Demographic Potentials Around and Across the Pacific Rim

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1. Introduction

Señores y señoras, friends, and members of the PRSCO family: Later this year both regional science and I are scheduled to celebrate our 50th birthdays. Apparently the ages of professional associations are calculated according to the traditional Japanese system: This fall the Golden Anniversary of the RSAI will commence with the 50th North American Meetings; the very first regional science conference was held in Detroit, 49 years ago, in December of 1954. I predated the founding of a formalized regional science group by one year, having been born in December of 1953 – although it took me a few years after that before I learned how to invert a matriz, or how to integrate an urban density gradient, or how to calculate the balancing factors in a doubly-constrained trip distribution model. It was not until I became a young man that I came to pass the various arcane initiation tests required of those seeking entry to 'Club Regional Science.'

PRSCO, the Pacific Regional Science Conference Organization, is the youngest (and, some of us might argue, the most vital!) of the three "superregional" or "supraregional" organizations that now together form the trinity of the RSAI. The first Pacific Conference was held August 26–29, 1969, in Honolulu, Hawaii, as a joint venture of the Western Regional Science Association (WRSA), which was founded in 1961, and the Japan Section, which was approved in 1962. Today, PRSCO includes six additional official member organizations: The Australian and New Zealand Section of the RSAI (ANZRSAI), the Canadian Regional Science Association (CRSA), the Chinese Regional Science Association–Taiwan (CRSA-T), the Indonesian Regional Science Association (IRSA), the Korean Regional Science Association (KRSA), and, of course, our gracious hosts this year, the Mexican Association of Science for Regional Development (AMECIDER).

For my Presidential Address I do not, however, wish to focus inwardly on PRSCO or my own past, but rather to look outward to assess the present status and future prospects of the peoples who live around the Pacific Rim – and, more specifically, the populations of the PRSCO countries. The organizers of this year's 18th Pacific Conference, Professors Serrano and Wences, have chosen as the principal theme: "The Economic, Social, Political and Cultural Potential of Regions in the Pacific Rim."

The perspectives I wish to share on our major conference theme may be a little different than those that might be contributed by certain other scholars who assemble together in a regional science group. Any of you who have attended a number of regional science gatherings may have heard participants preface their remarks by saying: "Well, speaking as an economist…" And then they proceed to give their version of the true doctrine – as vetted by that most-disciplined of the social science disciplines.

Well, despite my regional science training at the University of Pennsylvania, I do not self-identify as an economist. Rather I tend to label myself as a population geographer. So, "speaking as a population geographer," I would like to tackle our over-arching conference theme of "Potentials" from two perspectives: firstly, from that of an old-style economic geographer, asking what advantages and opportunities actually arise up from the vast watery spaces that characterize the Pacific Rim "super" or "supra" region, and, secondly, from a demographer's perspective, asking how the diverse characteristics of the Pacific Rim peoples may solidly position the PRSCO countries for substantial future opportunities for both economic and social development. In both cases I shall make use of concepts that could be termed "population potential."

Before I get into the substance of the paper, though, I'd like to tell a short story about how in Arizona's Geography Department, anyway, the Pacific Ocean came to be the center of the World…

A number of years ago when I was Department Head I got some money from my Dean to renovate our small classroom – the one where we hold faculty meetings and the discussion sections for Lay Gibson and my freshman class: "Human Geography and Global Systems." This room had a large, bare, blank wall in the back. Well, I discovered that one of our former students who now owns a map store in Tucson had a huge world wall map that is sold in the form of rolls of wallpaper. I remember being excited about the possibilities of this because a colleague of my mine, Tom Saarinen, had just finished a National Geographic Society study on the different centerings of World maps typically used in classrooms around the World. He found that there are three main types of layouts for World maps, called the Eurocentric, the Americentric, and the Sinocentric. Unfortunately, though, the workers from our University wallpapering shop showed up to mount our map on a Saturday. I had forgotten to leave them any directions about which sheet to put where. When we came back to work on Monday, we discovered that our room features a rather unique Pacifi-centric World map! I told everybody that this was great – we are just entering the millennium of the Pacific Rim, and we should start thinking about the World from this perspective…

2. The New Economic Geography and Population Potential within the Pacific Rim: 'Inside-Outing' the Traditional Core-Periphery Model

In what sense does the territory covered by the PRSCO member organizations constitute any sort of a coherent “super” or “supra” or “mega” region? Too often I think in regional science we have presumed that the word “region” necessarily implies intermediate-sized, subnational geographic units. But, to use an American colloquial expression, we may be “missing the boat” in not attempting to apply some of the same regionalization principles commonly used for subnational analyses to study multinational geographies.

In fact, over the last several decades, “regions” at two different scales have assumed enlarged importance. The territorial hegemony of the nation-state has been challenged firstly in terms of the dissolution of countries that were historically formed from multicultural conglomerates of regions rather than from the territories of unified cultural groups. And, secondly, we have witnessed the emerging importance of broader multi-country units – the metamorphosis of special purpose international trading coalitions and military defensive organizations into entities with broader scopes of power – new “super” or “supra” regions reflective of the increasing economic interdependencies characteristic of the globalization era.

Within the friendly international intellectual confines of regional science, European unification has become the topic of a burgeoning research enterprise. Papers now abound and proliferate on integration topics. This is especially evident at the European Congresses. In the case of the Pacific Rim, events have, of course, not yet anyway proceeded towards formal multinational political unifications, but one does not want to ‘miss the boat’ within the bigger-pond realm of the Pacific. We should not fail to recognize some strong trends that are towing the peoples of our countries ever more closely together; our bilateral dependency relationships with one another have been inexorably strengthening.

I think the Pacific Rim is a fascinating example of the new geographies of globalization because in fact what we are talking about are formerly fairly isolated clusters of population spotted around the world’s largest ocean. At first examination it seems almost ludicrous to consider the territory covered by “The PRSCO countries” to constitute any sort of “region”! The Pacific Rim would not seem to illustrate either of the two traditional regionalization principles. How could a population geographer of sound mind classify the Pacific Rim as either a *uniform/homogenous* or a *functional/nodal* region?

A uniform (or homogeneous) region is characterized by uniformity of the underlying attributes of the physical or cultural features. Looking around the PRSCO family it is hard to make a case that this is a grouping of peoples sharing similar cultures. While anthropologists tell us that the native peoples of the Americas may well have come from Asia via the Aleutian land bridge, much water has gone over the dam and much history has happened in the meantime. And while the English-speaking countries of the PRSCO group (Australia, Canada, New Zealand, the western U.S.) have some strong commonalities as a result of their shared British-empire colonial past, the same certainly cannot be said of this nine-country group as a whole. In the second part of the paper I shall return to examine in detail the demographic characteristics of the PRSCO countries. And, I will make the argument that it is the *diversity* rather than the homogeneity of demographic characteristics that leads to an outstanding amount of “population potential” around the Pacific Rim.

The second main type of region – variously termed the functional or the nodal region – arises from the strength of the linkages tying together its constituent parts; it is an area of the Earth’s land surface characterized by a relatively higher degree of spatial interaction taking place therein than elsewhere. Again, it is a stretch, at first, to see how a grouping of countries separated by thousands of kilometers of water – located on opposite margins of the world’s largest ocean – can constitute a logical, linkage-based cluster of territory and thereby a functional region. However, I believe a spatial-interaction-based rationale for defining a PRSCO “super-region” may in fact merit further examination.

The 6th President of the WRSA, Edward Ullman, is now well-known for having set forth an argument for there being three major “bases” for spatial interaction (see Ullman 1956, 1973, 1980). These days, Ullman’s three bases are conventionally termed: complementarity, transferability, and intervening opportunity.

Complementarity is a prerequisite for the establishment of trade, travel, immigration, and many types of communications. Effective supplies and demands have arisen between and among the PRSCO countries. Complementarities can be of many types: economic and climatic ones are what we usually give as class examples. In the later section of this talk, however, I shall discuss in some detail certain what I think of as the *demographic* complementarities that exist around and across the Pacific Rim.

Transferability is a term that Ullman used only some time after originally postulating his three bases. Originally he termed the concept simply that of ‘distance,’ noting that complementarities between two areas of the Earth’s surface may not give rise to interaction if these areas are simply too remote and inaccessible from one another. For a long time, trans-Pacific spatial interaction of all types was at low levels due to the length of sea journeys, the expense of long-distance air travel, and the unavailability of telecommunications in the pre-satellite era. Today all that has, of course, changed.

