



Migration Report

Priya Ravindra Dingorkar

BE in CE & Pursing Master of Business Analytics

Aarathy Babu

B.Tech

Junhao Wang

B.Accounting

Dilinie Seimon

BSc.

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**Department of
Econometrics &
Business Statistics**

☎ (03) 9905 2478
✉ questions@company.com

ABN: 12 377 614 630

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Abstract

There is no doubt that globalization is here to stay and that it continues to intensify and to reshape our identities and living spaces. **Migration** is one important factor that enhances globalization and helps in cultural and socio-economic changes in a large scale. This report will focus on a few aspects of migration.

Introduction

Migration is the movement of people from one place to another with the intentions of settling permanently or temporarily at a new location. With increased globalization, easy access to opportunities across the world and increased educational and skill levels of individuals, migration has become a common occurrence across the world.

The impact of migration is an important factor affecting both the home country and the destination country of the migrant. The impact however varies by the reason of migration. Labor migration, skill based migration, migration for education, marriage migration and migration of refugees are a few categories of migration based on the reason for migration.

Within the context of this report, the migration statistics in the years 2015 and 2016 will be analysed based on demographic factors of the migrants, their education and skill levels, preference of countries to migrate to and the type of occupations they are most likely to migrate for. The analysis will compare countries, continents and population within countries in deriving conclusions.

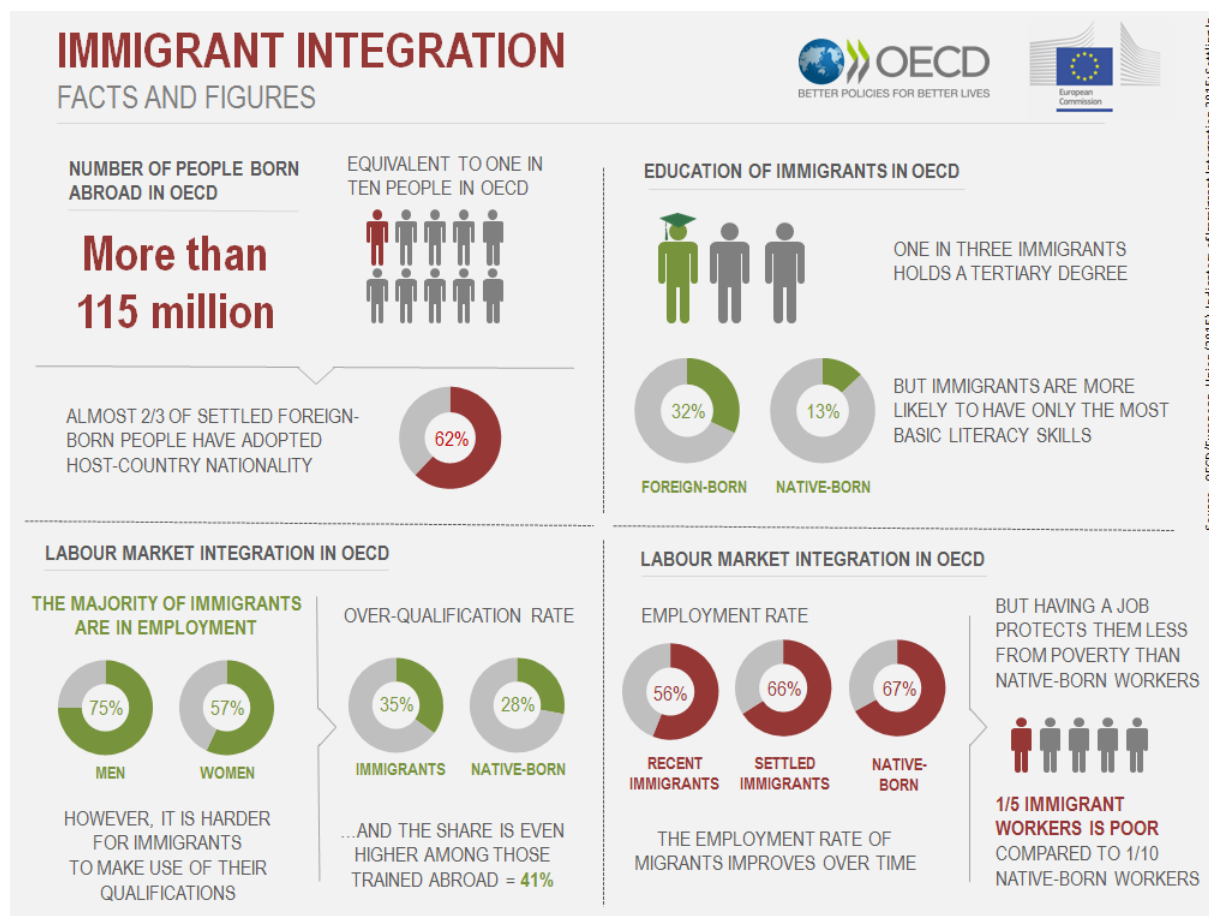


Figure 1: Migration Facts and Figures

Data Sources

The Organisation for Economic Co-operation and Development (OECD) provides a dataset based on the population censuses of OECD countries around the world. The OECD and the World Bank also collaborate in providing an [extensive dataset on the immigrants from OECD countries to non-OECD countries](#).

The dataset from the database of Immigrants in OECD and non-OECD countries from the year 2015-2016 will be used in the analysis within the report. The dataset includes information such as demographic characteristics of the immigrants, their duration stay, labor market outcomes, fields of study, educational attainment and their place of birth.

