Comparing demographic policy, change, and ethnic relations in Mauritius and Fiji

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This investigation establishes and explains the link between colonial demographic policy and different ethnic-conflict outcomes in Mauritius and Fiji today. Despite ominous predictions to the contrary, the paper argues that demographic trends in Mauritius have actually proven themselves as a source of political stability. The converse holds for Fiji. Mauritius and Fiji are particularly interesting in this regard because their similar colonial, economic, political, and social histories make it possible to isolate demographic variables and assess their salience relative to other independent variables, such as relative deprivation. Quantitative as well as qualitative analysis confirms the relative significance of demographics. These findings then generate hypotheses about the relationship between demographic trends and different outcomes of ethnic conflict. Although they have the potential to be elevated to a theory, the extent to which they are generalisible is a question of further empirical scrutiny in other cases. As such, this investigation claims to offer some insights into the way demographic trends – notably age structure and migration -- may aggravate and mitigate interethnic conflict. Specifically, the article hypothesizes that interethnic demographic trends and age structure are determinants a country's propensity for political (in)stability.

The first section of this paper reflects on the comparative method employed in this paper. The second section details the demographic history of Mauritius and Fiji in comparative perspective. The demographic history of both island states is, of course, also part of their colonial heritage for the demographic composition – and thus the conflictual interethnic relations -- found in both countries today are a colonial legacy. In effect, it could be argued that colonial demographic policy -- and subsequent demographic change – is the singular root cause of the ethnic mix in both countries. Ergo, colonialism and demography are inextricably linked to ethnic conflict on Mauritius and Fiji. Since the same holds for just about all other ethnic conflicts in the world today, that is, since demographic policy under a colonial specter of one kind or another is perhaps the overriding root cause of ethnic conflict, not only is it surprising that the relationship between demography and ethnic relations has been marginalized in

the literature on ethnic relations in Mauritius as well as Fiji but also that the relationship between demography and ethnic relations has received but scant attention in the analysis of ethnic conflict as such. Given that since the end of the Cold War ethnic conflict has become the main form of conflict in the world today, this is all the more reason to investigate the relationship between demographic policy, demographic change, and ethnic relations. In the process, we are likely to learn as much about the sort of demographic policies that might precipitate conflict later on as we may about the way demographic shifts may affect the nature of the conflict as well as a conflict's propensity for violence later on.

This paper posits disaggregated demographic change as a viable explanation for different outcomes of interethnic relations. Different communal groups in conflict rarely have identical age structures. From this proposition it follows that one group must have a younger age structure while the other group has an older age structure. Since younger populations are often associated with political instability, one may surmise that such differentials may prove problematic. Since, in the absence of emigration, a younger age structure results in population growth, one would expect situations where the minority ethnic group has a younger age structure to prove especially problematic for, by virtue of its younger age structure, it is also calling the other ethnic group's demographic – and thus usually political – dominance into question. If youthful populations are a likely cause of political instability and if political instability is heightened further by a minority's population growing more rapidly than a majority, one may hypothesize that conflicts where the minority has a younger age structure than the majority may be more intense than conflicts where the majority has a younger age structure than the minority, provided that migration is not intervening to mitigate or exacerbate natural increase.

The paper will scrutinize the explanatory power of this hypothesis by comparing the demographic trends in two ethnic conflicts. In the third instance, a quantitative analysis will assess the

salience of demographics relative to other possible explanations. The fourth section complements the statistical findings with a comparative analysis of demographic trends in the two case studies.

Background

Demographics affect the dialectic between the hegemonic inclination of those who hold power and the relatively deprived struggling to improve their lot in life: "The simple phenomenon of differential population growth rates is translated into changing political potentials" (Wriggins & Guyot 1973: 16). If the minority's age structure is younger, that means its population has (a) a higher proportion of youth – although not necessarily a higher total count – and that (b) its population is growing more rapidly than the majority's, that is, it is "catching up". Large youth cohorts are widely associated with political instability and violence; so is rapid population growth. But the argument I am advancing differs significantly from these conventional propositions about the relationship between demographic change and ethnic conflict. The analysis in this paper premised on a variable – age structure disaggregated by ethnic group -- that (A) aggregates youth and population growth for each group, (B) is able to account for migration, holds as an explanation of ethnic violence across (C) time and (D) space, and (E) has predictive power, that is, it is more than just another *ex post facto* explanation.

The relationship between demographics and ethnic violence is not well understood. Fearon and Laitin (2003) find more populous countries to be more prone to civil war in general, but no more prone to ethnic war in particular. The State Failure Task Force found disproportionately large cohorts of youth among the population as a whole to have a positive effect ethnic conflict (Esty et al., 1998). Braungart (1984), Fuller (1984), Pfaffenberger (1990), and Huntington (1996: 259-260) observe that ethnic violence in Sri Lanka coincides with peaks in the youth cohort. Courbage and Fargues (1997) and Baaklini (1983) have analyzed the civil war in Lebanon in light of demographic differentials

between Christians and Muslims and Judah alludes to differentials between Albanians and Serbs in Kosovo (1997:155).

Two propositions about the putative relationship between demographics and ethnic violence may be inferred from this cursory review of the literature. First, the younger the ethnic minority's population, the greater the probability of internecine conflict.[1] Second, the propensity for internecine conflict is a function of the differential in the rate of growth among ethnic groups. In this second proposition, co-ethnic migration acts as an intervening variable for it may bolster or deplete a population group (with migration often having an age-specific effect for migrants tend to be younger than a population's median). However, neither proposition stands up as a hypothesis. Both are readily falsifiable empirically.

First, despite the prevalence of large youth cohorts throughout developing countries, internecine violence remains an exception (Fearon and Laitin 1996). Similarly, differential demographic growth has been posited as a precipitant of ethnic tensions and democratic instability (Nordlinger 1972; Milne 1981; Olugbemi 1983; Wright 1983; Toft 2002). However, the ubiquity of demographic differentials between ethnic groups notwithstanding, incidents of interethnic violence are rare. In so far as interethnic violence is concerned, this sharp contrast suggests that differential demographic growth fails to explain ethnic-conflict outcomes. A related proposition posits a 20% threshold beyond which a controlled ethnic group’s size and growth precipitate political instability (Zureik 2003). Although the empirical evidence suggests that there may be something germane about the figure of 20% (Fuller & Pitts 1990; Urdal 2001), the choice seems arbitrary. Why should a critical threshold of 20% be any more germane than the minority becoming a plurality or even the majority? In effect, Mill (1910: 365), Nordlinger (1972), and Milne (1981) identify demographic parity as the pivotal ethnic-conflict threshold. Yet, the threshold's significance may derive more from a psychological predisposition towards the significance of that figure among the populations involved than from scientific evidence in support of

20% as a critical sociological mass. Indeed, there are plenty of countries where ethnic minorities surpass the 20% threshold – and which are marked by political instability but not necessarily by internecine conflict.

Method

The methodological inspiration for this article comes from a piece published by Don Horowitz (1989) comparing differences in outcome in Sri Lanka and Malaysia. In order to discern the path on which the nature of an inter-ethnic conflict depends, one has to be able to "control" for intervening variables – to the extent to which one can actually control for variables in the social sciences – that is, one has to pick two similar cases because that makes it easier to isolate variables that are constant. Most studies of ethnic conflict, however, are single-case studies and the comparative studies are premised on the "most-different systems" design where the case studies tend to compare but one variable.

A "most-similar systems" design, by contrast, at least in so far as ethnic conflict is concern, calls for closed systems. In the social sciences, however, closed systems are hard to come by, other than in experimental laboratories. Small-island states constitute somewhat of closed-system experimental laboratory because their interaction with the rest of the world is constrained by virtue of their isolation. Mauritius and Fiji may be located on different continents. Yet, they share many traits.

About 850,000 people live in Fiji; Mauritius is home to about 1.2 million people. But at 720 square miles, Mauritius has less than one-tenth of Fiji's landmass. In effect, it ranks among the most densely populated countries on the planet. Mauritius is also a very heterogeneous society. Fifteen linguistic groups are represented on Mauritius, as are four world religions. Although the main ethnic cleavage is between the dominant Creole minority and the subservient Indian majority, the high degree

of diversity within Mauritian society problematizes the reification of ethnic categories.[2] In Mauritius, 68 per cent of the population is of Indian descent – the highest concentration of Indians worldwide in any country outside of India -- while 27 per cent is Creole. The principal ethnic cleavage in Fiji is similar. About half the population is of Indian descent while the other half is native Melanesian with a Polynesian admixture.

Both countries were British colonies prior to gaining independence. They gained independence around the same time, 1968 and 1970, respectively. Their independence was managed by the same individual in London's Home Office. Immediately prior to being posted to Fiji as its first Governor General had governed Mauritius. Indian migrants – who originated as indentured labour -- comprise a substantial proportion of the population in both countries. They were shipped in to provide cheap labour on the sugar plantations; both countries' economies remain closely tied to sugar.

This choice in case studies is also interested in regard to outcomes. If density, natural increase and ethnic heterogeneity were the sole determinants of internecine violence, then Mauritius certainly beat the odds. On the advent of Mauritius' independence, James Meade, Nobel laureate in economics, a British commission, and an independent analysis arrived at similarly ominous conclusions about the prospects for ethnic harmony, economic development, and political stability on Mauritius (Meade 1961; Titmuss and Abel-Smith 1968; Naipaul 1973). Rapid population growth, the absence of economic growth, and the growing population density on a small island with no natural resources of its own caused some consternation among policy makers. Independence also flamed the inter-ethnic fires for the Franco-Mauritian and Creole communities saw independence as a ploy by the Indian majority to gain control of the state apparatus. What is more, the 1960s had proven a time of considerable labour and subsequently inter-communal unrest on Mauritius.

The post-independence period was thus potentially volatile. But in its aftermath, the major antagonists in the run-up to independence -- the Indian-backed Mouvement Militant Mauritien (MMM)

and the Franco- and Creole-backed Parti Mauritien Social Democrat (PMSD) – came together in a grand coalition and implemented many of the pre-independence commissions' recommendations concerning job creation, economic growth, education, social welfare, and so forth. At the same time, however, the government resisted the austerity As the first non-European associate member of the European Economic Community, in 1975 Mauritius signed a long-term agreement to provide the EEC with 500,000 tons of sugar annually at a price that would turn to be very favourable for Mauritius (and which subsequently became a major catalyst of national prosperity). This agreement was key in securing the funds required to afford aforementioned welfare-state policies. Rather than following the calls of the International Monetary Fund (IMF) to implement austerity measures, Mauritius built what locals now refer to "the welfare society". Ironically, today the IMF holds Mauritius up as Africa's poster-child for economic and social development.

The British took a hand-off approach on cultural issues in both countries. As a result, Creole remains the Mauritian vernacular. In Fiji, by contrast, that meant providing explicit protection and autonomy for locals, protections that were deemed crucial to preserve a native culture that was about to have to contend with the mass-immigration of indentured Indian labour. Mauritius had been uninhabited prior to being discovered and colonized. By contrast, there are natives in Fiji who lay claim to the archipelago as its original inhabitants. Unlike Mauritius, Fiji's land-tenure system has never been reformed and some 97% of land remains in the hands of Fijians.

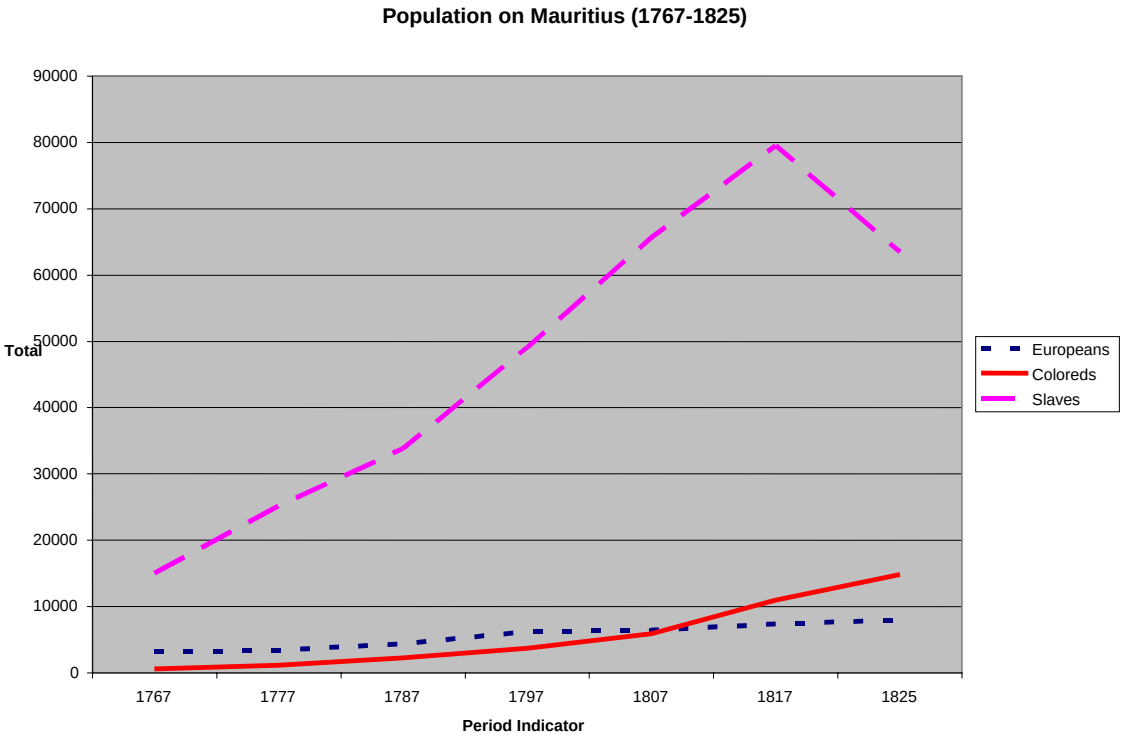
Still, prior to independence, experts were optimistic about Fiji. But contrary to the situation in Mauritius, inter-communal relations in Fiji have remained tense and polarized. The situation came to a head in 1987 when, for the first time in its post-independence history, a party headed by an Indian won the majority of seats. Some native Fijian elements reacted by staging a military coup. There had been previous incidents in the 1960s and 1970s when Indians had strategically been shut out from political office. A subsequent coup followed in 2000. Can demographics offer a viable explanation for the

outcome in each case, that is, can demographic patterns explain why Mauritius defied dire predictions while Fiji continues to struggle with intercommunal tensions?

