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Birthrate and Population Density as Predictors of Quality of Life

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BIRTHRATE AND POPULATION DENSITY AS PREDICTORS OF QUALITY OF LIFE

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Birthrate and Population Density as

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Abstract

It is thought that economies can benefit from developing their members by providing more opportunities. Thus, when populations grow quickly or are large, quality of life may decrease due to fewer opportunities. To test this hypothesis, two studies were used to investigate correlations between population and quality of life variables. The first study considered U.S. states, while the second study examined countries. Population measures included birthrate and population density, as well as population growth rate for countries. State quality of life measures were: graduation rates, GDP, unemployment, poverty, violent crime rate, and income. Country measures were: life expectancy, literacy, GDP per capita, unemployment, and poverty. Findings from state data did not support the hypothesis; however, country correlations were as predicted.

Birthrate and Population Density as Predictors of Quality of Life

Amartya Sen postulated that economies should focus on developing the capabilities of members by increasing the options available to them. Economic development is seen to occur when people have more options (Sen, 1999). In addition, it has been noted that fertility rates are higher in less developed countries than in developed countries (Baldwin, 1973). This suggests that, when an economy has a high population (measured through birthrate and density), there will be fewer options available due to limited resources. The limitation of resources may then lead to lower quality of life. This idea has caused debate regarding population policy during the 1970s (Baldwin, 1973; Burki & Shahid, 1975) and has continued into the present (Andreason, 1999). Yet, while population policy and its effects have been discussed, the ideas behind population policy do not appear to have been thoroughly evaluated. Moreover, research investigating population factors and availability of resources as related to quality of life has been limited.

Many countries have considered and implemented population policy. Population policies and programs have been adopted by 23 developing nations (Farley & Leavitt, 1971). China is, perhaps, the country most famous for implementation of population policy. Population policy was enacted in China in 1973 in response to a sharp increase in birthrate (Leow, 2008). Other countries that have considered population policy include Great Britain, Niger, and Uganda. Leaders in Great Britain are nervous that, with the country's current combination of birthrate and immigration, it will be unable to maintain its present quality of life (Gillman, 2007). Niger's leaders believe that Niger's fertility rate—one of the highest in Africa—is related to its economic growth (Niger: Population, 2008). Ranked 174 in terms of human development achievements on a list of 177 countries, Niger's population has nearly

tripled from 5.3 million in 1975 to 14 million in 2006 (Niger: Population, 2008). The head of

Uganda, a country which has one of the world's fastest growing populations, has also

considered population policy (Knight, 2008). Unlike the other government officials

discussed, though, the Ugandan leaders believe there are benefits to a rapidly growing

population and have rejected the option of population regulation due to this belief (Knight,

2008).

Most of the above government officials can be seen to consider population policy due

to a concern for their country's ability to maintain or improve quality of life. Government

officials in Great Britain, for example, believe population growth can be managed but not

without detriment to current quality of life (Gillman, 2007). Those leading the country have

concerns about ability to provide acceptable housing, water supply, transport, and roads if

Great Britain's population continues to grow at its current rate (Gillman, 2007). Other

concerns include ability to supply adequate healthcare and education, as well as what impact

the growth might have on the environment (Gillman, 2007). Worries of those in Niger center

on the ability to grow economically if population growth continues unchecked (Niger:

Population, 2008). The Ugandan leadership, on the other hand, seems to look past the large

number of unemployed and children living in slums to the successes of those Ugandans able

to overcome the limitations of their environment (Knight, 2008). In doing so, Uganda's

rulers fail not only to address the question of how to satisfy the country's people, but of how

to feed and employ Uganda's people (Knight, 2008).