Intervening opportunity, Ullman’s third concept, is kind of an interesting one to think about in the case of the Pacific Rim! Very little in the way of competing suppliers or labor pools exist along the intervening meridians of longitude between on the one side, Los Angeles, Vancouver, or Mexico City, and, on the other, Tokyo, Seoul, Taipei, Melbourne, Wellington, or Jakarta!

Curiously, it has been traditional to think of locations on a country’s seafronts as being edge rather than central locations. The traditional core-periphery model is typically conceptualized as in Figure 1. I think both In the case of traditional European-originated location theory and U.S. regional economics scholarship, primacy has typically been given to the role played by internal markets. In the American case, the “core” region of the country has been assumed to be the metropolitan areas of the East Coast megalopolis along with the eastern Midwest American Manufacturing Belt. In a classic paper written some 45 years ago in the *Papers of the Regional Science Association* our same Edward Ullman wrote of the seeming invincible position of such a core. He expressed considerable pessimism about the growth potential of what he called “corner” locations:

In contrast to the core areas the prospects for the fringe or corner areas appear rather bleak, since they are remote from the center of the system and the self generating momentum of the center. Their best hope is to possess some special lure such as the present role of climate of California or Florida, or, in the past, the superior trees in the Pacific Northwest. Only by such lures have the corner areas been able to overcome their remoteness from the Industrial Belt… (Ullman 1958, p. 185).

In line with such economic thought characteristic of a period of heavy industrialization, concepts such as the friction of distance and agglomeration economies assumed paramount importance. It is not surprising that the notion of "population potential" assumed a central role in early regional science methods of analysis. In his 1960 first edition of *Methods of Regional Analysis,* Walter Isard devoted one of ten substantive chapters to gravity and potential models. "Demographic potential" (or "population potential" as it is now more commonly referred to) originated in the writings of the social physicist John Q. Stewart (1942, 1947, 1948; see also Stewart and Warntz 1958, and Coffey 1981). Stewart defined this social accessibility concept analogous to the physicist's formula for gravitational potential:

$$V_i = k \, S_j \, (P_j / d_{ij})$$

Isard's modified version of Stewart's population potential map of the United States in shown in Figure 2. A rather more accurate and less stylized map for 1972 by Bill Coffey is shown in Figure 3. It includes both the USA and Canada, but it, unfortunately, chops off at Mexico's border.

Since the seminal years of regional science in the 1950s, and even since its glory years of the early 1970s, new and dramatically different considerations have entered the calculation of relative locational advantage. Wilbur Maki in a recent paper (Maki 2002) entitled "Positioning a Metropolitan Area for Global Competition" focuses on the exports of a metropolitan area's industries. He emphasizes only two factors: the role of institutions of higher education for "sharpening the area's intellectual resources as inputs for producing the unique outputs of its productive resources," and the quality of air transportation and communication facilities for "moving these outputs to their highest and most worthwhile uses."

My own recent studies of the evolving population redistribution trends have led me to a view that within the USA a bicoastal pattern is becoming ever more evident. As illustrated in Figure 4, the rise of the West Coast Megalopolis is the most salient feature of the new settlement geography. The traditional view of the core-periphery model of Figure 1 should perhaps be replaced by one something like that shown in Figure 4. To a fair extent, World population distribution is composed of a series of rims of high density along the oceanfronts of the continents. So what would a population potential map of the US look like if the relevant populations, *Pj,* are not those found in all the U.S. counties but rather those of the Pacific Rim countries?

My children when they were growing up and needing to get themselves dressed each morning used to talk about having to sometimes "inside-out" the clothes that they had just tried on and then prematurely taken off before putting them back on again. I think in many ways the forces of globalization have caused an "inside-outing" of the economic geographies of some of the continents. Being on what was once the outer edge, remote from internal markets, now becomes an advantage: cities seek to position themselves as gateways or "jumping off points" for trade, travel, and communications with partner countries across the ocean. While this may have always seemed blatantly evident to a Japanese or an Australian regional scientist, it may take some getting used to for an American or a Mexican. In addition to U.S. settlement patterns, other examples that could be cited include the construction of Kansai airport in Osaka Bay to provide southern Japanese cities access to pan-Pacific markets and more of a fighting chance to challenge the paramount position of Tokyo and Narita, or the rising importance of Amsterdam and its Schipol Airport as a main point of trans-Atlantic entry to the newly unifying Europe.

So to conclude the first half of my paper, I believe that in the future the Pacific Rim will increasingly come to be thought of as a functional multi-country region. Whereas in Europe the benefits and goals of unification both arise from and are thwarted by the fact that so many different cultures emerged in such a relatively small geographical area, in the Pacific case the same could be said to be true to both a lesser and a greater extent. Lesser in that there are fewer (but larger) populations of each constituent culture; greater in that the longest inter-country physical distances are much greater than in Europe: it's more than 12,000 kilometers from Wellington to Vancouver, whereas it is only approximately 3,000 km. from Lisbon to Stockholm.

3. The Demographic Potential of the Peoples of the PRSCO Countries

As part of a larger project to examine regional clustering of demographic trends across the World's countries, I've assembled a database to analyze how eight key demographic indicators have changed over approximately the last twenty years. Demographically speaking the world is very much in a transition period characterized by great variation in demographic indicators for less developed countries (LDCs) versus more developed countries (MDCs). These disparities, however, are, in the case of many of the more rapidly developing LDCs, quickly diminishing.

Development and demographic change are, of course, very much chicken-and-egg phenomena. Fertility needs to be brought down to lower dependency levels so that on a per capita basis a country's population can reap the benefits of economic growth, but at the same time greater material prosperity and the opportunity for rising female labor force participation provides the time-budget-based incentives that are seemingly the surest way to reduced desired family sizes.

For this presentation I would like to examine the *changes* over the last twenty years for the eight PRSCO countries on a spectrum of demographic indicators. My goal is to examine how the members of our "Club" rank compared to the world's countries as a whole.

The eight key demographic indicators are:

1. **The Total Fertility Rate** (TFR); the average total number of babies born to a woman as she passes through the child-bearing ages if she were to give birth at current age-specific fertility rates
2. **The Infant Mortality Rate** (IMR); deaths to infants less than one year per 1,000 live births

3. **Average Life Expectancy at Birth** (Life Exp); in years, based on current age-specific mortality rates
4. **The Youth Dependency Ratio** (YDR); Persons under 15 years of age as a percentage of persons of labor force age (15–64 years)
5. **The Elderly Dependency Ratio** (EDR); Persons 65 years and over as a percentage of persons of labor force age,15–64 years
6. **The Female Labor Force Participation Rate** (Fem LFPR); Percentage of females 15–64 years employed or unemployed and actively seeking employment
7. **The Urban Percentage of Population** (Urb Pop); Percent of population living in urban areas (note: country's practices differ with regard to their definition of "urban" versus rural populations)
8. **The Net Foreign Immigration Rate** (Net ImmR); Foreign immigration less foreign emigration per 1,000 population

Truly comparable international population data are difficult if not impossible to obtain. I've limited myself to indicators that are widely available both for the approximate present (estimated from the closest year available to to represent 2002 values) and for approximately two decades ago, that is, ca. 1982. I excluded countries that currently have total populations under one million. Countries that have split up during the last two decades (the former Soviet Union, Czechoslovakia, and Yugoslavia) are also excluded from my database. I was able to include countries that have unified since 1982 (namely, East and West Germany, and North and South Yemen). I used total populations of the former separated countries to combine their 1982 demographic indicators to create estimates for the same territory covered by the now unified countries.

Let's walk sequentially through a set of tables for these indicators, examining how the demographic characteristics of each of the PRSCO countries have been shifting vis-à-vis the other countries of the World. I shall highlight potentialities and challenges posed by specific demographic trends.

Table 1 shows the situation with respect to Total Fertility Rates – which are the average numbers of children to be born per woman if current age-specific fertility rates were to apply throughout the child-bearing years. The TFR of the World as a whole has dropped dramatically in the past twenty years from almost 4 children per woman down to less than 3. Most More Developed Countries now have rates below the "replacement level" of 2.1, whereas the typical rate for Less Developed Countries is around 3.