A cursory demographic history of Mauritius

The demographic histories of Mauritius and Fiji have received considerable attention – albeit it neither from a comparative angle nor have they been linked systematically and analytically to the nature of the conflict as it stands today. That is, many historians have written about the importation of slaves to Mauritius and the subsequent migration of indentured labour to Mauritius and Fiji. To the best of my knowledge, however, no one has tried to figure out just exactly these dynamics affect the nature of the conflict today. For the purposes of this paper, that is, for the purpose of ascertaining the sort of migration and migratory policy than may prove problematic for political stability later and for the purpose of ascertaining the way demographic shifts bear on the nature of a conflict and its propensity to turn violent, a sequential but cursory review of the data and type of immigration shall suffice. The more general hypothesis to be subjected to empirical scrutiny here is that the relationship between migration and the demographic differentials between groups is not an unintended consequence. Since migration is the independent variable, it follows that greater attention should be paid to the way migratory streams may precipitate a demographic disequilibrium between groups.

By the end of the seventeenth century, about 200 Dutch colonists and 500-1,000 slaves are estimated to have lived on Mauritius. Although control over Mauritius switched to the French, the population remained stable until the years 1735-1746 when another 2,000 slaves were “imported” from Madagascar and East Africa Coast (primarily Mozambique).



(Census of Mauritius and its Dependencies 1921: 3)

Between 1767 and 1807, the total population rose from 18,777 to 77,768 (Kuczynski 1949: 758). The French abolished slavery at the end of the eighteenth century. Still, trade continued unabated with 1,000 to 3,000 slaves being imported to Mauritius nearly every year from 1767 until 1810. By 1817, the population had reached 100,000, more than 80 percent of whom are thought to have been slaves – notably some 6,000 Indian slaves among them (Tinker 1974: 44) -- 11 percent free colored inhabitants, 8 percent Europeans or their descendants.

The French had ceded the island to the British in 1810. The latter abolished slavery a quarter of a century hence. Prior to emancipation, only 34,000 slaves were still working on the plantations, (Addison and Hazareesingh 1984) although the total number of slaves at the time was reportedly 66,000. (Bowman 1991: 18) A labour crisis ensued. Demand for labour outstripped supply for, by 1860, Mauritius had become the leading sugar cane exporter in the British Empire. (Alladin 1987) Instead of slaves, landowners had the British recruit indentured Indian labourers. (Bissoondoyal and Servansing

1986) Ample labour supply would depress wages. Indentured labourers started to arrive in 1834. Almost 200,000 Indian migrants would end up arriving on Mauritius between 1851 and 1881, 94% of them in the 1850s and 1860s. (Titmuss and Abel-Smith 1968: 45) By 1866, a total of 339,706 labourers had entered Mauritius. Between 1834 and 1861, the population effectively tripled to 310,000.

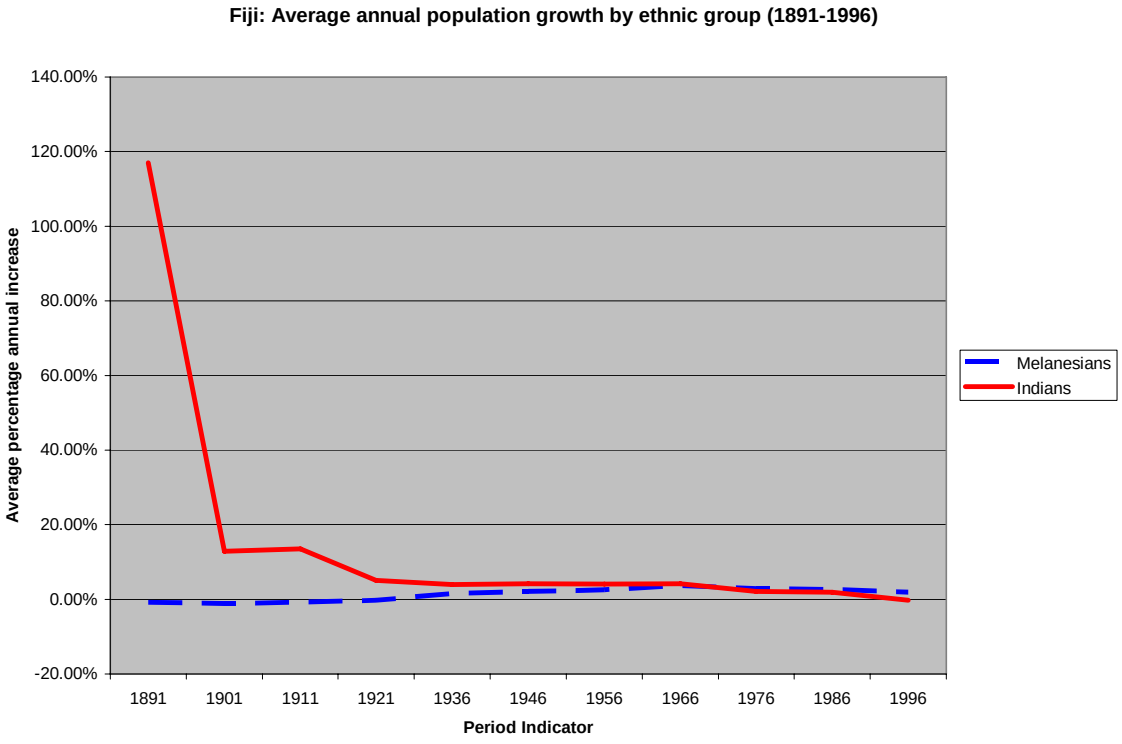
Significantly, Indians have formed a majority on the island ever since the 1860s. (Lutz 1994: 76-78) By 1839 they made up 18 percent of the population, 43 percent in 1851 and 67 in 1871. Interestingly, the proportion of Indians on Mauritius has since remained fairly stable. Trade in humans was halted in 1910. Over the entire 1834-1940 period, 451,796 Indians (346,036 males and 105,760 females) arrived on Mauritius. By the end of the nineteenth century, 370,000 South Asian labourers are believed to have resided on Mauritius.

Until the end of the nineteenth century population growth on the island is attributable almost exclusively to immigration. Although Indian migration began to peter out in the 1860s, the total population remained stable until about 1875 because many more males than females were brought to the island. That hampered natural growth. The unequal sex ratio was particularly noticeable among Indians. By the time immigration ceased, Indian males exceeded the number of women by a two to one margin. (Lutz 1994: 87)

In contrast to Mauritius, Fiji never had any imported slave labour because the immigration of about indentured Indian labourers occurred later than in Mauritius. Some 60,000 -- girmitiyas – were brought to Fiji between 1879 and 1916. The demographic impact of this population movement was compounded by a subsequent wave of Indian immigration to Fiji during the inter-war period. In absolute terms and relative to the population already established, migration to Fiji was smaller than to Mauritius. As a result, the numerical gap between Indians and natives Melanesians in Fiji has always been much closer than the gap between Indians and the “General Population” in Mauritius. The first comparative conclusion to draw, then, is that colonial migratory policy generated different outcomes

what the differentials between the two main population groups on each territory are concerned. That is, colonial migratory policy had the unintended consequence of producing a clear Indian majority in Mauritius. In Fiji, by contrast, it only produced a very sizeable Indian minority.

Yet, a further unintended consequence of colonial migratory policy was that the Indian minority in Fiji would inadvertently end up challenging the native predominance. Indian migration to Fiji postdates migration to Mauritius by several decades. As a result, the age structure of Indians in Fiji was comparatively younger than that of Indians in Mauritius. The age-structure differential is partially accountable for the rapid population growth among Indians in Fiji during the first half of the twentieth century. Immigration had virtually ceased by 1921. Yet, Fiji's Indian population quadrupled between 1921 and 1966. Only a disproportionately young population can sustain aberrations of four to five percent for over four decades in rates of nature increase.



(Fiji Islands Statistics Bureau 2002)

If population growth remains constant, the total fertility rate (TFR) must be declining. Were it not, the population would increase accordingly. A declining TFR notwithstanding, the number of women of childbearing age in the population continues to grow. As a result, the CBR actually rises, thus cancelling out the drop in the TFR. The result of such rapid growth is a sizeable youth cohort.

These growth dynamics cause Indians to outnumber native Melanesians by the end of the Second World War. By the late 1950s, Indian plurality is about to turn into an absolute majority (Meller and Anthony 1968: 28-29; Milne 1981: 61).

The second comparative conclusion to draw from colonial migratory policy in Mauritius and Fiji, then, is that migrating populations tend to be fairly young. As a result, they are likely to reproduce at above-average rates. "Native" populations are thus faced with a manifest and a latent development from migrants. Manifestly, there is a fear of being "swamped" by migration. Latently, the native population may gradually end up being outnumbered due to differentials in natural increase. Neither development was problematic for political stability in Mauritius. On the one hand, there was no native population that felt its territory was being "swamped". On the other hand, colonial migratory policy unintentionally preordained an incontrovertible Indian majority. In Fiji, by contrast, the feeling of being "swamped" was compounded by an unintended challenge to native numerical hegemony. Although in both cases the demographic outcome of colonial migratory policy was unintended, the comparative analysis finds that this outcome was not necessarily unpredictable.

Ergo, the impact migration may have on the demographic (im)balance between groups is anything but fortuitous. But this finding is only significant if it can also be shown that certain demographic outcomes appear to be more problematic for political stability than others. The following section assesses quantitatively whether there is any empirical evidence pointing to demographics as a determinant of ethnic conflict in either Mauritius or Fiji, or in both. In light of this evidence, the subsequent qualitative section aims to ascertain the actual nature of that relationship.

Quantitative analysis

This section tries to answer two questions: Are there comparisons which demonstrate a strong difference in development between Mauritius and Fiji? Are there differences which are better predictors of conflict? Using a bivariate analysis, this section is designed to identify differences between the two countries. I use the Phase III dataset compiled by the State Failure Task Force[3], which had data spanning the years from 1955-2002.

The analysis generated 186 strong negative relationships (or in other words, strong differences) between Fiji and Mauritus. Infant mortality was found to be the most frequent variable in such relationships, which is also confirmed by existing publications. This finding is consistent with the State Failure Task Force's general findings which identified infant mortality as one of the most reliable predictors of state failure. Other themes that emerged include population, population density and agricultural related variables. These themes highlight the difference between the two islands, and also represent a starting point for choosing variables of interest in a model of state failure.

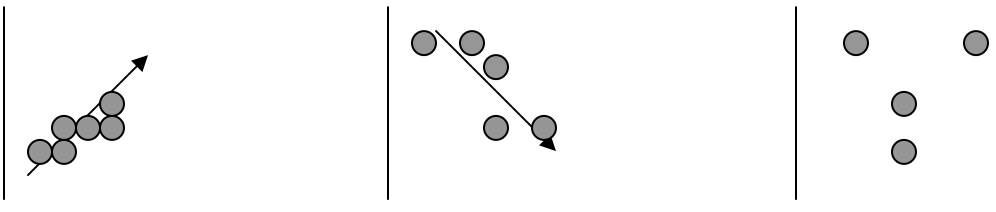
The broader implications of the results described above is clear with the addition of data involving the rest of the world. We found that Mauritius had more negative relationships than Fiji, when compared to the world data.

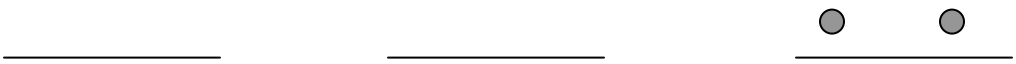
The following sub-section outlines the terminology that is used to present data and to explain the results. It also details objectives, hypotheses, and method. Data are presented in the results section but I have also included an appendix available which presents all the results.

Terminology

The Pearson-correlation method will be used to examine the relationship between two sets of variables. Correlation is a measure of the degree to which a linear model can describe a comparison of two variables. This is does not have the same meaning as a linear regression calculation, which signifies how well one variable can predict another variable. Pearson correlations are most useful in comparing two independent variables from different population sources, which is the situation in this study - Fiji and Mauritius are two separate islands, each with a different population. The Pearson correlations give us a sense of how linear the relationship is between two variables, but does not predict one variable from the other.

A Pearson correlation calculation produces values ranging from $r = +1.0$ to $r = -1.0$. A value of +1.0 is called a positive correlation, and indicates that as one variable is increasing, the other is *always* increasing as well.[4] A value of -1.0 is called a negative correlation, and this indicates that one variable is decreasing as the other is *always* increasing[5]. These two relationships represent perfect positive and perfect negative correlation respectively. The term "strong positive correlation" is used to describe a value of $0.8 \leq r \geq 1.0$ and "strong negative correlation" is used to describe a value $-1.0 \leq r \geq -0.8$. The significance of the latter relationship can be expressed as a situation where one variable is increasing, while the other is *usually* decreasing. In the context of this study, a variable pair with a negative correlation means that the islands have an opposing, or "different", relationship to each other in regards to the variable pair chosen, whereas a positive correlation would suggest a similarity between the two islands. The r^2 (r-squared value) is a measure of linearity, and is used in this study to verify whether a relationship has a linear shape, since this is an assumption of any Pearson-correlation calculation.