Although many beliefs are held regarding the benefits of population policy, the

research related to thought behind population policy has been minimal. Mazumdar is one

researcher who has attempted to address this through study of the impact of social growth on

economic growth (1996). Policy makers often face the challenge of how to improve social development of their citizens without detriment to their country's economic development (Mazumdar, 1996). From this comes the question of whether leaders should try to improve social development or focus primarily on economic growth, leaving members of society to care for themselves (Mazumdar, 1996). In examining this question, Mazumdar (1996) has found four different viewpoints: social development results from economic growth, economic growth and social development are unrelated, social development and economic growth are interdependent (without either one causing the other), and social development occurs prior to economic growth. Choosing to follow any of these viewpoints would lead resources to be distributed differently. Only those who follow the beliefs that social development causes or is related to economic development are likely to see investment of resources in people as a necessity. Mazumdar (1996) found that, on the whole, there is not a causal relationship between economic growth and social development. However, it may still be that resources are valuable to the development of both economic wellbeing and social development as factors in quality of life.

More closely related to the hypothesis that population affects quality of life via placing strain on resources is Mazumdar's 2005 investigation of literacy and population growth. Mazumdar (2005) states, "it has been observed that where literacy rates are higher, population growth rates are low, making economic growth faster even with limited resources." Such a statement reflects the idea that limited resources are not as problematic to development of a country with low population growth because the resources, though limited, are spread over fewer people. This is further supported by the observation that, when population growth rates rise above three percent in developing nations, any economic gains

made are negated (Farley & Leavitt, 1971). Here it seems population growth is both creating

strain on resources (the economic gains) and impacting a quality of life variable.

Mazumdar's 2005 study is relevant to the current study's research question as it is

thought population growth will impact availability of resources, including educational

resources. Mazumdar's research incorporates different aspects of modernization theory and

world systems theory. Both theories address the importance of resources as inputs to human

wellbeing that allow a population to have higher quality of life (Mazumdar, 2005).

Modernization theory places emphasis on industrialization as a factor in increasing material

opportunities, and, through this, increases in human wellbeing (Mazumdar, 2005). World

systems theory suggests that dependence of one country on another extracts resources from

the dependent country, leading to a lower quality of life (Mazumdar, 2005). Both of these

theories incorporate lack of resources as a driver behind low quality of life. In Mazumdar's

study, literacy can be viewed as a quality of life variable. It was found that both the initial

level of literacy and population growth affect literacy. Also, population growth was found to

be negatively related to income variables such as per capita real GDP (Mazumdar, 2005). At

the same time, economic growth in the short term was found to have a positive impact on

literacy (Mazumdar, 2005). Thus, one might assume population growth would be negatively

related to economic wellbeing and, through this relationship, might also be related to literacy

and other quality of life factors.

Findings that indicate population growth has negative consequences could not only

further the debate regarding population control, but have implications for marketers as well.

Marketers tend to think growing populations will lead to greater demand—the opposite of

this may actually be the case (Farley & Leavitt, 1971). If this is the case, organizations may

want to reconsider target markets or direction of philanthropic efforts. Farley and Leavitt suggest three ways in which marketers can help. The first, logistical support, addresses the methods used to distribute birth control and information about contraceptive measures (Farley & Leavitt, 1971). Currently, these products are distributed primarily through medical clinics; businesses have the ability to facilitate distribution through more intensive channels that have already been created and are in use (Farley & Leavitt, 1971). Businesses could also utilize their advertising and promotion skills to spread information about birth control techniques and create more informed populations (Farley & Leavitt, 1971). Finally, market research could be conducted to better the means by which birth control products are currently marketed and distributed (Farley & Leavitt, 1971). As can be seen, population policy cannot only be instigated by the government, but by business as well.

Hypothesis

It is hypothesized that the population variables (birthrate, population density, and population growth rate) will be negatively correlated with education, income, and health. This is expected for both state data and country data, though such outcomes should be more pronounced in country data due to greater variability among characteristics of countries.

One possible argument against this hypothesis would be that a growing number of people in a population result in a greater number of people to create or develop resources. On the other hand, the birthrate may be so high that people cannot be developed fast enough to train additional human resources. Thus, there is both a scarcity of physical resources, as well as a scarcity of mental resources to be dealt with. Due to the combination of physical resource scarcity and mental resource scarcity, then, societal development will be lower.

