

# **Calgary Economic Development**

## **Global Labour Supply Study**

### **Executive Summary**

**September 11, 2008**

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# 1. EXECUTIVE SUMMARY

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## 1.1 Purpose of the Study

With the completion of the occupational demand forecast, Calgary Economic Development (CED) now has insight as to those occupations that will be in high demand or will experience high growth over the next ten years. This information will be extremely useful to the community, assisting with workforce planning, development of curriculum and rationalizing specific industry or occupational support through workforce development activities.

It is widely acknowledged that at some point in the near future, the large majority of Canada's employment growth will come from immigration. CED proposes to undertake a study that will enable Calgary to be at the forefront of the immigration stream, and be actively marketing and recruiting in markets that have a demonstrated supply of talent that is aligned with occupations in high demand or high growth over the next ten years. The purpose of the project is to support CED's workforce recruitment efforts with informed, sound and rigorous analysis of global talent supply. The analysis enables CED and others to be strategic in regards to the geographies in which recruiters may undertake in-market recruiting and visitation. Given the high costs of such activities, CED wishes to inform and substantiate its activities to ensure the highest chances of success and the greatest return on its investment. Additionally, the information regarding talent supply modeling can be disseminated to Calgary employers in order to support their planning for overseas recruiting efforts.

The objective of this study is to provide guidance on which countries should be targeted for attraction of "supply" worker talent to meet Calgary's labour demand. The analysis is informed by statistics collected from 106 countries on the number of workers employed in each country in a number of "target occupations" which are in high demand in Calgary. The study also presents statistics which inform the probability of success in recruiting from each country. These measures can be used to further inform due diligence when evaluating the prospects of recruiting workers from any of the 106 countries. These measures are used to construct two indices which rank countries according to the probability of success in recruiting from each country.

## 1.2 Selection of Target Occupations

The selection of target occupations was based on the Calgary Labour Market Demand Study completed by Calgary Economic Development in January, 2008. This study highlighted the future demand for workers in Calgary for over 400 occupations. The Calgary Labour Market Demand Study identified, for each occupation, the number of workers which the Calgary Economic Region will require and could employ over a ten-year forecast horizon.

Together, RDA Global and CED identified thirty (30) occupational groups to target for recruitment. The groups were first of all based on the occupations which will be in high demand as identified in the Calgary Labour Market Demand Study. Consideration was given to the overall benefit of international recruiting efforts vis-à-vis the high-demand occupations--it was determined that *skilled workers* were the top priority for international recruiting. This resulted in some occupations, such as retail salespersons, not being included in the target occupations, despite the fact that these workers are in high demand.

The selection of groups of target occupations was based on broad functional categories which often aggregated workers at different skill levels in a particular field. For instance, computer science professionals and computer science technicians were grouped together into a category. This approach was taken because sometimes the only difference between two occupations is the number of years of education of the worker and functionally the jobs are quite similar. The grouping approach provided an advantage of broadly identifying the source of labour supply for larger groups which characterized types of workers. The thirty groups identified cover about 1/3 of the existing jobs in Calgary.

The specific selection of each target occupation group was made on the basis of four criteria:

- (1) Preference as given to occupations in which there are a large number or workers in demand in the future (i.e. accountants and financial professionals).
- (2) Preference was given to occupations in which demand is growing at a fast rate in the next five years (i.e. petroleum engineers).
- (3) Preference was given to occupation for which demand is growing at a fast rate in the next ten years (i.e. nurses)
- (4) Preference was given to workers with higher skill levels as these are workers which firms are more likely to invest in heavily to insure that they have adequate labour supply.

**Table 1.1 Target Occupations Selected for Study of International Labour Supply**

| Occupation Group Number | Occupations  | Workers in 2007 | Demand for Workers in 2017 | Growth 2007-17 | Workers Required for New Jobs |
|-------------------------|--|-----------------|----------------------------|----------------|-------------------------------|
| 1                       | C01 Physical science professionals & C11 Technical occupations in physical sciences  | 7,740           | 11,169                     | 44%            | 3,429                         |
|                         |  | 5,044           | 7,325                      | 45%            | 2,282                         |
| 2                       | C03 Civil, mechanical, electrical and chemical engineers & C13 Technical occupations in civil, mechanical and industrial engineering | 10,965          | 16,319                     | 49%            | 5,354                         |
|                         |  | 3,364           | 5,046                      | 50%            | 1,682                         |
| 3                       | C04 Other engineers & C14 Technical occupations in electronics and electrical engineering  | 12,073          | 17,527                     | 45%            | 5,453                         |
|                         |  | 5,784           | 8,542                      | 48%            | 2,758                         |
| 4                       | C05 Architects, urban planners and land surveyors & C15 Technical occupations in architecture, drafting, surveying and mapping       | 3,037           | 4,542                      | 50%            | 1,504                         |
|                         |  | 5,461           | 8,155                      | 49%            | 2,694                         |
| 5                       | C07 Computer and information systems professionals & C18 Technical occupations in computer and information systems                   | 19,663          | 29,248                     | 49%            | 9,585                         |
|                         |  | 7,786           | 11,483                     | 47%            | 3,697                         |
| 6                       | D01 Physicians, dentists and veterinarians   | 4,612           | 7,208                      | 56%            | 2,596                         |
| 7                       | D02 Optometrists, chiropractors and other health diagnosing and treating professionals   | 756             | 1,183                      | 56%            | 427                           |
| 8                       | D03 Pharmacists, dietitians and nutritionists  | 1,515           | 2,314                      | 53%            | 799                           |
| 9                       | D04 Therapy and assessment professionals   | 1,987           | 3,089                      | 55%            | 1,102                         |
| 10                      | D11 Nurse supervisors and registered nurses  | 9,017           | 14,046                     | 56%            | 5,029                         |
| 11                      | D21 Medical technologists and technicians (except dental health)   | 5,783           | 8,936                      | 55%            | 3,154                         |
| 12                      | D22 Technical occupations in dental health care  | 1,677           | 2,578                      | 54%            | 901                           |
| 13                      | D23 Other technical occupations in health care (except dental)   | 4,231           | 6,550                      | 55%            | 2,318                         |
| 14                      | D31 Assisting occupations in support of health services  | 8,429           | 13,175                     | 56%            | 4,746                         |
| 15                      | E13 Secondary and elementary school teachers and educational counsellors   | 21,418          | 26,906                     | 26%            | 5,488                         |
| 16                      | J12 Machine operators and related workers in metal and mineral products processing   | 1,346           | 1,957                      | 45%            | 611                           |
| 17                      | B01 Auditors, accountants and investment professionals   | 30,151          | 36,516                     | 21%            | 6,365                         |
| 18                      | B53 Finance and insurance clerks   | 18,608          | 22,491                     | 21%            | 3,883                         |
| 19                      | H11 Plumbers, pipefitters and gas fitters  | 4,702           | 6,135                      | 30%            | 1,433                         |
| 20                      | H12 Carpenters and cabinetmakers   | 8,297           | 10,812                     | 30%            | 2,515                         |
| 21                      | H13 Masonry and plastering trades  | 4,102           | 5,418                      | 32%            | 1,316                         |
| 22                      | H14 Other construction trades  | 6,459           | 8,529                      | 32%            | 2,070                         |
| 23                      | H21 Electrical trades and telecommunications occupations   | 9,423           | 12,298                     | 31%            | 2,875                         |
| 24                      | H31 Machinists and related occupations   | 1,437           | 1,816                      | 26%            | 379                           |
| 25                      | H32 Metal forming, shaping and erecting trades   | 6,952           | 8,915                      | 28%            | 1,963                         |
| 26                      | H41 Machinery and transportation equipment mechanics (except motor vehicle)  | 6,881           | 8,853                      | 29%            | 1,972                         |
| 27                      | H42 Automotive service technicians   | 5,861           | 7,550                      | 29%            | 1,689                         |
| 28                      | H43 Other mechanics  | 1,037           | 1,344                      | 30%            | 307                           |
| 29                      | H51 Upholsterers, tailors, shoe repairers, jewellers and related occupations   | 1,437           | 1,822                      | 27%            | 385                           |
| 30                      | H52 Printing press operators, commercial divers and other trades and related occupations, n.e.c.                                     | 1,236           | 1,549                      | 25%            | 313                           |