Positive Correlation Negative Correlation No Correlation r=0

The Pearson correlation value was the primary criteria in our search for data, however, there are other measures that were taken into account. The *degree of confidence* is an indicator of how often a relationship can be considered to be true. In statistical analysis data is most often within the 90% or 95% confidence level, and this forms another of our criteria.

The *number of cases* is an important factor; this indicates the number of data pairs which are analyzed for a correlation. A data pair is an ordered pair of data from the same year. If this value is high, then the yearly data between two variables overlaps well; we can be more confident that the result represents an overall relationship over time, since it represents a larger proportion of the yearly data.

The *frequency* in which a variable finds itself in this position can be interpreted as the degree to which it is useful in predicting a negative correlation. The frequency is also expressed as the number of times a variable is used. The relationships between the two islands can be seen through the consistency to which certain variables from one island-state correlate with variables from the other island-state. The higher the frequency that a variable is negatively correlated, for example, the more it is a predictor of that type of relationship in this particular case study. This is perhaps a more useful tool for us to analyze as it enables us to choose variables selectively, from a large list, with the goal of identifying negative correlations more efficiently.

Several categories of variables were used in the dataset including “country related variables”, “world norm variables”, and “percentage of world norm variables”. The first category includes variables that are limited to state-level statistics, such as population of Fiji and Mauritius or land area of Fiji and Mauritius. World-norm variables represent the average value of all countries in the world; the world norm of population density would be an example of this type of variable. This variable type has the

prefix "XX". The percentage-of-world-norm variables express a country-related variable as a percentage of the world norm.

Data Set and Hypothesis

Four datasets proposed themselves for this study: State Failure Task Force Phase III[6] (SFTF III), Minorities at Risk (MAR)[7], The PRIO/Uppsala Armed Conflict Dataset[8] (PRIO), and Correlates of War – Inter-State War Dataset (v.3.0)[9] (COW). The PRIO and COW datasets do not lend themselves to this study because they focus on the characteristics of wars rather than on demographic variables. The MAR dataset contains data for Fiji but not for its ethnic groups. The SFTF III dataset had ethnic, national and world norm data, with an extensive choice of variables. Its depth and flexibility lends itself well to the purposes of this investigation.

The investigation's interest in data disaggregated by ethnic group notwithstanding, its statistical criteria, for this particular exploration of the data, eliminated the ethnic data. This is explained below; ethnic data represents a prospective avenue of research -- once an appropriate comparison method is devised.

Using data from the Phase III dataset compiled by the State Failure Task Force[10], the investigation's objective was to find data that would support two hypotheses:

H_1 : Some variable pairings between both countries have a strong negative correlation.

H_2 : Some variables are a better predictor of conflict based on either Pearson correlation values and/or frequency of appearance.

Methodology

I extracted all the data that pertains only to Mauritius and Fiji. Using bivariate analysis I compared all variables from one country against the variables of the other (eg: Population of Mauritius versus Infant Mortality Rate of Fiji – and vice versa). No comparisons of variables were made within a country. In an effort to extract the most convincing statistical comparisons from the dataset, date was eliminated according to the following criteria:

1) Must have a Pearson correlation between -0.9 and -1.0

2) Must have at least 5 data points

3) Data must be linear (R^2 is greater than or equal to 0.7)

4) Data must be significant to at least the 90% confidence level

Two important themes were eliminated as a result. All variables which relied on ranking the two countries were eliminated.[11] "Ranking" variables cannot be appropriately evaluated using Pearson correlation methods. Ethnic data was eliminated by criteria 2 in most cases because there were only 3 data points taken for each ethnic-related variable. The goal of this exercise was to extract strong correlations. Data is more representative of chronological trends with increasing data points.

Results

A total of 186 variable pairs were extracted from the dataset. These variable pairs represent a strong negative correlation between statistics from both countries. A partial listing of results is appended to this paper.

Table 1: The frequencies of all country-related variables, used at least once, for Fiji

Variable	Description	No. of times variable is used for Fiji
UND26Y	Infant Mortality rate	20
WDIPOPD	Population density ppl per sq. km	13
WDIPOPT	Population, total	13
CAPTPOP	Total Population	9
FAOLABTL	Agricultural labor force - total	8
SFTGPOPD	Population Density	8
FAOEMPAG	Agricultural population	7
XXXATPOP	SFTGTPOP/XXWATPOP	7
SFTGTPOP	Total Population	7
UNUTPOP	Estimated Total Population in 1000s	7
UND10Y	Population density	6
UNUURBPC	Percent of population in urban areas	6
FAOLAREA	Cropland Area	5
XXXAPOPD	SFTGPOPD/XXWAPOPD	2
CIOD	Memberships in Regionally Defined Organizations	2
PWTRGDPC	Real GDP per capita	2
XXXFAOWO	FAOWOODS/XXWFAOWO	1

Table 2: The frequencies of all country-related variables, used at least once, for Mauritius

Variable	Description	No. of times variable is used for Mauritius
MXXXUN10Y	UND10Y/XXWUN10Y	18
MXXXWDOPD	WDIPOPD/XXWWDOPD	18
MXXXWDOPT	WDIPOPT/XXWWDOPT	18
MUND26Y	Infant Mortality rate	15
MFAOEMPAG	Agricultural population	15
MXXXAPOPD	SFTGPOPD/XXWAPOPD	15
MXXXATPOP	SFTGTPOP/XXWATPOP	10
MXXXCURPC	UNUURBPC/XXWCURPC	7
MCAPTPOP	Total Population	4
MWDIPOPD	Population density ppl per sq. km	3
MWDIPOPT	Population, total	3
MFAOLABTL	Agricultural labor force - total	3
MUND10Y	Population density	3
MWDIGDPPC	GDP per capita	3
MWDIOPEN	Trade (% of GDP)	3
MXXXWDPPC	WDIGDPPC/XXWWDPPC	3

MSFTGPOPD	Population Density	2
MSFTGTPOP	Total Population	2
MUNUTPOP	Estimated Total Population in 1000s	2
MXXXUN26Y	UND26Y/XXWUN26Y	2
MCIOD	Memberships in Regionally Defined Organizations	1
MFAOWOODS	Forest and woodland area	1
MPWTOPEN	Trade openness (exports+imports)/GDP	1

Table 3: Top ten variables ranked according to the sum of the country usage frequencies

Variable	Description	Sum of Frequencies
UND26Y	Infant Mortality rate	35
FAOEMPAG	Agricultural population	22
XXXUN10Y[a]	UND10Y/XXWUN10Y	18
XXXWDOPD[a]	WDIPOPD/XXWWDOPD	18
XXXWDOPT[a]	WDIPOPT/XXWWDOPT	18
XXXAPOPD	SFTGPOPD/XXWAPOPD	17
XXXATPOP	SFTGTPOP/XXWATPOP	17
WDIPOPD	Population density ppl per sq. km	16
WDIPOPT	Population, total	16

CAPTPOP	Total Population	13

a These variables only had frequencies for Mauritius

Table 4: The frequencies of variables which compare a country variable to the world norm

Variable	Description	No. of times variable is used to compare a Mauritius variable	No. of times variable is used to compare a Fiji variable	Sum of Frequencies
XXWUN26Y	World norm of UND26Y	19	16	35
XXWWDOPT	World norm of WDIPOPT	9	4	13
XXWAPOPD	world norm of SFTGPOPD	9	2	11
XXWATPOP	world norm of SFTGTPOP	9	2	11
XXWCURPC	World norm of UNUURBPC	7	2	9
XXWCIOD	World norm of CIOD	7	1	8
XXWWDOPD	World norm of WDIPOPD		3	3
XXWFAOWO	World norm of FAOWOODS		2	2
XXWWOPEN	World norm of WDIOPEN	1	1	2
XXWPGDPC	World norm of PWTRGDPC	1		1
XXWPWTOP	World norm of PWTOPEN	1		1
XXWUN10Y	World norm of UND10Y		1	1

Table 5: Top 25 variable pairs according to the Pearson-correlation value[12]

Variable 1	Variable 2	Pearson Correlation	Degree of Confidence	No. of Cases Considered
UND26Y	MWDIPOPD	-1	95%	7
UND26Y	MWDIPOPT	-1	95%	8
UND26Y	CAPTPOP	-1	95%	5
UND26Y	MUND10Y	-1	95%	9
WDIPOPD	MXXXUN10Y	-1	95%	7
MXXWFAOWO	XXXFAOWO	-0.999	95%	34
WDIPOPD	MXXXWDOPD	-0.999	95%	36
WDIPOPT	MXXXWDOPD	-0.999	95%	36
MFAOEMPAG	XXWAPOPD	-0.998	95%	17
MUND10Y	XXWUN26Y	-0.998	95%	9
XXWUN26Y	MUNUTPOP	-0.998	95%	45
UNUTPOP	MXXWUN26Y	-0.996	95%	45
XXWWDOPT	MFAOEMPAG	-0.996	95%	17
XXWWDOPT	MXXXWDOPD	-0.996	95%	36
UND10Y	MXXWUN26Y	-0.995	95%	9
XXWATPOP	MXXXWDOPD	-0.995	95%	36

UND26Y	MUND10Y	-0.995	95%	9
UND26Y	MUNUTPOP	-0.995	95%	9
MFAOEMPAG	XXWATPOP	-0.994	95%	17
UND26Y	MSFTGTPOP	-0.993	95%	9
UND26Y	MSFTGPOPD	-0.993	95%	9
XXWAPOPD	MXXXWDOPD	-0.992	95%	36
MXXWUN26Y	SFTGTPOP	-0.992	95%	42
MXXWUN26Y	XXWCURPC	-0.991	95%	45
XXWUN26Y	MXXCURPC	-0.991	95%	45

Discussion

A total of 186 variable pairs were extracted from the dataset. There is sufficient data to scrutinize the two hypotheses and to discuss their possible significance. A discussion of limitations and reservations follows.

The fact that the investigation was able to identify 186 variable pairs with strong negative linear relationships answers the first question. From these relationships one may infer that Mauritius and Fiji can be compared to one another as well as to the world norm.

These variable pairs represent a strong negative correlation, or statistical differences between Fiji and Mauritius. The first hypothesis postulated that such differences existed. The existence of these relationships is significant for two reasons. First, it intimates that one island state is “better off” than the other. This suspicion will be confirmed after the appraisal of other data. Second, if the claim

holds, it indicates that the island which is "better off" could be used, in a model of state failure, as a preliminary benchmark. The benchmark could serve as a point of comparison with other jurisdictions.

The second hypothesis asks if there are specific comparisons that are more likely to represent a situation of state failure, by virtue of the strength of correlation or its frequent usage. The point of this hypothesis is to gain a sense of the extent to which the difference – posited by H_1 -- is useful in a model of state failure.

The data used to scrutinize H_2 may be analyzed in two ways. One can compare how strongly two variables correlate, or one can compare how frequently a variable correlates. First I shall compare the strength of correlation. A Pearson correlation value of –1.0 represents perfect, negative, and linear relationship and values between –0.9 to –1.0 represent strong, negative, and linear relationship in this study. The top 26 variable pairs, representing correlations from -0.991 to -1.0, are shown in Table 1. One of the criteria of this study was that all correlations were to have a value of –0.9 or lower, which means that all covered comparisons are strong negative correlations. This only means that there exist strong differences between the two islands, but does not convey anything with regard to the extent of those differences. That requires us to evaluate the frequency data presented in Tables 1 through 4.

The frequency data for Fiji in Table 1 is a useful indicator of the sort of variables that lend themselves well to being compared to other jurisdictions. The most striking feature of this table is that infant mortality[13] is the best variable to use for negative correlation because it was found to be used the most. This observation is also consistent with Table 2, where its frequency for Mauritius is 15, and in Table 5, where the usage of UND26Y for Fiji occupies the top 4 positions in the table. Infant mortality thus emerges as a sound predictor of state failure. Nevertheless, the method used for this study does not allow us to determine the exact difference between the two countries regarding this and other variables. Between the two countries there may be a weak negative correlation, or a positive correlation, and this relationship could be identified through further analysis.

The variables for Table 2 can be parsed by themes, based on frequency of usage: Population, Infant Mortality, Population Density, and Agricultural. Population and population density are variables which occur frequently in various cases and should be considered in demographic comparisons. There were only a few agricultural variables in the dataset, but four out of five possible variables (excluding agricultural-related world-norm variables) emerge as useful variables for negative correlation. The same themes recur in Table 3 with regards to Mauritius -- with one important difference to be discussed presently. It is useful to categorize the trends according to frequency as one could apply the same themes to evaluate this or any other dataset further. The sheer amount of data that is available on states is staggering and an effective model of state failure must be able to simplify this data while still discerning trends. The four categories of Population, Infant Mortality, Population Density, and Agricultural are variables that should be part of such a model.

World-norm variables are germane indicators of a country's degree of development. The most obvious difference between the frequencies for Mauritius and Fiji (tables 1 and 2) are evidence by the inclusion of 'percentage of world norm variables' (PWNV with prefix – XXX) in the case of Mauritius in greater numbers than Fiji. Eight percentage-related variables are used for Mauritius, but only three for Fiji. Furthermore, this particular type of variable is used 91 times in the case of Mauritius and only 11 times for Fiji. This trend also shows up in Table 4, where the variables marked with subscripts were only used for Mauritius and not Fiji.

Consider the comparison between XXWATPOP to XXXUN10Y (a variable for Fiji). Our results show that this is either a weak negative correlation or a positive correlation. However, the same relationship for Mauritius, XXWATPOP versus XXXUN10Y demonstrates a strong negative correlation. This is also a chronological relationship. This comparison actually contrasts rates of population growth between the two countries, using the rate of population growth of the world norm as the standard. Mauritius' proportion of the world population declines as the world norm of the population increases.

This translates, because of time, into saying that the population growth rate of Mauritius is declining relative to the world-norm rate of natural increase. The data thus show that population growth on Mauritius is less rapid than on Fiji.