Alternatively, one might question if there is an optimal level of population growth or population density to be reached—demonstrated by a curvilinear (rather than linear) relationship. Such an idea would be depicted as a positive or negative relationship, a peak or low, and a second, oppositely-directed relationship. Due to the inconsistent directionality, the relationship would be obscured when examined by correlations alone. It would, however, still be an important relationship of which to take note. To ensure curvilinear relationships are found if present, graphs, in addition to correlations, are examined. It may be found, via note of a curvilinear relationship, that there is a point at which growth is no longer sustainable.

Methodological Issues

One potential methodological issue is related to the population density measure. This measure is calculated by dividing a region's population number by its area. Using this measure of population density may misrepresent certain regions that do not have an even spread of people across their area. For example, a country with both large cities and large expanses of uninhabitable regions will not reflect this characteristic as the regions are balanced by each other in the population density measure.

<div align="center">Method</div>

Data

Data was obtained from two primary sources. For state information, the U.S. Census Bureau's online website was consulted. Data from all fifty states and the District of Columbia was used. Although birthrate data was found, a measure of population growth rate was unavailable (Births, 2007). Thus, state measures of population have been limited to birthrate and population density. Other information used for correlations was obtained from

the *2007 Statistical Abstract: State Rankings* page made available by the U.S. Census Bureau (2007). This includes measures of population density, percent of the population who at least graduated high school, percent of population who earned a bachelor's degree or more, state GDP, unemployment level, poverty level, and violent crime rate (each taken in 2005). Average annual pay and three-year average median income were also obtained, however these measures were calculated in 2004.

In order to examine country data, the World Factbook was consulted (The world factbook, 2007). Of the listings, data of 191 countries were used. The Vatican City was excluded, as were non-independent countries (for example, Aruba was excluded as it is a territory of the Netherlands). Furthermore, countries could not be missing data for more than two of the quality of life measures. In addition to birthrate, population growth rate, and population density, measures of life expectancy, literacy rate, GDP per capita, unemployment rate, and poverty were taken from each country's webpage.

Design

Both studies used correlational designs.

Procedure

After appropriate measures were located, the data was entered into SPSS. Most data from the U.S. Census Bureau was available in a Microsoft Excel document and was transferred to SPSS using cut and paste functions to avoid entry errors. Data not available in an Excel document and all data from the World Factbook were entered by hand.

Once all relevant data was collected, correlations were calculated. At this time, scatter plots were also created. Correlation matrices for each study, as well as the scatter plots for each correlation pairing, were then examined.

Results

Anticipated Results

Study 1. Among state data, it was expected that increased population (measured with birthrate and population density) would be linked to lower levels of education (fewer years of school completed). It was also thought that population would be negatively correlated with average income and state GDP, while being positively correlated with unemployment and poverty rates.

Study 2. It was thought that correlations in Study 2 would be greater than those in Study 1 due to greater variability among country characteristics. It was anticipated that increased population would be negatively correlated with life expectancy, literacy rate, and GDP per capita. Population was also hypothesized to be positively correlated with unemployment rate and poverty rate.

Findings in line with those anticipated from Study 1 and Study 2 could have many implications. If expected results occur, support would be lent to the ideas that resources are needed to develop a country's people and population growth is not always beneficial. The findings could then be used in discussion of population policy, as well as contemplation of relative distribution and manner of assistance granted.

Findings

Summaries of descriptive statistics for each study can be seen in Tables 1 and 2.

Study 1. Overall, correlations from state data did not support the hypothesis (see Table 3). Few were significant and correlation directions were opposite of those expected. Birthrate was not significantly correlated with any of the quality of life indicators. Population density was positively correlated with percent of population who obtained a

bachelor's degree or more (r = .554, p < .05), average annual pay (r = .666, p < .05), three-year average median income (r = .506, p < .05), and violent crime rate (r = .644, p< .05). While a positive correlation between population density and violent crime rate provides support for the hypothesis, the other significant correlations do not provide support for the hypothesis. After an examination of the scatter plots, no curvilinear relationships were found.

Study 2. It was found that correlations in Study 2 were, indeed, larger than those in Study 1. Correlations between birthrate and population growth rate and the quality of life variables were all significant, in addition to having the predicted directionality (see Table 4). Thus, the hypothesis was supported. The population density measure, however, did not correlate as expected with the quality of life indicators.

