Why Do Some Countries Win More Olympic Medals? Lessons for Social Mobility and Poverty Reduction

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Not everyone in our country has equal access to competitive sports. Many are not effective participants on account of ignorance or disinterest, disability or deterrence. This analysis considers two separate arenas for enlarging the pool of effective participants, one related to sports and other to social mobility. In both cases, this paper finds the plausibility of an explanation based on effective participation rates. It examines what country characteristics are associated with greater success in the Olympics at the macro level by considering indicators such as health, education, and especially three variables of information and access (road length per unit of land area, the share of urban population and radios per capita). It also analyses the opportunities and achievements in the villages of two states, Karnataka and Rajasthan.

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Compared to its share in the world's population, India's share of Olympic medals is abysmally low. In the 2004 Olympic Games, for example, India won only one medal. Turkey, which has less than one-tenth of India's population, won 10 times as many medals, and Thailand, which has roughly 6 per cent of India's population, won eight times as many medals. India's one-sixth share in the world's population translated into a 1/929 share in 2004 Olympic medals. While Australia won 2.46 medals per one-million population and Cuba won 2.39 medals per one-million population, India brought up the bottom of this international chart, winning a mere 0.0009 medals per one-million population. Nigeria, next lowest, had 18 times this number, winning 0.015 medals per one-million population.[1] Why does the average Indian count for so little?

What prevents the translation of India's huge number of people into a proportionate – or even near-proportionate – number of Olympic medals? The gross domestic product certainly matters, as previous analyses have indicated [Bernard and Busse 2004], but something else also seems to be making a difference, given that Cuba, Ethiopia, Kazakhstan, Kenya and Uzbekistan – countries not known for having high average incomes – have won many more medals than India, despite having a far smaller national population. Why do 10 million Indians win less than one-hundredth of one Olympic medal, while 10 million Uzbeks won 4.7 Olympic medals?

In this article, we explore the concept of *effectively participating population*, arguing that not everyone in a country has equal access to competitive sports – or for that matter, to other arenas, including the political and economic ones. Many are not effective participants on account of ignorance or disinterest, disability or deterrence.

Amartya Sen (2002: 13-14) remarks, in the context of the economy, that "the ability to participate depends on a variety of enabling social conditions. It is hard to participate in the expansionary process of the market mechanism (especially in a world of globalised trade), if one is illiterate and unschooled, or if one is weakened by undernourishment and ill-health, or if social barriers… discrimination…no capital…no access…exclude substantial parts of humanity from fair economic participation". Barriers of different kinds can limit the pool of effective participants. Enabling social conditions help deepen and widen this pool.

In the arena of sports similarly, only a fraction of all potential athletes in any country constitutes the pool of active contestants. Olympians are drawn, not from the entire population of a country, but only from the share that is effectively participating.

The size of the effectively participating fraction varies from country to country, ranging hypothetically from zero to one. Countries where the fraction of effective participants is closer to one are better able to convert their pool of talent into medal-winning records. In other countries, where opportunity is less widely distributed, the fraction of effective participants is closer to zero. The talent pool in such countries is less effectively utilised. A large population may not count for very much; very few potential athletes actually participate and compete.

Low medal tallies can arise both because a country has very few people and because very few of its people effectively participate. Different debilitating factors can limit effective participation. Ill-health and poor nutrition can hamper early childhood development [Haddad et al 2003; Quisumbing 2003]. In addition, lack of information and lack of access can effectively exclude large swathes of a country's population from the competition. The resulting small percentage of effective participants helps explain more fully why despite a large population – and a large potential talent pool – a country ends up winning very few Olympic medals.

That one billion Indians together won only one Olympic medal seems otherwise hard to explain. Any explanation based on race or genetic characteristics seems facile simply on account of the immense diversity found in India. But if a vast majority of Indians are not effective participants, possibly because information about these events is available to a tiny number – and a tinier number yet know where and how to avail themselves of these opportunities – then a more complete explanation for poor performance comes to hand. Possibilities for institutional reform can be identified that can help perform valuable tasks even beyond the sports arena.

Not only for Olympics, but also in regard to Nobel Prizes, mathematical and scientific excellence, winning patents, etc, enlarging the pool of effective participants can be importantly applied. In this analysis, we consider two separate arenas, one related to sports and the other to social mobility. In both cases, we examine the plausibility of an explanation based on effective participation rates. Since the numbers of effective participants are not readily available – this concept, like some other valuable ones, such as democracy, social capital and human well-being is not easy to pin down in terms of a precise metric – we rely in our analysis on two sets of surrogate evidence.