### 1.3 Immigration Supply/Demand Index

To analyze the likelihood of workers in a target country would immigrate to Calgary, we developed an index which we refer to as the Immigration Supply/Demand Index. This index captures raw labour availability from each country and is based partially on the total stock of emigrates from the country and actual immigration to Calgary during the latest Census cycle. Countries which have a high rate of outward emigration or high rate of immigration to Calgary received high scores. Countries with both features naturally received the highest scored while those with neither received relatively low scores. The immigration supply/demand index captures an important dimension of labour mobility, but is not specific to a particular occupation.

## 1.4 Qualities of Immigrating Population Index

A second important consideration in selecting countries to target for recruiting is the relative difficulty that workers will face in integrating into Canadian life and culture. The second index captures the quality of the emigrating population informs us more about the qualities of persons from these countries that might make communication (perhaps assimilation) easier and provide for greater infusion of workers into Calgary's labour market. Those countries with populations which have greater skills (e.g. education and English language proficiency) will have a greater rank than those with emigrating populations who do not.

## 1.5 Analysis of Labour Supply

Building on the two indices (the supply/demand index and the qualities of the immigrating population index) we have provided a standard analysis for each of the target occupational groups. The analysis is based on the following:

- (1) Based on the natural breaks in the immigration supply/demand index, countries which received low immigration scores were removed from the list of potential country targets. This essentially filtered out countries which have low levels of emigration or historically have not had much or any immigration to Calgary.
- (2) The remaining countries were plotted on a two way axis which is used for strategic assessment. On the y-axis is the country's score for the immigration supply/demand index and on the x-axis is the country's score for the qualities of the immigrating population. This sorted the remaining countries into one of four quadrants—
  - a. High immigrant labour availability which is relatively easy to recruit (the upper right quadrant)
  - b. High immigrant labour availability which is relatively difficult to recruit (the upper left quadrant)
  - c. Smaller immigrant labour demand availability which is relatively easy to recruit (the lower right quadrant) and
  - d. Smaller immigrant labour demand availability which is also relatively more difficult to recruit.

In terms of assessment, the countries falling in quadrant (a) (the top right quadrant) can be considered "low-hanging fruit." Recruitment efforts from these countries are likely to be successful. Countries falling in quadrant (b) (top left) are the next most likely to be successful. Workers from these countries have high levels of mobility, however, due to language, education or cultural factors, integration into the Calgary workforce will be more difficult. It should be noted that workers from the countries falling into this quadrant have historically had relatively high levels of immigration to Calgary or Canada, despite these difficulties. Workers from quadrant

(c) (lower right) are a third tier choice for recruiting, however, these niche countries may provide good key sources of supply, especially if special training relationships can be established. Workers from these countries are likely to easily integrate into the Calgary workforce, and the source countries should be seen as a potential target for mid-term and long-term immigration partnership. Countries falling into quadrant (d) (lower left) reflect a smaller mobile workforce and will also face difficulties in integrating into Canadian life and work.

It should be noted that all countries appearing in the four-quadrant graphs have historically shown some level of immigration to Canada and thus the segmentation of workers according to the four quadrants should be seen as relative differences and workers from countries in all four quadrants can be considered as potential recruitment targets.

- (3) The final measure introduced into the strategic assessment figure is the number of workers in the target occupational group in each country. This measure is represented by the size of the bubble (or dot) that represents each country. A country with a large bubble has a large amount of supply. A country with a small bubble has a small level of supply. The bubble size is specific to the occupational group being assessed.

Interpretation of the strategic assessment figures is best completed by identifying the larger bubbles and their location within the four quadrants. These represent the key large supply opportunities. Smaller bubbles represent locations with smaller supply however they may represent areas of high recruiting success based on the quadrant in which they fall.