Along with the dataset, the OECD provides documentation on the methodology used in obtaining the data and a description of limitations in the methodology. The metadata also contains a detailed explanation of the spread of data over several files, the encoded variables, the domain of each variable and reasons for missing values in specific variables.

The OECD makes data available for use and consultation by the public under the license **CC BY-NC-SA 3.0 IGO**. This license allows us to share and modify data apart from commercial uses and has strict restrictions of attribution.

A few important definitions required to understand this report are mentioned below.

What is OECD ?

The Organisation for Economic Co-operation and Development (OECD) is a group of 34 member countries that discuss and develop economic and social policy. OECD members are democratic countries that support free-market economies

What is ISCED ?

The International Standard Classification of Education is a statistical framework for organizing information on education maintained by the United Nations Educational, Scientific and Cultural Organization. It is a member of the international family of economic and social classifications of the United Nations.

What is ISCO ?

The International Standard Classification of Occupations is an International Labor Organization classification structure for organizing information on labor and jobs.

Limitations of the dataset

The Database on Immigrants in OECD Countries (DIOC) 2015/16 provides information on age,duration of stay, labour force status and occupation of the migrants. The limitations of the dataset is as follows,

1. Confidentiality and Reliability issues

Due to confidentiality issues, the place of birth is recorded at the continental level such as Africa, Asia, Europe, etc.instead of the country level in the dataset,therefore the analysis is focused on only the destination countries.Also,there is only limited details available on the important variables like educational qualification and skills.

2. Unavailability of data

Unavailability of data on variables like age, skills,occupation ,labour force status and educational qualification proved to be a limitation to the analysis of the dataset.

3. Inconsistency of data

The dataset contains inconsistency in data for example the reference population for Switzerland, Luxembourg and New Zealand is 15+ and there is no information on the age group 0-14. Due to this reason and the fact that 0-14 age group belongs to the minor category, the age group 0-14 was not considered for the analysis of gender gap in migrant population.

Research Ethics

Dataset used in the report for analysis, has a lot of unknown values due to confidentiality issues and the methods used to ensure reliability and protect confidentiality. Major principles of research ethics have been used in this report no labels or absurd statements have been made keeping in mind obtain informed consent from potential research participants, minimize the risk of harm to participants, protect their anonymity and confidentiality, avoid using deceptive practices and give participants the right to privacy.

Methodology

Every migrant analyzes a few factors of the destination country before actually settling permanently or temporarily. Some of the factors are which are the best destination countries, what are the job opportunities, what is the unemployment rate, what is the level of education and their recognition worldwide, and similar many other factors. But our report is a live dataset from the past years and shows true analysis of what is the current situation of migration across the globe and particularly about Australia as well. Since our dataset is large and contains many files this report only focuses on four research questions, giving all of us a gist about the state of migration and migrants, across the world.

Research Questions

There research question we have aimed to answer are as follows:

- The top destinations for migration, the gender difference in migration in total and across different age groups
- Identifying the relationship between unemployment and education level as well as the gender gap in unemployment

- Analyzing the level of education of residents of Australia versus the duration they have been in Australia.
- Distribution of various skill levels, types of occupation and overqualified population across the globe in different continents

Table 1: *Top 10 destinations*

Country	Migrant_Count
United States of America	323127504
Japan	127094759
Mexico	119561904
Germany	82424843
Tunisia	78741055
France	66190412
United Kingdom	64381731
Italy	60383365
Korea	48141031
Spain	45977782

Migration and Gender Gap

Throughout history, humans have migrated for various reasons that could be classified as economic, social, political, etc. This section focuses on the preferred destination countries for migration as well as the gender difference across age groups in the migrant population in destination countries.

The table 1 depicts the preferred destinations for migration in the year 2015/16. Historically, the USA have been the most popular destination for migration and has remained the same in the year 2015-16, with the most preferred destinations being the USA, Japan, and Mexico across all ages.

Among the international migrants, 50.94 % are females and 49.06 % are males. Figure 2 shows the gender gap in each country's migrant population and it is observed that in 2015-16, women constituted more in the migrant population especially in the top preferred destinations like the USA, Japan, etc whereas the gap is relatively low in countries like Belgium, Finland, etc.