All PRSCO countries except Mexico now have TFRs below the World rate. Four PRSCO countries that experienced rapid economic development over the last two decades posted impressive percentage drops in their TFRs – on the order of 40% or greater. Indonesia and Mexico went from slightly above the LDC average in 1982 (almost 5 children per woman) down to less than 3 children on average by 2002. During the same period Taiwan and South Korea's rates dropped steeply also, falling to levels below those of many More Developed Countries. Japan, Australia, and Canada (all of which already had low rates in 1982) dropped significantly below replacement levels by 2002. In the case of Japan, the rate of only 1.3 children per woman ranks its reduced fertility as the fourth lowest in the World. In contrast to the worldwide trend, New Zealand and the United States both experienced modest *increases* in their TFRs, and their fertility remains roughly at long-term replacement levels.

Children are of course the labor force populations of the future, but equally, a high proportion of children in a country's population can stifle development through excessive youth dependency. All PRSCO countries have experienced quite rapid demographic transitions. Indonesia and Mexico are poised to join the other seven nations in having completed their transitions. Densely populated Taiwan, Korea, and Japan all have substantially below replacement fertility and will need to cope with smaller cohorts of labor-age population in the next several decades. The below-replacement rates in Canada and Australia are offset by significant net foreign immigration.

The Infant Mortality Rate is a telling indicator of social welfare; the IMR proxies for both the level and amount of diffusion throughout a country of medical care, nutrition, and sanitation. As can be seen in Table 2, substantial progress was made in the last 20 years in reducing deaths of infants less than one-year old. On average, however, the percentage reduction has been greater in the More Developed rather than the Less Developed World.

All nine PRSCO countries showed better than World-average reductions in infant mortality. The dramatic improvements in South Korea and Taiwan are especially noteworthy; they ranked 7th and 8th in the World for their percentage reductions in infant deaths. During the same time period, Japan more than cut its rate in half, and reached a level that is now 3rd best in the World (behind only Singapore and Hong Kong). New Zealand, Australia, and Canada rank among the 15th best. The United States trailed the nine-country PRSCO pack in rate of improvement due to inequality of access to top-quality medical care. Mexico and Indonesia both cut their rates more than in half, but both still have a substantial ways to go in order to join the other seven in eliminating most preventable infant deaths.

Another telling indicator with respect to some of the same factors as infant mortality is average life expectancy at birth. With respect to this measure, the PRSCO countries stack up exceedingly well. Japan and Australia now rank #1 and #2, respectively, among all World countries for longevity of their citizens, with Canada 6th and New Zealand 11th. Indonesia posted the 4th greatest gain in life expectancy among all countries; its newly born citizens now enjoy 20 years greater life expectancy than those born in 1982. And newly born Mexicans and Koreans can now expect to live 10 years longer than the previous generation.

As I mentioned briefly in my earlier discussion of the Total Fertility Rate statistics, dependency ratios are interesting measures to examine in the context of assessing potentials for future economic development. Tables 4 and 5 present the data for the PRSCO member countries on the last two decades of change in youth and elderly dependency ratios.

As fertility rates have dropped, the World's YDR has dropped also. The decrease has been greater overall in LDCs rather than MDCs. PRSCO youth dependency ratios have all – with the exception of the US – dropped sharply. South Korea's reduction is the

4th greatest in the World, Taiwan's is 10th, and Japan's 11th. Indonesia and Mexico both registered impressive reductions: greater than 30 percent. Both countries had well above average ratios for LDCs in 1982; by 2002, Indonesia's ratio had been brought down to below the Less Developed Country norm, while Mexico's youth dependency is currently right at the level typical of LDCs. If current trends continue all PRSCO YDRs should be below 35 percent within the next two decades.

With reductions in fertility and increased life expectancy, Elderly Dependency Ratios (EDRs) are on the rise around the World – most especially in those More Developed Countries where reduced levels of child-bearing have been the norm for the longest periods of time. At present, Japan has the second highest EDR in the World (trailing only Italy). Japan has 26.5 persons aged 65 or over for every 100 persons in the labor force ages of 15 to 64. Japan's percentage increase over the last 20 years, however, was topped by the relative increases in Indonesia and Taiwan. The EDRs of these countries more than doubled – albeit beginning from quite low bases.

In addition to age composition changes, the other major impact factor for many countries' labor forces have been rising female participation rates. Table 6 shows these trends. Women in PRSCO countries have been entering the work world over the last two decades at rates substantially above the rates of increase typical of most other countries. But despite the dramatic increases, in 2002 there was still great variation across the PRSCO countries in Female LFPR.

In all four of the Anglophone countries female participation is higher than the More Developed Country norm of 65 percent. Canada has the highest rate at 72 percent, followed closely by the United States, New Zealand, and Australia. Japan, despite its low Total Fertility Rate, has only slightly above World-average female labor force participation. Indonesia and South Korea are now slightly below the level characteristic of LDCs, while Taiwan and Mexico trail the rest of the PRSCO pack with less than half their women of working age in the labor force. It should be noted, however, that Mexico had the second greatest percentage increase among the nine countries in women participating in the labor force. It still ranks, however, in the bottom quarter of World nations in terms of female LFPRs. Taiwan ranks in the bottom third of World countries, after achieving only a very modest increase in its female labor force participation rate between 1980 and 2000. These statistics illustrate that in addition to level of development, cultural factors play major roles in setting the levels of a country's demographic indicators.

A "mobility transition," as postulated by Zelinsky (1970), has also characterized the current time period of human history. Extraordinarily high rates of urbanization have been found in many LDCs. More Developed Countries, on the other hand, seem now to be in a period of oscillating waves of movement up their urban hierarchies and of counter-urbanization (see, for instance, Kontuly 1988; Geyer and Kontuly 1996; Plane, Henrie, and Perry 2002). Considerable regional science research has been conducted since the first "turnaround" phenomena were noted in the 1970s (for example, Vining and Kontuly 1978; Vining, Pallone, and Plane 1981).

Table 7 shows that most of the increases over the last two decades in urban population shares were found in LDCs. With the exception of Indonesia, the PRSCO countries are all now among the World's most urbanized; the other eight countries' ranks for 2002 placed them among the top quartile. And Indonesia almost doubled its urban share of population from 20 to 39 percent of the total. Korea also underwent significant urbanization during the last two decades. Care should be taken, however, in interpreting these data because statistical practices differ greatly around the World in classifying "urban" population.

The last demographic indicator I wished to report was one for foreign immigration. Unfortunately international migration statistics are extremely problematic. I report in Table 8 estimates as given in the *2002 World Factbook* maintained on line by the U.S. Central Intelligence Agency. I do not know if this information is better or worse than their data on the distribution of Weapons of Mass Destruction. And I don't have comparable estimates for 20 years earlier.

Nonetheless, the statistics on Net Foreign Immigration do, I think, help round out the demographic profiles of the PRSCO countries. The four Anglophone countries are all significant receptors of foreign immigrants. They are among the top decile worldwide in terms of net migration. Note, however, some significant differences among them. In the case of Canada, net immigration is substantially larger as a component of population change than is the rate of natural increase, whereas in the cases of Australia, New Zealand, and the U.S., both immigration and natural increase contribute significantly to overall population growth.

On the other end of PRSCO migration spectrum are Indonesia and Mexico. Both are immigrant-sender countries. Both have only very recently experienced declines in fertility so they still have extremely high current rates of natural increase. And these countries will continue to experience considerable future momentum for growth due to their young age structures. Net emigration, highly focused on the young labor force ages, provides some relief from excessive labor market entrants.

Taiwan and Korea have negligible net immigration; their levels of natural increase are comparable to those of Australia, New Zealand, and the United States. Japan has zero net immigration and an RNI that soon will turn negative meaning overall population declines. The challenge for Japan will be to sustain its world economic leadership position with a shrinking labor force age population and a rapidly aging population.

We've now examined the values and rates of change of all eight demographic indicators for the PRSCO countries. What are the general conclusions to be drawn from all this information? To summarize the evidence I submitted my variables to two different factor analyses. In both cases I calculated factor scores, and examined those for the nine PRSCO countries. I then cluster analyzed both the standardized values of the original data and the factor scores for all the World's countries to study whether the PRSCO countries all group together or, if not, which ones – demographically speaking – are the most similar and which the most dissimilar.

My first factor analysis was carried out using the eight demographic indicators at their year 2002 values. I used principle components analysis as my extraction method. Based on an examination of eigen values and a scree plot I determined that three factors,

accounting for 89 percent of overall variance, should be extracted[1]; these were then submitted to a Varimax rotation. The rotated factor loadings are presented in Table 9.