These observations are also substantiated by table 5. It shows that world-norm variables are significant only 33 times for a Fiji variable compared to 63 times for a Mauritius variable. Although we cannot assume that all the PWNV are increasing and the country variables are decreasing, we can, in the case of population-related variables, make such an assumption. The final comparison between Fiji and Mauritius which pertains to state failure is that of the number of times variables are used in each case – a comparisons of the sums of the frequency values of Tables 1 and 2. There are 114 negative correlations involving Fiji variables, but 150 negative correlations involving Mauritius variables.

The results of WNV and PWNV suggest that the demographic condition in Mauritius is "better" than in Fiji. The fact we are able to arrive at our conclusion about the general state of affairs on Mauritius, demonstrates the significance of world norm related variables to a model of state failure. The relationship of a state's demographic development to the world norm thus appears to be of some significance.

Curiously, economic variables do not feature prominently in these results.[14] That includes trade and GDP-related variables. Political variables were eliminated by our criteria, and a different approach will be needed to evaluate them. The current results suggest that differences between these two countries are driven more by social and physical variables rather than economic or political variables. However, it is possible that the social and physical variables are linked by another statistical approach.

Agricultural world-norm variables do not negatively correlate with the state data – save for XXFAOWO for two Fiji variables. This indicates that the land-use relative to population density in Mauritius and Fiji is comparable to the world norm. For the purposes of this case study the comparison

of agricultural data between the two countries appears to be more telling than a comparison to world norms. This is suggested by the prominence of agricultural variables in Tables 1 and 2. Mauritius and Fiji also have similar frequency values for the sum of all agricultural variables used in correlations, which are 21and 19 respectively. The fact that the results suggest that Fiji and Mauritius are no worse off than the world in so far as agricultural variables are concerned means that they may be more significant in interstate comparisons for a model of state failure.

The general results from Table 6, which shows the strengths of the top 25 negative correlations, confirm the themes of this discussion. Still, it was surprising to see that our statistical comparisons generated 5 perfect negative correlations, with the Pearson correlation for the top 25 variable pairs extending down only as far as -0.991. The intensity of the differences should be noted. The top 5 pairings are all population variables of some sort. The relative salience of demographic variables as a theme of comparison is thus validated.

Comparative analysis

The bivariate analysis thus indicates that, for the purpose of comparing the conflicts in Mauritius and Fiji, demographics matters. That is not to say that other variables, such as relative deprivation do not matter. Rather than ruling out other explanations, the broader objective of this paper is to make a case for demographic differential as integral to the analysis of ethnic conflict. Following up on the correlations that establish demographics as a determinant variable in the analysis of conflict, the question is whether any demographic shifts are more problematic as precipitants of political instability than others. A taxonomy of two age-structure hypotheses exists. Each taxonomy presumes a closed system, that is, the absence of migration for, as we have already seen, migration acts as a wild card.

H1: The majority may have an older age structure than the minority.

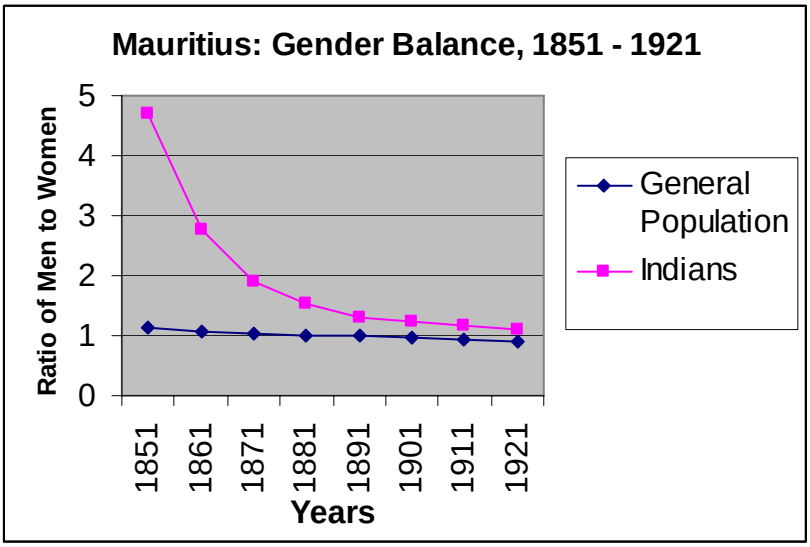
H2: The majority may have a younger population structure than the minority.

Mauritius

Until 1834, Mauritius had been colonized by Europeans, coloreds and slaves. Mauritius was rapidly becoming a leading exporter of sugarcane in the British Empire (Alladin 1987). Since labour was in short supply, landowners had the British import indentured Indian labourers (Bissoondoyal and Servansing 1986). As a result, the island's population effectively tripled to 310,000 by 1860. Indians have been in the majority ever since (Lutz & Wils 1994: 76-78). By 1871, they made up 67 per cent of the island's population.

The proportion of Indians to the General Population has remained stable over time. Initially, natural increase among the Indian population was hampered by the unsanitary conditions to which Indians were subjected (Parahoo 1986; Ly-tio-Fane Pineo 1984) and by an unequal ratio in the distribution of gender (Lutz & Wils 1994:87). Of the 451,796 Indians who arrived on Mauritius between 1834-1940, 346,036 were males.

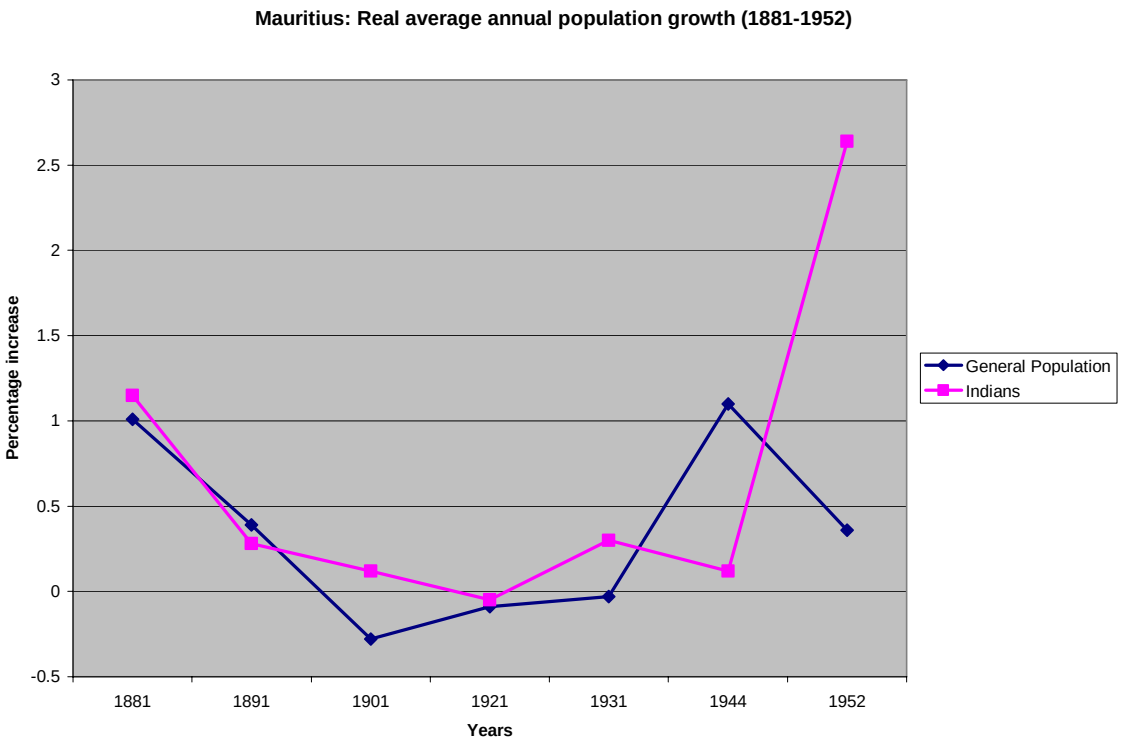
Figure 1: Mauritius, Gender Balance, 1851 - 1921



(Source: Census of Mauritius and its Dependencies 1944: Table VII)

Natural increase among the Indian population was hampered by the *return* of 157,539 Indians (128,761 males and 22,778 females) to their country of origin prior to 1910 (Kuczynski 1949:797). The Indian multitudes and their youthfulness notwithstanding, unsanitary conditions, an unbalanced ratio in the distribution of gender (figure 1), and emigration ensured that the Indians' rate of natural increase approximated that of the General Population (figure 2).

Figure 2: Mauritius, Real Average Annual Population Growth, 1881 - 1952

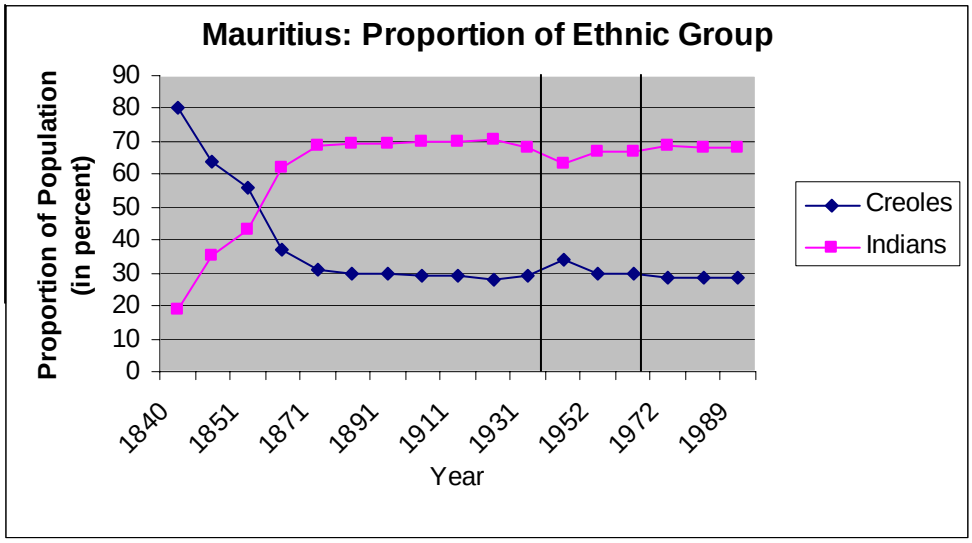


(Census of Mauritius and its Dependencies 1851-1952)[15]

Due to the large base of their population, however, Indians were able to maintain their absolute edge.

Only once in Indo-Mauritian demographic history it appeared as if Indians might stand to lose that edge: From the 1930s until the mid-1940s (table 3). That period coincides with significant unrest instigated by mainly Indian labourers on the island.

Figure 3: Mauritius, Population Proportion of Ethnic Group 1840 - 1989



(Source: Census of Mauritius and its Dependencies, 1861-1973; estimates 1982-2001) [16]

Until 1921, the rate of natural increase for both ethnic groups had been about the same. At that point, the Creole population entered the demographic transition. Improvements in health care provided to Creoles led to greater rates of natural increase. Initially, the subservient Indian majority did not benefit from improvements in health care; so, its rate of natural increase remained unchanged. With a higher rate of natural increase, Creoles now had a comparative advantage.

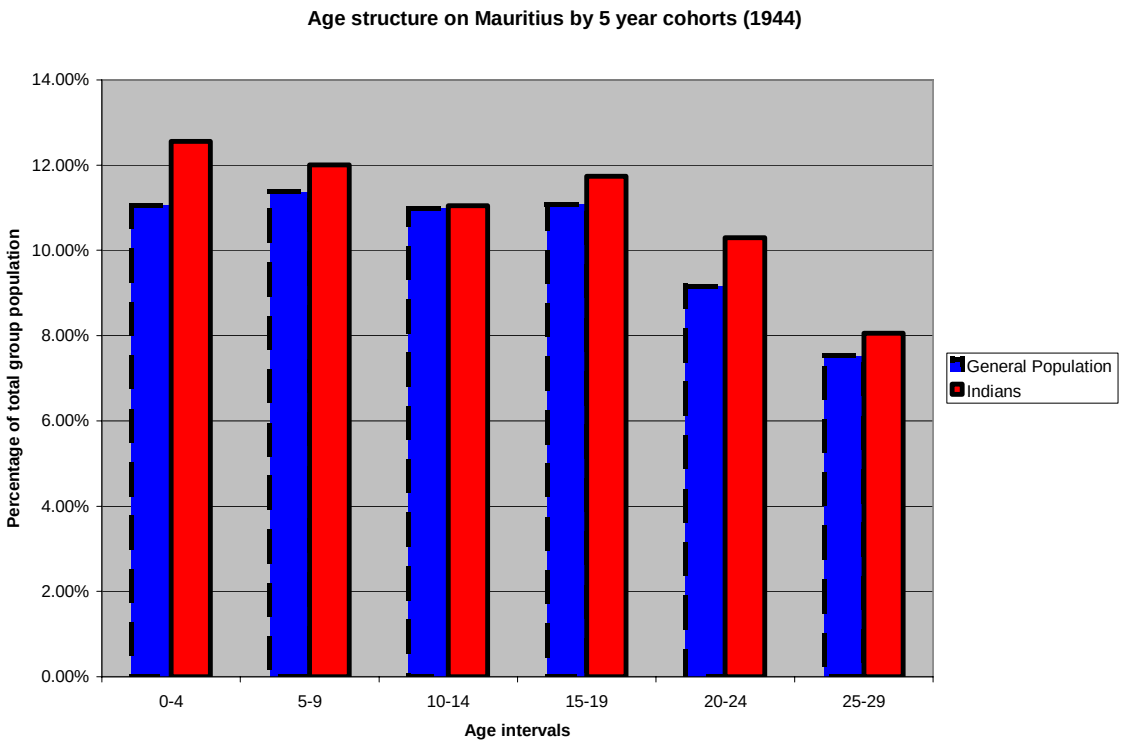
Their sheer numbers made Indians a force to be reckoned with on Mauritius. By the 1930s, however, Indians were starting to lose the game of numbers to the Creoles. Were these demographic trends to persist, the best option open to Indians would be to buttress their political influence by means of concessions extracted from the dominant minority. Indians pressed for the popular vote. A decade after the first major incident of internecine unrest in 1937, the number of enfranchised Mauritians had grown from 11,437 to 71,230 (or about 40 per cent of the adult population) (Tinker 1976:335). By virtue of their numbers Indians benefitted disproportionately from the expansion of the franchise.