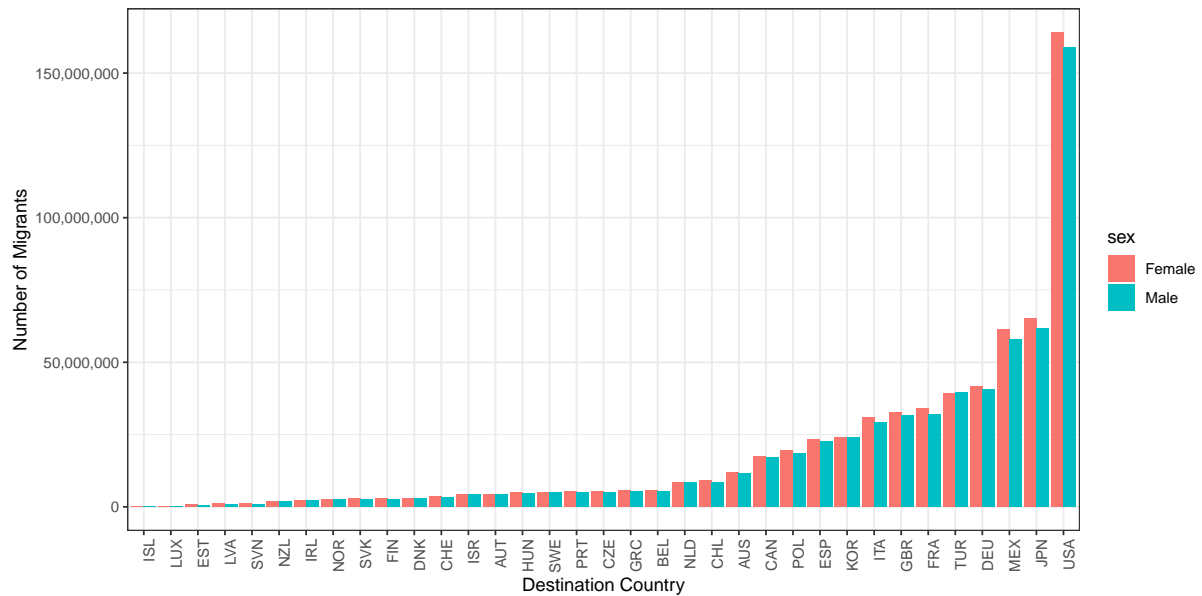


Figure 2: Gender difference in migrant population in countries

In 2015-16, the most number of migrants fell in the age group 25-64, with females being higher in number compared to males in countries like the USA, Mexico, Germany, etc. In countries like Japan, Korea and Spain it can be seen that there is no gender gap in the migrant population of age group 25-64 whereas in countries like Poland and Turkey the number of males is higher than females for the same age group. Amongst the age group 15-24, there is a relatively low gender difference in the migrant population compared to the other age groups and the trend is uniform in almost all the countries whereas amongst the migrants who are 65 years old and above, the number of females is higher than that of males in the USA, Japan, Italy, etc and Mexico being one of the top destinations for migration, saw an influx of an equal number of males and females aged over 65 in the year 2015-16.

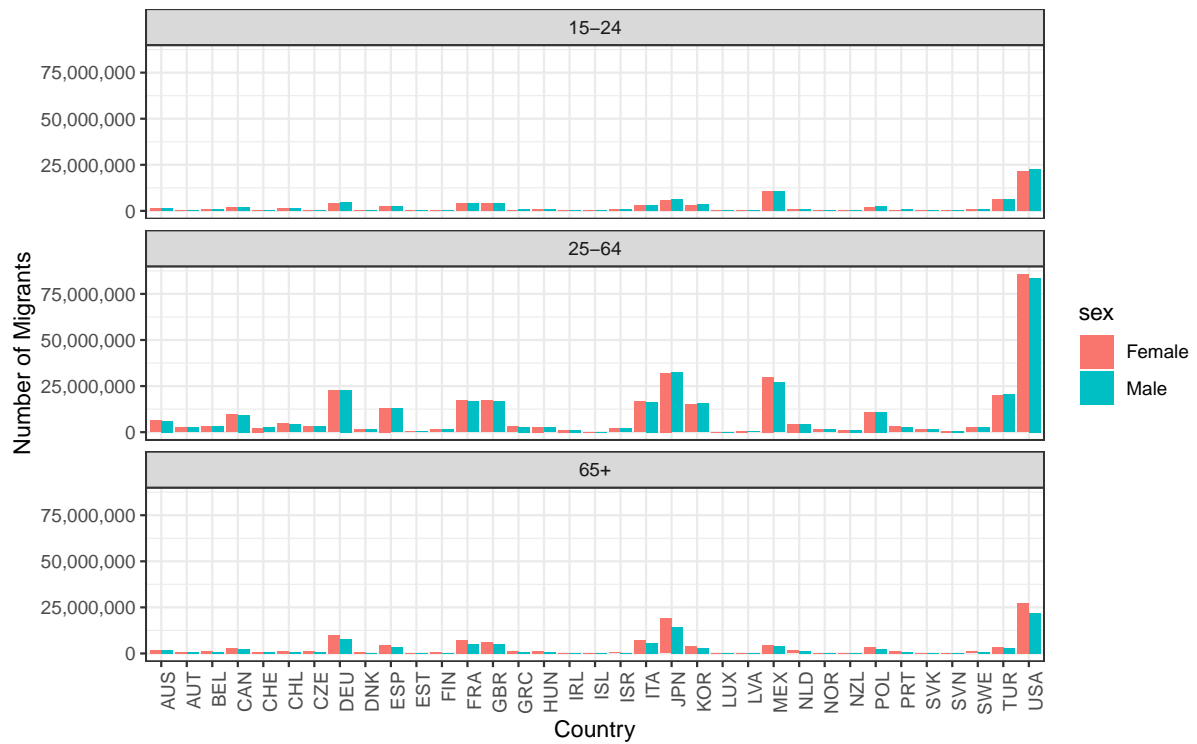


Figure 3: Gender difference in migrant population across age groups in countries

The Education Level of Australian Residents

In the past few decades, Australia has acquired many skilled migrants, contributing substantially towards the local economy. Hawthorne (2010) states that by 2007, two thirds of them were former international students recruited in Australia rather than offshore applicants. This transition has also been named as the “*two-step-migration*” by Hawthorne (2010).

This section will analyse the education levels of current residents of Australia categorized by their duration of stay in the country.

The dataset provides information on the education levels of Australian residents and their duration of stay within the country.

The residents of Australia have been categorized based on their duration of stay within the country as

- native born
- less than 5 years
- between 5 - 10 years
- more than 10 years

The level of education has been categorized using a broad three-category classification as

- low
- medium
- high

However the duration of stay of 26% of Australian residents is unknown, while the education level of 25% residents is unknown. These values will also be used in the analysis as unknowns, to provide a more accurate overlook on the overall numbers.

