed in the *Arts, Entertainment and Recreation* sector.

FIGURE 3.5.4: SHARE OF FOREIGN WORKERS BY ECONOMIC SECTORS (2018)

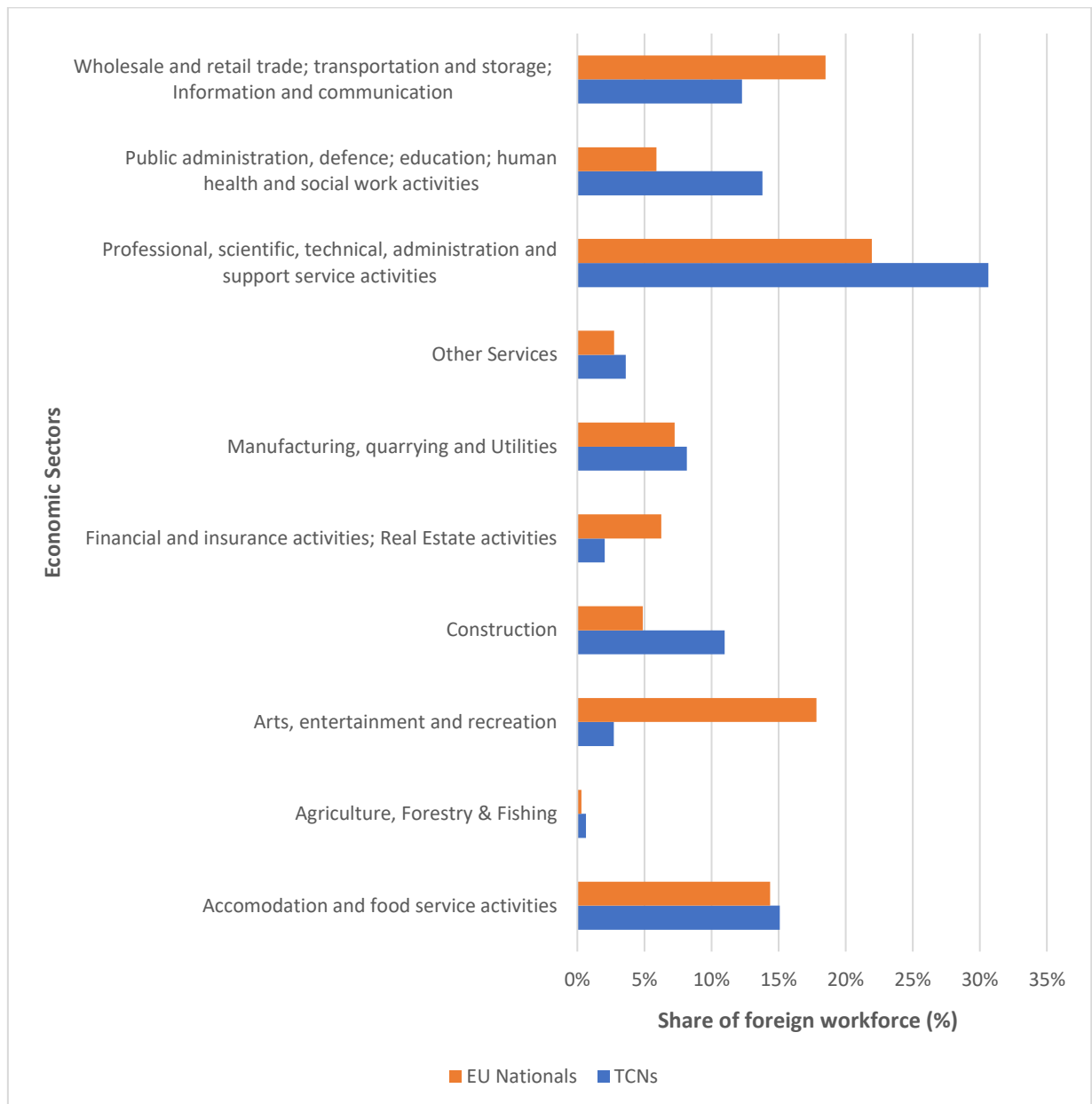


Table 3.5.2 hereunder provides an examination of the concentration of foreign workers in the different economic sectors as at the end of December 2018. Evidently, the sector with the largest concentration of foreign workers is the *Arts, Entertainment and Recreation* sector, which includes iGaming and where less than half of the workers employed in the sector are Maltese nationals (41.4 per cent). The main share of workers, other than Maltese nationals, employed

in this sector are EU Nationals, which amount to 91.4 per cent of the foreign workers employed here. Another sector that is highly permeated with migrant workers is the *Accommodation and Food Service Activities* sector which incorporates the Hospitality industry, where over 41 per cent of persons employed are foreigners. Of the latter, nearly 40 per cent were TCNs whilst the remaining 60 per cent were EU Nationals. Similarly, over 34 per cent of individuals employed in the *Professional, Scientific, Technical, Administration and Support Service Activities* sector were foreigners in the year 2018.

TABLE 3.5.2: SHARE OF FOREIGNERS EMPLOYED ACROSS DIFFERENT ECONOMIC SECTORS

Sectors	2018		2010
	Maltese Nationals	Foreign Workers	Foreign Workers
Accommodation and Food Service Activities	58.4%	41.6%	11.8%
Agriculture, Forestry and Fishing	92.8%	7.2%	1.8%
Arts, Entertainment and Recreation	41.4%	58.6%	33.7%
Construction	69.9%	30.1%	7.2%
Financial and Insurance Activities; Real Estate Activities	81.7%	18.3%	4.7%
Manufacturing, Quarrying and Utilities	83.7%	16.3%	4.5%
Other Services	75.0%	25.0%	8.5%
Professional, Scientific, Technical, Administration and Support Service Activities	65.6%	34.4%	11.6%
Public Administration, Defence; Education; Human Health and Social Work Activities	91.1%	8.9%	2.7%
Wholesale and Retail Trade; Transportation and Storage; Information and Communication	84.0%	16.0%	3.4%

When comparing the 2018 situation with 2010 (as shown in the table above), it is evident that the same trend is observable, however, the shares are much less pronounced given that the total share of foreigners employed in the local labour market in 2010 stood at 6.1 per cent compared to 22.5 per cent in 2018. For instance, whilst the *Arts, Entertainment and Recreation* sector was still the sector with the highest concentration of foreigners in 2010, only about one third of the workforce in this respective sector where foreigners compared to over half of employees being foreigners in 2018. The same observation can be perceived for the *Accommodation and Food Service Activities* sector whose share stood at 11.8 per cent compared to 41.6 per cent in 2018.

CHAPTER 4:

METHODOLOGICAL APPROACH

CHAPTER 4: METHODOLOGICAL APPROACH

This chapter provides an overview of the methodology applied to analyse the relationship under investigation in an effort to attain the objectives of the present research inquiry. The initial subsection outlines the foundations of the general model on which this study is based and, consequently, details the specific model and estimation methods undertaken. Subsequently, an overview of the data used is provided by clearly indicating the data sources and choice of variable.

4.1 GENERAL GRAVITY MODEL

Traditional gravity models are based on and are similar to Newton's Law of Gravitation, which implies that particles attract each other with a force directly equal to the product of their masses, and inversely as the square of the distance between them (Rodriguez, 2016). The origins of the gravity model date back to the early 1960s when Tinbergen (1962) proposed such a model to explain international bilateral trade flows. During the nineteenth century, Ravenstein was the initial pioneer behind the use of the gravity models to evaluate migration patterns. It is believed that the theoretical underpinnings of a gravity model for migration follow standard procedures for trade flows as specified in trade literature. In recent times, the use of gravity models has become more common and is often exploited as a tool for evaluating migration processes. The increased use of gravity models in the context of migratory flows has allowed for a better understanding of migration determinants. Departing from the gravitational analogy on which such models are based, gravity models imply that migratory flows between two countries are directly proportional to their size, generally measured by population, and inversely proportional to the distance between them, typically used as a proxy for travelling costs (Ramos, 2016).

Linneman (1966) and Bergstrand (1985) suggest that a gravity model is often perceived as a reduced-form equation of a general equilibrium within demand and supply structures. As a matter of fact, literature on migration recognises the notion that, due to scarcity, and with labour being viewed as a scarce resource, labour needs to be efficiently distributed amongst the widespread labour markets. In view of this, countries must compete with one another in order to attract and retain migrant workers for their markets to function accordingly. Thus, migration flows are often regarded as an equilibrium mechanism to balance labour markets across countries, where migration flows from countries with excess supply, to countries with excess demand. With gravity models being derived from theoretical models like the random utility maximisation (RUM) model, they are deemed extremely useful in migration literature since they are worthy of evaluating such mechanisms. RUM models are deemed relevant in this field given that in such models, individual choices are determined by the maximisation of utility.