Labour unrest in 1937 and in 1943, as well as the general strike in 1938, were allegedly triggered by the grievances of Indian labourers and small planters. Differential increase, however, postulates that these grievances may have been ethnically motivated. Whereas the rate of natural increase among Creoles rose, the rate of natural increase among Indians remained constant. The gap between the two ethnic populations narrowed accordingly. Only after Indians were able to bolster their political influence did they, too, benefit from improved health care. At that point, the rate of natural increase among Indians picks up sharply – and political unrest subsided.

The low rates of natural increase throughout the late nineteenth century were due to epidemics of cholera, smallpox, the Bubonic plague in 1899, hurricanes and an outbreak of the Spanish flu in 1919. The rise in natural increase among all populations on Mauritius recorded at the end of the Second World War is largely the result of DDT spraying in 1948/49 that eliminated malaria as a mass killer. Yet, DDT spraying in and of itself cannot explain the disproportionate rise in the crude birth rate (CBR) among Indians, especially given that their CBR picked up before spraying was initiated. The spraying of DDT, however, bolstered the rate of natural increase among Indians at a time when Indians just started to enter the demographic transition.

The demographic transition offers one possible explanation for the sudden rise in the Indian CBR. A lower fertility rate among women but a greater number of woman overall can cause the CBR to rise. Indeed, a rise in the rate of natural increase among Indians indicates that Indians were only starting to enter the demographic transition (Xenos, 1977). Since Indian immigration was more recent and substantial than Creole immigration, it ensured that even decades after Indian immigration had ceased, the Indian population was younger than the Creole population. The census conducted in 1944 illustrates the point (figure 4).

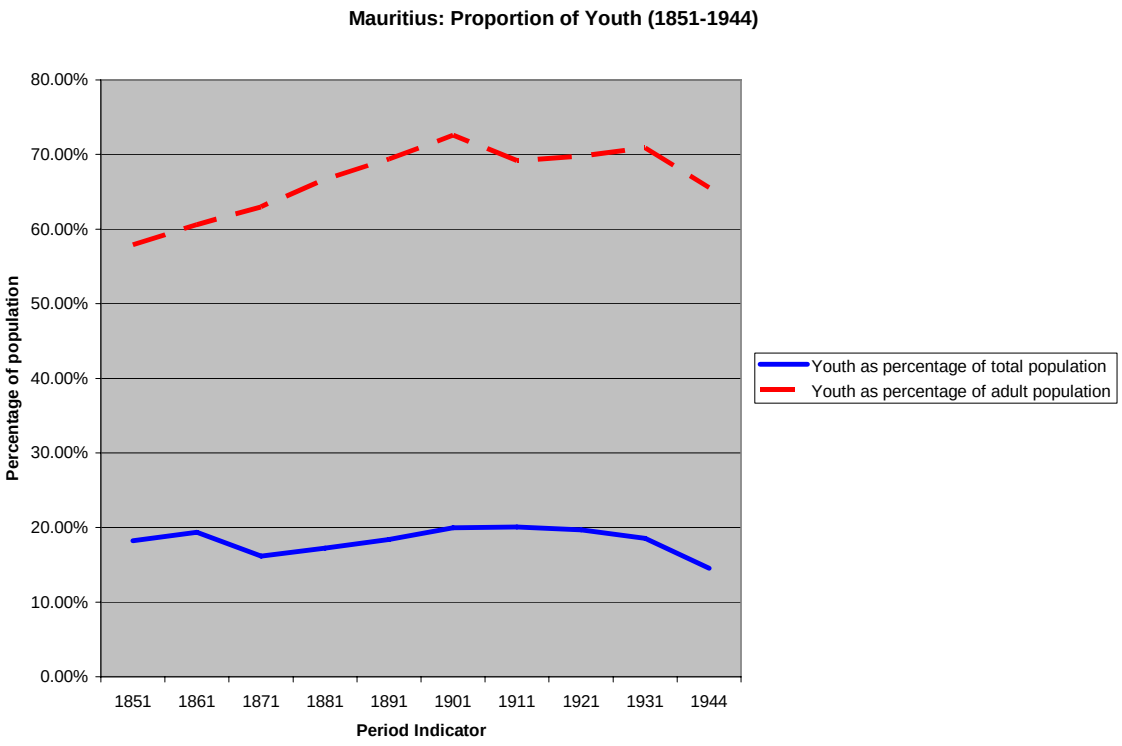
Figure 4: Age Structure in Mauritius by five-year Cohorts, 1944



(Source: Census of Mauritius and its Dependencies, 1944)

By simple virtue of being younger and more numerous, Indians were able to produce a greater number of children than Creoles. Since Indians comprised two-thirds of the population as a whole, the young structure of the Indian population manifests itself in the form of large cohorts of youth on the island throughout the first half of the twentieth century (figure 5).

Figure 5: Mauritus, Proportion of Youth, 1851 - 1944



(Source: Census of Mauritius and its Dependencies, 1944)

The graph illustrates how the immigration of Indians coincides with a rise in the proportion of youth. Since the number of Creoles remained largely unchanged until the end of the nineteenth century, this trend is indicative of a disproportionately younger population among Indians.

During the 1960s, Mauritius witnessed an unprecedented decline in fertility. This had had two effects. Presently, natural increase among all ethnic groups will have slowed to the point where Mauritius' population may actually start to shrink. Second, slow natural increase among a population that has almost passed through the demographic transition translates into rapid aging. As a result, youth make up a diminishing proportion of the population. The balance of Creoles to Indians has remained unchanged since independence and the steep decline in fertility from the 1960s onwards has almost halted natural increase. Their age structures, however, differed considerably prior to

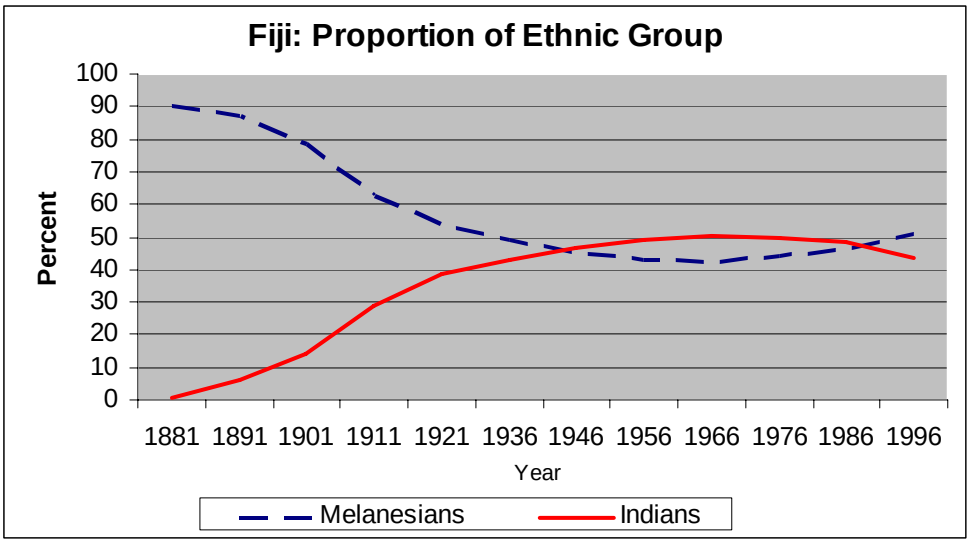
independence, with Indians having a younger population. One would thus expect political instability to wane with time.

Fiji

Unlike Mauritius, Fiji has a native population that lays claim to the territory. The immigration of about 60,000 indentured Indian labourers – girmitiyas – to Fiji occurred later than in Mauritius, between 1879 and 1916. Its impact was compounded by a subsequent wave of Indian immigration to Fiji during the inter-bellum period.

The number of migrants to Fiji was smaller than in Mauritius, both in absolute terms and relative to the population already established there. As a result, the absolute gap between Indians and Melanesians has always been much closer than the gap between Indians and Creoles in Mauritius (figure 6).

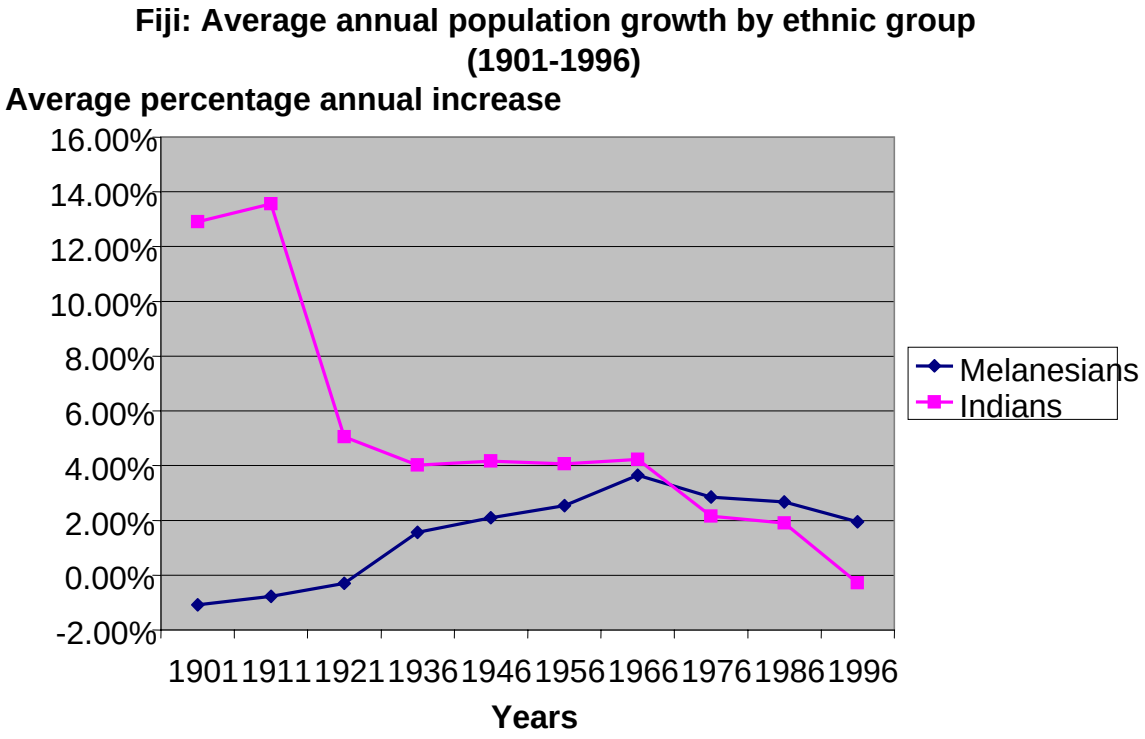
Figure 6: Fiji, Proportion of Ethnic Group, 1881-1996



(Source: Fiji Islands Statistics Bureau 2002)

Since the migration of Indians to Fiji postdates their migration to Mauritius by several decades, it follows that the Indian population on Fiji remained young longer into the twentieth century than the Indian population on Mauritius. That largely explains the rise in the rate of natural increase among Indians on Fiji during the first half of the twentieth century (figure 7).

Figure 7 Fiji: Average Annual Population Growth by Ethnic Group, 1901 – 1996



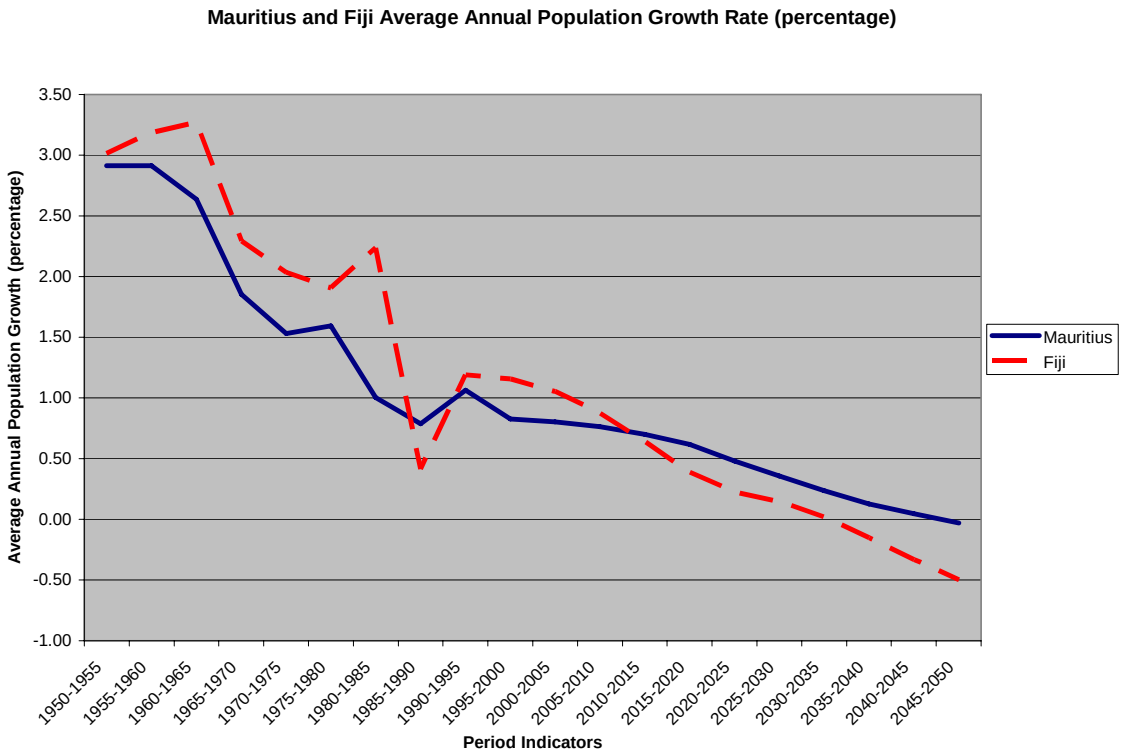
(Source: Fiji Islands Statistics Bureau 2002)

Due to the compound effect of natural increase and immigration, Fiji's Indian population quadrupled between 1921 and 1966. By the 1950s, not only were Indians an absolute majority, they also had a fairly young age structure. Demographic developments in Fiji thus intimate an ethnic dimension to the political unrest of 1959. Indeed, a recent re-examination of the circumstances found that the unrest in 1959 may have been more ethnically motivated than is commonly acknowledged (Heartfield 2002).