As can be seen, all but two of the variables load on the first factor, which – based on the signs for the loadings of the specific variables – I have termed "Underdevelopment." High *positive* scores on this factor are associated with *high* Youth Dependency Ratios, *high* Total Fertility Rates, and *high* Infant Mortality Rates and with *low* levels of Life Expectancy at Birth, *low* Elderly Dependency Ratios, and *low* Urban Population Shares.

The single variable with a primary loading on Factor 2 is the Female Labor Force Participation Rate. The positive sign indicates that countries with high *positive* factor scores are those with *high* percentages of working age women in the labor force. Cultural factors play a stronger role for female labor force participation than does development level.

Factor 3 contains the loading for the other variable that is not strongly correlated with the others: Net Foreign Immigration.

Table 10 gives the factor scores for the nine PRSCO countries. I've sorted the list in reverse order of the scores on Factor 1, "Underdevelopment." Note that all 9 PRSCO countries have negative scores, meaning that – on the basis of the six indicator variables loading on this factor – all nine countries tend toward the more developed rather than less developed end of the worldwide demographic spectrum. Japan is the greatest outlier of the nine with respect to its Factor 1 score. (In fact, across the entire World, only Italy has a more extreme negative score: -1.740.) The scores on Factors 2 and 3 are as expected given our earlier analysis of the individual indicators. In terms of Female Labor Force Participation, Canada and the U.S. had the highest rates in 2002, whereas Mexico's score is more than one standard deviation below the average for world countries as a whole. And with respect to immigration, the four Anglophone countries: Canada, New Zealand, Australia, and the United States score highly and positively on this factor. The others all have negative scores, with Mexico having the highest rate of net out-migration.

To examine whether, demographically speaking, we could consider the nine PRSCO countries as part of a single demographic bloc – or several different ones – I experimented with various cluster analyses of both the factor scores and the original demographic indicator variables for all the world countries. Table 11 shows a hierarchical clustering of the z-scores of the original eight demographic indicator variables. Because of missing data for a couple of countries, the sample size is 128. The first two countries to combine in this clustering are Spain and Greece. But at the very next step, the first combination of PRSCO countries is found, with the United States joining New Zealand. Shortly afterwards (at the 119-cluster stage) Australia joins New Zealand and the USA. And, still quite early in the process, Canada also enters this same cluster. So, from among the PRSCO members, the four Anglophone countries appear to have the most similar demographic characteristics in 2002.

About one-quarter of the way later on through the hierarchical clustering, Korea and Taiwan combine. None of the other three PRSCO countries, however, are put into groups with one another until the last third of the process. It isn't until the 41-cluster stage that Japan enters the same (More Developed Country) cluster that contains New Zealand, the USA, Australia, and Canada.

Only in the final stages do the large clusters containing Indonesia and Mexico merge together with one another. At this point of the process the World is essentially in two large groupings, with all the PRSCO countries in the More Developed cluster and all (except three outliers[2]) in an even larger LDC grouping. Because 6 out of the 8 original variables are all correlated with development levels, it's not surprising that the hierarchical clustering produces groups of countries at similar stages of development.

An alternative to clustering the original variables in a data set is to cluster factor scores. In our case this will give greater weight to the cultural differences underlying female labor force participation and to foreign immigration as a sorting variable. When the scores on the three factor scores are clustered, however, the results are not radically different from those based on the z-scores of the original variables. To further experiment, I tried using a K-means procedure to obtain optimal groupings of World countries for successively larger numbers of clusters. In doing it that way I allowed for different groupings of PRSCO countries to emerge depending on how many groups the World is being split into. In a hierarchical clustering once two countries are joined they are never separated. That is not the case for the PRSCO countries when optimal clusters are found at each step.

With the World split into either two or three clusters, all PRSCO countries remain bundled together. The 2-cluster solution is not a very interesting one since only three outlier countries are split off from all others. In the more interesting 3-cluster case, all PRSCO countries are assigned to the MDC rather than LDC cluster.

When four optimal clusters are formed, Mexico, Taiwan, and Indonesia split off to form part of a cluster of rapidly developing LDCs. This bifurcation of the PRSCO countries remains stable up through the seven-cluster case, whereupon the PRSCO countries begin to fragment into multiple and never very stable optimal groups. Japan splits away from the other more developed PRSCO countries when nine optimal clusters are formed. It clusters with most of the western European countries, whereas the four Anglophone countries are found in an eight-country group that also includes Germany, Hong Kong, Ireland, and Israel. Korea at the nine-cluster stage joins the medium-development cluster along with Taiwan, Mexico, and Indonesia.

To study how the changes in the levels of the demographic indicators further help to classify countries, I carried out a second factor analysis using a larger, 15-variable data set – the 8 demographic indicators at their 2002 values, and the 7 change variables for the 1982–2002 time period. Again I used principle components analysis. This time, examination of the eigen values led me to extract 7 factors,[3] which together accounted for 90.2 percent of the variance in the data. These were then submitted to a Varimax rotation, producing the factor loadings displayed in Table 12.

Like in the case of the 2002 indicators, the first factor can be dubbed as representing demographic "Underdevelopment." Again loading highly and positively on this factor are the Youth Dependency Ratio, the Total Fertility Rate, and the Infant Mortality Rate,

whereas the Elderly Dependency Ratio, Life Expectancy at Birth, and the Urban Population Share load with high negative values. In addition, two of the change variables have significant secondary loadings on this first rotated factor. Countries with positive scores on Factor 1 tend to have either increases or only small decreases in their Infant Mortality Rates and Youth Dependency Ratios: these are the World's least developed countries.

The second factor is again associated with cultural differences causing differential rates of female labor force participation for countries at equivalent levels of development. Countries with high positive scores on this factor are those that have generally high rates of women in the work force. Additionally, however, the large negative loading on the change variable for female LFPR indicates that countries with high scores on this factor also have low rates of increase in participation – in many cases because their rates were already relatively high as of 1982.

Factor 3 I term "Younger Age Structure" because it involves the change variable for the Total Fertility Rate. Countries having positive scores on this factor are those that actually experienced rising rates of childbearing or failed to reduce their TFRs by very much. Such countries are found both among LDCs and MDCs. Logically enough, this factor also receives the primary (and positive) loading for the variable measuring changes in Youth Dependency Ratios. And note that it contains a secondary loading for the TFR variable itself. Most of the countries experiencing big drops in childbearing are LDCs that remained at above-average TFR levels in 2002.[4]

Factor 4 I label "Improved Survivorship" because it involves the change variables for the two life span indicators; positive scores on Factor 4 are associated with increases in Life Expectancy at Birth and reductions in the Infant Mortality Rate. Factors 5, 6, and 7 represent "Immigration," "Aging," and "Urbanization" influences. These are unique factors that take the primary loadings for, respectively, the Net Foreign Immigration Rate, change in the Elderly Dependency Ratio, and Change in the Urban Population Share.

Table 13 contains the factor scores for the nine PRSCO countries, again sorted by the inverse of their loadings on the first ("Underdevelopment") factor. The inclusion of the seven change variables along with the eight demographic indicators alters slightly the rankings of PRSCO countries on this first "Underdevelopment" factor (cf. Tables 10 and 13). Whereas eight countries receive negative scores on "Underdevelopment," Indonesia records a small negative score.

In terms of Female Labor Force, Mexico is the only country to stand out. Its one standard deviation negative score is due to its substantially below average participation rate (World rank: 104) and despite the fact that in terms of rate of increase of working women it is in the top quartile of countries.

On "Younger Age Structure," the United States and New Zealand stand out because of their *increasing* Total Fertility Rates and only modestly reduced Youth Dependency Ratios compared to those being experienced in most World countries. Note that whereas Korea, Taiwan, and Indonesia all have negative scores of one standard deviation or greater, Japan, despite its number 1 ranking in the World in terms of reduction of the YDR, has a score close to zero. This is because its Total Fertility Rate reduction was in the middle of World countries and its TFR, already below replacement level by 1982, was among the World's lowest in 2002.

Indonesia is the only PRSCO country to have a large score on the "Improved Survivorship" factor. The more developed countries among the PRSCO group were already ahead of the much of the World by 1982 in terms of both Life Expectancy at Birth and Infant Mortality Rate, so their changes were below those typical of the majority of countries.

The scores on the three remaining factors are what we would expect given the earlier discussion of their respective singular variables.