As outlined in the afore-mentioned definition of a gravity model, a simple gravity model can be specified in the following manner:

$$Migration_{ij} = \frac{Pop_i Pop_j}{Distance_{ij}} \quad (eq. 4.1.1)$$

The subscripts ‘i’ and ‘j’ in the above equation represent the countries of origin and the destination of migration flows respectively. Equation 4.1.1 implies that migration flows occur from country ‘i’ to country ‘j’, and are a function of the sizes of the two countries in question, where population (‘Pop’) is used as a proxy of this variable, and the distance between them.

In an effort to simplify estimation, the above model (eq. 4.1.1) is generally transformed into a linear form equation through the use of logarithms. Such a transformation results in the following specification:

$$\ln(Migration_{ij}) = \ln(Pop_i) + \ln(Pop_j) - \ln(Distance_{ij})$$

(eq. 4.1.2)

In econometric terms, the specific estimation runs via a linear regression model to estimate this kind of model implies the following approximation:

$$\ln(Migration_{ijt}) = \beta_0 + \beta_1 \ln(Pop_{it}) + \beta_2 \ln(Pop_{jt}) - \beta_3 \ln(Distance_{ijt}) + \varepsilon_{ijt}$$

(eq. 4.1.3)

In equation 4.1.3, the estimated coefficients (i.e. the betas) represent the effect of each respective variable included in the estimation on migration flows. For instance, β_1 captures the effect of the size of the population in the country of origin ‘i’ at time ‘t’ on the flow of migration from country ‘i’ to country ‘j’. Similarly, β_2 indicates the same effect, however from the destination country’s perspective. Such coefficients are expected to be positive given that the larger the country, the higher the capacity to attract migrant flows. Moreover, the coefficient β_3 implies the estimated impact of the distance between two countries on migration, which is expected to be negative given that the further way from each other the countries in question are, the lower the migrants’ willingness to travel. β_0 is considered to be a constant term and ε_{ijt} is the error term which represents the margin of error of the model in question by indicating the sum of deviations. Given that the model is a log-log form model, where both the dependent and

independent variables are log-transformed, the beta (β) coefficients are referred to as elasticities and indicate the expected percentage change in the dependent variable when the respective independent variable increases by one (1) per cent.

4.2 MODEL SPECIFICATIONS

In an effort to capture crucial determinants that influence migration decisions, gravity models tend to be enlarged with a number of push and pull factors, that is, factors which attract or repel migration flows from one country to another. These modified models tend to be useful in analysing the effects of other factors (apart from the ones suggested by the traditional gravity model). These enhance or impede flows of migrant workers between countries experiencing excess supply of labour and those faced with labour shortages. In view of this, the model adopted for this study is based on an augmented gravity model aimed at apprehending key factors deemed influential for labour migrants opting to relocate to Malta. Most of the explanatory variables included in the specification implemented in this study relate to economic variables given that, as per the literature reviewed thus far, are crucially important in migration processes.

Taking into consideration all of the above aspects and the literature in this field, the core model estimated in this analysis is based on the following specification:

$$\begin{aligned} \ln(Migr_{imt}) = & \beta_0 + \beta_1 \ln(N_{it}) + \beta_2 \ln(N_{mt}) - \beta_3 \ln(D_{imt}) + \beta_4 \ln(U_{it}) + \beta_5 \ln(U_{mt}) \\ & + \beta_6 \ln(Wratio_t) + \beta_7 \ln(GDP_{mt}) + \beta_8 \ln(Migr_{im\ t-1}) + \varepsilon_{ijt} \end{aligned}$$

(eq. 4.2.1)

In equation 4.2.1, the subscript ‘i’ refers to the country of origin, ‘m’ refers to the country of destination (in this case Malta), whilst ‘t’ refers to the time period in question. The dependent variable ‘ $Migr_{imt}$ ’ refers to the stock of migration flows from the source country ‘i’ to Malta (‘m’) at time ‘t’. The initial three (3) variables represent the basic gravity model, with ‘ N_i ’ referring to the population of each country of origin included in the dataset, ‘ N_m ’ representing Malta’s population and ‘ D_{im} ’ indicating the distance between each country of origin and Malta. The additional explanatory variables utilised to augment the traditional gravity model, and which are included in the previous estimation, are as follows:

- ‘ U_i ’ represents the unemployment rate of the country of origin of migration flows;
- ‘ U_m ’ depicts the unemployment rate of Malta;
- ‘ $Wratio_t$ ’ indicates the ratio of the annual average wage earned by migrant workers hailing from county ‘i’ in Malta compared to the gross domestic product (GDP) per capita of country ‘i’ at time ‘t’;
- ‘ GDP_m ’ illustrates GDP growth in Malta;
- ‘ $Migr_{im\ t-1}$ ’ signifies the stock of migrants from country ‘i’ in Malta during the previous time period.

In an attempt to capture a broader range of elements that may influence the migration decision, a variation of equation 4.2.1 was deemed more suitable, wherein two relevant dummy variables were included. In view of this, the following specification was considered in the analysis:

$$\ln(Migr_{imt}) = \beta_0 + \beta_1 \ln(N_{it}) + \beta_2 \ln(N_{mt}) - \beta_3 \ln(D_{imt}) + \beta_4 \ln(U_{it}) + \beta_5 \ln(U_{mt}) \\ + \beta_6 \ln(Wratio_t) + \beta_7 \ln(GDP_{mt}) + \beta_8 \ln(Migr_{im\ t-1}) + \beta_9 Lang + \beta_{10} EU + \varepsilon_{ijt}$$

(eq. 4.2.2)

A dummy variable is a qualitative binary variable which generally has a value of either one (1) or zero (0), and tends to be included in regression analysis to incorporate variables which are qualitative in nature, such as gender, marital status, and other aspects (Gujarati and Porter, 2010). The first of the two dummy variables included in the above iteration is '*Lang*', which establishes whether the English Language is an official language in the respective source country, which takes the value of one (1) in cases where English is an official language and zero (0) where this is not the case. The second dummy variable, '*EU*', is included to represent countries which are part of the European Union, which takes the value of one (1) if the country of origin in question is an EU member state and zero (0) if the country of origin is considered as a third country nation.

In order to attain the objective of this research and to answer the relevant research questions of the study under review, different variations of the models specified above were considered. To address the first research question: '*what are the key determinants that are attracting foreign workers to Malta?*' - equation 4.2.2 was run using aggregate data for all countries for the years between 2012 and 2018. The results attained at this stage were aimed at providing a clear indication of the factors influencing migration decisions, and the most influential aspects in this regard can be evidently established. Subsequently, in order to deal with the second research question: '*has the significance of such determinants changed over the years?*' - the dataset was split into two distinct time cohorts: (i) 2012 - 2014 and (ii) 2015 - 2018. Here, approximation 4.2.2 was run for the two groups using aggregate data for all the countries within each cohort. The results extracted from such estimations allow the researcher to determine changes in the influence and importance of factors attracting foreign labour to Malta during different periods of time, if any.

Moreover, in an attempt to tackle the third research question: ‘*do such determinants vary depending on the country of origin of migrant workers?*’ - the same time cohort specifications (i.e. aggregate, 2012 - 2014 and 2015 - 2018) were also implemented for two separate migrant groups, from the EU nationals and TCNs alike. This attempt was undertaken in order to distinguish whether any factors were deemed more significant in the migratory decision between the two groups and across years. Here, a variation of equation 4.2.2 was estimated for each migrant group since the dummy variable *EU* would be frivolous in such cases, as it would be zero (0) in all cases for the TCN group and one (1) for the EU group. In view of this, for this part of the analysis, the following specification was run:

$$\ln(Migr_{imt}) = \beta_0 + \beta_1 \ln(N_{it}) + \beta_2 \ln(N_{mt}) - \beta_3 \ln(D_{imt}) + \beta_4 \ln(U_{it}) + \beta_5 \ln(U_{mt}) \\ \beta_6 \ln(Wratio_t) + \beta_7 \ln(GDP_{mt}) + \beta_8 \ln(Migr_{imt-1}) + \beta_9 Lang + \varepsilon_{ijt}$$

(eq. 4.2.3)

The underlying assumptions of regression analyses are assumed to hold in each model run, as it is assumed that the regressors are non-stochastic, thus implying that the explanatory variables are not random. Moreover, a basic underlying assumption in the model is that the error term (ε) satisfies the common classical assumptions (Gujarati, 2015). The assumptions include:

- I. Linearity: where the model implicates a linear relationship between the dependent and independent variables.
- II. Full rank: which implies that there exists no exact linear relation between any of independent variables included in the model.