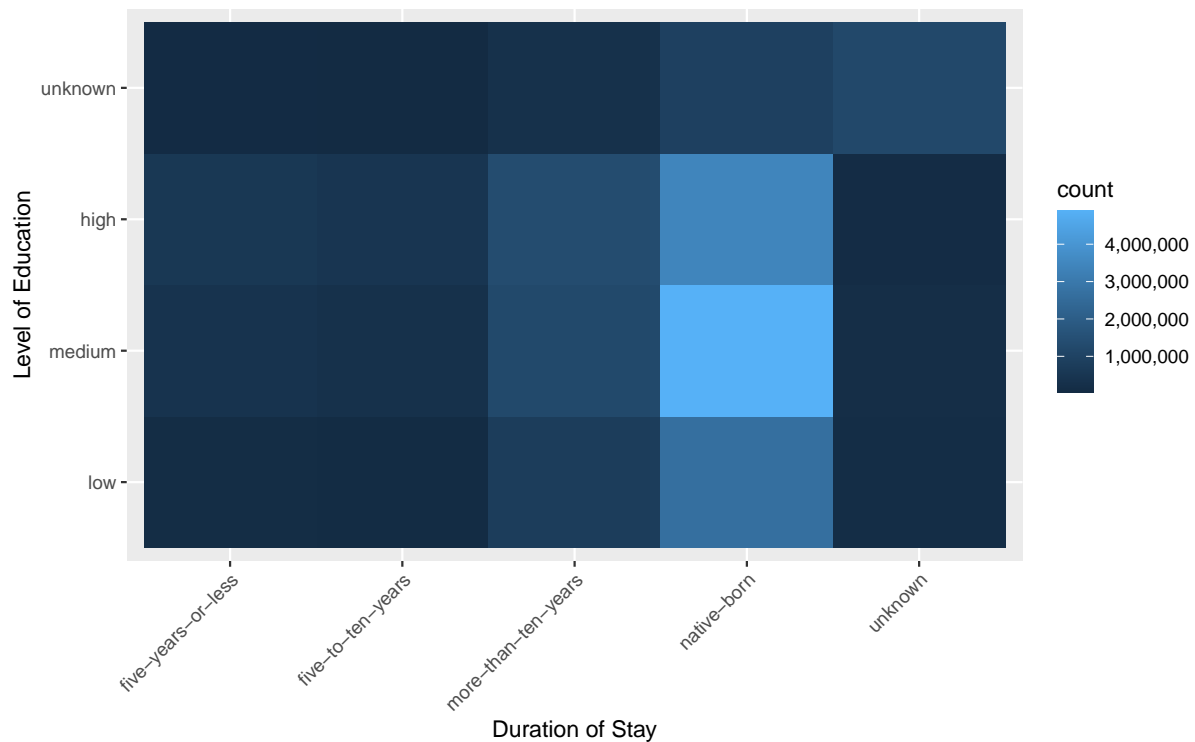


Figure 4: Breakdown of Australian residents based on their level of Education and duration of stay in Australia

Figure 4 shows the breakdown of Australian residents based on their duration of stay in Australia and their level of education; the higher counts of residents are represented by light blue and the lower number of residents are represented by dark blue. The dataset contains a few unknowns about the residents, some on the level of education and some on the duration of stay, which is also represented in figure 4.

It's obvious that the highest counts of Australian residents are natives, and it is interesting that a majority of them have a medium level of education, followed by natives having a higher level of education and only a few of them having a low level of education. It's also interesting how the numbers of Australian residents who have been in the country for over ten years, shows higher counts of numbers than those who have been in the country for a lower duration of time. It can also be seen that in all three categories of non-native born Australians, most have received a high level of education.

Table 2: *Percentages of Australian residents with different levels of education over each category of duration of stay*

Duration of stay	High level of education (%)	Medium level of education (%)	Low level of education (%)	Unknown level of education (%)
five-to-ten-years	54%	31%	9%	5%
five-years-or-less	50%	34%	10%	6%
more-than-ten-years	37%	34%	21%	8%
native-born	29%	41%	22%	8%

A breakdown of Australian residents with different durations of stay, into their level of education is represented in table 2. It can be seen that the majority of individuals who have obtained residency in Australia recently have a high level of education while only a few of them have a low level of education. A significant increase in percentages of individuals with higher levels of education obtaining residency in Australia can also be seen from table 2. Most native-Australians (41%) have a medium level of education, while others with shorter durations of stay in Australia have much higher levels of education.

Green, Kler, and Leeves (2007) states that the immigration policies in Australia has placed an increased focus in skill-based selection criteria, and has resulted in over-education of recently arrived Australian immigrants. This can be attributed to the most of the recent immigrants having a high level of education as represented by figure 4 and table 2.

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Table 3: unemployment gendergap

country	unemployrateM	unemployrateF	unemployrateGAP
AUS	4.862303	4.0115099	-0.8507930
AUT	5.336735	3.9353913	-1.4013437
BEL	4.347939	3.2985616	-1.0493775
CAN	5.778106	4.3270743	-1.4510321
CHE	3.865908	3.2144728	-0.6514349
CHL	4.809590	3.9577202	-0.8518701
CZE	2.396411	2.4515907	0.0551801
DEU	2.936210	2.0469143	-0.8892954
DNK	2.148729	2.1059917	-0.0427379
ESP	10.985712	10.8943528	-0.0913595
EST	5.300859	3.4574224	-1.8434366
FIN	9.559730	6.8315897	-2.7281404
FRA	8.392850	7.8781252	-0.5147248
GBR	3.663103	2.8918511	-0.7712517
GRC	10.585938	7.4697667	-3.1161718
HUN	7.512527	5.7554851	-1.7570423
IRL	9.371130	6.6267541	-2.7443755
ISL	3.634079	3.1891160	-0.4449626
ISR	3.226836	2.9344538	-0.2923819
ITA	6.557226	5.1080372	-1.4491892
JPN	3.452669	1.6996869	-1.7529817
KOR	NA	NA	NA
LUX	46.543493	35.7410219	-10.8024711
LVA	7.869852	5.4260483	-2.4438039
MEX	3.497137	0.9523001	-2.5448371
NLD	3.881309	3.8180653	-0.0632437
NOR	2.147195	1.4721626	-0.6750323
NZL	3.579875	3.6812728	0.1013976
POL	7.015866	5.7597853	-1.2560810
PRT	7.032256	5.9746734	-1.0575825
SVK	11.368361	8.7232843	-2.6450766
SVN	4.902322	4.6408436	-0.2614786

