RESEARCH ON IMMIGRATION ACROSS COUNTRIES

CHANDRIKA MOHAN

ABSTRACT

This project aims at analysing datasets on immigration of the human population across various countries and works on deducing the required information. The objective is to analyze the preferences of people all over the world and determine which cities are more universally opted for. The documents included in this research were retrieved from national sites and platforms like Kaggle which covers details regarding immigration for the past ten years.

INTRODUCTION

Immigration is the international movement of people to a destination country of which they are not natives or where they do not possess citizenship in order to settle or reside there, especially as permanent residents or naturalized citizens, or to take up employment as a migrant worker or temporarily as a foreign worker.

In order to achieve our objective, interactive charts help track changing immigration patterns and characteristics of the immigrant population through time. By placing immigration to foreign countries in its broader historical context, the characteristics of today's migration flows and the immigrant communities they establish can be better understood.

The following dataset chooses 35 different countries for analysis and gives the count of people migrated to the respective countries in the past 10 years, i.e. from 2008 to 2018. Some of the data are missing which are computed using statistical methods. This final dataset is then used for further research and analysis.

RESEARCH OBJECTIVES:

- 1. Is there any rise of immigrants in the West as compared to the Middle East and the European Union countries in the past decade?
- 2. Has the mean ratio of people immigrating to these countries remained constant?
- 3. Is there a greater cross cultural immigration in recent years as compared to the early 2000s?
- 4. Analyze which of the countries have a higher immigration rate and which ones lesser in the past ten years.
- 5. What have been the rates of overall immigration for individual countries?
- 6. Has the rise in population affected the parameters being worked upon?
- 7. By how much has this population increased among various countries?
- 8. Is there any direct link between the population charts and their respective immigration rates?
- 9. Which country has fared the most in the past decade with regards to developing into a more suitable country for the masses?
- 10. At the same time, which country has proved to disappoint migrators over the decade?

ANALYSIS

> read.table("clipboard",sep='\t',header=TRUE)

	Country	X2008	X2009	X2010	X2011	X2012	X2013	X2014	X2015	X2016	X2017	X2018
1	Australia	203874	219400	202212	206362	235993	244849	233908	223654	218488	224220	186640
2	Austria	94368	91660	96896	109921	125605	135228	154260	198658	158746	139329	NA
3	Belgium	106012	102714	113582	117948	128948	117595	106345	128762	103187	109515	NA
4	Canada	247242	252170	280686	248701	257763	259034	260283	271808	296385	286485	NA
5	Chile	43577	35892	41431	50651	65247	84352	83549	101911	135490	NA	NA
6	Czech Republic	76151	38199	28046	20673	28607	27843	38490	31589	34808	43527	NA
7	Denmark	37018	31957	33442	34572	35490	41342	49039	58695	54641	49046	NA
8	Estonia	1929	2229	1199	1675	1107	1633	1347	7370	7693	9067	NA
9	Finland	19906	18087	18212	20416	23334	23873	23647	21414	27274	23735	NA
10	France	216033	211387	221784	228055	247036	251299	251767	242707	245663	245902	NA
11	Germany	573815	606314	683529	841695	965908	1108068	1342529	2016241	1719075	1384018	NA
12	Greece	42901	46534	33368	23206	17732	NA	NA	NA	NA	NA	NA
13	Hungary	35547	25582	23884	22514	20340	21250	26004	25787	23803	36453	NA
14	Iceland	7471	3392	2988	2754	2827	3932	4348	4963	7859	11758	NA
15	Ireland	89700	50700	23900	33700	37200	41000	43700	49300	53900	57200	NA
16	Israel	13701	14574	16633	16892	16558	16884	24112	27908	25977	26357	NA
17	Italy	496549	406725	424499	354327	321305	279021	248360	250465	262929	301071	NA
18	Japan	344509	297092	287071	266867	303926	306742	336525	391160	427585	474996	NA
19	Korea	302174	232844	293070	307249	300177	360473	407063	372935	402203	452657	NA
20	Latvia	3465	2688	2790	2861	3666	3525	4501	4505	3448	5136	NA
21	Luxembourg	16803	14635	15814	19108	19439	19797	21024	22608	21557	23147	NA
22	Mexico	15913	23852	26180	21992	18153	62990	43481	34406	35906	32778	NA
23	Netherlands	103356	104410	110235	118457	115678	122321	139348	159483	182160	183856	NA
24	New Zealand	63910	60326	57618	60997	62045	67509	80289	91767	95634	99321	NA
25	Norway	58820	56682	65065	70759	70012	66934	61429	59068	58508	49774	NA
26	Poland	41834	41277	41061	41336	47131	46614	31977	86087	107038	127997	NA
27	Portugal	72826	61445	50747	45369	38537	33246	35265	37851	46921	61413	NA
28	Slovak Republic	7415	5141	4161	3751	2940	2475	2418	3774	3610	2911	2869
29	Slovenia	43772	24168	11321	17974	17277	15724	18374	19928	20028	27660	NA
30	Spain	567372	365367	330286	335893	272489	248350	264485	290005	352174	454424	NA
31	Sweden	83318	83763	79036	75852	82597	95361	106100	113868	142986	124976	NA
32	Switzerland	157271	132444	134171	142471	143783	155401	152106	150432	143100	137803	NA
33	Turkey	NA	NA	29905	NA	NA	NA	NA	NA	380921	466333	NA
34	United Kingdom	456000	430000	459000	453000	383000	406000	504000	481000	455000	520000	NA
35	United States	1107126	1130818	1042625	1062040	1031631	990553	1016518	1051031	1183505	1127167	NA