Table 14 summarizes the results, for the PRSCO countries, of a hierarchical cluster analysis of the 15-variables (in z-score form). The agglomeration schedule is broadly similar to that found when just the eight indicators themselves were used, however there are some differences. This time instead of New Zealand and the USA combining first, Australia and Canada are the initial PRSCO countries to pair up in the agglomeration schedule. Because of a couple of additional missing data values for the change variables, 126 countries in total are being clustered this time. Worldwide, the Australia⇔Canada pairing is preceded by only three others.[5] Subsequently, almost a quarter of the clustering process unfolds before PRSCO countries join together. At the 83-cluster stage New Zealand (along with the Netherlands, with which it had combined earlier) is pulled into the Australia⇔Canada grouping. The, when 76 clusters are reached, Korea joins a cluster with Taiwan – which has already paired up with Brazil. (These demographic similarities are interesting considering the current search for a rationale for Brazil's potential PRSCO membership!)

At the approximate mid-point in the hierarchical clustering process the {Australia⇔Canada⇔New Zealand⇔Netherlands} group combines with one containing the USA and ten Northern and Western European countries.[6] Then approximately another one-quarter of the agglomeration schedule passes before additional PRSCO countries again join together.

At the 32-cluster step the More Developed Country cluster containing the four Anglophone PRSCO countries merges with one that by now includes Japan.[7] This cluster is further expanded a little while later in the agglomeration schedule when it merges with the Korea and Taiwan group (that now has picked up Hong Kong in addition to Brazil).

Only very late in the process (at the 15-cluster stage) do the groups containing Indonesia and Mexico merge. Three steps later that combined group melds with the More Developed Country bloc that includes all six of the other PRSCO members. After the PRSCO countries are all grouped together with the More Developed World, major unifications of the remaining LDC blocs occur. The 4-

cluster stage is a significant one, because it is here where the MDC and LDC Worlds are finally brought together. The final three steps are used simply to rope in three demographic outlier countries.[8]

Time does not permit a detailed discussion of the K-Means optimal clustering analyses that I carried out on the factor scores I derived from the Principal Components Analysis of the full 15-variable data set. Highlights are, however, as follows. The optimal two-cluster solution bifurcates the World into a 79-country less-developed group and a 47-country more-developed one. All nine PRSCO countries cluster together in the MDC group. The 3-cluster and 4-cluster solutions are not particularly interesting because most countries are lumped together into a single group while the other clusters contain just a few not particularly well-matched unusual cases. Included in one of these smaller groupings in the 3-cluster case, however, are Indonesia, Japan, and Taiwan, and, in the 4-cluster case, Indonesia and Taiwan.

For the 5-cluster solution, two large blocs of countries re-emerge. In this case, however, the PRSCO countries are bifurcated, with the four Anglophone countries assigned to one of the large blocs and the five others assigned to the opposite one. In the 6-cluster case Japan joins with the four Anglophone PRSCO countries. When 7 optimal clusters are derived, three large groupings result, with PRSCO countries distributed among all three. The four Anglophone countries remain bundled with one another, but now Indonesia, Japan, and Korea are found in one of the other two groups whereas Mexico and Taiwan are in the third. The 8 and 9-cluster solutions involve four main blocs of countries whereas the 10-cluster one splits the World largely into five groups. In all three cases the PRSCO countries, however, belong to just three of the major groupings, with some minor switching occurring in how they combine with one another within these.

4. Conclusions: Club Regional Science

Our time for this session is now gone. So, let us leave aside the intricacies of clustering algorithms and ask: what should we conclude about the demographic positioning within the World of the nine current PRSCO countries?

PRSCO is obviously not a unitary demographic bloc! My factor and cluster analyses have, I think, highlighted that both development levels and less broad-brush cultural factors contribute to the overall demographic profile of any given country – as well as to help determine how similar that profile is to one for any other country. Although all nine PRSCO countries are now either among the World's most developed or most rapidly developing, they embrace a broad range of cultures.

Whether the Pacific Rim makes any sense or not as a demographic region has hardly been proven by this exercise! I'd like to think, however, that a demographically-based regionalization need not reflect only the principles of uniform or formal regions. What might a nodal or functional demographic region look like? I think the demographic profiles of the PRSCO countries provide a great deal of evidence of inter-country complementarities. Some have the demographics characteristics typical of mature market countries, whereas the characteristics of the others show either the realization of or the emerging promise of being ranked among the World's primary centers of production and innovation.

The demographic data for the PRSCO group really adds up to a bright picture! Unlike parts of the World where the momentum of the demographic transition and economic development appears to have gotten stalled, the PRSCO nations are all ones which either already have reached the fourth and final low stationary stage – or they show great promise of reaching that point very soon.

In some other more developed parts of the world, substantially *below*-replacement-level fertility has been experienced concomitant with gloomy prognoses about future prosperity. In these contexts, substantial concerns have been raised about the viability of future labor forces. With the exception of Japan, the PRSCO nations have not overshot the replacement-level fertility mark. And even for Japan I don't necessarily think the demographic outlook need be too pessimistic. Japan is among the World's countries that have arguably reached a carrying capacity level of population, but it remains one in which children are cherished and one where there remains considerable potential to augment future labor supply – either through yet unrealized capacity in terms of female participation or through a yet untapped source: foreign immigration.

Speaking of immigration, I think one of the strengths of the PRSCO group is the substantial amount of population movement now taking place both across and around the Pacific Rim. Significant immigration characterizes the bilateral relationships of at least half of the PRSCO country pairs.

To conclude my talk today I want to say that I'm not sure whether the PRSCO countries or the Pacific Rim more broadly has yet become a strong multi-country "region." But I very much believe that PRSCO is a wonderful *club* to which to belong: Both for us as individuals, and for our countries, coming together with one another helps us realize our potentials, our potentialities.

Some of you somewhere in the World may have made the acquaintance of the Economics Editor of Springer-Verlag Publishing, Marianne Bopp. At a regional science conference several years ago, Marianne mentioned to me that it was always nice to get back together with the members of 'Club Regional Science.' I've been very much enriched by having been a member of the RSAI and of the PRSCO family during the twenty-year time span we've been analyzing.

Now I don't know if interpersonal bonding is enhanced because we must make all those long, long trans-Pacific flights to get together! Does spaciousness lend specialness to our friendships? I think in the case of the Pacific Rim region, much as in the case of the American West where I'm from – it actually may. So I would close with the words of the American poet, Henry David Thoreau. Thoreau once wrote:

"Nothing makes the earth seems so spacious as to have friends at a distance; they make the latitudes and the longitudes."

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TABLE 1. Change in Total Fertility Rates for PRSCO Countries, 1982–2002

Area or Country	*TFR*		*Rank 2002*	*Pct. Change*	*Rank for Change*
	1982	*2002*			
World	3.9	2.8	--	-28.2	--
More Developed Countries	2.0	1.6	--	-20.0	--
Less Developed Countries	4.6	3.1	--	-32.6	--
Taiwan	2.7	1.4	12	-48.1	16
Indonesia	4.7	2.6	50	-44.7	22
Korea, South	2.6	1.5	15	-42.3	30
Mexico	4.8	2.9	56	-39.6	40
Japan	1.8	1.3	4	-27.8	61
Australia	2.2	1.7	21	-22.7	72
Canada	1.8	1.5	15	-16.7	87
New Zealand	1.9	2.0	34	5.3	115

United States	1.9	2.1	36	10.5	121

SOURCES: Total Fertility Rates from: *1982 World Population Data Sheet* and *2002 World Population Data Sheet,* Population Reference Bureau, Washington, D.C. Percentage changes and country ranks calculated by the author.