After consulting scatter plots of the population density data and various quality of life measures, outliers were found. These outliers were Singapore and Monaco—both countries had population densities more than three standard deviations from the mean. Due to their abnormally high population densities, it was thought the countries may have skewed the data enough to impact analyses. Thus, Singapore and Monaco were removed from the data set and correlations between population density and quality of life variables were calculated once again. Results of this second analysis still yielded results unsupportive of the hypothesis (see Table 5).

Discussion

It was shown that, among countries, higher birthrates and growth rates are associated with lower quality of life. This suggests that resources are important to the development of a country. At present, it is more common for humans to use their mental capabilities over their

physical capabilities. It is no longer as important to have a great deal of workers to harvest crops. It is important, however, to have a handful of people who have been raised with sufficient resources to allow for the mental development necessary to build a machine to harvest crops.

State population and quality of life variables, as well as country population density and quality of life variables, did not behave as expected. Outcomes of state data analyses may be due to lack of variability amongst states, as well as the high level of development in the U.S. It may be that there are not enough group differences with regards to quality of life and the level of resources amongst citizens of the different U.S. states. Rather, the results represent the presence or absence of cities, and the opportunities they present, within a range of fairly low population level as compared to many countries.

As for country population densities, results were likely different than expected due to the population density measure used. This measure was calculated by dividing population by the total land area of the country. In calculating population density via this method, uninhabited areas and variations between rural and extremely dense city areas were not taken into account. Such a measure of population density could have affected the usefulness of the measure to the study.

On the other hand, if the density measure were valid, it is important to ask why it would fail to support the hypothesis when birthrate and growth rate correlations did support the hypothesis. One possible answer is related to the nature of the measures. While birthrate and growth rate both reflect a rate of change/additions to the population, population density is more static. The research question asks if quality of life will decrease due to a reduction in available resources caused by a large or expanding population. It may be that the original

size of the population is not as important as how quickly the population is growing. If a country is densely populated, perhaps the nation has come to a solution that allows for provision of an adequate amount of resources to its population. However, once that balance is shifted by a rapidly growing population, resources cannot be acquired fast enough to provide for the additional citizens.

Implications

Implications of these findings could be used to support two viewpoints. Generally, the findings lend support for population policy. In addition, findings could be used to better plan the nature and direction of aid given to developing nations.

Population Policy. If nations do, indeed, develop slower when their resources are spread too thinly, it seems population policy might be a wise idea. Rather than attempt to grow resources (something many countries may see as nearly impossible), countries can attempt to limit population growth. This would mean current resources would be spread over fewer people, thus increasing resources per capita. Greater resources per person should then lead to more favorable development and growth, allowing the population policy to slacken as more resources become available. However, it is important to consider the ethical implications of population policy and weigh the costs of such an action against its benefits.

When considering implementation of population policy, it is also important to think about the various formal and informal methods available for controlling population growth. China's attempt to curb birthrate has been referred to as the "one-child policy" because it limits couples to bearing and raising one child (Leow, 2008). Variations in this policy allow rural families, as well as urban couples who were single children, to have two children (Leow, 2008). Other variations allow even more children to ethnic minorities and those

located in poorer areas (Leow, 2008). Another formal method of population control involves migration regulation. For countries like Great Britain that have a high population growth rate due, in part, to a high level of immigration, the answer might be to put immigration restrictions in place (Gillman, 2007).

Countries could also enact informal measures of population control. In addition to controlling the flow of immigration and migration, Great Britain's leaders have contemplated taking measures to promote smaller family size and reduce unplanned teenage pregnancy (Gillman, 2007). In less developed countries, informal measures could include education. It is thought that Niger's high birthrate is due, in part, to women's low level of education (Niger: Population, 2008). Here, though, a problem arises when attempting to locate further resources that can be allocated toward education of additional people. In trying to implement this control, the country would have to seek help from without. Another informal method of population control that would require assistance from an external entity would be increased modernization. It has been found that as a country becomes more modernized, its fertility rate decreases (Leaders: How to..., 2007). Yet, such a change would be difficult to instigate from within a country already struggling due to lack of resources.