**Figure 1.1 Total Targeted Labour Supplies from Each Target Country**

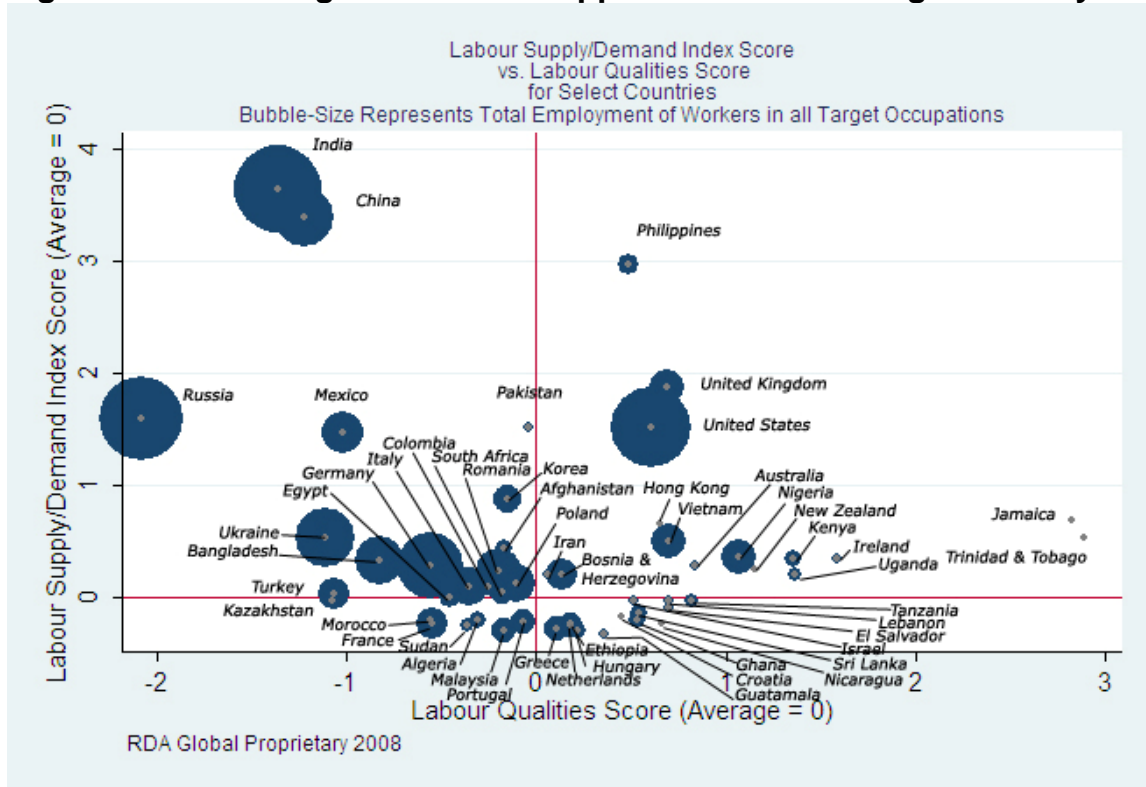


Figure 1.1 provides an analysis of labour supply that can be targeted for recruitment of the target occupations. The bubble size represents the total number of workers in each country who are working in one of the target occupations noted in table 1.1. Specific strategies for attracting workers internationally can be further informed by the analysis of supply for the particular occupational group (the figure above covers all target occupational groups combined); however, generally speaking, the larger countries in the upper quadrants represent the best supply. Those in the upper left quadrant also offer good labour supply, however, these workers will face greater difficulties in integrating into Canadian life. CED and others involved in recruiting must consider these difficulties when recruiting workers from these countries and if recruiting is undertaken in these countries, additional efforts and costs will likely be required to bridge the cultural and language difficulties that workers from these countries will face when integrating into Calgary’s workforce. The remaining two quadrants present certain difficulties. Those in the bottom right quadrant are less likely to encounter difficulty integrating into Calgary’s workforce however they are also less likely to actually immigrate, and generally represent smaller pockets of supply. A highly-targeted recruitment strategy for these countries is required which takes into consideration “push factors” which might motivate particular workers in these countries to seek work opportunities overseas. Those in the bottom left quadrant generally represent less attractive prospects, however, for certain occupations they may prove helpful. Further analysis of a specific occupation may highlight a large pool of workers falling in

this quadrant. If recruiting prospects in more attractive countries is not adequate to meet demand, the sheer size of the supply in this quadrant may justify the costs recruiting from the country. However, it should be understood that special efforts must be made to overcome difficulties these workers will face in transitioning to work in Calgary. Incentives may have to be high to persuade these workers to immigrate as workers from these countries have traditionally been less likely to immigrate to Canada.

We recommend coordinating recruiting efforts in the 23 countries in Table 1.2 which represent the largest total supply of all target workers with relatively high probability of recruiting success. These top 23 countries represent a combined 63% of the total global workforce working in the target occupations. The list of countries also reflects countries which had relatively higher scores on the immigration demand/supply index.

Some countries in the list do not match our intuition on the overall opportunity in recruiting. In particular, Bangladesh, Nigeria, and Vietnam are poorer countries which were added to the list of top prospects because of the size and composition of their labour force. In addition, Canada is the second largest destination country for Vietnamese emigrates. Nigeria's use of English language made it relatively more attractive and Bangladesh's stock of emigrates is similar to that of the UK—over four million emigrates—and Canada is in the top ten destination countries for these immigrants.

Recruiting efforts in these three countries can be considered somewhat speculative and additional research may be needed to confirm the feasibility of recruiting certain types of workers from these countries.

The countries in Table 1.2 represent either large sources of supply or supply which is very likely to immigrate to Calgary and integrate well into the Calgary workforce.

**Table 1.2 Top Countries for Labour Supply of Target Occupations**

| Rank | COUNTRY           | Worker Supply in Target Occupations (2007) | Total Employees (2007) | Percent of Employees Working in Target Occupations |
|------|-------------------|--|------------------------|--|
| 1    | China             | 71,880,818                                 | 653,035,937            | 11%  |
| 2    | India             | 46,094,388                                 | 361,737,670            | 13%  |
| 3    | United States     | 37,882,263                                 | 141,094,529            | 27%  |
| 4    | Russia            | 20,410,043                                 | 70,933,485             | 29%  |
| 5    | Bangladesh        | 14,979,967                                 | 69,090,401             | 22%  |
| 6    | Germany           | 14,443,131                                 | 41,957,052             | 34%  |
| 7    | Nigeria           | 9,313,256                                  | 41,914,644             | 22%  |
| 8    | Mexico            | 8,492,912                                  | 37,684,557             | 23%  |
| 9    | United Kingdom    | 7,788,278                                  | 27,830,597             | 28%  |
| 10   | France            | 7,649,080                                  | 25,322,084             | 30%  |
| 11   | Italy             | 6,645,482                                  | 23,524,656             | 28%  |
| 12   | Vietnam           | 6,537,721                                  | 42,672,984             | 15%  |
| 13   | Ukraine           | 5,549,141                                  | 20,996,651             | 26%  |
| 14   | Poland            | 4,875,280                                  | 16,253,997             | 30%  |
| 15   | Turkey            | 4,785,719                                  | 22,418,049             | 21%  |
| 16   | Philippines       | 4,552,528                                  | 33,297,165             | 14%  |
| 17   | Korea             | 4,228,549                                  | 21,532,279             | 20%  |
| 18   | Australia         | 3,453,583                                  | 10,591,815             | 33%  |
| 19   | Hong Kong         | 726,194                                    | 3,330,118              | 22%  |
| 20   | New Zealand       | 633,883                                    | 2,125,627              | 30%  |
| 21   | Ireland           | 576,727                                    | 2,074,922              | 28%  |
| 22   | Jamaica           | 312,534                                    | 1,094,334              | 29%  |
| 23   | Trinidad & Tobago | 142,987                                    | 551,984                | 26%  |

## 1.6 Measures Informing Indexes

Several measures were tested in a factor analysis to determine the best indicators of likelihood of success in attracting workers from each country. The following five measures loaded well on the factor analysis and were eventually used in the immigration indices.