- III. Exogeneity of the independent variables (or mean independence): suggests that the independent variables are independent of the dependent variable, hence implying that the expected value of the disturbances has zero mean and doesn't depend on the independent variables.
- IV. Homoscedasticity and no autocorrelation (or spherical errors): infer that the error terms have a constant variance and are not correlated with each other.
- V. Data generation is random: which stipulates that observations included in the sample dataset must be randomly selected and may be any mixture of constants and random variables.
- VI. Normal distribution amongst the disturbances.

4.3 DATA SOURCES

Establishing the appropriate nature of the data utilised in any research is key to ensure that the results attained are robust in reaching the objective at hand. Given the characteristics of panel data, and keeping in mind the research questions of the study under review and the data at hand, the use of panel data was deemed appropriate for this examination. Henceforth, the data utilised in this analysis is based on a cross-sectional panel dataset with observations spanning across both time and countries. A few of the advantages of panel data, listed by Hsiao (2003) and Klevmarken (1989), include the following:

- I. More informative data: panel data provides more variability in the data as researchers can determine further informative data on variables. With more meaningful data in hand, researchers can deduce more reliable and robust estimates.
- II. Better behavioural understanding: panel models permit researchers to construct and model complicated behavioural models that tend to be restricted with pre cross-sectional or time series data.
- III. The ability to analyse dynamics of adjustment: panel data allows for intertemporal estimation.

Whilst panel data has its disadvantages, such as data collection problems and possible measurement errors from panel surveys, panel data is still very advantageous to use despite its costs.

For the study under review, a total of 60 countries were included in the dataset, which pertained to the top countries from which migrant workers employed in the Maltese labour market hailed from as at the end of 2018. From these, 27 countries were EU states (including EEA and EFTA countries), whilst the remaining 33 countries were third countries from across the globe. A list of all the countries included in this analysis is detailed in Appendix B. As one can observe, such countries include the top 40 nationalities (20 EU and 20 TCNs) which had the highest shares of citizens employed in the local labour market as at end of 2018, as outlined in the previous chapter. The timeframe of the study undertaken hereunder covers the period between 2012 and 2018.

Given the diversity of the variables included in the estimated model, a number of different sources to collate the required data were used, namely Jobsplus' administrative data, World Bank data, Eurostat data and an online distance calculator³. One of the crucial underlying pediments in data analysis is the quality of the data gathered, hence the importance of using reliable sources for compiling the necessary dataset. The cross-sectional dataset incorporates annual observations for the period covering 2012 through 2018 for each respective country and year, which implies a total of 420 observations in the sample. In econometrics, this kind of dataset is referred to as a balanced panel since the number of time observations (7) is the same for each individual country included in the database and no missing data was encountered. Furthermore, the data is also referred to as a short panel because the number of cross-sections (i.e. countries) is greater than the number of periods that the data spans over. Moreover, the database utilised for this study is a fixed panel dataset given that the same countries were observed during each period and no additional countries were included during different phases.

As can be viewed from the estimations specified above (eq. 4.2.2 and 4.2.3), a total of eleven (11) separate variables were included in the undertaken analysis in order to evaluate the relationship in question. The dependent variable '*migr*' included in the specifications refers to the total number of migrant workers employed in the local labour market as at the end of each year for each respective country. This implies that end of year stock figures have been utilised to proxy migration flows from countries of origin to Malta, with such data being collated from Jobsplus' administrative data. For this research, country of origin refers to the nationality of each migrant worker employed in Malta. The independent variable '*N*' refers to the population of each country in the sample wherein the population is included in the model as a proxy for

³ <https://www.timeanddate.com/worldclock/distance.html>

the size of the country. When the variable is denoted by ‘ i ’, it implies that the population figure is referring to the country of origin in question; whilst when the variable is denoted by ‘ m ’, it specifies Malta’s population. Data on population figures was extracted from the World Bank’s open online datasets where the numbers pertain to the total population. The latter incorporates all residents, irrespective of legal status or citizenship, in absolute values for each country in each year. The explanatory variable ‘ D ’ indicates the distance in kilometres between each country’s capital city and Valletta (Malta’s capital city), which was calculated individually for each country through the use of an online distance calculator. In the model, distance acts as a representation for travelling and transportation costs.

Moreover, variable ‘ U_i ’ denotes the unemployment rate in each country of origin for each year included in the study, whilst ‘ U_m ’ depicts the unemployment rate in Malta. Such figures were also extracted from the World Bank’s open online datasets, with this indicator demonstrating the number of unemployed persons (i.e. persons without work but available and searching for employment) as a percentage of the total labour force in each territory and are based on ILO estimates. ‘ $Wratio_m$ ’ refers to the ratio of wages earned by migrant workers hailing from each country of origin in Malta compared to the GDP per capita of their respective country. This indicator was specifically constructed for the research being undertaken in this study. The numerator represents the annual average basic wage of migrants hailing from a particular country of origin, as obtained from Jobsplus. No individual data was communicated here as annual averages per country included in the analysis were provided. The wage was converted in purchasing power parity (PPP) terms through the use of the price level ratio of the PPP conversion factor as elicited from the World Bank online data. Moreover, the denominator features the GDP per capita in PPP of each country of origin included in the database, and was

likewise downloaded through the World Bank's online databank. The independent variable ' GDP_m ' captures the real GDP growth rate in Malta which is a measure of economic activity within the country and is defined as the percentage change in real GDP from the previous year. The data for this variable was quoted from Eurostat's online database. The explanatory variable ' $Migr_{imt-1}$ ' is a lagged term of the dependent variable and represents the stock of migrants from each country of origin in Malta during the previous time period. This term implies that the dependent variable relies linearly on its own previous values, which, as specified in the literature review, acts a proxy for networks in the stimulations.

4.4 ETHICAL CONSIDERATIONS

With reference to the data utilised in this research, all ethical considerations were taken into account. As per University's Research Code of Ethics, the necessary 'self-assessment ethical clearance' form was duly filled and submitted. Given that all the data exploited for this study was secondary data with no primary data being collected, the submitted form was confirmed from Faculty of Economics, Management and Accountancy Research Ethics Committee (FEMA FREC) and no further ethical authorisation was required from the University Research Ethics Committee (UREC).

4.5 ESTIMATION METHODS

Panel data analysis can be carried out using a number of estimation methods, each of which serve a different purpose due to their underlying assumptions. In an effort to deal with heterogeneity and observe different effects, panel data models inspect group (individual-

specific) effects, time effects, or both (Park, 2011). It is the researcher's decision, based on the relevant tests, to opt for the correct method when undertaking a study using panel data. The most common and variant techniques in this area include Pooled Ordinary Least Squares (OLS) estimation, Fixed Effects estimation and Random Effects estimation.

Originally, the gravity model was linearised and estimated using linear OLS methods (Gomez and Milgram, 2009). This is only possible based on the assumption of homoscedasticity, where the variance of the error term is deemed constant across observations. A simple and straightforward approach is the Pooled Least Squares method, also referred to as the Common Effects Model. Here, the time and individual dimensions are not considered, and the model assumes that the behaviour of data is consistent across the different periods. Thus, this essentially ignores the structure of the panel data at hand. This method is based on the uncomplicated OLS technique:

$$y_{it} = \alpha + \beta_1 x_{1it} + \dots + \beta_k x_{kit} + \varepsilon_{it} \quad (\text{eq. 4.4.1})$$

$$\text{Where } z_{it} = v_i + u_{it}$$

The estimator of this method is considered biased and inconsistent in instances where v_i and X_{it} are correlated. The resulting bias in this method is commonly referred to as the heterogeneity bias, given that this is caused by omitting the time-constant variable (Baltagi, 2005). When researchers determine that other complex models are more useful for the data at the hand, the pooled OLS technique could be considered more as a benchmark to which the results from other complex methods may be compared.

Another commonly used estimation method with panel data is the Fixed Effects Model, which takes into consideration individual unobserved Fixed Effects for each unit ‘i’ (i.e. country). In an effort to estimate this technique using simple OLS estimation, the model is essentially transformed in a manner to eliminate the unobserved effect of v_i from the specification. Such transformation is carried out by subtracting the averages from the actual values so that, over time, the fixed effects equal its average.

$$y_{it} - \bar{y}_i = \beta_1(x_{1it} - \bar{x}_{1i}) + \dots + \beta_k(x_{kit} - \bar{x}_{ki}) + (\varepsilon_{it} - \bar{\varepsilon}_i)$$

(eq. 4.4.2)

Although the variable coefficients (i.e. the betas – β) are estimated using the pooled OLS technique, the fixed effects model is based on the assumption of arbitrary correlation between v_i and the explanatory variables. This means that the model assumes that the subjects of interest and their respective variances are equal. A pitfall of this model is that estimators do not function for variables that are constant over time due to the transformation process as outlined above. For instance, this is encountered in the distance variable, which is one of the primary variables of the gravity model. The Fixed-Effects Vector Decomposition method is a modification of the fixed effect estimator that allows for the incorporation of time-invariant regressors. An advantage of this method is that it does not imply strong structural underlying assumptions, hence it is becoming an increasingly common method applied by economists (Head and Meyer, 2013). The fixed effects method results in consistent estimates as long as the specific model structure is in multiplicative form.