Replacing missing values with the mean of its respective columns

```
> na2mean<- function(x) replace(x,is.na(x),mean(x,na.rm=TRUE))
```

> data<-replace(data,TRUE,lapply(data,na2mean))

>data

```
Country
                     X2008
                                X2009
                                        X2010
                                                   X2011
                                                             X2012
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         Australia
                    203874
                             219400.0
                                       202212
                                               206362.0
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           Austria
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   Czech Republic
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23
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28 Slovak Republic
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       Switzerland
                             132444.0
                                       134171
                                                142471.0
                                                          143783.0
                                                                     155401.0
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33
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                                        29905
                                                158236.4
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                                                                     171552.1
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34
   United Kingdom
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                                                                                                               520000.0
     United States 1107126 1130818.0 1042625 1062040.0 1031631.0 990553.0 1016518.0 1051031.0 1183505.0 1127167.0
```

To perform other operations, we use commands from the 'dplyr' package

```
> install.packages("dplyr")
> library(dplyr)
```

```
> data<-data %>% rowwise() %>% mutate(Mean = mean(c(X2008:X2018),na.rm=TRUE),Median = median(c(X2008:X2018),na.rm=TRUE))
> new<-select(data,Country,Mean,Median)
> new
```

A new dataset is created which holds the mean and median of the entire dataset.

```
# A tibble: 35 x 3
    2 Austria 94561 94561
3 Belgium 100384. 100384.
4 Canada 170998. 170998.
5 Chile 69166. 69166.
     6 Czech Republic 85452. 85452.
   7 Denmark 65886 65886
8 Estonia 48342. 48342.
9 Finland 57330 57330
 10 France 155394 155394
11 Germany 334285 334285
11 Germany 334285 334285
12 Greece 68828. 68828.
13 Hungary 65150. 65150.
14 Iceland 51112. 51112.
15 Ireland 92227 92227
16 Israel 54228. 54228.
17 Italy 295652 295652
18 Japan 219632 219632
19 Korea 198464. 198464.
20 Latvia 49110. 49110.
21 Luxembourg 55778. 55778.
22 Mexico 55334. 55334.
23 Netherlands 99056. 99056.
24 New Zealand 79332 79332
25 Norway 76787 76787
26 Poland 68294 68294
 25 Norway 76787 76787
26 Poland 68294 68294
27 Portugal 83790 83790
 28 Slovak Republic 5142 5142
 29 Slovenia 69263 69263
30 Spain 331064. 331064.
31 Sweden 89036 89036
32 Switzerland 126013 126013
 33 Turkey 131961 131961
 34 United Kingdom 275378. 275378.
  35 United States 600940. 600940.
```