**EMSTOCK:** a measure of emigration stock which denotes the number of emigrants from each country—in total number of persons—in 2005.

**CALIMM:** a measure of the total number of persons who immigrated to Calgary from 1996-2001.

**ENGLISH:** a measure which attempts to account for the requisite English language requirements for immigration to Canada. Each country was coded based on the formal and informal usage of English as a language. For example, Australia and New Zealand were coded as 1; Argentina and France coded as 0; and India and Pakistan were coded as 0.5 because of the informal importance (e.g. social and political mobility) of English despite the fact that these countries have other state languages.

EMRATE\_TERED: a measure that attempts to tap into the skill level of emigrants. This variable is the emigration rate of the tertiary educated population in each country for the year 2000. The variable is quantified in percentages of people in each country with a tertiary education who have emigrated from the country.

CANRANK05: Each country in the dataset has a list of top ten countries for emigration. The countries that had Canada in the top ten were ranked according to their order within the top ten (e.g. Canada was the second ranked place for immigrants from Mexico so it received a value of 2). Additionally, those countries in which Canada was not in the top ten for 2005 were coded 11.

**Table 1.3 Measures Informing the Immigration Indices**

| Country                | EMSTOCK  | CALIMM   | ENGLISH   | EMRATE_TERED  | CANRANK05  |
|------------------------|--|--|---|---|--|
|                        | Number of emigrants from each country—in total number of persons | Number of persons who immigrated to Calgary from 1996-2001 | Requisite English language requirements for immigration | Emigration rate of the tertiary educated population (%) | Countries that had Canada in the top ten destinations for emigrates are ranked according to their order within the top ten |
| Afghanistan            | 2,031,678  | 915  | 0   | 13.2  | 5  |
| Albania                | 860,485  | 50   | 0   | 20  | 6  |
| Algeria                | 1,783,476  | 125  | 0   | 6.5   | 6  |
| Argentina              | 806,369  | 90   | 0   | 2.5   | 9  |
| Australia              | 415,270  | 215  | 1   | 2.3   | 4  |
| Austria                | 415,270  | 35   | 0   | 2.3   | 4  |
| Bahrain                | 20,090   | 50   | 0   | 3.4   | 4  |
| Bangladesh             | 4,885,704  | 295  | 0   | 4.7   | 7  |
| Belarus                | 1,799,790  | 10   | 0   | 3   | 11   |
| Belgium                | 454,599  | -  | 0   | 5.9   | 7  |
| Bermuda                | 24,281   | -  | 1   |   | 3  |
| Bolivia                | 417,956  | 25   | 0   | 6   | 7  |
| Bosnia and Herzegovina | 1,471,594  | 725  | 0   | 28.6  | 8  |
| Brazil                 | 1,135,060  | 105  | 0   | 3.3   | 11   |
| Brunei                 | 12,623   | 15   | 0   | 21  | 1  |
| Bulgaria               | 937,341  | 105  | 0   | 5.8   | 10   |
| Cambodia               | 348,710  | 85   | 0   | 6.8   | 5  |
| Chile                  | 584,869  | 60   | 0   | 5.3   | 5  |
| China                  | 7,258,333  | 4,065  | 0   | 4.2   | 4  |
| Colombia               | 1,969,282  | 485  | 0   | 11  | 6  |
| Costa Rica             | 127,061  | 15   | 0   | 6.6   | 6  |
| Croatia                | 726,031  | 225  | 0   | 29.4  | 5  |
| Cyprus                 | 160,728  | 10   | 0   | 17.9  | 6  |
| Czech Republic         | 418,175  | 30   | 0   | 9.9   | 5  |
| Denmark                | 234,008  | 55   | 0   | 7   | 6  |
| Dominican Rep.         | 1,068,919  | -  | 0   | 21.7  | 11   |
| Ecuador                | 1,016,037  | 10   | 0   | 10.9  | 5  |
| Egypt                  | 2,399,251  | 310  | 0   | 4.2   | 6  |
| El Salvador            | 1,128,701  | 125  | 0   | 31.5  | 2  |
| Ethiopia               | 445,926  | 230  | 0   | 17  | 5  |
| Finland                | 333,155  | 10   | 0   | 8.4   | 4  |
| France                 | 1,889,164  | 155  | 0   | 3.9   | 8  |
| Germany                | 4,095,015  | 330  | 0   | 8.8   | 6  |
| Ghana                  | 906,698  | 175  | 0   | 42.9  | 8  |
| Greece                 | 1,218,233  | 10   | 0   | 14  | 4  |
| Guatemala              | 685,713  | 10   | 0   | 21.5  | 4  |
| Honduras               | 414,955  | -  | 0   | 21.8  | 7  |
| Hong Kong              | 716,246  | 1,270  | 0   | 28.7  | 1  |
| Hungary                | 471,298  | 115  | 0   | 12.1  | 3  |
| India                  | 9,987,129  | 3,595  | 0.5   | 4.2   | 8  |
| Indonesia              | 1,736,717  | 20   | 0   | 2   | 10   |
| Iran                   | 969,920  | 735  | 0   | 13.1  | 3  |
| Ireland                | 927,904  | 15   | 1   | 34.4  | 4  |
| Israel                 | 808,078  | 50   | 0.5   | 6.5   | 3  |
| Italy                  | 3,459,027  | 130  | 0   | 7   | 4  |
| Jamaica                | 1,037,599  | 145  | 1   | 82.5  | 3  |
| Japan                  | 940,028  | 110  | 0   | 1.5   | 6  |
| Jordan                 | 641,154  | 55   | 0   | 6.4   | 6  |
| Kazakhstan             | 3,710,351  | 185  | 0   | 1.1   | 11   |
| Kenya                  | 427,324  | 200  | 1   | 26.3  | 5  |
| Korea                  | 1,609,206  | 1,590  | 0   | 7.9   | 3  |
| Kuwait                 | 185,802  | 75   | 0   | 10  | 3  |