Whereas the fixed effects method yields efficient estimates based on the underlying key assumption, in instances where the fixed effects are uncorrelated with the independent regressors, this is not the case. This means that inefficient estimates are attained. As a matter of fact, there are cases where the effects are assumed to be randomly distributed amongst the units of interest. In such cases, the Random Effects Model would be the option for the researcher given that this method functions under assumptions that contradict the Fixed Effects Model. Whilst the averages are subtracted in the fixed effects model, only a fraction (λ) of the averages are subtracted in the random effects model, thus implying that the latter model is based on a quasi-demeaning method.

$$y_{it} - \lambda \bar{y}_i = \beta_1(x_{1it} - \lambda \bar{x}_{1i}) + \dots + \beta_k(x_{kit} - \lambda \bar{x}_{ki}) + (\varepsilon_{it} - \lambda \bar{\varepsilon}_i)$$

(eq. 4.4.3)

$$\text{Where } \varepsilon_{it} - \lambda \bar{\varepsilon}_i = (v_i + u_{it}) - \lambda(v_i + \bar{u}_{it})$$

Equation 4.4.3 is estimated using the pooled OLS method with the parameter λ being unknown to the researcher and which thus can only be estimated. The parameter $\hat{\lambda}$ indicates how close the random effects estimators are, either to the fixed effects estimators, or to the pooled OLS estimators. As $\hat{\lambda}$ approaches zero (0), the estimators are closer to the pooled OLS estimators, whilst as $\hat{\lambda}$ approaches one (1), the estimators are closer to the fixed effects estimators. A key underlying assumption of this method is the orthogonality of the regressors and individual effects, implying that the unobserved heterogeneous element v_i should be randomly distributed amongst the observed countries.

All three estimation methods are useful and can provide meaningful results. However, given the underlying contradictory assumptions, the researcher must decide which method best suits the variables and research being carried out. There are a set of econometric tests which need to be carried out in an attempt to establish the correct method to be pursued. To select an appropriate model, three tests can be run to determine which of the models (pooled, fixed or random effects) provide the best and most robust and efficient results for the study under review.

The Chow Test, proposed by the econometrician Gregory Chow in 1960, is the appropriate test to establish whether the Common Effect (or pooled OLS), or the Fixed Effects method is the most suitable model in estimating the panel data at hand. Essentially, this test tests the data for poolability or the presence of individual effects. The null hypothesis of this test is that the common effect is the correct method, whilst the alternative hypothesis implies that the fixed effects estimation is fit. Moreover, the Hausman Test, anticipated by Jerry Hausman in 1978, is commonly opted for in order to determine whether the most relevant method is the Fixed Effects or the Random Effects. Generally, this test proceeds the Chow Test when the alternative hypothesis holds (i.e. that the fixed effects model precedes the common effects model). The null hypothesis of the Hausman Test implies that the Random Effects model holds, whereas the alternative hypothesis suggests that the Fixed Effects model is best applicable.

Moreover, if following the Hausman Test, the Random Effects Method is suggested to be the most appropriate method, followed by the Lagrange Multiplier Test as devised by Breusch and Pagan (1980), which is utilised to determine whether the Random Effects Method supersedes the Common Effects Method. For this test, the null hypothesis indicates that the Common

Effects Method is best. On the other hand, the alternative hypothesis implies that the Random Effects Model is the optimal choice.

The following chapter provides an overview of the estimation results attained when undertaking the methodological approach outlined above. Furthermore, the results of the performed tests and, subsequently, the adopted model, are also reviewed extensively.

CHAPTER 5: RESULTS AND DISCUSSION

CHAPTER 5: RESULTS AND DISCUSSION

Following the methodological approach identified in the previous chapter, the suggested tests and specifications were run. All tests and specifications were run using the statistical software EViews. This chapter presents the empirical findings relating to the key determinants in attracting labour migration to Malta, clearly identifying the significance of each. Subsequently, recommendations based on the results attained are presented and put forward in the following concluding chapter.

5.1 MODEL TESTING

As outlined in the methodology, a number of specifications were run in an effort to address the research's main objectives and aims. The initial step was to identify the appropriate estimation model for the data at hand. As previously discussed, there are a variety of different models for panel data, namely: pooled regression, fixed effects and random effects. The use of each depends entirely on what the researcher is trying to attain, as well as the assumptions being inferred beforehand.

TABLE 5.1.1: SPECIFICATION TEST RESULTS

Test Name	p-value
Chow Test	0.0722
Hausman Test	0.3121
Lagrange Multiplier Test	0.0854

To determine the most appropriate model for the study under review, three different tests were run: the Chow Test, the Hausman Test and the Lagrange Multiplier Test. Table 5.1.1 indicates the results of each respective test, with the corresponding p-values obtained through Eviews testing software. The Chow Test was performed to establish whether the common effects model (also known as the pooled regression) or the fixed effects model is better in explaining the data.

Recall that:

H_0 : Select common effects estimation

H_1 : Select fixed effects estimation

With a p-value of the Chi-square statistics greater than 0.05, the null hypothesis is accepted and thus, the common effects model supersedes the fixed effects model as the best fit model. Following this attempt, the Hausman test was run to assess which model, between the random effects and fixed effects estimation, is most suitable. This test indicates whether the unique errors are correlated with the regressors. Given that an essential assumption of the random effects model is that random effects errors are uncorrelated with the explanatory variables, the null hypothesis is in favour of the random effects estimation. Henceforth:

H_0 : Select random effects estimation

H_1 : Select fixed effects estimation

As depicted in Table 5.1.1, the p-value for the test in question is 0.3121 (meaning a p-value greater than 0.05), implying that the null hypothesis must be accepted, hence suggesting that

the random effects model is a better fit than the fixed effects model. In view of this, the Lagrange Multiplier Test was run in an effort to determine whether the random effects model was better than the common effects model in explaining the data at hand. The null hypothesis in this test is that variances across cross-sections are zero, suggesting that there are no significant differences that exist across units, meaning that, essentially, there is no panel effect. Therefore:

H_0 : Select common effects estimation

H_1 : Select random effects estimation

The p-value corresponding to the Breusch-Pagan test (within the LM test) is greater than 0.05, indicating that the researcher should accept the null hypothesis, as the common effects estimation is more efficient. The hypothesis across both cross-sections and time hold implying that the panel effect for the data at hand can be ignored.

Overall, it is clear from the undertaken tests that the most suitable model for the research inquiry at hand is the Pooled Regression Estimation. In principle, this result is worthy given that, for the present inquiry, the main interest is in the general key determinants in attracting labour migrants to Malta. At this stage of the analysis, the researcher is not concerned with establishing the determinants pertaining to each country included in the dataset, but rather, at observing overall behaviour. Moreover, when comparing the behavior of EU Nationals with that of TCNs, the researcher divides the data into two distinct groups, essentially comparing all EU countries against all third country nations.

5.2 ESTIMATION RESULTS

This sub-section provides an overview of the empirical results attained for the estimations distinctly run for aggregate labour migration, EU labour migration and TCN labour migrants respectively.

5.2.1 Estimation results of overall labour migration

Table 5.2.1.1 demonstrates the results achieved in an attempt to answer the first two research questions of this study: (i) *‘What are the key determinants that are attracting foreign workers to Malta?’* and (ii) *‘Has the significance of such determinants varied during the years under review?’*. Here, the specification 4.2.2 was run for all the countries included in the dataset for the three different time cohorts (2012 - 2018, 2012 - 2014 and 2015 - 2018).

TABLE 5.2.1.1: ESTIMATION RESULTS FOR AGGREGATE DATASET

Variable	2012-2018 Estimates	2012-2014 Estimates	2015-2018 Estimates
N_i	0.0497*	0.2599*	0.1104*
N_m	0.5449*	0.1604*	-0.0060
D_im	-0.1377*	-0.2776*	0.0039
U_i	0.3207*	0.2555*	0.4661*
U_m	-0.9898*	-0.6825*	-0.5461*
Wratio	0.8515*	-0.2574	0.8958*
GDP_m	0.9042*	0.9441*	0.4948*
Migr_im-1	0.8713*	0.7002*	0.9941*
Lang	0.0355*	0.1206*	-0.0123
EU	0.0715*	0.2139*	0.0356*
R-squared	0.9283	0.8764	0.9014
Durbin-Watson	1.9998	1.8677	1.9215

*significant at the 5% level

As displayed in the second column of Table 5.2.1.1, when estimation 4.2.2 was run for all the years included in the sample (that is, 2012 - 2018), all the variables were statistically significant at the five (5) per cent level, with results following apriori expectations and literature findings. As expected, and as per basic gravity model, the population of both the country of origin (N_i) and destination (N_m) have a positive impact on migration flows. This is mainly due to the fact that population is used as a proxy for size, implying that, ceteris paribus, the larger the country area, the higher the migration flows. This could suggest that a larger country has a higher capacity of accepting migrants, hence the positive influence of this variable. On the other hand,

the distance between the two countries (D_{im}) negatively affects migration flows, implying that the farther away the two countries are from each other, the lower the number of persons migrating from such countries.