Adding the total and mean of all countries put together in a given year in the original dataset

> data1<-rbind(data,
data.frame(Country="Total",t(colSums(data[,-1]))))
> data2<-rbind(data1,
data.frame(Country="Mean",t(colMeans(data1[,-1]))))
> data2

	Country	X2008	X2009	X2010	X2011	X2012	X2013	X2014	X2015	X2016		X2018	Mean	Median
	<fct></fct>	<dbl></dbl>	<dbl></dbl>	<db1></db1>	<db1></db1>	<dbl></dbl>	<dbl></dbl>	<db1></db1>	<dbl></dbl>	<db1></db1>	<dbl></dbl>	<dbl></dbl>	<dbl></dbl>	<dbl></dbl>
700	Australia	203874	219400	202212	206362	235993	244849	233908	223654	218488	224220	186640	195257	195257
2	Austria	94368	91660	96896	109921	125605	135228	154260	198658	158746	139329	94754.	94561	94561
	Belgium	106012	102714	113582	117948	128948	117595	106345	128762	103187	109515	94754.	100384.	100384.
4	Canada	247242	252170	280686	248701	257763	259034	260283	271808	296385	286485	94754.	170998.	170998.
5	Chile	43577	35892	41431	50651	65247	84352	83549	101911	135490	221819.	94754.	69166.	69166.
6	Czech Republic	76151	38199	28046	20673	28607	27843	38490	31589	34808	43527	94754.	85452.	85452.
7	Denmark	37018	31957	33442	34572	35490	41342	49039	58695	54641	49046	94754.	65886	65886
8	Estonia	1929	2229	1199	1675	1107	1633	1347	7370	7693	9067	94754.	48342.	48342.
9	Finland	19906	18087	18212	20416	23334	23873	23647	21414	27274	23735	94754.	57330	57330
10	France	216033	211387	221784	228055	247036	251299	251767	242707	245663	245902	94754.	155394	155394
11	Germany	573815	606314	683529	841695	965908	1108068	1342529	2016241	1719075	1384018	94754.	334285	334285
12	Greece	42901	46534	33368	23206	17732	171552.	185351.	213065.	218771.	221819.	94754.	68828.	68828.
13	Hungary	35547	25582	23884	22514	20340	21250	26004	25787	23803	36453	94754.	65150.	65150.
14	Iceland	7471	3392	2988	2754	2827	3932	4348	4963	7859	11758	94754.	51112.	51112.
15	Ireland	89700	50700	23900	33700	37200	41000	43700	49300	53900	57200	94754.	92227	92227
16	Israel	13701	14574	16633	16892	16558	16884	24112	27908	25977	26357	94754.	54228.	54228.
17	Italy	496549	406725	424499	354327	321305	279021	248360	250465	262929	301071	94754.	295652	295652
18	Japan	344509	297092	287071	266867	303926	306742	336525	391160	427585	474996	94754.	219632	219632
19	Korea	302174	232844	293070	307249	300177	360473	407063	372935	402203	452657	94754.	198464.	198464.
20	Latvia	3465	2688	2790	2861	3666	3525	4501	4505	3448	5136	94754.	49110.	49110.
21	Luxembourg	16803	14635	15814	19108	19439	19797	21024	22608	21557	23147	94754.	55778.	55778.
22	Mexico	15913	23852	26180	21992	18153	62990	43481	34406	35906	32778	94754.	55334.	55334.
23	Netherlands	103356	104410	110235	118457	115678	122321	139348	159483	182160	183856	94754.	99056.	99056.
24	New Zealand	63910	60326	57618	60997	62045	67509	80289	91767	95634	99321	94754.	79332	79332
25	Norway	58820	56682	65065	70759	70012	66934	61429	59068	58508	49774	94754.	76787	76787
26	Poland	41834	41277	41061	41336	47131	46614	31977	86087	107038	127997	94754.	68294	68294
27	Portugal	72826	61445	50747	45369	38537	33246	35265	37851	46921	61413	94754.	83790	83790
28	Slovak Republic	7415	5141	4161	3751	2940	2475	2418	3774	3610	2911	2869	5142	5142
29	Slovenia	43772	24168	11321	17974	17277	15724	18374	19928	20028	27660	94754.	69263	69263
30	Spain	567372	365367	330286	335893	272489	248350	264485	290005	352174	454424	94754.	331064.	331064.
31	Sweden	83318	83763	79036	75852	82597	95361	106100	113868	142986	124976	94754.	89036	89036
32	Switzerland	157271	132444	134171	142471	143783	155401	152106	150432	143100	137803	94754.	126013	126013
33	Turkey	169167	153661.	29905	158236.	160102.	171552.	185351.	213065.	380921	466333	94754.	131961	131961
34	United Kingdom	456000	430000	459000	453000	383000	406000	504000	481000	455000	520000	94754.	275378.	275378.
35	United States	1107126	1130818	1042625	1062040	1031631	990553	1016518	1051031	1183505	1127167	94754.	600940.	600940.
36	Total	5920845	5378129.	5286447	5538274.	5603583.	6004322.	6487293.	7457270.	7656973.	7763670.	3316408.	4618624.	4618624.
37	Mean	328936.	298785.	293692.	307682.	311310.	333573.	360405.	414293.	425387.	431315.	184245.	256590.	256590.