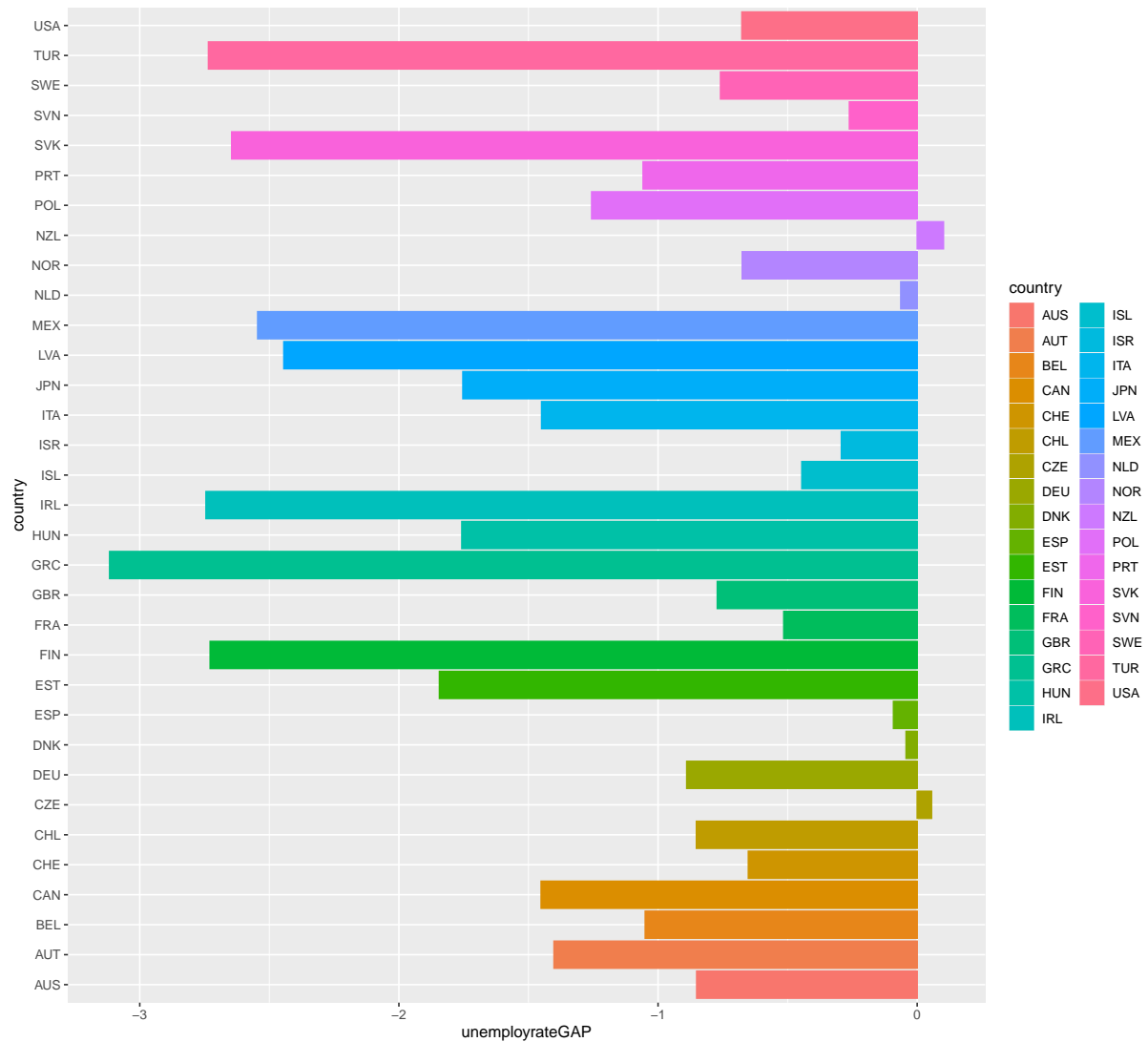


Figure 5: unemployment gender gap

Analysis:

We can draw conclusion from 5 that Generally speaking, gender gap in unemployment rate does exist, the unemployment rate gaps are negative in most country, this means female have lower unemployment rate than male.