Moreover, as per apriori expectations and in line with the literature reviewed, economic factors have the highest implications on migration decisions. In particular, pull factors, which constitute aspects of the destination country, in this case, Malta, have a higher impact than push factors of source countries. As a matter of fact, the unemployment rate of source countries (U_i) attracts immigration to Malta by approximately 0.32 per cent, whilst the local Maltese unemployment rate (U_m) pushes labour migrants away from Malta by more than treble the amount (approximately 0.99 per cent). The wage ratio ($Wratio$) also has a positive effect on migration flows given that as this ratio increases by one (1) per cent, incoming labour migration also increases by around 0.85 per cent. One should recall that an increase in this ratio implies a greater disparity between the wage obtained by foreigners whilst working in Malta and the GDP per capita in their home country. Furthermore, GDP growth in the country of destination (GDP_m), that is, Malta, is also a key determinant in attracting foreign labour. As the economy flourishes by an additional one (1) per cent, incoming labour migration increases by approximately 0.90 per cent. The lagged term of the dependent variable ($Migr_{im-1}$), acting as a proxy for networks, similarly has a positive impact on migration as the more networks an individual has in the destination country, the easier it is for him/her to move to the country in question.

The specification also included two dummy variables, one indicating whether countries are EU member states and the other indicating whether source and destination countries have a

common language, specifically, English, as an official language. Both dummies were also significant at the five (5) per cent level, implying that labour migration increases from EU countries and from countries which have English as an official language. Such dummies increase migration by 0.07 and 0.03 per cent respectively.

The results attained in this part of the analysis are robust and reliable as the R^2 statistic of this specification is relatively high (0.9283), indicating that the explanatory variables included in the estimation explain around 93 per cent of the variation in labour migration. Additionally, the Durbin-Watson statistic is within the desired values to ensure that no autocorrelation is present in the model. This was mainly achieved by including the lagged term of the dependent variable as one of the regressors.

Similarly, the same specification was estimated for two distinct time cohorts by splitting up the sample as follows: 2012 to 2014, and 2015 to 2018. The first group can be viewed as an indication of the influences that occurred following the 2007 - 2008 financial crisis, whilst the second group can provide an indication of the detrimental factors as other economies across the globe started gaining pace. As columns three and four of Table 5.2.1.1 indicate the respective results, it is clear that the significance and influence of such determinants does vary across the years. The population of the source country remained positive and significant in both groups, with the coefficient increasing in the initial years and then decreasing thereafter, although both coefficients were higher than the initial run (that is, for the entire sample). The population of the destination country, Malta, was only significant for the first group of years (2012 - 2014), but with a lower significance than the initial run, decreasing from having a 0.54 per cent change in migration, to 0.16 per cent. For the second group of years (2015 - 2018), the population of

Malta proved to be negative, but insignificant, implying that this variable did not have an effect on migration flows during the period under review. Similarly, the distance variable was negative and significant for the initial time cohort, but positive and insignificant during the second run. This could suggest that increased connectivity throughout the world has made it more convenient for individuals to travel, thus diminishing the effect of distance on migration decisions. With reference to the unemployment rate of the source country, this remained positive and significant across the different years. However, its significance was prominent during the later years (2015 - 2018) by nearly doubling, from having a 0.26 per cent influence, to 0.47 per cent. Whilst the unemployment rate of Malta stood by apriori expectations, negative and significant, its prominence decreased slightly during the 2015 - 2018 period. The wage ratio was initially insignificant for the period 2012 - 2014, but became substantially significant in the other years, where it had a 0.89 per cent effect increase in migration. GDP growth remained significant throughout the years, with its prominence remaining constant in the initial years, but nearly halving during the subsequent period. Additionally, the 'networks' variable contained its significance as an influential factor during all the years under review.

The EU state dummy variable was rather significant during 2012 and 2014, where the share of EU nationals employed in the labour market stood at 68.9 per cent out of the total foreign employment. The coefficient decreased substantially but remained significant thereafter and during such years so that the share of TCNs within the labour market increased by seven (7) percentage points. Moreover, the English language dummy was positive and significant for the initial time cohort, but insignificant during the subsequent period, implying that labour migration was not necessarily dependent on countries having a common language with Malta between 2015 and 2018. The R^2 statistic for both estimations were relatively high too, standing

at 88 per cent for the 2012 - 2014 period and 90 per cent for the 2015 - 2018 period. This implies that the choice of regressors are adequate and reflects the determinants affecting labour migration to Malta. In the same way, the Durbin-Watson statistic also indicates no autocorrelation for both specifications.

5.2.2 Estimation results for EU and TCN labour migration

Moreover, the data was split further into two different migrant groups: EU nationals and TCNs. Thus, estimation 4.2.3 was run for six (6) times in an effort to answer the third research question of this research: (iii) '*do such determinants vary depending on the country of origin of migrant workers?*'. Tables 5.2.2.1 and 5.2.2.2 provide the results attained for the two respective distinct groups in the separate three-time cohort groupings: aggregate, 2012 - 2014 and 2015 - 2018. Such results provide a respectable understanding of how the different migrant groups respond to diverse factors affecting their decision to migrate.

TABLE 5.2.2.1: ESTIMATION RESULTS FOR EU COHORT

Variable	2012-2018 Estimates (EU)	2012-2014 Estimates (EU)	2015-2018 Estimates (EU)
N _i	0.2070*	0.2839*	0.1628*
N _m	0.1647*	0.2180*	0.1309*
D _{im}	-0.1713	-0.1106*	-0.1724*
U _i	0.3339*	0.3229*	0.3189*
U _m	-0.5090*	-0.4287*	-0.7972*
Wratio	0.6837*	0.6518*	0.9454*
GDP _m	0.3575*	0.1706*	0.2240
Migr _{im} -1	0.8635*	0.7970*	0.9082*
Language	0.2042*	0.1931*	0.2025*
R-squared	0.9644	0.9477	0.9520
Durbin-Watson	1.9267	1.8659	1.9830

*significant at the 5% level

The second column of Table 5.2.2.1 displays the estimation results for the EU group for the aggregate years in the sample, whereas the third and fourth columns indicate the results for the same group, however for the segregated two-time cohorts. Once again, all the variables here follow the researcher's apriori expectations and are nearly all significant at the five (5) per cent level. Both the population variables are positive and significant in the three columns, illustrating the fact that they have a positive impact on migration flows. The significance of the population of the source country more or less follows the same trend as the entire migrant data as explained earlier, though the influence of such a variable is now more pronounced. Overall, when the country of origin's population increases by one (1) per cent, migration flows in Malta increase

by 0.21 per cent. This rises slightly to 0.28 per cent for the years 2012 - 2014 and falls to 0.16 per cent thereafter. The population of the host country follows a very similar trend, that is, when Malta's population increases by one (1) per cent, labour migration from EU countries generally increases by 0.16 per cent. Its influence rises to 0.22 per cent during the initial years and drops to 0.13 per cent for the later years. Such gravitational findings imply that continued population growth will result in increased migration. The distance variable was deemed to be insignificant in general, however with the sample split into two, this variable was significant. Whilst distance initially had a negative impact on the migration of Europeans by 0.11 per cent for every one (1) per cent increase in distance, for the later years, this negative effect increased to 0.17 per cent. As a matter of fact, this might explain the rise of Italian labour migrants in recent years with figures rising more by more than double, increasing from 3,054 in 2014, to 9,379 in 2018, with Italy being the closest EU country to Malta.

Furthermore, the economic variables included in the regression also follow expectations as per literature and display the same trends explained earlier for the overall aggregate model. The unemployment rate of the source country remained more or less constant during the entirety of the sampled years, positively influencing migration by approximately 0.3 per cent for every one (1) per cent rise in the respective unemployment rate. This implies that this factor would increase the number of Italians by 3.06 per cent compared to 1.44 per cent in Austrians. In fact, in 2018, Italians were the highest number of Europeans employed in Malta due to Italy having one of the highest unemployment rates in Europe when compared to Austria's low unemployment rate. Malta's unemployment rate also remained significant throughout the years, however the share of influence varied during the distinct time groupings. Overall, this factor negatively affected migration by 0.51 per cent every time the local unemployment rate

experienced a one (1) per cent variation. This effect decreased to 0.43 per cent between 2012 and 2014 and rose drastically to 0.79 per cent between 2015 and 2018. This may be a result of the significant declines in the Maltese unemployment rate between 2014 and 2018, with the number of registered unemployed individuals falling from 6,287 in 2014, to 2,167 in 2018. Inevitably, such fluctuations impacted the employment possibilities of both nationals and foreigners, hence impacting the migration decision of foreigners.