As informal measures lack government enforcement and intrusiveness, it seems they would be less likely than formal population policy to elicit public protest. At the same time, though, these measures may have less of an impact on population growth. This is because the lack of formality means the government will be unable to force the population to conform to its standards. These more passive measures could, however, be utilized with success if the country is not in dire need of population control. Thus, it might be beneficial for countries who foresee their population growth rate rising to a point that cannot be supported to

implement these less formal measures early. In doing so, the country may be able to avoid the protest that would be likely to accompany later implementation of formal population policy.

Supporters of population policy believe it can sustain or increase the quality of life for current and future generations. Government officials in Great Britain believe that, through use of population regulation measures, provision of adequate housing, transport and road systems, clean water, healthcare, and education will be ensured (Gillman, 2007). Other expected benefits are related to economic wellbeing (Niger: Population, 2008). When examined in regards to Study 2, population policy could decrease population and, via this impact, influence those measures of wellbeing correlated with population measures. This could mean increases in life expectancy, literacy rate, and GDP per capita, as well as decreases in unemployment rate and poverty level would be linked to population policy.

Despite suspected benefits, there is a great deal on which opponents of population policy might base their argument. Social problems are likely to arise with a lower birthrate as there will be fewer young adults in the workforce to pay taxes and provide for the elderly (Leow, 2008). Inconsistencies in children allotted (like those in Chinese population policy) may also lead to social problems. Members of society may become jealous of one another due to differences in child allotment or take extreme measures to ensure the one child they are allotted has the characteristics they desire (for example, male or female). Moreover, formal population policy impinges upon rights of individuals by limiting choices about family size and, with immigration policy, habitation location. Alternatively, informal population policy faces battles on moral grounds as it involves promotion of things forbidden in some belief systems, such as birth control methods and education of women. In Niger,

any population policy implemented would have to gain the support of, or face an uphill battle with, religious leaders who have historically been seen to combat attempts to abolish child marriage and introduce contraception (Niger: Population, 2008). These ideas, as well as personal beliefs, have led others to suggest population policy is unnecessary and, in some cases, to encourage population growth.

Those who deem population policy unnecessary are likely to base this judgment on the belief that nature will check growing populations. Proponents of this idea cite the S-shaped growth curve of insect populations in a Petri dish as their support (Leaders: How to..., 2007). At the start, the population of the insects barely grows; it then rises steeply and, upon reaching an inflection point, flattens or falls (Leaders: How to..., 2007). Upon reaching the inflection point, the insect population has been constrained by both overcrowding and a shortage of resources (Leaders: How to..., 2007). If this idea can be extended to humans, population policy becomes a moot topic. Population regulation would be unnecessary as the scarcity of resources dictates the level of sustainable population growth. Whether true or untrue, allowing population to be controlled in this way could result in great suffering due to the health and wellbeing issues caused by scarce resources. The consequences of allowing populations to develop, constrained only by nature, must be weighed against the consequences of formal restraints enacted by mankind.

A third viewpoint held on population policy involves the encouragement of population growth. In Uganda, it is hypothesized that current increases in the labor force will be beneficial in the future (Knight, 2008). Dr. Musinguzi, Uganda's population advisor, believes Uganda is simply in the early stages of development and will follow in the footsteps of developed nations. This involves population growth that will, in time, take advantage of

the "demographic transition" (Knight, 2008). The transition involves a "swing from the high

birth and death rates of pre-industrial, uneducated, unhealthy populations to the low birth and

death rates of their richer, healthier and more cautious descendants" (Knight, 2008). Current

population growth is simply in anticipation of the opportunity to take advantage of a

"demographic window" that will allow Uganda to enter the industrial world (Knight, 2008).