In this paper, we first consider the *macro-national level*, we examine the question: What country characteristics are associated with greater success in the Olympic Games? We use country-level data to test several hypotheses about the determinants of Olympic success. In addition to GDP, we consider some other indicators related, respectively, to health, to education, and to "connectedness" (i e, information and access). Three variables – road length per unit of land area, share of urban population, and radios per capita – act as surrogates for connectedness in this part of the analysis, helping test the hypothesis about effective participation.

Secondly we take the analysis into a separate arena, concerned with social mobility. We look at the *micro level*, examining opportunity and achievement in villages of two Indian states, Karnataka and Rajasthan. As the national economy has grown rapidly over the past 10 years, what self-advancement gains were recorded by younger villagers? Who achieved what by way of positions in the national economy? What separates relatively high-achieving younger villagers from relatively low-achieving ones? Is there, once again, a story here about effective participation rates?

The macro as well as the micro part of the analysis show that public information matters a great deal. Individuals who are better informed and better connected to opportunities tend to perform comparatively better than other equally capable and equally educated individuals. At the country level, information and connectedness also make an important difference. Countries in which information and access are more widespread – where the potential for effective participation is comparatively high – tend to win a higher share of Olympic medals. Of course, other things also matter. Training facilities and coaching standards matter. The quality of equipment provided also matters. In general, richer countries should be expected to perform better in these regards. But we find that public information still has an important effect. Enhancing public information will deepen and widen the pool of effective participants, enabling individuals to find positions more commensurate with their abilities, and simultaneously enabling countries to ratchet up their performance in diverse arenas.

1 Macro-Level Analysis

Different regression models were used to examine the relationship between key national characteristics and Olympic success. The question was posed in two ways: First, what factors contribute to a country's ability to take home a greater share of the available medals? Second, what factors seem to determine the likelihood that a country will win at least one Olympic medal?

1.1 More Informed Populations Perform Better

A starting assumption for this analysis is that potential Olympians are randomly distributed among populations.[2] All other things being equal, we would expect to be able to predict the Olympic medals won by a country based upon its share in global population. Clearly, such an analysis does not work in the case of India. The figures in Table 1 (p 145) show that it is also unhelpful in the case of other countries.

The first column of Table 1 provides population-projected medal totals for the 2004 Olympic Games for the 20 most populous countries.[3] The third column of this table gives the actual numbers of medals won by these countries at the 2004 Olympics held in Athens. Five of these countries overachieved based on the size of their populations, 14 others underachieved, and one country (Turkey) exactly matched its predicted medal total. The greatest overachievements were recorded by Russia and Germany, both of which won more than four times as many medals as were predicted by their population share. Pakistan, Bangladesh, Vietnam and the Philippines failed to win a single medal, while India won just one of its predicted 157 medals.

Although a larger population does contribute to greater Olympic success, it turns out to be a poor predictor when considered in isolation from other factors. A simple regression of a country's share of Olympic medals on the natural log of its population explains only about 16 per cent of the variance in the dependent variable (Table 2).

One must therefore look toward other country characteristics to explain why some countries are comparatively more successful in producing Olympic medal winners. Bernard and Busse (2004) explain Olympic success in terms of both population and economic resources, asserting that GDP is the best predictor of national Olympic performance.

National wealth undoubtedly plays an important role in a country's capacity to produce athletes. Athletes in rich countries will quite likely have better facilities and equipment and therefore have an advantage over athletes from poorer countries. The second column of Table 1 shows the predicted medal counts of the same 20 countries, but this time the predicted figures are based upon the natural log of the country's population as well as its GDP per capita. Including per capita GDP brings the predicted medal count closer to the actual medal count for 15 of the 20 countries, the exceptions being the United States, Russia, Turkey, Iran and Thailand. Additionally, the difference between the predicted and actual number of medals won on average by all of these countries falls from 31.1 to 17.6 medals. Few would dispute the importance of relative wealth, but wealth is nevertheless an incomplete response to the question of who wins how many medals at the Olympic Games. The regression equation considering GDP per capita and population size still accounted for less than one-third of the total observed variation in medals tallies (Table 2).