Similarly, the wage ratio was also statistically significant during the periods under review. This wage variable influences migration flows by approximately 0.68 per cent when considering all the years in the sample, suggesting that flows of Romanians, whose disparity ratio is high, would increase by 0.92 per cent compared to a rise of 0.71 per cent in Swiss nationals. During the initial years, it impacted migration by nearly the same magnitude at 0.65 per cent, whilst in the later years, the effect increased to 0.95 per cent. The fact that this elasticity was very close to one (1) could indicate that during the later years, wages in the domestic market were sensitive to migration flows. An effect of 0.95 implies that GDP growth was less influential for EU citizens when compared to the general model for all migrants. Whereas for the overall model, changes in GDP growth affected migration flows by 0.90 per cent, here, a one (1) per cent change in GDP growth only increased migration flows by 0.36 per cent. This impact decreased to 0.17 per cent in the 2012 - 2014 period and increased slightly to 0.22 per cent in the following years. Given that most Europeans know English, the dummy variable for this factor proved to positively impact migration flows towards Malta, having an impact of around 0.20 per cent in all the different variations of the model run. Like previous estimations, the R^2 and Durbin-Watson statistics prove that the undertaken estimations provide reliable and efficient results, with the R^2 hovering around 95 and 96 per cent.

TABLE 5.2.2.2: ESTIMATION RESULTS FOR TCN COHORT

Variable	2012-2018 Estimates (TCN)	2012-2014 Estimates (TCN)	2015-2018 Estimates (TCN)
N _i	0.0630*	0.0645*	0.0616*
N _m	-0.0450	-0.0393	-0.0503
D _{im}	-0.1259*	-0.1213*	-0.1205*
U _i	0.0533*	0.0812*	0.0399*
U _m	-1.1526*	-0.9308*	-0.6713*
Wratio	0.5005*	0.3764	0.4505*
GDP _m	0.1052*	0.0930*	0.1206*
Migr _{im} -1	0.8015*	0.8052*	0.8013*
Language	0.0200	-0.0024	0.0345
R-squared	0.8724	0.8786	0.8691
Durbin-Watson	1.9167	1.7899	1.8362

*significant at the 5% level

Table 5.2.2.2 above displays the estimation results of specification 4.2.3 for the TCN migrant cohort. The source country's population was deemed significant but had a rather negligible effect on labour migration towards Malta, with an estimated impact of 0.06 per cent in each variation of the model for every one (1) per cent increase in the country of origin's population. On the other hand, labour migrants from third country nations were not influenced by Malta's population in their decision to migrate. Irrespective of the capacity or overcrowding in the country, they were still willing to carry out the journey in pursuit of employment. Similar to previous estimations, although the distance variable is significant, its influence is rather minimal, negatively affecting migration flows by 0.12 per cent in each run. As a matter of fact,

this is in line with the reality in Malta, where foreign workers come from across the globe, ranging from the Philippines to Italy. Although quite similar, this variable is slightly more influential for Europeans possibly due to the number of bordering countries with employment opportunities acting as a buffer to the migration decision of such individuals towards possibilities which are farther away.

Even though economic variables are significant for the TCN cohort, the influential element is much more pronounced for the EU nationals. For instance, the country of origin's unemployment rate has a very low impact on migration flows from third country nations, reflecting an increase of only 0.05 per cent in migration towards Malta when their home country's unemployment rate increased by one (1) per cent. EU nationals are much more responsive to changes in their domestic unemployment variation. On the other hand, TCNs are more responsive towards the destination country's unemployment rate. For all the years included in the sample, a one (1) per cent change in Malta's unemployment rate decreases migration flows by 1.15 per cent. Given that this figure represents an elasticity and is greater than one (1) implies that migration flows from third country nations are very sensitive to Malta's labour market developments and absorption capacity. When examining this factor for the different years, it remained relatively highly influential, negatively impacting migration by 0.93 per cent between 2012 and 2014 and 0.67 per cent in the subsequent years.

Another aspect in which EU nationals and TCNs differ is the wage variable. Whilst EU nationals respond extensively to this variable, TCNs are less sensitive. Overall, when the wage ratio changes by one (1) per cent, the migration of EU nationals increases by 0.68 per cent, whilst the migration of TCNs increases by 0.50 per cent. When investigating the distinct factors

across the different years, the variation in response to this variable is even more pronounced. In the initial years (2012 - 2014), TCNs respond to a change in this variable by increasing flows to 0.38 per cent compared to 0.65 per cent of EU nationals, whilst in later years, migration from EU countries increases by 0.95 per cent in relation to a 0.65 per cent rise of TCNs. Economic growth is of little influence for TCNs, where flows from such nations increase by a mere 0.1 per cent across all the different years when GDP growth in Malta increases by one (1) per cent. Similar to EU nationals, TCNs are also influenced by networks in the host country, affecting increases in immigration flows by 0.80 per cent during all the distinct specifications undertaken. As for the language variable, this was deemed insignificant for the TCN cohort for all the years under review. This reflects a difficulty Maltese people, especially the older generations, encounter when dealing with individuals from such countries. The fact that such individuals are unable to communicate in English dampens the experience for all those concerned. Likewise, the results acquired in this section are robust and efficient, with factors explaining the 87 per cent of the variation in labour migration flows from third countries.

5.3 CONCLUDING REMARKS

The results attained above are very meaningful and useful in determining influential factors for labour migration to Malta. During the initial years, results indicated that labour migrants were primarily interested in finding a job, which is justifiable given the fact that Malta sailed through the financial crisis and was amongst the few countries to continue growing once the crisis was over. In the following years, labour migrants were choosier in the kind of job they searched for, with wages playing a part in their decision to migrate. As a matter of fact, this is clearly depicted by the wage variable included in the model, whose coefficient was insignificant during the first

periods, but became significant in the later years. This undoubtedly implies that as other European countries gained pace during recent years, labour migrants had alternative options for finding employment, and thus, the quality of the job pursued became of interest too. Notwithstanding, the behaviour and significant impact of each variable does vary depending on whether the migrants come from an EU country, or from a third country nation. Whilst EU nationals are more responsive to income and GDP growth, TCNs are much more sensitive to changes in the unemployment rate of the destination country. In view of all this, Malta was required to exploit its competitive advantage, not just as a result of experiencing robust job growth, but by also offering quality jobs in an effort to remain competitive with other countries across the globe. Based on such results, some recommendations are put forward in the subsequent, concluding chapter.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

In light of the influx of foreign workers experienced by Malta during recent years, with figures increasing drastically from 4,118 in 2004, to 10,687 in 2010, and reaching 55,280 in 2018, the main aim of this research was to establish the key determinants in attracting foreign labour to Malta. An additional aim was to identify whether there are any crucial differences between the attraction of EU nationals and TCNs. As the Maltese economy grew and outpaced its European counterparts, the reliance on such foreign labour became even more amplified. Malta's labour resource has been extensively stretched during recent years, as apart from drastically increasing female employment, the employment rate of graduates has been the second highest in the EU, standing at 90.4 per cent (The Knowledge Academy, 2018). Hence, this illustrates the importance for Malta to exploit the relevant competitive advantage to maintain the attractiveness of the country in the eyes of the prospective migrant work force, as well as the currently employed. Indeed, it is also crucial for Malta to retain its current foreign work force as it is already challenging for the country to meet its demands by importing the required labour, let alone by additionally replacing the current employees as well.

The underlying theory of this study was Borjas' (1989) concept of an exiting immigration market where individuals are 'traded' between countries, with labour flowing from countries experiencing a surplus of labour to countries dealing with labour shortages. However, countries must still compete with one another within this 'market' in an effort to attract the relevant labour. In an attempt to analyse the relationship in question and to understand the key factors in attracting labour migrants to Malta, a traditional gravity model of migration was developed for this research. The model was additionally augmented with a number of economic variables

to determine key push-pull factors that come into play. A total of 60 countries were included in the sample population and the study was carried out using data that spanned over seven years (2012 - 2018). Based on the literature reviewed, crucial economic variables, mostly relating to the country of destination, were incorporated within this model. In total, nine (9) specifications were estimated: three (3) for the entire sample population, that is all the countries included in the dataset; three (3) for EU countries; and an additional three (3) for third countries. For each group, an estimation was run for all the years in the sample (2012 - 2018), and then separately for the periods 2012 - 2014 and 2015 - 2018. The intention behind such different variations of the model was to not only determine the key characteristics in attracting foreign labour, but to also investigate the change in significant influential factors across a number of years. Additionally, the researcher aimed at exploring whether any significant differences in key factors exist between EU nationals' and TCNs' decisions to migrate.