Those demographic dynamics contrast with the ones associated with the period of violence and instability spanning from 1987 to 2000, with attempted *coup d'États* at either end. Indians passed through the demographic transition more rapidly than native Melanesians; consequently, the Indian fertility rate and of natural increase dropped below the Melanesians' rates. The decline in Melanesian fertility has been more gradual. In the early 1980s, Indians and Melanesians traded "fecund advantage." For the first time in decades, Melanesians now had the edge in terms of the total fertility rate. As a result, natural increase among Melanesians now exceeded that among Indians. Melanesians were poised to challenge Indian plurality.

Melanesians also had migration working in their favour. Despite a decline, Melanesian fertility still exceeds levels of replacement. Yet, the Indian population is in decline. The explanation for this paradox is out-migration. The graph plotting the proportion of ethnic groups in Fiji shows that the 1987 coup attempt comes at a time when Indians had lost their majority and the compound effect of a decline in fertility and emigration was about to cost them their plurality. The subsequent coup attempt in 2000 coincides with Melanesians regaining the demographic majority they had relinquished during the 1930s. Since the late 1980s, Fiji's Indian population has been shrinking at the rate of half a per cent a year. The Indian population has contracted by a quarter over the last decade. Over 50,000 have left. The rate of emigration has had a visible impact on the average annual rate of population growth (figure 8)

Figure 8: Mauritius and Fiji, average Annual Population Growth Rate, 1950-2050



(Source: UN Population Projection, 2000 revision)

Providing that these trends persist, the number of Indians in Fiji will keep diminishing.

A lower rate of fertility coupled with out-migration has caused an absolute decline in Fiji's Indian population for the population that is most likely to emigrate includes the women of childbearing age and the part of the population most likely already to have children. Emigration further decelerates natural increase. First, the part of the population that could reproduce is the one most prone to leave. Second, the potential for future increase is undermined by children who are leaving with the parents.

Natural increase among Melanesians, by contrast, held steady. With no emigration and a slower decline in fertility, the Melanesian CBR has been exceeding the Indian CBR since the 1980s. Now that increase was clearly favouring the Melanesian *majority*, it is perhaps a bit less surprising that

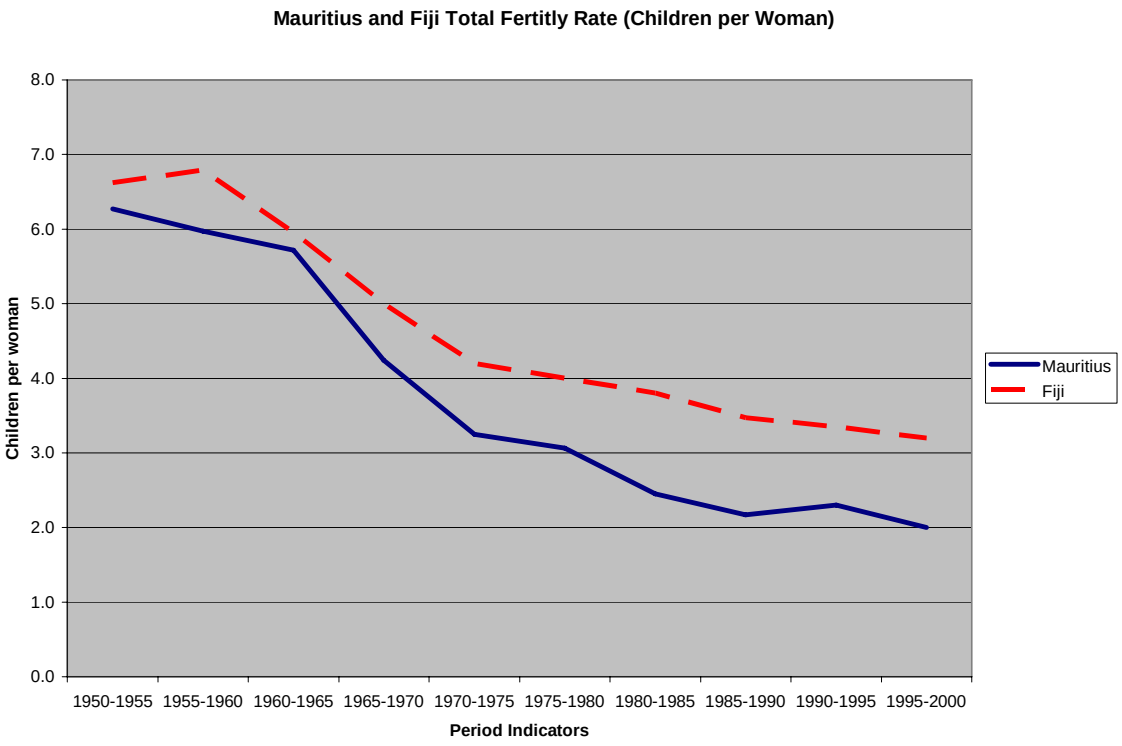
Melanesians did not react well to the results of the 1987 election which produced the country's first-ever Indian Prime Minister.

The situation on Mauritius in the late 1930s and early 1940s was reversed. Creoles were gaining on Indo-Mauritians. In absolute terms, however, Indo-Mauritians still had the edge due to a higher CBR. Indo-Mauritians may have lagged in terms of relative increase but they were still far more numerous.

Discussion

Fiji's population is still in the process of passing through the demographic transition. Unlike Mauritius, behavioural change in Fiji has been gradual and fertility remains higher than in Mauritius. Fiji's population continues to grow at 1.41 per cent – as opposed to 0.88 per cent per annum on Mauritius -- it is aging far less rapidly (33 per cent of its population is under the age of 15 as opposed to 25 per cent in Mauritius) and on average women still give birth to almost three children, which is well above the level of replacement. On Mauritius, the TFR is 2.01 children (Prinz 1991) which is below the level of replacement of about 2.1 (figure 9).

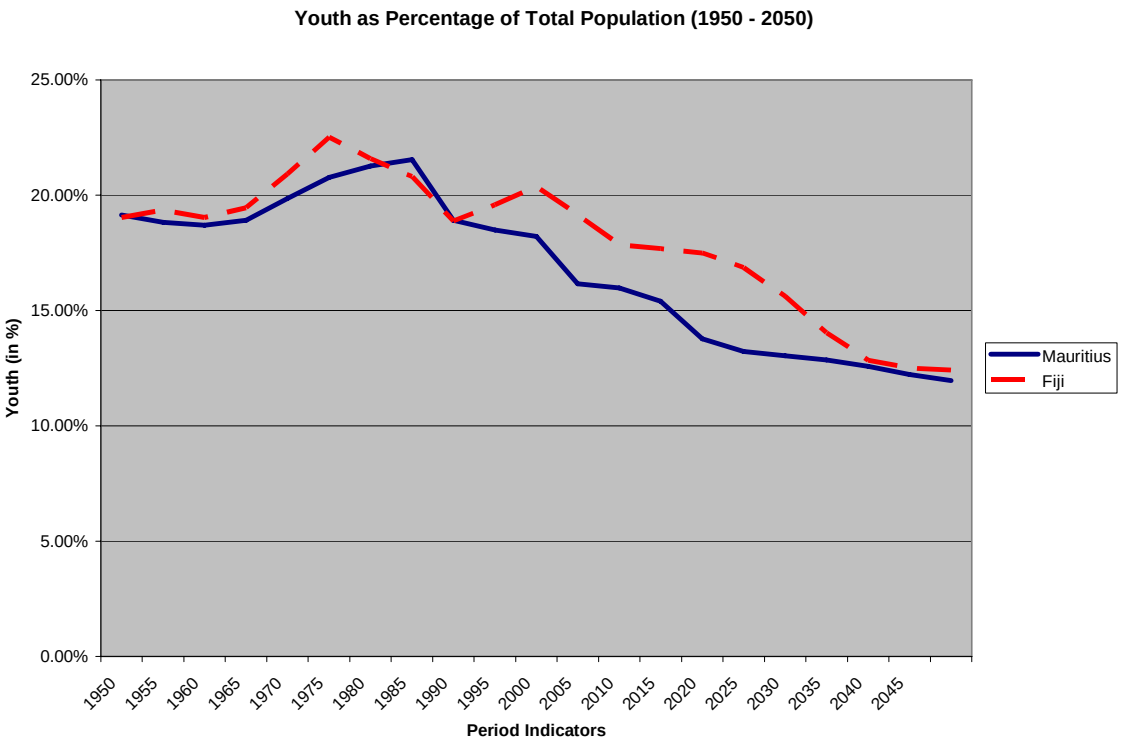
Figure 9: Mauritius and Fiji: Total Fertility Rate, 1950-2050



(Source: UN Population Projection, 2000 revision)

This trend is partially a function of the average age at which women get married. Women on Fiji marry earlier (22.5 years of age) than women in Mauritius (23.8) (UN 2000). As a result, the proportion of youth among the population has been diminishing more gradually (figure 10):

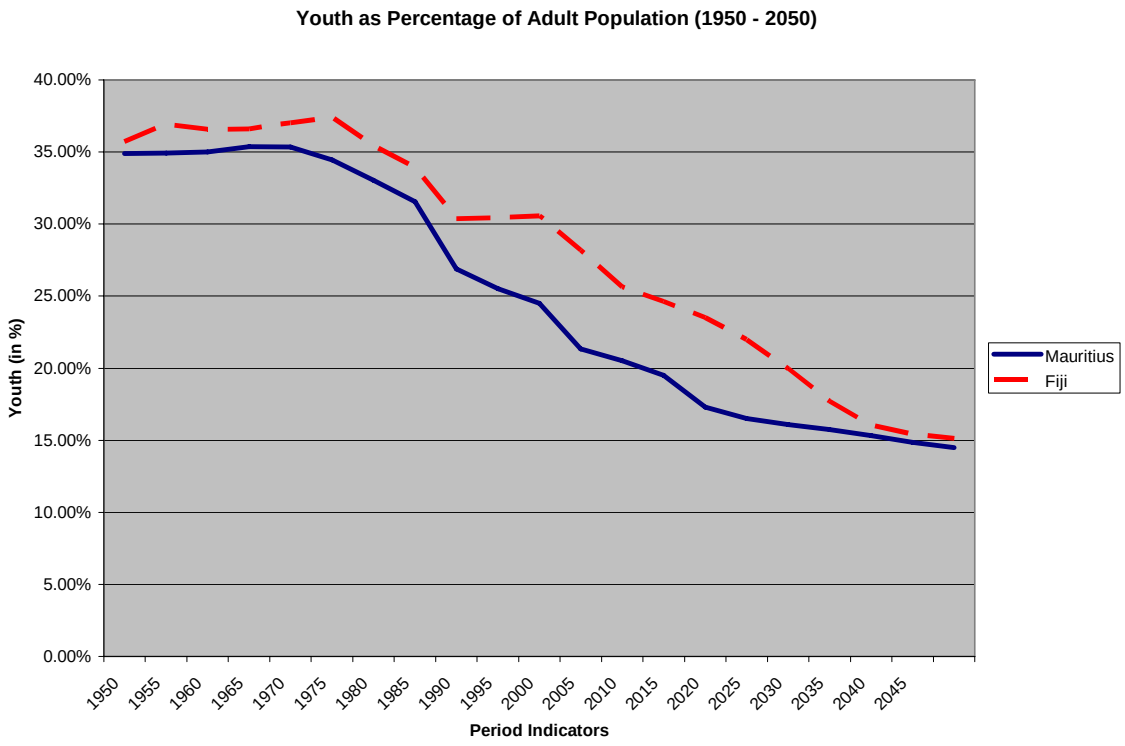
Figure 10: Mauritius and Fiji, Youth as percentage of Total Population, 1950 – 2050



(Source: UN Population Projection, 2000 revision)

When the 0-15 cohort is factored out, the dimensions are even more striking (figure 11):