TABLE 2. Change in Infant Mortality Rates for PRSCO Countries, 1982–2002

Area or Country	***IMR (per 1,000)***		*Rank 2002*	*Pct. Change*	*Rank for Change*
	1982	*2002*			
World	85	54	--	-36.5	--
More Developed Countries	20	7	--	-65.0	--
Less Developed Countries	96	60	--	-37.5	--
Korea, South	34	8	27	-76.5	7
Taiwan	24	6.1	24	-74.6	8
New Zealand	12.6	5.3	15	-57.9	37
Japan	7.4	3.2	3	-56.8	42
Mexico	56	25	52	-55.4	44
Australia	11	5.2	14	-52.7	56
Canada	10.9	5.3	15	-51.4	65
Indonesia	93	46	74	-50.5	67
United States	11.8	6.6	26	-44.1	77

SOURCES: Infant Mortality Rates from: *1982 World Population Data Sheet* and *2002 World Population Data Sheet, Population Reference Bureau, Washington, D.C. Percentage changes and country ranks calculated by the author.*

TABLE 3. Change in Life Expectancy for PRSCO Countries, 1982–2002

Area or Country	*Life Exp. (Yrs.)*		*Rank 2002*	*Pct. Change*	*Rank for Change*
	1982	*2002*			
World	60	67	--	11.7	--
More Developed Countries	72	76	--	5.6	--
Less Developed Countries	57	65	--	14.0	--
Indonesia	48	68	68	41.7	4
Mexico	65	75	31	15.4	40
Korea, South	66	76	26	15.2	41
Australia	73	80	2	9.6	66
New Zealand	73	78	11	6.8	82
Canada	74	79	6	6.8	88
Japan	76	81	1	6.6	92
Taiwan	71	75	31	5.6	95
United States	74	77	21	4.1	102

SOURCES: Life Expectancy estimates from: *1982 World Population Data Sheet* and *2002 World Population Data Sheet,* Population Reference Bureau, Washington, D.C. Percentage changes and country ranks calculated by the author.

TABLE 4. Change in Youth Dependency Ratio for PRSCO Countries, 1982–2002

Area or Country	*YDR (Pct.)*		*Rank 2002*	*Pct. Change*	*Rank for Change*
	1982	*2002*			
World	59.3	47.6	--	-11.7	--
More Developed Countries	34.8	26.9	--	-8.0	--
Less Developed Countries	68.4	53.2	--	-15.2	--
Korea, South	65.5	31.0	28	-52.7	4
Taiwan	52.4	30.0	24	-42.7	10

Japan	35.8	20.6	1	-42.5	11
Indonesia	75.0	48.4	48	-35.4	26
Mexico	76.4	53.2	56	-30.3	39
Australia	42.2	29.4	23	-30.3	40
Canada	35.8	27.9	17	-22.0	58
New Zealand	44.4	35.4	32	-20.4	63
United States	34.8	31.8	29	-8.7	86

SOURCES: YDRs, percentage changes, and country ranks calculated by the author using age composition data from: *1982 World Population Data Sheet* and *2002 World Population Data Sheet,* Population Reference Bureau, Washington, D.C.

TABLE 5. Change in Elderly Dependency Ratio for PRSCO Countries, 1982–2002

Area or Country	*EDR (Pct.)*		*Rank 2002*	*Pct. Change*	*Rank for Change*
	1982	*2002*			
World	10.2	11.1	--	9.3	--
More Developed Countries	16.7	22.4	--	34.3	--
Less Developed Countries	7.0	8.1	--	14.9	--
Indonesia	3.6	7.8	65	118.8	2
Taiwan	6.3	12.9	32	102.5	3
Japan	13.4	26.5	2	97.1	4
Mexico	5.5	8.1	60	47.8	18
Korea, South	6.9	9.9	39	43.0	25
Canada	13.4	19.1	22	42.3	26
New Zealand	14.3	18.5	23	29.2	46
Australia	14.1	17.6	24	25.5	52
United States	16.7	19.7	21	18.2	62

SOURCES: EDRs, percentage changes, and country ranks calculated by the author using age composition data from: *1982 World Population Data Sheet* and *2002 World Population Data Sheet,* Population Reference Bureau, Washington, D.C.

TABLE 6. Change in Female Labor Force Participation Rate for PRSCO Countries, 1980–2000

Area or Country	*Fem. LFPR (Pct.)*		*Rank 2000*	*Pct. Change*	*Rank for Change*
	1980	*2000*			
World	57	61	--	7.0	--
More Developed Countries	59	65	--	10.2	--
Less Developed Countries	57	60	--	5.3	--
New Zealand	46	68	33	47.8	14
Mexico	31	42	104	35.5	27
Australia	52	67	37	28.8	32
Canada	57	72	25	26.3	38
Indonesia	46	58	62	26.1	39
United States	58	70	30	20.7	46
Japan	52	62	52	19.2	47
Taiwan	39	46	94	17.9	51
Korea, South	50	58	62	16.0	55

SOURCES: Rates from *2002 Women of Our World,* Population Reference Bureau, Washington, D.C., http://www.prb.org. Data for T from Directorate-General of Budget, Accounting & Statstics (DGBAS) Executive Yuan http://www.stat.gov.tw/main.htm

TABLE 7. Change in the Urban Percentage of Population for PRSCO Countries, 1982–2002

Area or Country	*Pct. Urban*		*Rank 2002*	*Pct. Change*	*Rank for Change*
	1982	*2002*			

World	37	47	--	27.0	--
More Developed Countries	69	75	--	8.7	--
Less Developed Countries	26	40	--	53.8	--
Indonesia	20	39	82	95.0	18
Korea, South	55	79	20	43.6	38
Taiwan	66	77	25	16.7	70
Mexico	67	74	29	10.4	85
Canada	76	78	22	2.6	101
Japan	76	78	22	2.6	101
United States	74	75	27	1.4	106
Australia	86	85	15	-1.2	116
New Zealand	82	77	25	-6.1	124

SOURCES: Urban percentages of population from: *1982 World Population Data Sheet* and *2002 World Population Data Sheet,* Population Reference Bureau, Washington, D.C. Percentage changes and country ranks calculated by the author.

TABLE 8. Rates of Net Foreign Immigration and of Natural Increase for PRSCO Countries, 2002

Country	*Net Immigration Rate (per 1,000)*	*Rank*	*RNI (per 1,000)*
Canada	6.07	7	3
New Zealand	4.48	9	7
Australia	4.12	10	6
United States	3.50	13	6
Japan	0.00	40	2
Korea, South	0.00	40	8
Indonesia	-0.21	82	16
Taiwan	-0.30	85	6
Mexico	-2.71	121	21

SOURCES: The Net Foreign Immigration Rates are estimates from *The World Factbook 2002,* United States Central Intelligence Agency, http://www.cia.gov/cia/publications/factbook/index.html; country ranks calculated by the author; the Rates of Natural Increase are from the *2002 World Population Data Sheet,* Population Reference Bureau, Washington, D.C.

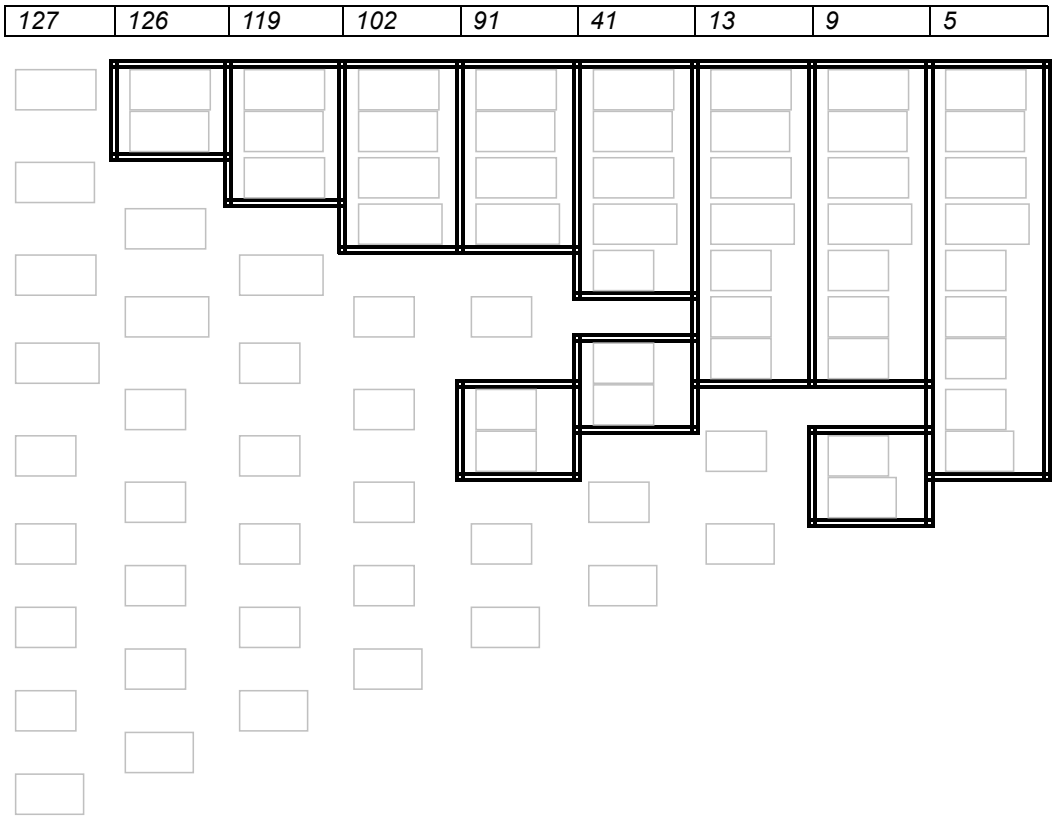
TABLE 9. Varimax Rotated Factor Loading Matrix Derived from 8 Demographic Indicators for 130 World Countries in 2002