Table 4: *unemployment rate on different level of education*

country	educationlevel	unemployRATE
AUS	high	0.0354576
AUS	low	0.0443595
AUS	medium	0.0532527
AUS	unknown	0.0358913
AUT	high	0.0311428
AUT	low	0.0701552
AUT	medium	0.0457923
AUT	unknown	NaN
BEL	high	0.0298011
BEL	low	0.0431251
BEL	medium	0.0461857
BEL	unknown	0.0122354
CAN	high	0.0452058
CAN	low	0.0517304
CAN	medium	0.0601727
CHE	high	0.0328462
CHE	low	0.0416613
CHE	medium	0.0336930
CHL	high	0.0179900
CHL	low	0.0427796
CHL	medium	0.0498058
CHL	unknown	0.0527589
CZE	high	0.0167868
CZE	low	0.0409399
CZE	medium	0.0226775
CZE	unknown	0.0487416
DEU	high	0.0160581
DEU	low	0.0374303
DEU	medium	0.0236941
DEU	unknown	0.0093930
DNK	high	0.0231097
DNK	low	0.0177326
DNK	medium	0.0225601
DNK	unknown	0.0210787

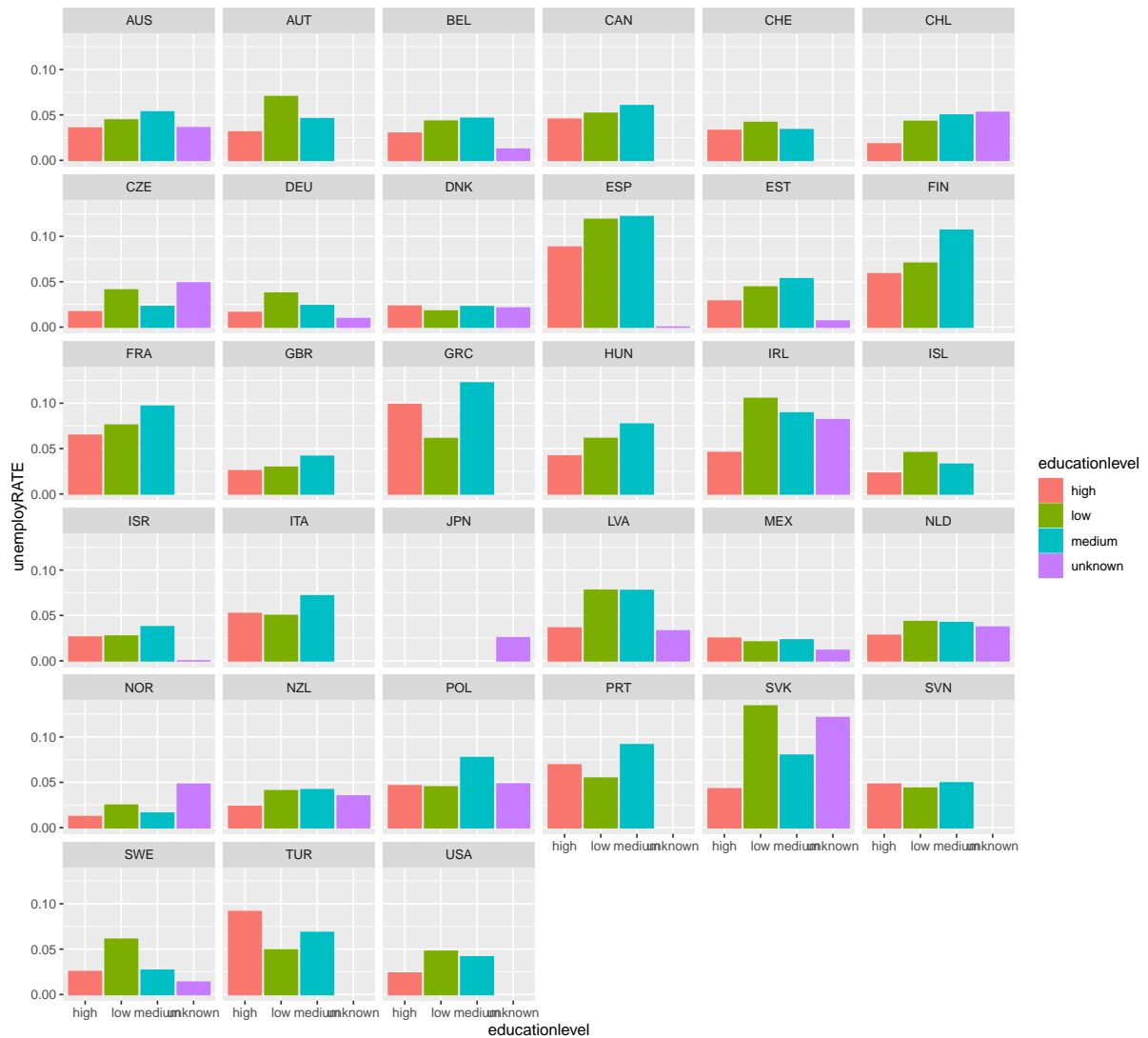


Figure 6: (#fig:ed_un)unemployment rate among different education level

Analysis:

?? Generally speaking, most have lower unemployment rate compared to low education level groups, but this is not the case in TUR,PRT,RGC AND ITA.