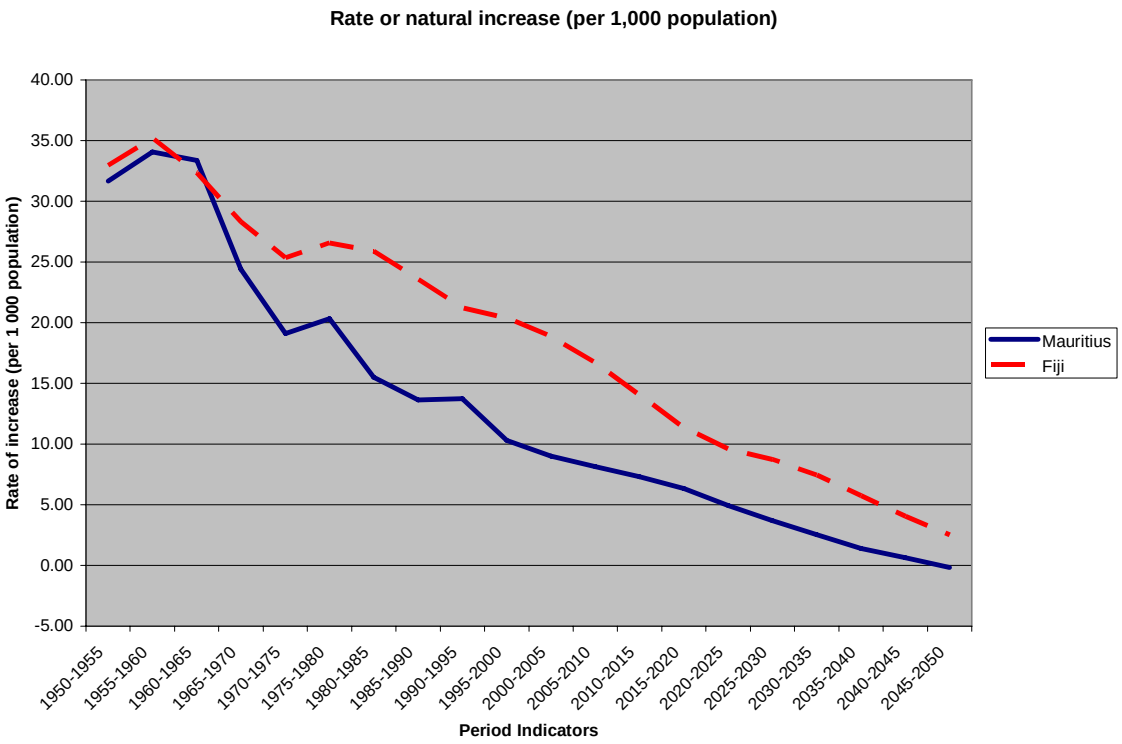
Figure 11: Mauritius and Fiji, Youth as a Percentage of Adult Population, 1950-2050



(Source: UN Population Projection, 2000 revision)

In 1996, one-third of the population in Fiji was between the ages of 10 and 24. That is, the base of the Melanesian population is young and broad; consequently, any decline in the rate of natural increase among Melanesians is bound to be gradual (figure 12):

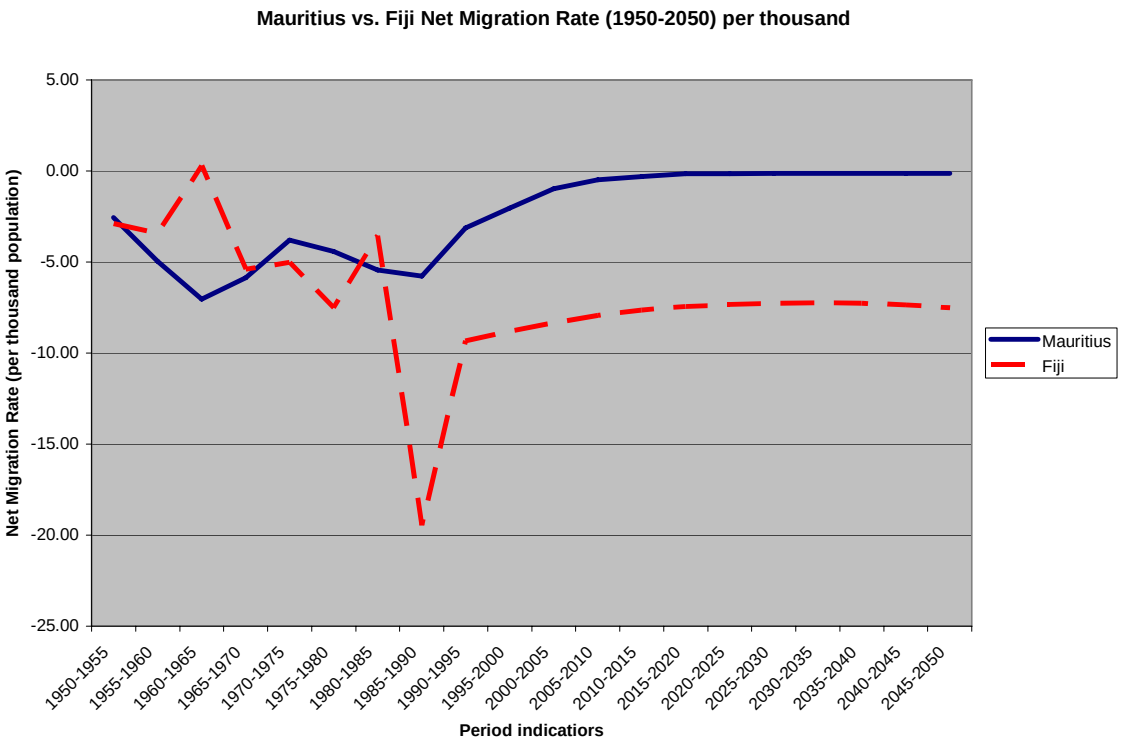
Figure 12: Mauritius and Fiji, Rate of natural increase (per 1,000 population), 1950-2050



(Source: UN Population Projection, 2000 revision)

The gap between the two ethnic groups on Fiji has always been narrower than that between Creoles and Indo-Mauritians. An Indian plurality has, therefore, never been a foregone conclusion in Fiji. On a territory claimed by Melanesians, that is of great importance. It means that native Melanesians never had to relinquish the hope of regaining control over "their" land. Out-migration and a decline in the TFR among Indians has made it possible for Melanesians to regain the plurality (figure 13):

Figure 13: Mauritius vs. Fiji, Net Migration Rate, 1950 – 2050



(Source: UN Population Projection, 2000 revision)

Formerly a dominant majority, Indians on Fiji now find themselves in the position of a subservient minority. As a result, the question is no longer one of a just political deal for Melanesians as a national minority. The concern is now the protection of Indians as a political minority. Issues of this sort tend to be difficult enough to resolve in countries that have already passed through the demographic transition. A satisfactory solution is likely to be complicated by demographic trends that favour the new majority and a majority whose claims are bolstered by a large cohort of youths who, in as many years, has twice taken up the Melanesian cause.

Still, the patterns that emerge substantiate the explanatory and predictive potential of a demographic dimension of inter-communal relations. The Mauritian population entered the demographic transition earlier than the Fijian population; therefore, it is older. Yet, both cases show

evidence of significant differentials in age structure. Nowadays, the ethnic populations on Mauritius are structured similarly to one another. On Fiji, by contrast, the formerly subservient minority's population is younger than the formerly dominant majority's population, whose demographic position has been undermined further by emigration. As a result, the minority has been in a position to challenge the majority's plurality. In the end, demography does appear to offer a viable explanation for differences in the outcome of inter-communal relations on Mauritius and Fiji.

Conclusion

The statistical analysis identified four key themes: Agricultural, Population, Population Density and Infant Mortality. The subsequently comparison posited differentials in age structure between groups as a plausible explanation for the different outcomes of intercommunal relations on the two island states. Demographic change per se never had a significant impact on the conflict in Mauritius because Indians had consolidated their majority early on, all population groups in the island state have been aging rapidly since the 1960s and, as a result, no one group has the sort of young age-structure dynamics that may call Indian hegemony into question. In Fiji, by contrast, migration temporarily spawned a very young Indian population which reproduced rapidly and, in the process, undermined the hegemonic demographic position of the native population. However, the younger population structure among Fiji's native population made it impossible for Indians to consolidate their temporary plurality. Owing to population aging and outmigration, native Fijians have been able to ensure that, unlike Mauritius, native Fijian instance on barring Indians from control of the state apparatus have ultimately proven successful.

The claim that ethnic-conflict situations where a non-dominant minority group has a younger age structure may prove problematic for political stability thus appears defensible. At the same time, the case of Fiji, notably the episodes of political instability starting in 1987 -- which, effectively, was triggered by the first-ever real possibility of having Indians at the helm – suggest that situations where the majority has a younger age structure than the minority may prove particularly volatile. This conclusion is actually what power-transition theory would suggest and is one that Monica Duffy Toft has shown to hold in a large-scale statistical analysis. Demographics, therefore, have not been problematic in Mauritius because the same group has always maintained numerical hegemony – and thus control of the state apparatus – and said group, concomitant with other communal groups on Mauritius, is also aging fairly rapidly. In so far as demographic change and difference is concerned, the comparison of Mauritius and Fiji thus suggests that the most volatile situations are those where a majority's hegemonic demographic situation is called into question but where the same group is eventually able to recapture a hegemonic position. This may be due to its younger age structure, co-ethnic immigration, or emigration by the other group. The younger age structure among a group that regains a demographically dominant position is problematic not only in so far as that it makes it possible for the group to regain demographic dominance but also because of the more general link between youthful populations and political instability.

This hypothesis (A) aggregates youth and population growth for each group, (B) is able to account for migration, holds as an explanation of ethnic violence across (C) time and (D) space, and (E) appears to have (potential) predictive power, that is, it is more than just another *ex post facto* explanation. The final point is especially noteworthy for the quantitative analysis suggested that Mauritius was "better off" demographically than Fiji, an observation subsequently confirmed by the comparative analysis.

Both the quantitative as well as the comparative analysis thus point to demographic change disaggregated by ethnic group as a viable approach to explaining different outcomes of intercommunal relations. What is more, the analysis suggested that demographics and related variables, such as land, may actually be more powerful predictors of different outcomes than grievance. Economic data, after all, did not feature prominently in the results which suggests that social and physical variables may be more important in an explanatory model of different outcomes of ethnic relations.

Yet, a comprehensive model should also consider political and ethnic data -- which were not considered in this investigation. The demographic criterion alone is most certainly too restrictive and should thus be expanded to include more variables. Furthermore, no inference can be drawn from the quantitative analysis as to the similarities between two countries because positive correlations were not part of the analysis. A stronger and clearer picture of the comparison would have been realized by the inclusion of such data. The search for negative correlations was further limited to those that turned out to be strong. Weak negative correlations, by contrast, may allow a model to take into account “weakly different”, “strongly different” or “not different”. The method applied in this paper allows inferences only regarding strongly different relationships.

These limitations notwithstanding, some important conclusions follow from the investigation. It was able to identify strong differences and some similarities between Mauritius and Fiji. It was able to isolate specific variables and these variables clearly validated a demographic approach. It was further able to establish demographic change and difference as well as in age structure not only between ethnic groups in Mauritius and Fiji. Subsequently, the comparative section was able to substantiate differences in size, differential demographic development, and age structure between groups as a viable explanation for different outcomes of ethnic relations in the two island states.

This is not just significant in so far as Mauritius and Fiji are concerned. In 1994, the United Nations Programme of Action for the Sustainable Development of Small Island Developing States (SIDS) was ratified in Barbados. The protocol sought to draw attention to the particular economic and environmental challenges faced by SIDS. In January of this year, Mauritius hosted the protocol's ten-year review. Among the emerging themes was the extent to which economic and environmental issues are tied to political stability. Since a majority of the 39 SIDS exhibit a high degree of ethno-cultural diversity, there is now a growing realization that managing inter-communal relations is a prerequisite for achieving economic and environmental goals. Ergo, being able to identify demographic patterns that may prove particularly problematic for intercommunal relations constitutes a significant contribution towards attaining these goals.

Two conclusions follow from this investigation. First, the demographic change that ensues in a system as a result of migration should not be posited as an unintended consequence. Rather, the disequilibrium it causes has a bearing on ethnic relations. Second, migration turns out to be particularly problematic when a native population's majority or even its plurality is challenged temporarily by migration but the native population's age structure makes it probable that it may one day recapture a position of demographic dominance. The propensity for serious political instability and possibly violence appears to be especially high once the native population is able to consolidate its hegemonic demographic position.

APPENDIX - COMPLETE LISTING OF VARIABLES PAIRS

Variable 1	Variable 2	Pearson Correlation Value (r)	Degree of Confidence (%)	Number of Cases (Number of Data Points)
UND26Y	MWDIPOPD	-1	95	7
UND26Y	MWDIPOPT	-1	95	8
UND26Y	MCAPTPOP	-1	95	5
UND26Y	MUND10Y	-1	95	9
WDIPOPD	MXXXUN10Y	-1	95	7
XXWFAOWO	XXXFAOWO	-0.999	95	34
WDIPOPD	MXXXWDOPD	-0.999	95	36
WDIPOPT	MXXXWDOPD	-0.999	95	36
MFAOEMPAG	XXWAPOPD	-0.998	95	17
MUND10Y	XXWUN26Y	-0.998	95	9
CIOD	MFAOWOODS	-0.998	95	5
XXWUN26Y	MUNUTPOP	-0.998	95	45
CIOD	XXWFAOWO	-0.997	95	6
UNUTPOP	XXWUN26Y	-0.996	95	45
XXWWDOPT	MFAOEMPAG	-0.996	95	17
XXWWDOPT	MXXXWDOPD	-0.996	95	36
UND10Y	XXWUN26Y	-0.995	95	
XXWATPOP	MXXXWDOPD	-0.995	95	36
UND26Y	MUND10Y	-0.995	95	9
UND26Y	MUNUTPOP	-0.995	95	9
MFAOEMPAG	XXWATPOP	-0.994	95	17
UND26Y	MSFTGTPOP	-0.993	95	9
UND26Y	MSFTGPOPD	-0.993	95	9
XXWAPOPD	MXXXWDOPD	-0.992	95	36
XXWUN26Y	SFTGTPOP	-0.992	95	42
XXWUN26Y	MXXXWCURPC	-0.991	95	45
XXWUN26Y	MXXXCURPC	-0.991	95	45
SFTGTPOP	MFAOEMPAG	-0.99	95	17
SFTGPOPD	MFAOEMPAG	-0.99	95	17
XXWUN26Y	UNUURBPC	-0.99	95	45
MFAOEMPAG	FAOLAREA	-0.99	95	16
WDIPOPD	MFAOEMPAG	-0.99	95	17
WDIPOPT	MFAOEMPAG	-0.99	95	17
MXXXWDOPD	UND10Y	-0.989	95	7
UND26Y	MWDIPOPT	-0.989	95	8
XXWUN26Y	MSFTGTPOP	-0.989	95	42
XXWAPOPD	MFAOEMPAG	-0.988	95	17
SFTGPOPD	XXWUN26Y	-0.988	95	38
XXWUN26Y	WDIPOPT	-0.987	95	37
MSFTGPOPD	XXWUN26Y	-0.987	95	38
XXWUN26Y	MWDIPOPD	-0.987	95	36
XXWUN26Y	MWDIPOPT	-0.987	95	37
MWDIPOPD	UND26Y	-0.986	95	7
XXXATPOP	MFAOLABTL	-0.986	95	17