	Factor:		
Variable (Demographic Indicator)	*1*	*2*	*3*
Total Fertility Rate (TFR)	**.951**	.022	-.002
Infant Mortality Rate (IMR)	**.919**	.225	-.040
Life Expectancy at Birth (Life Exp)	**-.906**	-.278	.059
Youth Dependency Ratio (YDR)	**.960**	.004	-.103
Elderly Dependency Ratio (EDR)	**-.833**	.316	.046
Female Labor Force (Fem LFPR)	.084	**.963**	.001
Urban Population Share (Urb Pop)	**-.754**	-.380	.254
Net Foreign Immigration (Net ImmR)	-.082	-.005	**.991**

TABLE 10. Factor Scores for the PRSCO Countries Based on the Eight Demographic Indicators for 2002

Country	*Factor 1. "Under-Development"*	*Factor 2. "Female LFPR"*	*Factor 3. "Immigration"*
Japan	***-1.74***	0.78	-0.20
Canada	***-1.28***	0.95	**1.49**
Australia	***-1.26***	0.52	**1.01**
United States	***-1.20***	0.87	0.81
New Zealand	***-1.14***	0.68	**1.07**
Taiwan	***-1.03***	-0.67	-0.26
Korea, South	-0.97	-0.26	-0.11
Mexico	-0.42	***-1.22***	-0.82
Indonesia	-0.16	0.06	-0.29

TABLE 11. Hierarchical Clustering of the PRSCO Countries: 8 Demographic Indicators



Note: Numbers *in column headings show the stage (number of total clusters in the World) at which successive combinations of PRSCO countries occur.*

Clustering Method: Minimum Between Groups Linkage based on Squared Euclidean Distances between Z-scores transforms of the original variables.

TABLE 12. Varimax Rotated Factor Loading Matrix Based on 8 Demographic Indicators (2002) and 7 Change Variables (198 2002)

Variable	*Factor:*						
	1	*2*	*3*	*4*	*5*	*6*	*7*
TFR	**.885**	.002	*.405*	.002	-.022	-.091	.085
%Ch TFR	.145	.165	**.929**	-.132	.100	-.024	.005
IMR	**.869**	.249	.252	-.119	-.045	-.037	.102
%Ch IMR	*.481*	.293	.169	**-.528**	-.282	-.077	.031
Life Exp	**-.855**	-.282	-.184	.269	.027	.042	-.114
%Ch Life Exp	.049	-.166	-.059	**.941**	-.044	.014	.036
YDR	**.922**	.041	.268	.000	-.105	-.063	.083
%Ch YDR	***.526***	.231	**.744**	.002	-.059	-.055	.039
EDR	**-.885**	.165	.213	-.108	-.007	.130	-.098
%Ch EDR	-.150	.066	-.049	.034	-.029	**.982**	.041
Fem LFPR	-.024	**.851**	.239	-.152	.021	.024	.122
%Ch FemLFPR	-.269	**-.835**	-.074	.170	.073	-.063	.060
Urb Pop	**-.730**	*-.472*	-.040	-.077	.189	-.019	-.134
%Ch Urb Pop	.246	.165	.025	.027	-.014	.045	**.952**
Net ImmR	-.105	-.043	.063	.013	**.978**	-.032	-.012

TABLE 13. Factor Scores for the PRSCO Countries Based on 15 Variables: Demographic Indicators, 2002, and Changes, 1982–2002

Country	*Factor:*						
	1	*2*	*3*	*4*	*5*	*6*	*7*
Japan	***-1.67***	0.30	0.14	-0.35	-0.25	**2.04**	-0.37

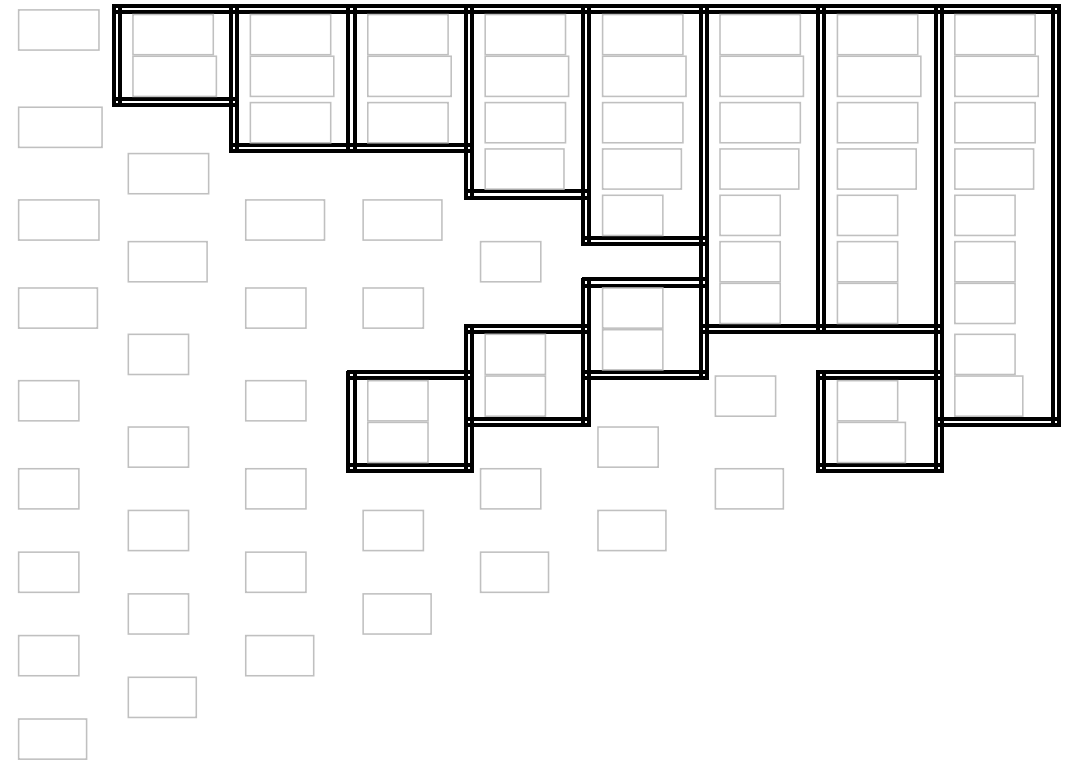
United States	***-1.51***	0.34	**1.68**	-0.32	0.57	-0.14	-0.35
New Zealand	***-1.37***	-0.22	**1.40**	-0.14	0.94	0.22	-0.37
Canada	***-1.35***	0.52	0.50	-0.20	**1.36**	0.50	-0.38
Australia	***-1.31***	0.24	0.20	-0.11	0.87	0.02	-0.38
Korea, South	-0.83	0.15	***-1.23***	0.40	0.21	0.49	0.27
Taiwan	-0.66	-0.40	***-1.10***	-0.27	0.08	**2.32**	-0.26
Mexico	-0.17	***-1.02***	-0.49	0.15	-0.78	0.84	-0.34
Indonesia	0.23	0.24	***-1.00***	**1.71**	-0.13	**2.67**	0.72

Note: The factors represent, respectively:

1. *Underdevelopment*
2. *Female Labor Force*
3. *Younger Age Structure*
4. *Improved Survivorship*
5. *Immigration*
6. *Aging*
7. *Urbanization*

TABLE 14. Hierarchical Clustering of the PRSCO Countries: 15-Variable Data Set

125	*122*	*83*	*76*	*66*	*32*	*21*	*15*	*12*



Note: Numbers *in column headings show the stage (number of total clusters in the World) at which successive combinations of PRSCO countries occur.*

Clustering Method: Minimum Between Groups Linkage based on Squared Euclidean Distances between Z-scores transforms of the original variables.