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| Country           | EMSTOCK  | CALIMM   | ENGLISH   | EMRATE TERED  | CANRANK05  |
|-------------------|--|--|---|---|--|
|                   | Number of emigrants from each country—in total number of persons | Number of persons who immigrated to Calgary from 1996-2001 | Requisite English language requirements for immigration | Emigration rate of the tertiary educated population (%) | Countries that had Canada in the top ten destinations for emigrates are ranked according to their order within the top ten |
| Latvia            | 232,865  | 60   | 0   | 10.2  | 5  |
| Lebanon           | 621,903  | 335  | 0   | 29.7  | 2  |
| Lithuania         | 320,473  | 10   | 0   | 11.8  | 8  |
| Luxembourg        | 42,361   | -  | 0   | 7.6   | 11   |
| Macau             |  | -  | 0   |   |  |
| Macedonia         | 370,826  | 10   | 0   | 20.9  | 11   |
| Malaysia          | 1,458,944  | 30   | 0   | 10.4  | 6  |
| Mexico            | 11,502,616   | 285  | 0   | 14.3  | 2  |
| Morocco           | 2,718,665  | 15   | 0   | 10.3  | 9  |
| Mozambique        | 803,261  | -  | 0   | 42  | 11   |
| Nepal             | 753,662  | 40   | 0   | 2.7   | 11   |
| Netherlands       | 812,475  | 120  | 0   | 8.9   | 2  |
| New Zealand       | 498,006  | 90   | 1   | 15  | 4  |
| Nicaragua         | 683,520  | 45   | 0   | 30.9  | 3  |
| Nigeria           | 836,832  | 310  | 1   | 36.1  | 11   |
| Norway            | 180,575  | 50   | 0   | 5.4   | 7  |
| Pakistan          | 3,415,952  | 1,780  | 0.5   | 9.2   | 5  |
| Panama            | 215,240  | 10   | 0   | 20  | 4  |
| Paraguay          | 421,279  | -  | 0   | 2.3   | 4  |
| Peru              | 898,829  | 110  | 0   | 6.3   | 8  |
| Philippines       | 3,631,405  | 3,315  | 1   | 14.8  | 4  |
| Poland            | 2,316,438  | 380  | 0   | 12.3  | 4  |
| Portugal          | 1,950,486  | -  | 0   | 13.8  | 5  |
| Puerto Rico       |  | -  |   |   |  |
| Romania           | 1,244,052  | 850  | 0   | 14.1  | 7  |
| Russia            | 11,480,137   | 890  | 0   | 1.3   | 11   |
| Saudi Arabia      | 80,705   | 130  | 0   | 0.7   | 2  |
| Singapore         | 230,007  | 110  | 0   | 15.2  | 10   |
| Slovakia          | 520,962  | 95   | 0   | 15.3  | 6  |
| Slovenia          | 133,965  | -  | 0   | 11  | 4  |
| South Africa      | 713,104  | 690  | 0   | 5.4   | 5  |
| Spain             | 1,323,373  | -  | 0   | 2.6   | 11   |
| Sri Lanka         | 935,599  | 160  | 0   | 27.5  | 3  |
| Sudan             | 587,120  | 400  | 0   | 5.6   | 8  |
| Sweden            | 300,771  | 35   | 0   | 4.4   | 9  |
| Switzerland       | 481,060  | 105  | 0   | 9.1   | 6  |
| Syria             | 480,708  | 85   | 0   | 5.2   | 6  |
| Taiwan            |  | 715  | 0   |   |  |
| Tanzania          | 188,789  | 110  | 0.5   | 15.8  | 3  |
| Thailand          | 758,180  | 45   | 0   | 2.2   | 11   |
| Trinidad & Tobago | 361,596  | 45   | 1   | 78.4  | 2  |
| Tunisia           | 623,221  | 10   | 0   | 9.6   | 9  |
| Turkey            | 4,402,914  | 125  | 0   | 4.6   | 11   |
| UAE               | 41,287   | 110  | 0   | 1.2   | 3  |
| Uganda            | 154,747  | 45   | 1   | 21.6  | 4  |
| Ukraine           | 6,081,890  | 410  | 0   | 6   | 9  |
| United Kingdom    | 4,158,909  | 1,600  | 1   | 16.7  | 3  |
| United States     | 2,261,443  | 1,550  | 1   | 0.5   | 2  |
| Uruguay           | 288,480  | 10   | 0   | 8.6   | 6  |
| Uzbekistan        | 2,185,539  | 45   | 0   | 1   | 11   |
| Venezuela         | 463,759  | 115  | 0   | 3.3   | 5  |
| Vietnam           | 2,225,413  | 685  | 0   | 39  | 2  |
| Vietnam           | 2,225,413  | 685  | 0.0   | 39.0%   | 2  |

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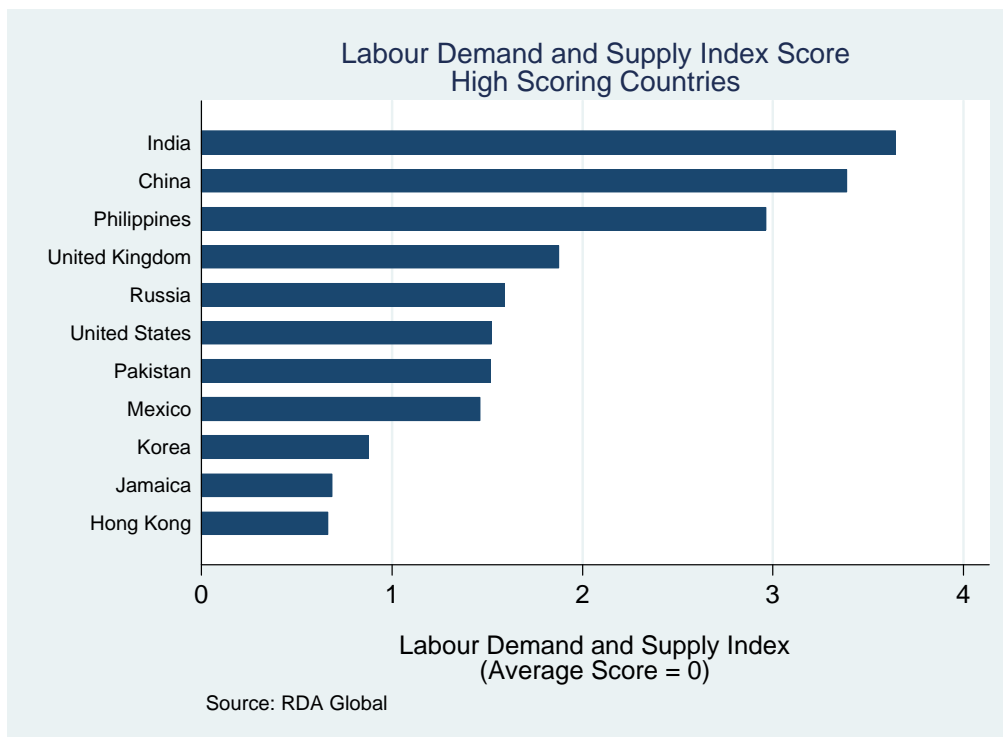
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## 1.7 Immigration Supply/Demand Index

The Immigration Supply Demand Index captures raw labour availability from each country and is based partially on the total stock of emigrates from the country and actual immigration to Calgary during the latest Census cycle. Countries which have a high rate of outward emigration or high rate of immigration to Calgary received high scores. Countries with both features naturally received the highest scores while those with neither received relatively low scores. The immigration supply/demand index captures an important dimension of labour mobility, but is not specific to a particular occupation. Additional background on the Immigration Supply/Demand Index is contained in the methodology section of this report.