The results attained do conform with existing literature findings. Whilst the traditional gravity model variables were significant, key findings established that economic factors are indeed influential in the decision to migrate, and that pull factors tend to be more significant. Differences across years were also observed and variances in behaviours between EU nationals and TCNs were similarly established. Whilst during the period after the financial crisis individuals tended to migrate simply in pursuit of a job, during later years, when the global economy was revived, individuals were also interested in the quality of jobs pursued. Whereas EU nationals tend to be more sensitive to wage differentials and economic growth in the country of destination, TCNs tend to be more responsive to unemployment rates within both the source and host countries.

6.1 LIMITATIONS

Whilst the findings of this research were significant and tested accordingly, some limitations and improvements of the model should be highlighted, and the results must be interpreted whilst taking such points into account. For this study, a stock of migrant workers from each country of origin included in the sample as at end of each year was utilised. Ideally, two-way data on migration flows between Malta and each country of origin could be attained, allowing for a more in-depth analysis of the multifaceted migration process. However, it is a known fact that reliable and detailed data on migration is somewhat limited. Moreover, the number of years included in this study amount to seven (7), which is still comprehensive given that panel data is availed of. Thus, the number of observations are adequate. Nonetheless, additional periods in the research could imply a more meaningful understanding of the changes in behaviour of both EU nationals and TCNs across the years. Furthermore, given the complexity of the decision to migrate, the determinants included in the model are not exhaustive, as it is near to impossible to incorporate all the determinants playing a role in this process. Besides, a number of other subjective variables from the individuals' perspective also come into play, such as the personal outlook on the level of pollution, or educational systems of a country. However, such indicators are difficult to quantify.

6.2 FUTURE WORK

Despite such limitations, the findings of this research provide policymakers with useful evidence on key determinants that influence migration flows. Though the state of the economy plays a vital role in this regard, wage developments are equally important and must not be left

behind. As a matter of fact, a core finding of this empirical analysis is that EU nationals are very responsive to wage differentials, and figures of labour migration to Malta during recent years concur with this finding. In spite of Malta's outstanding economic growth between 2014 and 2018, the share of EU nationals has declined, whereas the share of TCNs has increased by 6.8 per cent during the same period. This is mainly due to the fact that wages have not followed suit, that is, wages have not followed the same upward trend, with Malta experiencing negative year-on-year real wage growth between 2016 and 2017 (AMECO database), whereas the vast majority of EU countries registered positive growth. Without a doubt, EU nationals have been on the lookout for better wages and with Malta lagging behind in this regard, such individuals have opted for countries offering more attractive wages. Malta needs to gain speed in this sphere in order to attract the foreign workers required to meet rising demands.

One of the major findings of this study is that wages in the domestic market are sensitive to migration flows. This issue is one of constant political debate, particularly on whether the influx of foreigners into the local labour market exerts downward pressure on wages of nationals. Indeed, further empirical research into this topic would be one of major interest, both at a policy, and at an individual level. Future research in this field, particularly this strain of work, would be useful and is recommended in an effort to ensure that the local workforce is not undermined with the introduction of such foreigners in the local labour market. In turn, this should lead to necessary policy actions to limit any brain drain of local labour.

REFERENCES

REFERENCES

- Baltagi, B. H. (2005). *Econometric Analysis of Panel Data*. New York: John Wiley & Sons Inc., 3rd Edition.
- Beine, M., Bertoli, S., & Moraga, J. F. (2016). "A Practitioners' Guide to Gravity Models of International Migration," *World Economy*, Vol 39 (4): 496 - 512.
- Berger, M. C., & Webb, M. A, (1987). "Commercial Policy and the Brain Drain," *Applied Economics*, Vol 19 (2): 143 - 153.
- Bergstrand, J. H. (1985). "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence," *The Review of Economics and Statistics*, Vol (67): 474 - 481.
- Bijak, J. (2006). *Forecasting International Migration: Selected Theories, Models and Methods*. Warsaw: Central European Forum for Migration Research.
- Blejer, M. I., Johnson, H. G., & Porzecanski, A. C. (1978). "An Analysis of the Economic Determinants of Legal and Illegal Mexican Migration to the United States," *Research in Population Economics*, Vol (1): 217 - 231.
- Borg, I. (2019). "The Length of Stay of Foreign Workers in Malta." Central Bank of Malta, Policy Note.
- Borjas, G. J. (1989). "Economic Theory and International Migration," *International Migration Review*, Vol 23 (3): 457 - 485.

- Breusch, T. S., & Pagan, A. R. (1980). "The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics," *The Review of Economic Studies*, Vol 47 (1): 239 – 253.
- Buch, T., Hamann, S., Niebuhr, A., & Rossen, A. (2014). "What Makes Cities Attractive? The Determinants of Urban Labour Migration in Germany," *Urban Studies*, Vol 51 (9): 1960 - 1978.
- Chew, S., & Chew, R. (1995). "Immigration and Foreign Labour in Singapore," *ASEAN Economic Bulletin*, Vol 12 (2): 191 - 200.
- Cuaresma, J. C., Moser, M., & Raggl, A. K. (2013). "On the Determinants of Global Bilateral Migration Flows," *IDEAS Working Paper Series from RePEc*, IDEAS Working Paper Series from RePEc.
- Davila, A. E. (1983). "Economic Determinants of Illegal Mexican Immigration to the U.S.," *Economic Review*, Federal Reserve Bank of Dallas: 13 - 23.
- De Haas, H. (2010). "Migration and Development: A Theoretical Perspective," *International Migration Review*, Vol 44 (1): 227 - 264.
- De Vortez, D., & Maki, D (1983): "The Immigration of Third World Professionals to Canada: 1968-1973," *World Development*, Vol 11 (1): 55 - 64.
- European Commission (2015). "What are the pros and cons of composite indicators?" Available at <https://ec.europa.eu/jrc/en/faq/what-are-pros-and-cons-composite-indicators-32104>.
- European Commission (2017). "Country Report Malta 2017."

Eurostat (2018). “GDP main aggregates and employment estimates for third quarter 2018.” Eurostat News Release 188/2018.

Eurostat (2019a). “Real GDP growth rate – volume.” Available at <https://ec.europa.eu/eurostat/databrowser/view/tec00115/default/table?lang=en> (accessed on 15 July 2019).

Eurostat (2019b). “Employment rate by sex, age group 20-64.” Available at https://ec.europa.eu/eurostat/databrowser/view/t2020_10/default/table?lang=en (accessed on 15 July 2019).

Gallardo-Sejas, H., Pareja, S., Llorca-Vivero, R., & Martínez-Serrano, J. (2006). “Determinants of European immigration: A cross-country analysis,” *Applied Economics Letters*, Vol 13 (12): 769 - 773.

Gallaway, L. E., & Vedder R. K. (1971). "Mobility of Native Americans," *Journal of Economic History*, Vol 31(3): 613 - 649.

Gomez, E. H., & Milgram, J. B. (2009). “Are Estimation Techniques Neutral to Estimate Gravity Equations? An Application to the Impact of EMU on Third Countries’ Exports.” *Universidad de Granada*.

Grech, A. G. (2015). “Understanding the Macroeconomic Impact of Migration in Malta,” Central Bank of Malta, Policy Note.

Green, A. G. (1976). *Immigration and the Post-War Canadian Economy*. Ontario: MacMillan, 1st Edition.

Greenwood, M. J., & McDowell, J. M. (1982). "The Supply of Immigrants to the United States," Washington D.C: The Gateway: U.S. Immigration Issues and Policies: 54-85.

Greenwood, M. J., & McDowell, J. M. (1992). "The Macro Determinants of International Migration: A Survey," paper prepared for a conference on Mass Migration in Europe: Implications in East and West.

Gujarati, D. N. (2015). *Econometrics by Example*. New York: Red Globe Press, 2nd Edition.

Gujarati, D. N., & Porter, D. C. (2010). *Basic Econometrics*. New York: McGraw Hill, International Edition, 2nd Edition.

Gurieva, L. K. & Dzhioev, A. V. (2015). "Economic Theories of Labor Migration." *Mediterranean Journal of Social Sciences*, Vol 6 (7): 101.

Gurinaite, V. (2014). "Labour Force Migration within EU: Analysis of Push and Pull Factors," M.A. Economics Dissertation, Central European University, Budapest.

Harris, J. R., & Todaro, M. P. (1970). "Migration, Unemployment and Development: A Two-Sector Analysis," *The American Economic Review*, Vol 60 (1): 126-142.