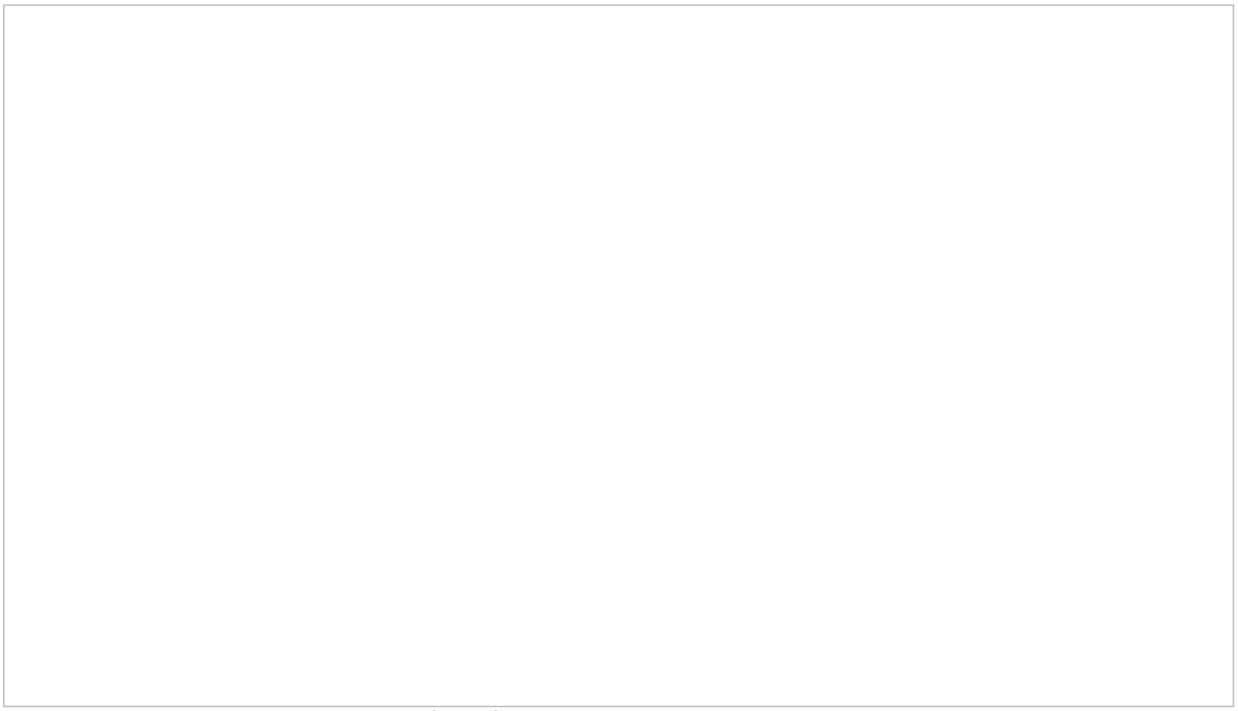
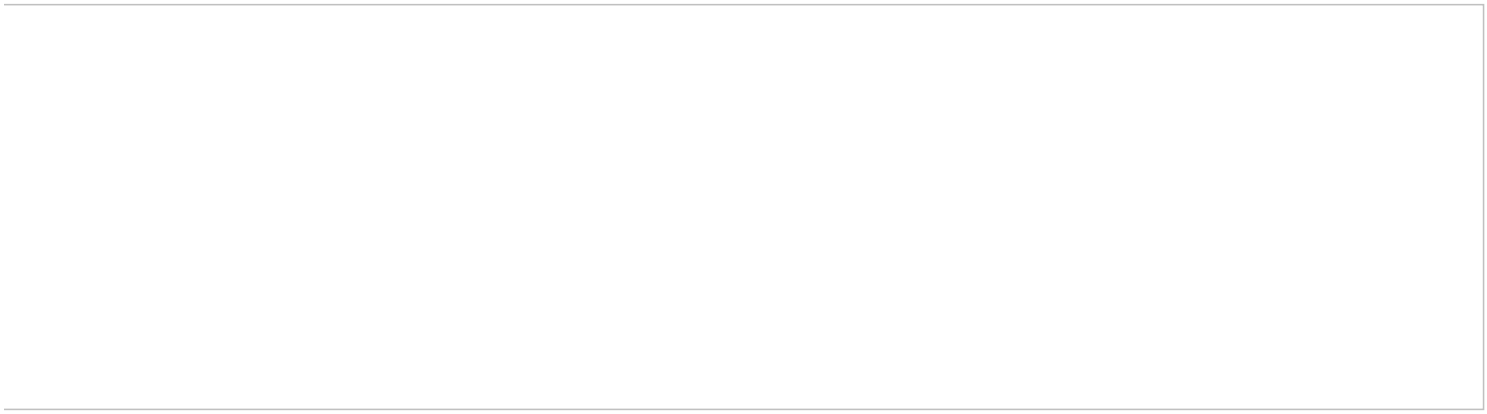


FIGURE 1. Traditional Representation of the Core–Periphery Model

$V_i = k \, S_j \, (P_j / d_{ij})$

FIGURE 2. Weighted Population Potentials, United States, 1940, Source: Isard (1960) based on a map by John Q. Stewart

FIGURE 3. The Core Region of North America as Depicted by Population Potential
Source: Coffey (1981)



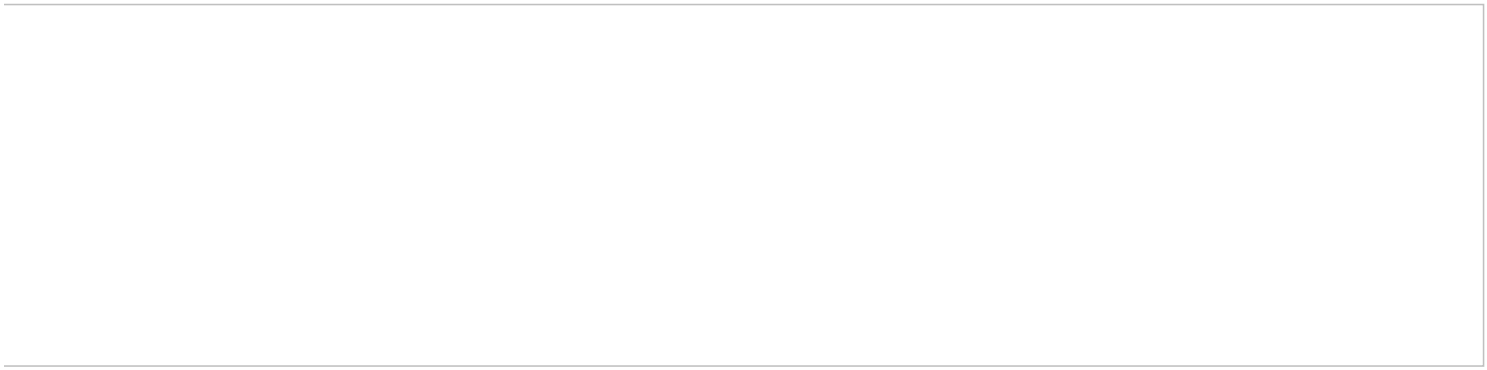


FIGURE 4. Bi-coastal Distribution Trend of the US Population
Source: Henrie and Plane (2002)

[1] Eigen values for the first three factors are, respectively, 4.931, 1.207, and 0.993; they account, respectively, for 61.632, 15.084, and 12.408 percent of the variance in the data.

[2] Liberia, Kuwait, and Singapore

[3] The first seven factors have, respectively, eigen values of 6.555, 2.112, 1.415, 1.149, 0.912, 0.753, and 0.637; they count, respectively for 43.699, 14.081, 9.436, 7.658, 6.080, 5.022, and 4.243 of the variance.

[4] TFR and ΔTFR are positively correlated (R = .512).

[5] Mauritius⇔Sri Lanka, Greece⇔Spain, and Mexico⇔Peru.

[6] Denmark, Finland, Norway, Sweden, The United Kingdom, Austria, Belgium, France, and Germany.

[7] Plus Cuba, Ireland, and a number of low TFR countries in Eastern and Southern Europe: Bulgaria, Hungary, Poland, Romania, Greece, Italy, Portugal, and Spain.

[8] Bhutan, Mali, and Singapore.