Skills, Occupation and Qualification across the Globe

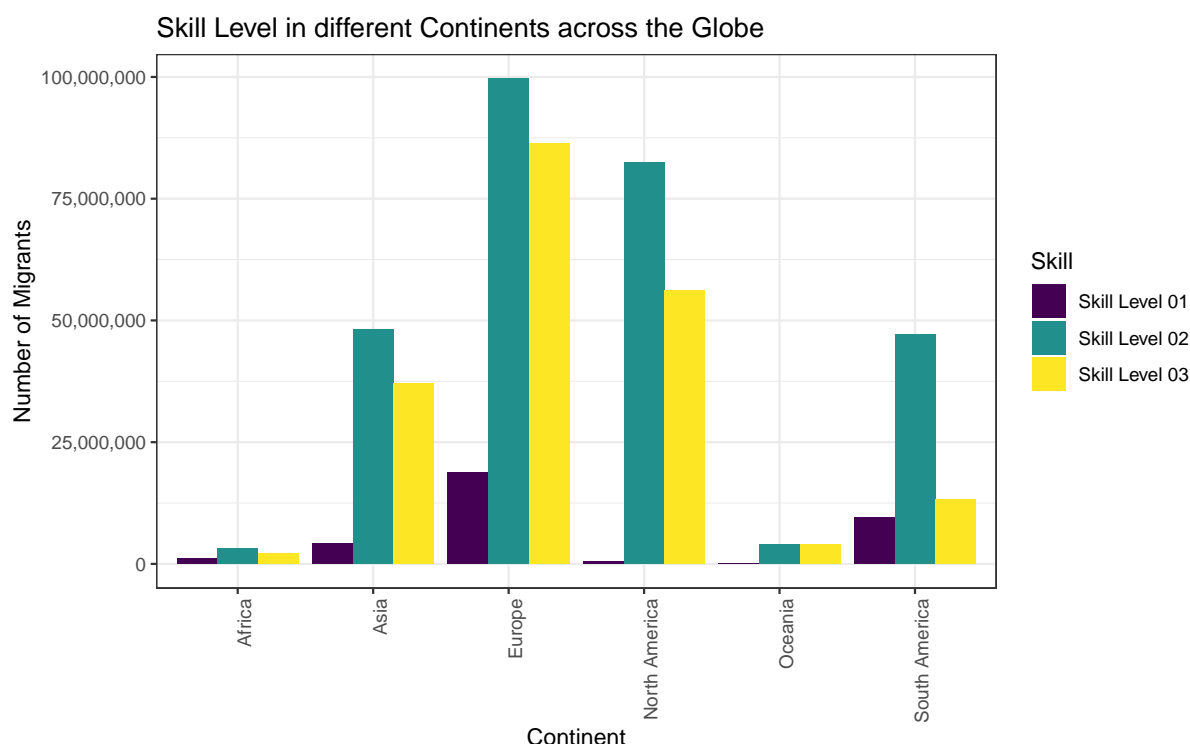


Figure 7: Types of Skill

In figure 7 talks about the different **Skill Levels**. It is defined as a function of the complexity and range of tasks and duties to be performed in an occupation into groups that people have across the globe in. Let us understand the different skills. Skill Level 01 typically involve the performance of simple and routine physical or manual task, these task require physical strength and/or endurance. Skill Level 02 typically involve the performance of tasks such as operating machinery and electronic equipment, they should also have the ability to read and write to a certain extend. Skill Level 03 involves the performance of complex technical and practical tasks that require an extensive body of factual, technical and procedural knowledge in a specialized field, requires high level literacy and numeracy and well developed interpersonal communication skills. The graph here shows that **Europe** have the highest number of migrants with all these skill levels. **North America** has very less migrants involved in skill level 01 and most migrants have skill level 02 and level 03. **South America** have more people with skill level 02 followed by skill level 03 and skill level 01. **Oceania** has very few migrants with skill level 01 and people with skill level 02 and skill level 03. Most of the migrants in **Asia** have skill level 02 and skill level 03. **Africa** has very migrants with all the skill levels.