Summary

> summary(data)

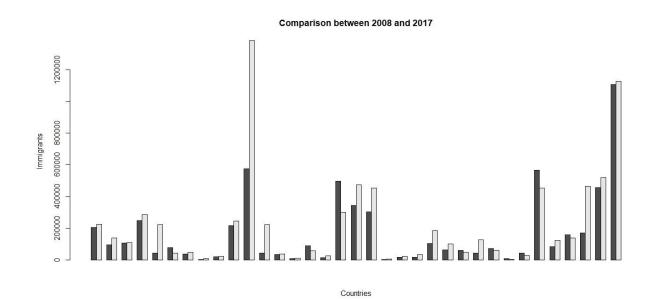
Country			X2008					X2009					X2010				
Australia	:	1	Min		:	1929	Min	n.		:	2229	M:	in.		:	1199	
Austria	:	1	lst	Qu	. :	36283	ls	t (Qu.	:	24875	1:	st	Qu	. :	23892	
Belgium	:	1	Med	ian	:	76151	Med	dia	an	:	60326	Me	edi	an	:	50747	
Canada	:	1	Mea	n	:	169167	Me	an		:	153661	Me	ean	ı	:	151041	
Chile	:	1	3rd	Qu	. :	209954	3r	d (Qu.	:	215394	3:	rd	Qu	. :	211998	
Czech Rep	ublic:	1	Max		:1	107126	Max	х.		:1	130818	Ma	ax.		: 1	042625	
(Other)	:2	29															
X2011			X	201	2		- 1	X2(013	3			X2	01	4		
Min. :	1675	Mi	n.	:		1107	Min.		:		1633	Min		:		1347	
1st Qu.:	21333	ls	t Q	u.:	1	9890	1st (Qu	. :	2	5858	lst	Qu	.:	2	28991	
Median :	60997	Me	dia	n:	6	5247	Media	an	:	8	4352	Med:	ian	:	8	3549	
Mean :	158236	Me	an	:	16	0102	Mean		:	17	1552	Mean	n	:	18	35351	
3rd Qu.:	217209	3r	d Q	u.:	24	1515	3rd (Qu	. :	24	6600	3rd	Qu	.:	24	11134	
Max. :1	062040	Ma	х.	:	103	31631	Max.		: 1	110	8068	Max	•	:	134	12529	
X2015	i.		Х	201	6		2	X2(017	7			X2	01	В		
Min. :	3774	Mi	n.	:		3448	Min.		:		2911	Min		:	2	2869	
1st Qu.:	29749	ls	t Q	u.:	3	31041	1st (Qu	. :	3	4616	lst	Qu	.:	94	1755	
Median :	101911	Me	dia	n:	10	7038	Media	an	:	12	4976	Med:	ian	:	94	1755	
Mean :	213065	Me	an	:	21	8771	Mean		:	22	1819	Mean	n	:	94	1755	
3rd Qu.:	233181	3r	d Q	u.:	25	4296	3rd (Qu	. :	26	6194	3rd	Qu	.:	94	1755	
Max. :2	016241	Ma	х.	:	171	9075	Max.		:1	138	4018	Max		:	186	640	