Hassan, K. M. (1988). "The Immigration of Third World Scientists and Engineers to the United States: Theoretical, Empirical and Policy Evaluations," *Pakistan Journal of Applied Economics*, Vol 7 (1): 43-58.

Head, K., & Mayer, T. (2013). "Gravity Equations: Workhorse, Toolkit, and Cookbook," *IDEAS Working Paper Series from RePEc*, IDEAS Working Paper Series from RePEc.

Hsiao, C. (2003). *Analysis of Panel Data*. United Kingdom: Cambridge University Press, 2nd Edition.

Incaltarau, C. & Juravle, D. (2014). “The Attractiveness of the EU States. What does migration indicate?” *EURINT*, Vol 1: 141–157.

International Labour Organisation (2018). “Labour Migration.” Available at <https://www.ilo.org/global/topics/dw4sd/themes/migration/lang--en/index.htm> (accessed on 20 January 2019).

International Organisation for Migration (2015). “Who is a migrant?” Available at <https://www.iom.int/who-is-a-migrant> (accessed on 19 November 2018).

Jennissen, R. P. W. (2003). “Economic Determinants of Net International Migration in Western Europe,” *European Journal of Population*, Vol (19): 171–198.

Jennissen, R. P. W. (2004). “Macro-economic determinants of international migration in Europe.” Ph. D. Dissertation, University of Groningen, Groningen.

Jerome, H. (1926). “Migration and Business Cycles.” New York: National Bureau of Economic Research, Publication No. 9.

Karemera, D., Oguledo, I. V., & Davis, B. (2000). “A Gravity Model Analysis of International Migration to North America,” *Applied Economics*, Vol 32 (13): 1745-1755.

Kelley, A. (1965). “International Migration and Economic Growth: Australia, 1865-1935,” *The Journal of Economic History*, Vol 25(3): 333 - 354.

- Klevmarken, A. (1989). "Modelling Labor Supply in a Dynamic Economy," *IDEAS Working Paper Series from RePEc*, IDEAS Working Paper Series from RePEc.
- Kuznets, S., & Rubin, E. (1954). "Immigration and the Foreign Born," *Occasional Paper No. 46*, National Bureau of Economic Research, New York: 26 - 34.
- Lainos, T. P. (1972). "The Migration Process and Time Lags," *Journal of Regional Science*, Vol 12(3): 425 - 433.
- Lall, S. V., Selod, H., & Zmarak, S. (2006). "Rural-Urban Migration in Developing Countries: A Survey of Theoretical Predictions and Empirical Findings," *Policy Research Working Paper Series 3915*, The World Bank.
- Lee, E. (1966). "A Theory of Migration.," *Demography*, Vol 3 (1): 47 - 57.
- Lim, L., & Pang, E. F. (1986). *Trade, Employment, and Industrialisation in Singapore*. Geneva: International Labour Office.
- Linneman, H., & Ball, R. J. (1966). "An Econometric Study of International Trade Flows," *The Economic Journal*, Vol 77 (306): 366 - 368.
- Lucas, R. (1975). "An Equilibrium Model of the Business Cycle," *Journal of Political Economy*, Vol 83 (6): 1113 - 1144.
- Massey, D., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. (1994). "An Evaluation of International Migration Theory: The North American Case," *Population and Development Review*, Vol 20 (4): 699 - 751.

- Mayda, A. (2010). "International migration: A panel data analysis of the determinants of bilateral flows," *Journal of Population Economics*, Vol 23 (4): 1249 - 1274.
- Moraga, J. F., and Molina, G. L. (2018). "Predicting Spanish Emigration and Immigration," *AIReF Working Paper Series*, WP/2018/6.
- Needham, W. R. (1968). "Immigration to Canada from the British Isles 1951-1964: A Regional Analysis of Sending Areas," Ph.D. Dissertation, Queen's University, Ontario.
- Park, H. M. (2011). "Practical Guides to Panel Data Modeling: A Step-by-Step Analysis Using Stata." Tutorial Working Paper. Graduate School of International Relations, International University of Japan.
- Pietrzak, M., Wilk, J., & Matusik, S. (2013). "Gravity model as the tool for internal migration analysis in Poland in 2004-2010," *IDEAS Working Paper Series from RePEc*, IDEAS Working Paper Series from RePEc.
- Piore, M. (1979). *Birds of Passage: Migrant Labor and Industrial Societies*. Cambridge: Cambridge University Press.
- Quigley, J. M. (1972). "An Economic Model of Swedish Emigration," *Quarterly Journal of Economics*: 111 - 126.
- Ramos, R. (2016). "Gravity Models: A tool for migration analysis," *IZA World of Labor*, 239.
- Ramos, R., & Surinach, J. (2013). "A Gravity Model of Migration between ENC and EU," *IDEAS Working Paper Series from RePEc*, IDEAS Working Paper Series from RePEc.

Ravenstein, E. (1885). "The Laws of Migration," *Journal of the Statistical Society of London*, Vol 48 (2): 167 - 235.

Ravlik, M. (2014). "Determinants of International Migration: A Global Analysis," *IDEAS Working Paper Series from RePEc*, IDEAS Working Paper Series from RePEc.

Mitze, T., & Reinkowski, J. (2010). "Testing the Validity of the Neoclassical Migration Model: Overall and Age-Group Specific Estimation Results for German Spatial Planning Regions," *IDEAS Working Paper Series from RePEc*, IDEAS Working Paper Series from RePEc.

Sultana, H., & Fatima, A. (2017). "Factors Influencing Migration of Female Workers: A Case of Bangladesh." *IZA Journal of Development and Migration*, Vol 7 (1): 1 - 17.

The Knowledge Academy (2018). "The European countries with the highest and lowest graduate employment rate." Available at <https://www.theknowledgeacademy.com/blog/the-european-countries-with-the-highest-and-lowest-graduate-employment-rate/> (accessed on 10 January 2020).

Thet, K. K. (2014). "Pull and Push Factors of Migration: A Case Study in the Urban Area of Monywa Township, Myanmar". Department of Statistics at The Institute of Economics in Monywa, Myanmar.

Thomas, D. S. (1941). "Social and Economic Aspects of Swedish Population Movements." New York: MacMillan.

Times of Malta (2019). "Malta will need another 13,000 foreign workers this year." Available at <https://timesofmalta.com/articles/view/malta-will-need-another-13000-foreign-workers-this-year.699691>.

Tinbergen, J. (1962). *Shaping the World Economy; Suggestions for an International Economic Policy*. New York: Twentieth Century Fund.

Vujicic, M., Zurn, P., Diallo, K., Adams, O., & Dal Poz, M. (2004). "The Role of Wages in the Migration of Health Care Professionals from Developing Countries.," *Human Resources for Health*, Vol 2 (3).

Walsh, B. (1974). "Expectations, Information and Human Migration: Specifying an Econometric Model of Irish Migration to Britain", *Journal of Regional Science*, Vol 14 (1): 107 - 120.

Wilkinson, M. (1967). "Evidences of Long Swings in the Growth of Swedish Population and Related Economic Variables, 1860-1965," *Journal of Economic History*, Vol 27: 17 - 38.

APPENDICES

APPENDIX A

The following tables are based on the International Standard Classification of Occupations (ISCO - 08).

Major ISCO Code	Nomenclature	Skill Level
1	Managers	3 + 4
2	Professionals	4
3	Technicians & Associate Professionals	3
4	Clerical Support Workers	2
5	Services & Sales Workers	2
6	Skilled Agricultural, Forestry & Fishery workers	2
7	Craft & Related Trades Workers	2
8	Plant & Machine Operators, & Assemblers	2
9	Elementary Occupations	1
0	Armed Forces Occupations	1 + 2 + 4

Skill Level	ISCED
4	8 Doctoral or equivalent level 7 Master's or equivalent level 6 Bachelor's or equivalent level
3	5 Short-cycle tertiary education
2	4 Post-secondary non-tertiary education 3 Upper secondary education 2 Lower secondary education
1	1 Primary education 0 Early childhood education

APPENDIX B

Albania	Macedonia (F.R.Y.)
Australia	Mali
Austria	Morocco
Belgium	Netherlands
Bosnia & Herzegovina	Niger
Brazil	Nigeria
Bulgaria	Norway
Canada	Pakistan
China	Philippines
Croatia	Poland
Czech Republic	Portugal
Denmark	Romania
Egypt	Russian Federation
Eritrea	Senegal
Estonia	Serbia
Ethiopia	Slovak Republic
Finland	Slovenia
France	Somalia
Gambia	South Africa
Germany	Spain
Ghana	Sudan
Greece	Sweden
Hungary	Switzerland
India	Syria
Ireland	Thailand
Italy	Tunisia
Ivory Coast	Turkey
Latvia	Ukraine
Libya	United Kingdom
Lithuania	United States of America