Other Ugandans believe encouraging population growth is wise as human labor could be a

valuable resource that can be exported to other countries (Knight, 2008). These theories have

yet to be tried and proven—only time will tell if Uganda's actions are wise. However, one

must question how a country may export its people if it does not have the resources to train

them appropriately. Even if globalization leads to a work force that is highly integrated and

transferable/mobile on a global scale, workers will continue to be as good as the resources

invested in them. Thus, countries that encourage rapid population growth with the

expectation that the population can be exported as human capital must also consider whether

globalization will lead to more integrated and mobile developmental resources. The idea of

encouraging population growth in order to export labor can only be successful if the

resources used to develop workers are also more global in nature.

Nature and Direction of Aid. The findings of this study could also be used to

formulate plans regarding the nature and direction of aid given to developing countries. In

place of giving additional resources, other countries could provide forms of aid that lead to

lower birthrates (such as creating sex education programs and providing forms of birth

control). With a lower rate of population growth, the country's resources would be spread

over fewer people and fewer additional resources would be needed. In this way, outsiders

can help other countries become more self-sufficient. Findings could also be used to direct

aid, as those countries with the highest ratio of birthrate, growth rate, and/or population density as compared to resources should be in the greatest need of aid.

Results may also have practical implications in the business world, as birthrate and population growth rate could become valuable tools for market researchers. Due to linkages, marketers may be able to use birthrate, population density, and/or population growth rate to make predictions about markets and provide guidance regarding international market decisions. Population variables may also be used to better direct the philanthropic activities of firms. As discussed by Farley and Leavitt, business can influence growth rates by contributing logistical resources, advertising and promotion skills, and marketing research efforts to the battle against population growth (1971). Firms could fulfill duties related to social responsibility while developing future overseas markets by providing aid that attempts to check population growth. Through activities such as providing sex education courses and methods of birth control to developing nations, firms would be engaging in what the public sees as socially responsible actions, while also creating future consumers in those countries in which aid was provided.

Firms can be seen to benefit from philanthropy in many ways. In today's society, firms are expected to be more socially responsible (Ferrell & Hartline, 2005). This responsibility can have a positive impact on the firm's reputation, image, and marketing efforts (Ferrell & Hartline, 2005). In addition, philanthropic activities are often tax deductible (Pearce & Robinson, 2007). Philanthropy can be even more beneficial to a firm if used strategically—something that should not be difficult as elements of social responsibility should already be incorporated into company strategy (Ferrell & Hartline, 2005). Engaging in actions that increase quality of life should also lead to development of new markets, since

quality of life increases will mean greater disposable income. If this outcome can be attributed to a particular firm's aid, those influenced by the aid will be more likely to have positive feelings toward the company and want to purchase its goods or services. Increases in philanthropic efforts, especially those enacted on a global scale, could also lead to the globalization of training resources that is necessary for the success of those countries that believe in encouraging population growth in order to export labor. An expanded labor market will allow companies more choice in who they hire, with this increase in choice leading to a more skilled set of employees.

In spite of the benefits that can be obtained through engaging in philanthropy, firms must take care when incorporating population regulation assistance into philanthropic efforts. Actions, such as provision of contraceptive measures, may be seen as threats to other cultures' ways of life. This may create ethical dilemmas for the organization and/or cause the organization's actions to be viewed in a negative light. Such an occurrence would then cancel any good intentions held by the firm and could be viewed as a risk of engaging in corporate philanthropy.

Future Research

It is important to note that population variables are simply related to quality of life and may not be the cause of fluctuations in quality of life. Thus, future research would be necessary in order to establish a more causal link. This would most likely mean examining case studies such as China and its quality of life before and after implementation of population policy. Countries considering population policy must remember that variations in fertility and migration assumptions could have a major impact on the actual rate of population growth (Gillman, 2007). Such an impact could render population policy useless

or, on the other hand, make it even more necessary. Due to this, as well as the various beliefs surrounding population policy, it is obvious that decisions regarding population regulation are delicate and can become extremely complicated. This makes research on population regulation even more valuable.

Additionally, more in-depth examination of population density and its implications might be undertaken. Due to concerns about the validity of the population density measure used in Study 2, it may be useful to examine population density in order to create a measure that accounts for differences among the less dense rural areas of a country and its denser city areas. Furthermore, one might ask what impact a country's ratio of dense city areas to rural area has on its development. For example, is it more beneficial for a country to have many heavily-populated areas (vertical cities) or to spread its resources so there is more space per person in its cities? A third population density-related research question to be considered is whether there is an optimal level of population density that should not be surpassed.