The index scoring revealed natural groupings of countries with eleven (11) countries receiving notably high scores, and forty one (41) countries receiving mid-level scores. The remaining countries all received low scores and these scores were relatively similar to one another. Figure 1.2 contains the high-scoring countries. These countries typically displayed a large stock of labour supply for emigration and/or high levels of immigration into Calgary. Given the high level of mobility and/or established immigrant community in Calgary, workers from these countries are highly likely to immigrate to meet the labour demand in Calgary.

**Figure 1.2 High Scoring Countries in the Demand/Supply Index**



**Figure 1.3 Labour Demand and Supply Index (All Countries)**

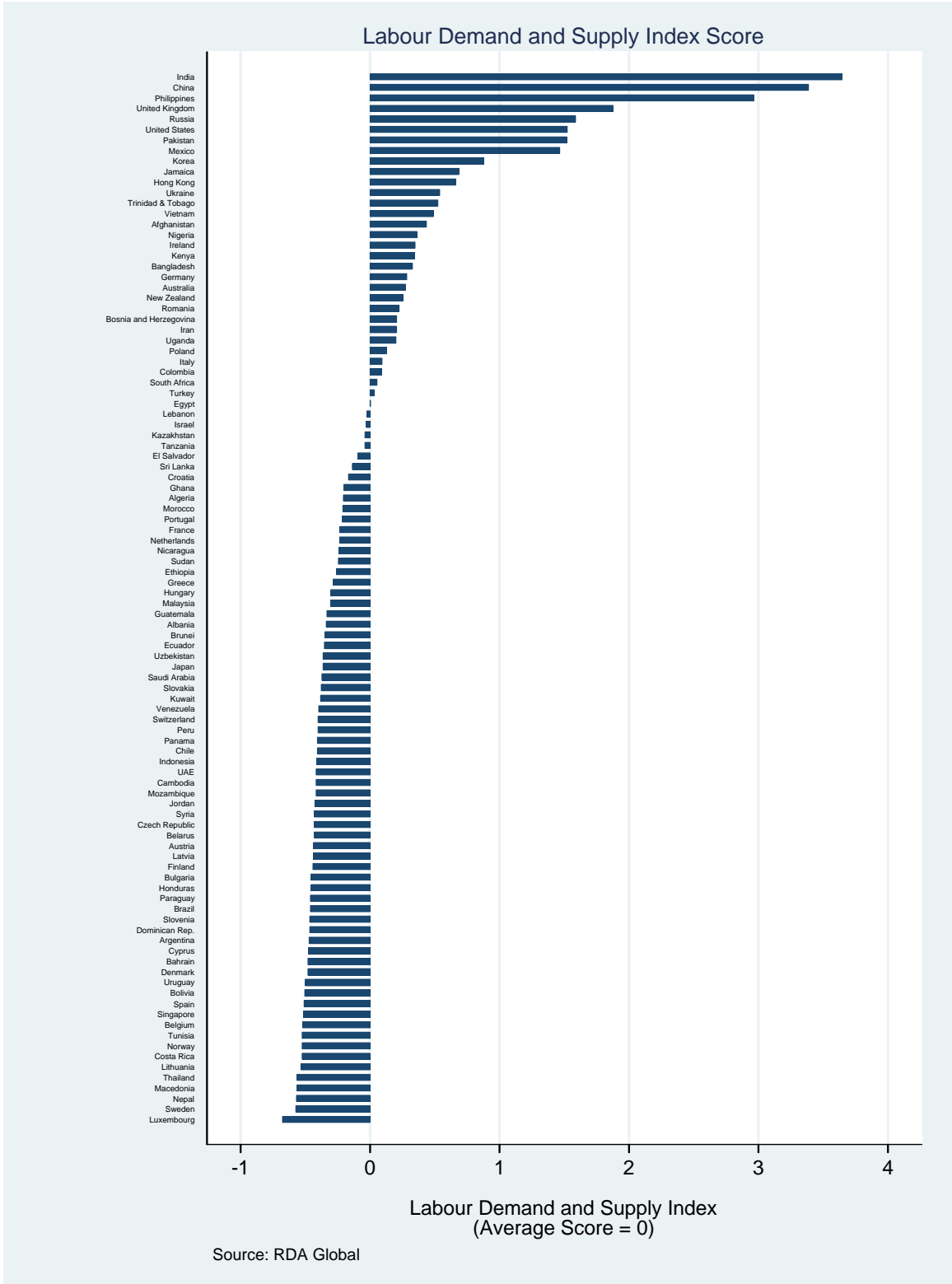


Figure 1.3 contains scores for all countries. There are forty eight (48) countries which received relatively low scores.

Low-scoring countries range from a score of -.34 (Albania) to -.68 (Luxembourg). It is notable that scores for low-scoring countries are not strongly differentiated from one another. Unlike high-scoring countries, there were no low-scoring countries with strongly low scores.

It is also noteworthy that the scores for countries are not evenly balanced in the sense that there are 31 countries with higher than average (positive) scores and 68 countries with lower than average (negative) scores. This suggests that much of the emigrating labour force is concentrated in a smaller subset of key supply countries.