Mean Median
Min. : 5142 Min. : 5142 1st Qu.: 65518 1st Qu.: 65518 Median: 85453 Median: 85453

DESCRIPTIVE STATISTICS

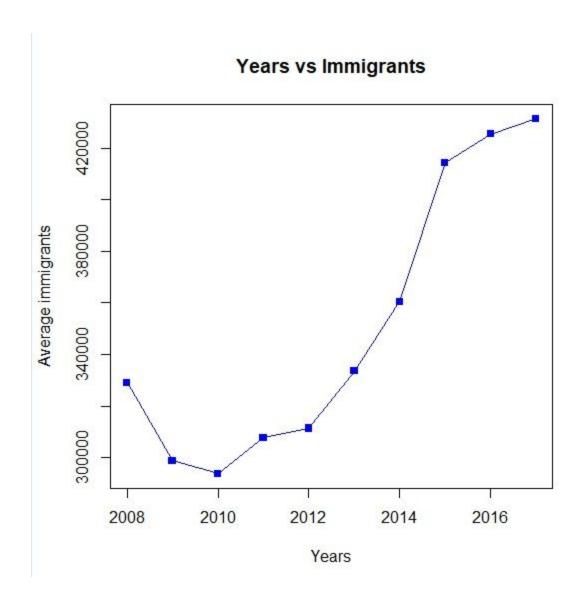
First, we analyse the difference in the number of immigrants between 2008 and 2017 for each of the countries in the specific order: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States

- > an<-rbind(data\$X2008, data\$X2017)
- > barplot(an, beside=T)
- > barplot(an, beside=T,main="Comparison between 2008 and 2017", xlab="Countries",ylab="Immigrants")



The next analysis helps us gain a proper understanding of the total number of immigrants across the time span of ten years by taking a cumulative average across the sample 35 countries.

>plot (c (2008:2018), data2[37,2:12], type='o', col="blue", xlab="Years", ylab="Average immigrants", main="Years vs Immigrants",pch=15)



In order to further analyse the differences among some major Eastern and Western countries, a select few countries are picked from the entire set and calculations are based upon them.

Calculating mean of Western countries:

```
> wc<-c("Germany","United Kingdom", "United States", "Canada")
> west<-data2[data2$Country %in% wc ,]
> west2<-rbind(west,
data.frame(Country="MeanWest",t(colMeans(west[,-1]))))
> west2
```

```
Country
                                  X2009 X2010 X2011
                                                                X2012
                                                                           X2013
                                                                                     X2014
                                                                                               X2015
                                                                                                           X2016
                                                                                                                      X2017 X2018
                                                                                   <dbl> <dbl> <dbl> <dbl> <dbl> 260283 271808 296385
  <fct>
                        <dbl>
                                   <db1>
                                            <dbl>
                                                      <dbl>
                                                                 <dbl>
                                                                            <dbl>
                                                                                                           <dbl>
                                                                                                                      <dbl> <dbl>
                                                                                                                                        <dbl>
                                                                                                                                                  <dbl>
1 Canada
2 Germany 573815 606314
3 United Kingdom 456000 430000
                                          683529 841695
                                                             965908 1108068 1342529 2016241 1719075 1384018
                                                                                                                             94754. 334285
3 United Kingdom 456000 430000 459000 453000 383000 406000 504000 481000 455000 520000 94754. 275378. 275378. 4 United States 1107126 1130818 1042625 1062040 1031631 990553 1016518 1051031 1183505 1127167 94754. 600940. 600940.
5 MeanWest
                     596046. 604826. 616460 651359 659576. 690914. 780832. 955020 913491. 829418. 94754. 345400. 345400.
```