Finally, future research might also take into account the idea of base level of resources. For example, Chinese officials do not believe that China can support much more than its current population of 1.3 billion (Leow, 2008). Research that indicates what fluctuations in levels of various types of resources contribute most to a country's ability to support population growth could be interesting. Such research could also be applicable because it could be used to direct a country's growth and allow it to better cope with population growth. It might also be discovered that there is a certain ratio of resources to growth rate that should be maintained for healthy growth of a nation. Moreover, research like this would also provide further insight into the suggestion that it is not necessarily the

number of citizens a nation must provide for, but the rate of population growth that is important.

Through examination of real-life examples and the results of Study 2, it is apparent that population variables such as birthrate and growth rate are linked to quality of life. However, the question of how best to act on this finding remains unanswered. Governments may act via population policy. Yet, even with this approach, there are variations and disagreements. Action may also be left to the business world as findings can be used to guide philanthropic efforts of firms while creating future labor and customer markets. Regardless of the mode of action chosen, it seems Amartya Sen had a valid hypothesis. It is left to his followers to decide how best to increase options available in order to develop capabilities of populations worldwide.

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Table 1: State Data Descriptive Statistics

	Mean	Median	Minimum	Maximum	Standard Deviation
Birthrate (per 1000 births)	13.80	13.50	10.60	21.20	1.76
Population Density	361.36	94.50	1.20	8966.10	1255.19
HS Graduate or More (percent of population)	86.62	87.00	78.20	92.70	3.87
Attained BA or More (percent of population)	27.35	25.80	15.10	46.70	5.76
Average Annual Pay	36,808.90	35,186.00	27,830.00	63,887.00	6859.11
3-Year Average Median Income	47,873.58	46,952.50	35,261.00	64,169.00	7274.04
State GDP (billions)	243.33	144.00	23.00	1622.00	292.03
Unemployment (percent)	4.92	4.90	2.80	7.90	1.07
Poverty (percent below poverty level)	13.07	12.60	7.50	21.33	3.21
Violent Crime Rate (1 per 100,000 population)	422.41	387.00	98.00	1459.00	229.86

Table 2: Country Data Descriptive Statistics

	Mean	Median	Minimum	Maximum	Standard Deviation
Birthrate	22.67	20.36	8.10	50.16	11.32
Population Growth Rate	1.31	1.29	-1.00	4.84	1.10
Population Density	260.22	73.03	.03	16,754.36	1305.02
Population Density (after outlier adjustment)	139.04	72.30	.03	1271.77	202.11
Life Expectancy	66.80	71.05	8.35	83.52	12.61
Literacy Rate	82.61	90.70	21.80	100.00	19.62
GDP per Capita	11447.12	5900.00	600.00	71400.00	12,718.20
Unemployment Rate	13.99	8.75	0	90.00	15.43
Poverty	33.68	30.95	0.90	86.00	19.42

Table 3: United States of America State Correlations

	HS Graduate or More	Attained BA or More	Average Annual Pay	3-Year Average Median Income	State GDP	Unemployment	Poverty	Violent Crime Rate
Birthrate	-.067	-.006	-.088	.010	.106	.088	.152	.191
Population Density	-.106	.554**	.666**	.506**	-.033	.199	.191	.644**

** Correlation is significant at the 0.01 level (2-tailed)

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Table 4: Country Correlations

	Life Expectancy	Literacy Rate	GDP per Capita	Unemployment Rate	Poverty
Birthrate	-.745**	-.809**	-.594**	.482**	.704**
Population Growth Rate	-.421**	-.677**	-.358**	.300**	.494**
Population Density	.129	.083	.155*	-.094	-.159

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Table 5: Country Correlations with Modifications to Adjust for Outliers

	Life Expectancy	Literacy Rate	GDP per Capita	Unemployment Rate	Poverty
Population Density	.183*	.087	.103	-.060	-.159

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)