## **1.8 Qualities of Immigrating Population Index**

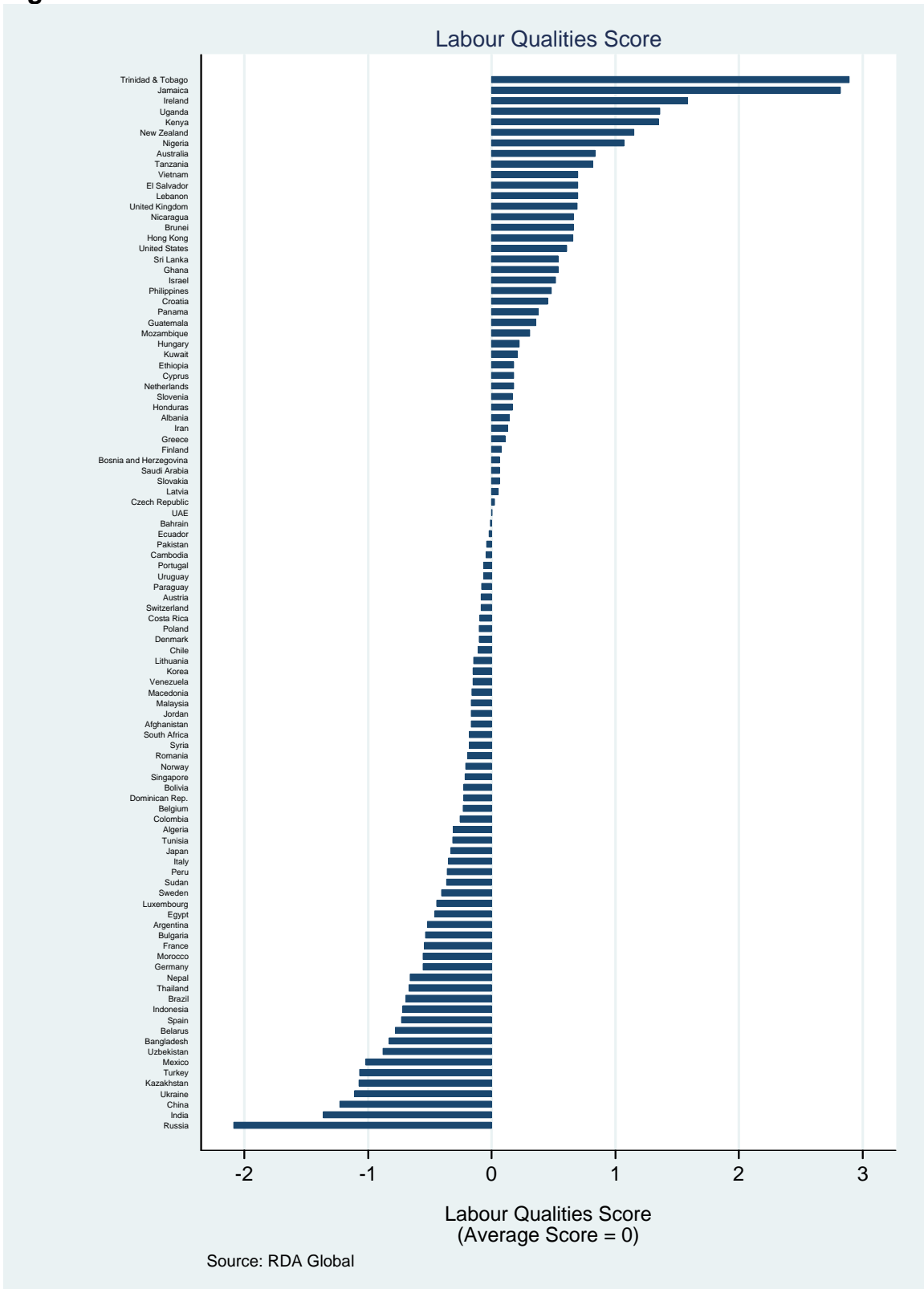
The second index captures the quality of the emigrating population informs us more about the qualities of persons from these countries that might make communication (perhaps assimilation) easier and provide for greater infusion of workers into Calgary's labour market. Those countries with populations which have greater skills (e.g. education and English language proficiency) will have a greater rank than those with emigrating populations who do not.

Scores for the Labour Qualities Index range from a high of 2.89 (Trinidad & Tobago) to a low of -2.09 (Russia). The scoring of the index is relatively evenly distributed. Countries with high scores tend to be English-speaking countries with a high rate of emigration for persons with a tertiary education.

It is interesting to note that several of the countries which scored high on the labour demand/supply index scored lowest in the labour qualities index. Countries such as China, India, Russia and Mexico all represent high levels of mobile labour supply, but may face language or cultural difficulties. They may also find that their educational qualifications present limitations when seeking work in Calgary.

Clearly, there are a large number of immigrant workers in Calgary from some countries which score relatively low on the labour qualities index. This suggests that these workers can overcome the cultural, educational, and language hurdles and successfully immigrate. Thus, it suggests that this index is probably a lesser determinant of success in immigration than the supply/demand index. In our analysis we use the index to differentiate the level of difficulty in immigration among likely sources of labour supply.

**Figure 1.4 Labour Qualities Index**



Source: RDA Global

## **1.9 Additional Measures on Country Labour Supply**

In order to facilitate targeted due diligence on the supply of workers, the study collected a number of measures for each country. These measures are contained in a complete country profile for each occupation. Table 1.4 contains an outline of the measures available to analyze each country prior to conducting recruiting efforts for target occupations.

**Table 1.4 Key Variables contained in the Complete Country Profile**

| Category              | Variable Name                                     | Units        | Description   | Source Description   |
|-----------------------|---|--------------|---|--|
| Geography             | Country   |              | Country   |  |
|                       | Region  |              | World region  |  |
|                       | Subregion   |              | Sub-grouping of world regions   |  |
| Occupation            | Calgary Target Occupations                        | N/A          | Target occupation groups (defined by CED)                             | Defined by CED   |
|                       | NOC OCCUPATION (4-DIGIT)                          | N/A          | Canadian National Occupational Classification                         | Statistics Canada  |
|                       | NOC OCCUPATION (3-DIGIT)                          | N/A          | Canadian National Occupational Classification                         |  |
|                       | NOC OCCUPATION (2-DIGIT)                          | N/A          | Canadian National Occupational Classification                         |  |
|                       | NOC OCCUPATION (1-DIGIT)                          | N/A          | Canadian National Occupational Classification                         |  |
| Workers & Labor Force | Workers in Occupation (2007)                      | workers      | National Employment for the specific occupation or occupational group | National Economic Census and Survey Sources, ILO, OECD, Eurostat |
|                       | Total Country Employment (2007)                   | workers      | Total National Employment   | RDA Global Economic Database, ILO                                |
|                       | Country Employment Growth (2007)                  | %            | 2007 National Employment Growth                                       | RDA Global Economic Database, IMF, World Bank                    |
|                       | 2007 Employment in Industry                       | workers      | 2007 National Employment in a selected industry                       | RDA Global Economic Database                                     |
|                       | Country Unemployed Persons (2003)                 | persons      | Persons unemployed in the country                                     | ILO Laborstat, Country Labour Statistics Sources                 |
|                       | Unemployed Persons in Specific Occupation (2006): | persons      | Persons unemployed in a stated employment category                    | ILO, Country Labour Statistics Sources                           |
| Economy               | GDP Growth (2007)                                 | %            | Real GDP Growth in 2007   | Country National Account Reporting, World Bank, IMF              |
|                       | Nominal GDP (PPP) 2007                            | US\$Billions | Nominal GDP expressed in purchasing power parity                      | IMF  |
|                       | GDP Per Capita (2005)                             | USD          | Nominal GDP per unit population                                       | IMF  |
| Calgary Immigration   | Immigrants to Calgary 1996-2001                   | persons      | Total Immigrants to Calgary over the period                           | Statistics Canada  |
|                       | Calgary Non-Permanent Immigrants (2001)           | persons      | Total Calgary Non-Permenant Residents by Country of Origin            | Statistics Canada  |
|                       | Calgary CMA Permanent Residents (2005)            | persons      | Total Calgary Non-Permenant Residents by Country of Origin            | Statistics Canada  |
| Canada Immigration    | Immigrants to Canada (1996-2001)                  | persons      | Total Immigrants to Canada over the period                            | Statistics Canada  |
|                       | Canada Non-Permanent Immigrants (2001)            | persons      | Total Canada Non-Permenant Residents by Country of Origin             | Statistics Canada  |
|                       | Inflow of Workers to Canada (2005)                | persons      | Inflow of workers to Canada   | Statistics Canada  |
|                       | Inflow of Workers to Canada (2001)                | persons      | Inflow of workers to Canada   | Statistics Canada  |