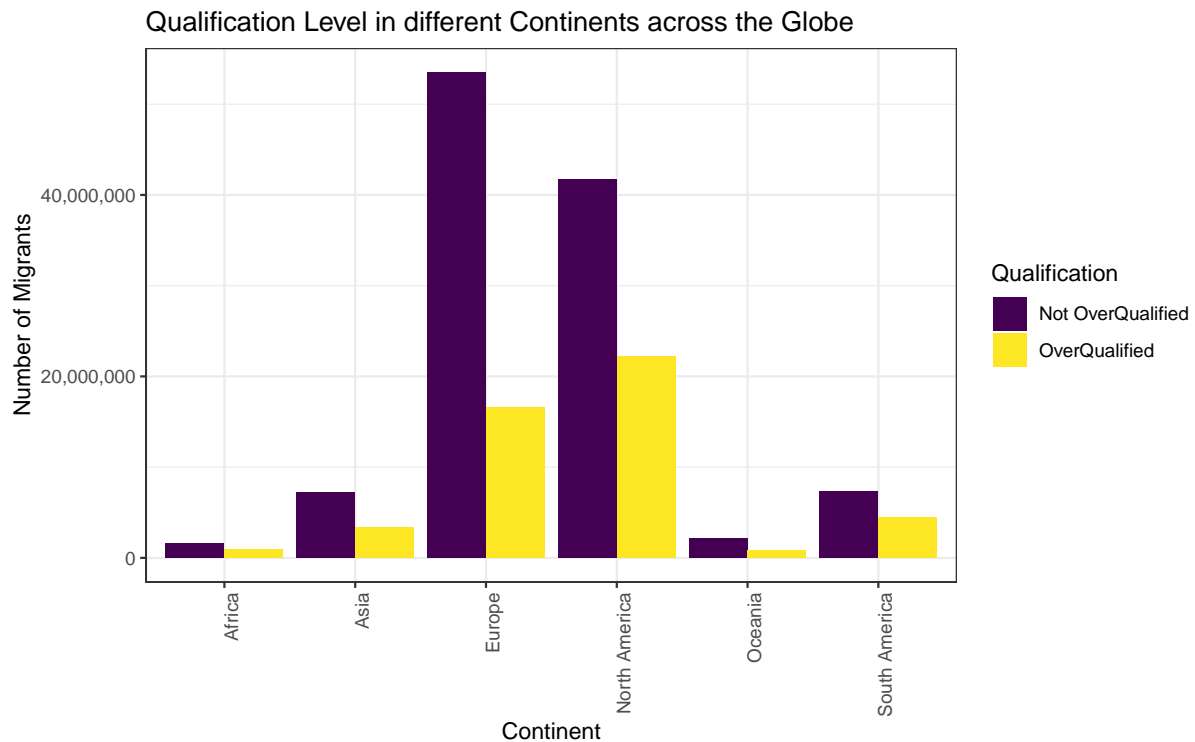


Figure 8: Occupation Types

In figure 8, Overqualified indicates whether a worker is highly educated for the job that he is doing in a particular continent with respect to their education attainment he has received. Looking at the figure closely, we have seen that, **North America** has the highest over qualified people, followed by **Europe**, **South America**, **Asia**, **Africa** and **Oceania**. Not overqualified here refers to that, most migrants have just the right level of education attainment. We see that the top three continents with the right qualification amongst the migrants are **Europe**, **North America** and **Asia**

Table 5: List of Occupations that people engage in after Migration

Occupations	Africa	Asia	Europe	North America	Oceania	South America
Armed Forced Occupations	16578	134184	1161864	57483	78087	123354
Clerical Support Worker Occupations	346142	3335802	20918780	807736	854191	3722436
Craft and Related trade Occupations	507452	3238802	23205091	1746178	511284	8491454
Elementary Occupations	1039390	4126580	19477937	490819	63336	10020788
Managerial Occupations	295844	1351722	12933257	1541335	1050874	1736952
Plant and Machine Operators and Assembler Occupations	402639	3854407	14180541	741683	698375	5953850
Professional Occupations	820935	7401650	37449078	3015180	1699599	5056319
Service and Sales Worker Occupations	817080	4945890	31421967	2355201	1124498	11610410
Skilled Agricultural, Forestry and Fishery Occupations	187722	1537852	8223032	73344	784091	4668935
Technicians and Associate Professional Occupations	554736	5544054	34331795	2866619	1120886	3800846

In table 5 different occupations levels in different continents.

Conclusion

Migrants have made significant impacts on socio-economic as well as the political sphere of a destination countries. From the analysis on the Database on Immigrants in OECD Countries (DIOC) released by The Organisation for Economic Co-operation and Development (OECD), we conclude the following,

1. In the year 2015-16 , 50.94
2. People between 25-64 years old migrated more compared to the other age groups in year 2015-16.

References

- Bai, Y, L Yao, T Wei, F Tian, DY Jin, L Chen, and M Wang (2020). Presumed asymptomatic carrier transmission of COVID-19. *Jama* **323**(14), 1406–1407.
- Green, C, P Kler, and G Leeves (2007). Immigrant overeducation: Evidence from recent arrivals to Australia. *Economics of Education Review* **26**(4), 420–432.
- Hawthorne, L (2010). How valuable is “two-step migration”? Labor market outcomes for international student migrants to Australia. *Asian and Pacific Migration Journal* **19**(1), 5–36.
- Hyndman, RJ (2016). *forecast: Forecasting functions for time series and linear models*. cran.r-project.org/package=forecast.
- Hyndman, RJ and Y Khandakar (2008). Automatic time series forecasting: the forecast package for R. *Journal of Statistical Software* **26**(3), 1–22.
- Hyndman, RJ and AB Koehler (2006). Another look at measures of forecast accuracy. *International Journal of Forecasting* **22**(4), 679–688.
- ILO (2012). *International Standard Classification Of Occupations*. Accessed on 2020-06-04. <https://www.ilo.org/public/english/bureau/stat/isco/docs/publication08.pdf>.
- OECD (2016). *Database on Immigrants in OECD Countries (DIOC) 2015/16*. Database on Immigrants in OECD Countries. Accessed on 2020-06-01. <http://www.oecd.org/els/mig/dioc.htm>.
- OECD (2019). *The new immigrants Global trends in migration towards OECD countries between 2000/01 and 2015/16*. Accessed on 2020-06-05. <http://www.oecd.org/els/mig/Migration-data-brief-4-EN.pdf>.

- Tierney, N, D Cook, M McBain, and C Fay (2020). *naniar: Data Structures, Summaries, and Visualisations for Missing Data*. R package version 0.5.0. <https://CRAN.R-project.org/package=naniar>.
- Variables, Coverage, Sources (2016). OECD. <http://www.oecd.org/migration/mig/methodology-DIIOC-2015-2016.pdf>.
- Wickham, H, M Averick, J Bryan, W Chang, LD McGowan, R François, G Golemund, A Hayes, L Henry, J Hester, M Kuhn, TL Pedersen, E Miller, SM Bache, K Müller, J Ooms, D Robinson, DP Seidel, V Spinu, K Takahashi, D Vaughan, C Wilke, K Woo, and H Yutani (2019). Welcome to the tidyverse. *Journal of Open Source Software* 4(43), 1686.
- Wickham, H, J Hester, and R Francois (2018). *readr: Read Rectangular Text Data*. R package version 1.3.1. <https://CRAN.R-project.org/package=readr>.
- Wickham, H and D Seidel (2019). *scales: Scale Functions for Visualization*. R package version 1.1.0. <https://CRAN.R-project.org/package=scales>.
- Xie, Y (2016). *bookdown: Authoring Books and Technical Documents with R Markdown*. ISBN 978-1138700109. Boca Raton, Florida: Chapman and Hall/CRC. <https://github.com/rstudio/bookdown>.
- Zhu, H (2019). *kableExtra: Construct Complex Table with 'kable' and Pipe Syntax*. R package version 1.1.0. <https://CRAN.R-project.org/package=kableExtra>.