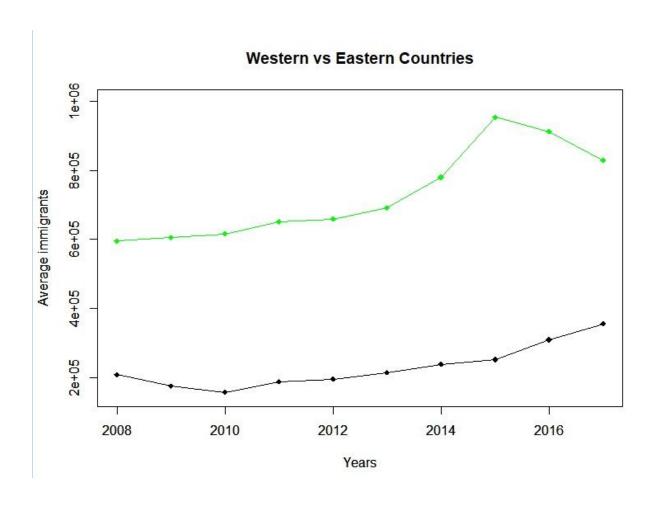
Calculating mean of Eastern countries:

```
> ec<-c("Japan","Korea","Israel","Turkey")
> east<-data2[data2$Country %in% ec ,]
> east2<-rbind(east,
data.frame(Country="MeanEast",t(colMeans(east[,-1]))))
> east2
```

```
Country X2008 X2009 X2010 X2011 X2012 X2013 X2014 X2015 X2016 X2017 X2018
            <db1>
                     <dbl> <dbl>
                                     <db1>
                                             <db1>
                                                     <db1>
                                                              <db1>
                                                                      <db1>
                                                                              <db1>
                                                                                       <db1> <db1>
                                                                                                      <db1>
  <fct>
                            16633
l Israel
                   14574
                                                                     27908
                                                                             25977
                                                                                     26357 94754. 54228.
                                    16892
                                            16558
                                                     16884
         344509 297092 287071 266867 303926 306742 336525 391160 427585 474996 94754. 219632 219632 302174 232844 293070 307249 300177 360473 407063 372935 402203 452657 94754. 198464. 198464
2 Japan
                                                                                            94754. 198464. 198464.
3 Korea
          169167 153661. 29905 158236. 160102. 171552. 185351. 213065. 380921 466333 94754. 131961 131961
4 Turkey
5 MeanEast 207388, 174543, 156670, 187311, 195191, 213913, 238263, 251267, 309172, 355086, 94754, 151071, 151071,
```

This data is then plotted into graphs

```
> plot(c(2008:2017),west2[5,2:11],type='o',col="green",xlab="Years", ylab="Average immigrants",main="Western vs Eastern
Countries",pch=18,ylim=c(150000,1000000))
> par(new=TRUE)
> plot(c(2008:2017),east2[5,2:11],type='o',col="black",xlab="Years",y lab="Average immigrants",pch=18,ylim=c(150000,1000000))
```



CONCLUSIONS:

The first bar graph showcases how much the immigration rates have varied with regards to both specific countries, as well as within a time frame of 10 years.

Based on our initial analysis, the number of immigrants have, on the whole increased in the span of a decade. Germany has seen the highest rise in terms of preference, while Italy has become the least preferred location for permanent residence.

It also gives us a clear picture as to which countries are in general more inviting such as the United Kingdom and the United States; and also the countries which haven't grown in this aspect despite the duration of 10 years, like, Estonia and Finland.

It allows us to look at the entire research in a brief format and helps us proceed with further analysis.

The next plot gives us data on the average number of immigrants throughout the decade. Between 2008 to 2010, one can notice the fall in the immigrants, which tells us that not many people were willing to shift from their home countries. This trend however, completely changes in the following years as people are more open to settling down in their non-native countries.

The third analysis is conducted to prove the theory that Western countries in general, have greater migration countries than Eastern countries. From the beginning of time, i.e. 2008, Western countries

have always been preferred as suitable places for sustenance. The countries chosen to prove this theory include the United Kingdom, the United States, Germany and Canada; while the Eastern spectrum included Japan, Turkey, Israel and Korea.

As we observe the line graphs of the two, where Western countries are indicated with green while Eastern are indicated with black; the difference among them is blatant.

This can also be backed up looking at the mean immigrants of each of those countries for every year starting from 2008 to 2017, where the West has exorbitantly higher numbers than that of the East.

Thus, a detailed analysis of the rates of immigration across countries within a span of 10 years has been successfully concluded and their results recorded.