SFTGTPOP	MXXXWDOPD	-0.986	95		36
SFTGPOPD	MXXXWDOPD	-0.986	95		36
WDIPOPD	XXWUN26Y	-0.986	95		36
Variable 1	**Variable 2**	**Pearson Correlation Value (r)**	**Degree of Confidence (%)**	**Number of Cases (Number of Data Points)**	
MXXXWDOPD	WDIPOPD	-0.986	95		36
MXXXWDOPD	WDIPOPT	-0.986	95		36
MXXXATPOP	CAPTPOP	-0.985	95		23
MXXXAPOPD	XXWAPOPD	-0.984	95		38
MXXXAPOPD	XXWWDOPT	-0.984	95		37
FAOLABTL	MXXXWDOPD	-0.982	95		17
MXXXAPOPD	XXWATPOP	-0.982	95		38
XXWAPOPD	MXXXWUN26Y	-0.982	95		45
XXWAPOPD	MXXXWUN26Y	-0.982	95		45
MXXXATPOP	FAOEMPAG	-0.981	95		17
UND10Y	MUND26Y	-0.981	95		9
FAOLABTL	MFAOEMPAG	-0.981	95		17
MXXXUN10Y	WDIPOPT	-0.981	95		8
XXWAPOPD	MXXXUN10Y	-0.98	95		9
MXXXUN10Y	WDIPOPD	-0.98	95		7
MXXXAPOPD	FAOEMPAG	-0.979	95		17
XXWWDOPT	MXXXATPOP	-0.979	95		37
MXXXWDOPT	XXWWDOPT	-0.979	95		37
XXWWDOPT	MXXXWDPPC	-0.979	95		37
XXWATPOP	MXXXUN10Y	-0.978	95		9
XXWCURPC	MXXXWDOPD	-0.978	95		36
XXXATPOP	MWDIGDPPC	-0.977	95		17
MXXXCURPC	FAOLAREA	-0.977	95		35
WDIPOPT	MXXXUN10Y	-0.976	95		8
MXXXWDOPD	CAPTPOP	-0.976	95		23
MXXXAPOPD	WDIPOPD	-0.976	95		36
MXXWUN10Y	UND26Y	-0.975	95		9
XXWATPOP	MXXXWDOPT	-0.975	95		37
MUND26Y	SFTGPOPD	-0.975	95		9
XXXATPOP	MCAPTPOP	-0.974	95		26
UNUTPOP	MUND26Y	-0.974	95		9
MXXXAPOPD	WDIPOPT	-0.974	95		37
XXWWDOPT	MXXXUN10Y	-0.974	95		8
SFTGTPOP	MUND26Y	-0.973	95		9
MXXXUN10Y	SFTGTPOP	-0.973	95		9
MXXXUN10Y	UNUTPOP	-0.973	95		9
MXXXWDOPD	UNUTPOP	-0.973	95		36
MXXXUN10Y	UND10Y	-0.972	95		9
UND26Y	MCAPTPOP	-0.972	95		5
XXWWDOPT	MXXXWUN26Y	-0.972	95		40
XXWUN26Y	MXXXWWDOPT	-0.972	95		40
XXWATPOP	MXXXWUN26Y	-0.971	95		45
MXXXUN10Y	SFTGPOPD	-0.971	95		9
MCAPTPOP	XXWUN26Y	-0.971	95		26

XXWATPOP	MXXXWUN26Y	-0.971	95	45
MXXXATPOP	WDIPOPD	-0.97	95	36
MXXXWDOPT	XXWAPOPD	-0.968	95	37
MXXXAPOPD	SFTGTPOP	-0.967	95	38

Variable 1	Variable 2	Pearson Correlation Value (r)	Degree of Confidence (%)	Number of Cases (Number of Data Points)
XXWCURPC	MXXXAPOPD	-0.967	95	38
WDIPOPT	XXWUN26Y	-0.967	95	37
MUND26Y	WDIPOPD	-0.967	95	7
MXXXUN10Y	XXWPGDPC	-0.967	95	9
XXWCURPC	MXXXUN10Y	-0.967	95	9
UNUTPOP	MXXXAPOPD	-0.967	95	38
MXXXAPOPD	SFTGPOPD	-0.966	95	38
CAPTPOP	MFAOEMPAG	-0.965	95	13
XXWAPOPD	UND26Y	-0.964	95	9
XXWAPOPD	MUND26Y	-0.964	95	9
CAPTPOP	MXXXUN10Y	-0.964	95	5
MXXXATPOP	FAOLABTL	-0.963	95	17
MUND26Y	XXWCURPC	-0.963	95	9
CAPTPOP	MUND26Y	-0.963	95	5
XXWUN26Y	MFAOLABTL	-0.962	95	17
UND26Y	XXCURPC	-0.961	95	11
MXXXWDOPT	WDIPOPD	-0.961	95	36
WDIPOPD	MXXXUN10Y	-0.96	95	7
MUND26Y	WDIPOPT	-0.96	95	8
MXXXWDOPT	FAOEMPAG	-0.958	95	17
PWTRGDPC	MUND26Y	-0.957	95	7
WDIPOPD	MXXXWDOPT	-0.957	95	36
MXXXAPOPD	UND10Y	-0.956	95	9
XXWATPOP	MUND26Y	-0.956	95	9
UNUURBPC	MUND26Y	-0.956	95	9
MXXXATPOP	WDIPOPT	-0.956	95	37
FAOEMPAG	MFAOEMPAG	-0.954	95	17
MXXXWDOPT	SFTGPOPD	-0.952	95	37
XXWUN26Y	MCIOD	-0.952	95	6
XXXATPOP	MXXXWDPPC	-0.951	95	17
SFTGTPOP	MXXXWDOPT	-0.951	95	37
WDIPOPT	MXXXWDOPT	-0.951	95	37
MXXXWDOPT	WDIPOPT	-0.951	95	37
XXWCURPC	MFAOEMPAG	-0.951	95	17
XXWCURPC	MXXXWDOPT	-0.951	95	37
MWDIGDPPC	XXWUN26Y	-0.949	95	17
WDIPOPT	MXXXWDOPT	-0.948	95	37
UND26Y	XXWWDOPT	-0.947	95	11
FAOLABTL	MXXXCURPC	-0.947	95	17
XXWCIOD	MXXXAPOPD	-0.947	95	37
UNUTPOP	MXXXWDOPT	-0.945	95	37
MXXXWDOPT	XXWCIOD	-0.945	95	37
CAPTPOP	MXXXCURPC	-0.944	95	23

XXXAPOPD	MFAOLABTL	-0.943	95	17
XXWWDOPD	XXWUN26Y	-0.942	95	39
UND26Y	XXWATPOP	-0.94	95	9
MWDIGDPPC	XXXAPOPD	-0.94	95	17
MFAOEMPAG	UNUTPOP	-0.94	95	17

Variable 1	Variable 2	Pearson Correlation Value (r)	Degree of Confidence (%)	Number of Cases (Number of Data Points)
WDIPOPD	MXXXUN26Y	-0.939	95	7
FAOLABTL	XXWUN26Y	-0.937	95	11
XXWUN26Y	FAOLABTL	-0.937	95	17
MXXXAPOPD	FAOLABTL	-0.937	95	17
XXWATPOP	MXXXCURPC	-0.937	95	45
MXXXAPOPD	CAPTPOP	-0.937	95	23
MXXXATPOP	XXWCIOD	-0.937	95	40
FAOLAREA	MXXXWDOPD	-0.935	95	35
MXXXUN10Y	XXWCIOD	-0.935	95	8
CAPTPOP	MXXXWDOPT	-0.934	95	23
MXXXWDOPT	UND10Y	-0.933	95	8
UNUURBPC	MFAOEMPAG	-0.933	95	17
MXXXWDOPD	XXWCIOD	-0.933	95	36
MXXXATPOP	FAOLAREA	-0.933	95	35
MXXXWDOPT	FAOLABTL	-0.93	95	17
MXXXWDOPT	FAOLAREA	-0.93	95	35
UNUURBPC	MXXXWDOPD	-0.929	95	36
MUND26Y	XXWCIOD	-0.928	95	8
XXWWDOPT	MXXXCURPC	-0.928	95	40
MXXXUN10Y	UNUURBPC	-0.926	95	9
XXWWDOPD	XXXATPOP	-0.925	95	36
XXWWDOPT	UND26Y	-0.924	95	9
MWDIOPEN	UND26Y	-0.922	95	8
XXWUN26Y	MXXXWDPPC	-0.92	95	17
FAOEMPAG	MXXXWDOPD	-0.919	95	17
MXXXAPOPD	UNUURBPC	-0.917	95	38
XXWWDOPT	XXXAPOPD	-0.916	95	37
MXXXATPOP	SFTGPOPD	-0.916	95	38
XXWAPOPD	MXXXCURPC	-0.915	95	45
FAOEMPAG	XXWUN26Y	-0.914	95	12
XXWUN26Y	XXWCIOD	-0.914	95	43
XXWCIOD	XXWUN26Y	-0.914	95	43
FAOEMPAG	MXXXCURPC	-0.913	95	17
XXWWDOPD	XXXAPOPD	-0.913	95	36
MUND26Y	XXWPWTOP	-0.911	95	9
CAPTPOP	MXXXUN26Y	-0.911	90	5
MUND26Y	XXWWOPEN	-0.91	95	8
PWTRGDPC	MXXXUN10Y	-0.909	90	8
UND26Y	MWDIOPEN	-0.905	95	8
MXXXATPOP	XXWATPOP	-0.905	95	42
XXWWOPEN	UND26Y	-0.904	95	8
XXWUN26Y	MWDIOPEN	-0.904	95	37

MPWTOPEN	XXWUN26Y	-0.902	95	38

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Endnotes

[1] This presumes a "normal" age structure, that is, a population that does not, say, consist exclusively of children.

[2] By definition, Creole refers to a mixture. In the context of Mauritius, Creoles are colored people who trace their origins to Madagascar and East Africa, especially Mozambique; therefore, their ethnic background is diverse.

While that fragmentation is manifest among the Indian community, religious divisions appear to trump linguistic ones. Although 65 per cent of the population in Mauritius is of Indian ancestry, for instance, its Muslim contingent (17 per cent), its Dravidian contingent (6 per cent Tamil and 3 per cent Telugus), and its Marathi contingent (2 per cent) have rarely aligned themselves politically with the North Indian Biharis (42 per cent). What communal cohesion is concerned, however, that categorization is somewhat misleading. Hindus are commonly understood as a religious group whereas Tamils and Telegus are commonly understood as a cultural and, to a lesser degree, linguistic group. But on Mauritius, Hindu has more of a cultural than a religious connotation. That has the effect of reinforcing ethnic cohesion among Indians (Alber 1994). Many older rural Indo-Mauritians still communicate in Bhojpuri (a Hindi dialect) although Hindi and Urdu are also common. Similarly, one might expect Hindus to be divided along caste lines. For Indo-Mauritians, however, castes do not represent strict endogamous units. Marriage and kinship cut across caste lines. The ethnic division of labour on the island further reinforces group cohesion: Hindus and Muslims tend to work in rural agriculture, especially the sugar industry (Eriksen 1997). Inter-ethnic marriages are rare and in the fewer than 1 in 10 cases where they do occur, the evidence suggests they have consolidated, not undermined, ethnic consciousness (1989: 148-154; 1997; 1998: 121-130; Oodiah 1992: 59; Nave 2000). On closer examination, then, Indo-Mauritians constitute more cohesive a community than an initial glance might suggest.

[3] http://www.cidcm.umd.edu/inscr/stfail/

[4] It is also possible for a positive correlation to exist in the case of two variables which are always decreasing instead of increasing.

[5] As a clarification, we can reword this sentence to have an equivalent meaning: A value of -1.0 … indicates that one variable is increasing as the other is always decreasing. Pearson correlation, unlike linear regression, is only concerned with the relationship, rather than predictions, between two variables, and thus you can evoke the "vice versa" statement without changing the meaning.

[6] http://www.cidcm.umd.edu/inscr/stfail/

[7] http://www.cidcm.umd.edu/inscr/mar/

[8] http://www.prio.no/cwp/ArmedConflict/

[9] http://cow2.la.psu.edu/COW2%20Data/WarData/InterState/Inter-State%20War%20Format%20(V%203-0).htm

[10] http://www.cidcm.umd.edu/inscr/stfail/

[11] A ranking variable is one that uses an arbitrary number system to represent a conclusion. For example, the democracy level of a country could be represented by the numbers 1 through 10. There are methods by which one could evaluate ranking statistics, but Pearson correlations do not apply to them.

[12] The Data Dictionary is included as an Appendix. The full data dictionary for the Phase III State Failure Task Force dataset can be found at http://www.cidcm.umd.edu/inscr/stfail/sfdata.htm . If variable 1 and variable 2 were switched, they would still generate the same correlation data. The prefix M signifies that the data is from Mauritius for the labeled variable.

[13] UND26Y

[14] Agricultural results are excluded from this category because those variables do not have a monetary component.

[15] All subsequent graphs in this section draw on the same census data.

[16] Data after 1973 are based on estimates because collection of data by ethnic group was halted beginning with the census in 1983