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| Category                      | Variable Name   | Units   | Description   | Source Description                             |
|-------------------------------|---|---------|---|--|
| Workforce Education           | % of Workforce with post-secondary education (non tertiary) | %       | % of Workforce with post-secondary education (non tertiary) | World Bank, Country Census Sources             |
|                               | % of Workforce with Post-Secondary First Level Education    | %       | % of Workforce with Post-Secondary First Level Education    | World Bank, Country Census Sources             |
|                               | % of Workforce with Post-Secondary Second Level Education   | %       | % of Workforce with Post-Secondary Second Level Education   | World Bank, Country Census Sources             |
| Graduates                     | Total Tertiary Graduates (2005)                             | persons | Total Tertiary Education Graduates in Country               | OECD, Eurostat ILO, Country Statistics Sources |
|                               | Total Tertiary Graduates (2000)                             | persons | Total Tertiary Education Graduates in Country               | OECD, Eurostat ILO, Country Statistics Sources |
|                               | 2000 Graduates in Field                                     | persons | Graduates in Stated Field                                   | UNESCO, Country Education Statistics Sources   |
|                               | 2001 Graduates in Field                                     | persons | Graduates in Stated Field                                   | UNESCO, Country Education Statistics Sources   |
|                               | 2002 Graduates in Field                                     | persons | Graduates in Stated Field                                   | UNESCO, Country Education Statistics Sources   |
|                               | 2003 Graduates in Field                                     | persons | Graduates in Stated Field                                   | UNESCO, Country Education Statistics Sources   |
|                               | 2004 Graduates in Field                                     | persons | Graduates in Stated Field                                   | UNESCO, Country Education Statistics Sources   |
|                               | 2005 Graduates in Field                                     | persons | Graduates in Stated Field                                   | UNESCO, Country Education Statistics Sources   |
|                               | 2006 Graduates in Field                                     | persons | Graduates in Stated Field                                   | UNESCO, Country Education Statistics Sources   |
|                               | Graduates in Narrow Field (2005) (OECD only)                | persons | Graduates in Narrow Field (2005) (OECD countries only)      | OECD   |
| Tertiary Education Enrollment | Tertiary Education Enrollment 2001                          | persons | Total Enrollment in Tertiary Education Programs             | UNESCO, Country Education Statistics Sources   |
|                               | Tertiary Education Enrollment 2002                          | persons | Total Enrollment in Tertiary Education Programs             | UNESCO, Country Education Statistics Sources   |
|                               | Tertiary Education Enrollment 2003                          | persons | Total Enrollment in Tertiary Education Programs             | UNESCO, Country Education Statistics Sources   |
|                               | Tertiary Education Enrollment 2004                          | persons | Total Enrollment in Tertiary Education Programs             | UNESCO, Country Education Statistics Sources   |
|                               | Tertiary Education Enrollment 2005                          | persons | Total Enrollment in Tertiary Education Programs             | UNESCO, Country Education Statistics Sources   |
|                               | Tertiary Education Enrollment 2006                          | persons | Total Enrollment in Tertiary Education Programs             | UNESCO, Country Education Statistics Sources   |

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| Category  | Variable Name   | Units              | Description   | Source Description  |
|---|---|--------------------|---|---|
| Total National Wage Levels<br>(average for all workers) | Average Monthly Wages (2001)                          | current \$CDN      | Average National Monthly Wages in Canadian Dollars for Business Sector                                    | ILO, Country Labour Statistics Sources                          |
|   | Average Monthly Wages (2002)                          | current \$CDN      | Average National Monthly Wages in Canadian Dollars for Business Sector                                    | ILO, Country Labour Statistics Sources                          |
|   | Average Monthly Wages (2003)                          | current \$CDN      | Average National Monthly Wages in Canadian Dollars for Business Sector                                    | ILO, Country Labour Statistics Sources                          |
|   | Average Monthly Wages (2004)                          | current \$CDN      | Average National Monthly Wages in Canadian Dollars for Business Sector                                    | ILO, Country Labour Statistics Sources                          |
|   | Average Monthly Wages (2005)                          | current \$CDN      | Average National Monthly Wages in Canadian Dollars for Business Sector                                    | ILO, Country Labour Statistics Sources                          |
|   | Average Monthly Wages (2006)                          | current \$CDN      | Average National Monthly Wages in Canadian Dollars for Business Sector                                    | ILO, Country Labour Statistics Sources                          |
| Other   | Total Alberta Teaching Authorities Issued (2002-2007) | Authorities Issued | Total Alberta Teaching Authorities Issued by Country of Preparation-- total issued between 2002 and 2007. | Alberta Education, Teacher Development and Certification Branch |
|   | Specialist Physician Remuneration                     | Salary \$USD       | Remuneration (salary) in Current US Dollars   | OECD Health Statistics  |
|   | General Physician Remuneration                        | Salary \$USD       | Remuneration (salary) in Current US Dollars   | OECD Health Statistics  |

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For additional information about the methodology for this study, please consult the full recommendations report. Additional information on target occupations and country supply can be obtained in the database which accompanies this report.