Table 1: Predicted and Actual Medal Totals for the 2004 Olympics

Country	Prediction I (Population)	Prediction II (Population and Per Capita GDP)	Medals Actually Won
China	188	20	63
India	157	19	1
United States	43	32	102
Indonesia	32	13	4
Brazil	27	15	10
Pakistan	22	12	0
Russian Federation	21	15	92
Bangladesh	20	11	0
Nigeria	19	11	2
Japan	19	24	37
Mexico	15	14	4
Germany	12	22	49
Vietnam	12	10	0
Philippines	12	11	0
Egypt	11	10	5
Turkey	10	12	10
Ethiopia	10	8	7
Iran	10	11	6
Thailand	9	11	8
France	9	21	33
Average difference between predicted and total	32.15	17.65	

Table 2: Share of Medals (OLS Models)

	Dependent Variable: Percentage of Total Medals Won		
Variable	Model 1	Model 2	Model 3
Log of population	0.2903998**	0.3380099**	0.3090126**
	(0.0244275)	(0.0257944)	(0.0284423)
GDP per capita		0.0000648**	0.000012
		(.00000542)	(0.0000103)
Life expectancy			-0.0082981
			(0.008474)
Primary school enrolment			-0.0000248
			(0.0038261)
Radios			0.0024599**
			(0.0002191)
Per cent urban			0.0074302*
			(0.0031728)
Roads			0.0001494
			(0.0056119)
Host country			3.869344**
			(0.5227088)
Constant	-3.974535**	-5.282913**	-4.547654**
	(0.3817463)	(0.411508)	(0.5688057)
R^2	0.1626	0.3215	0.6369
N	730	651	341

* $p<0.05$, ** $p\leq0.001$.
Standard errors are in brackets.

Other factors also need to be considered in order to construct a more complete explanation. Further, it needs to be explored why and how economic resources can make a difference. For policymakers, the important question is: how should the available resources be put to their best use? To help with this objective, we looked additionally at four other factors that could potentially contribute to Olympic success by facilitating higher effective participation. We consider health, education, public information and physical connectedness.

Health Hypothesis: A promising young athlete will clearly be less likely to develop into an Olympian if he or she is unable to remain healthy. Countries vary a great deal in the degree to which they are able to maintain healthy populations. Some of this variation can be attributed to unalterable climatic and geographic factors, but policy decisions surely play an important role in the public's health. For this analysis we use life expectancy at birth as an indicator of the general health level of the population. Life expectancy has an advantage over other general health indicators (e g, infant mortality rate), since it is more likely to capture the effect of the HIV/AIDS pandemic, particularly acute in certain countries and affecting an older age group.

Education Hypothesis: Education might plausibly affect the likelihood that an athlete becomes an Olympian in two ways. First, it is possible that gaining literacy, numeracy, and exposure to ideas through the process of education contribute to the ambition of a young athlete. Alternatively, it may be that by attending school a gifted athlete is more likely to be "discovered" by a coach or teacher, who can then contribute to the development of this individual. Primary school enrolment rates are used to test this hypothesis.

Public Information Hypothesis: Public information might also plausibly contribute to Olympic success by inspiring the ambition of young athletes. A talented individual might begin to dream about becoming an Olympic athlete only after watching the Olympics on television, listening to them on the radio, or reading about them in the newspaper. We use available statistics for radio receivers per 1,000 residents as an indicator for the average level of public information in a country.

Physical Connectedness Hypothesis: It is difficult to imagine how many potential Olympians are born in remote and isolated communities. Their talents may never be discovered, their dreams of success not reaching far beyond their immediate surroundings. The degree of "connectedness" of a country's population seems reasonably to be a plausible contributor to the development of the pool of athletic talent. We measure connectedness in two different ways, using the percentage of the population in urban areas and the kilometres of road per 1,000 hectares of land area.

Controlling for differences in per capita GDP, we examined the relative importance of these four other factors, considering data from the summer Olympic Games held between 1992 and 2004.[4] The data concerning Olympic medals were gathered from the web site of the International Olympic Committee.[5]

The analysis reported below does not distinguish between gold, silver and bronze medals.[6] Medals awarded in team sports were counted, following convention, as a single medal.

The source of all non-Olympic data is the World Bank's World Development Indicators (WDI) database. Published data are missing for the year of a particular Olympics, necessitating certain adjustments in the analysis. Because life expectancy figures were largely missing for 1996, the 1997 data were used instead while analysing results from the 1996 Games. Similarly, for primary school enrolment, 1991 data were used for examining results from the 1992 Games, and 1999 data were used for the results of 1996. There was no information on radios per 1,000 inhabitants for the years 2000 and 2004 or any of the intervening years. Because this number can change relatively quickly, we perforce had to drop the 2004 Games while examining the impact that radios can make. But we were able to examine this variable for earlier Olympic Games. For instance, we used radios data for 1997, while examining the medal tally for the Olympic Games held in 2000. All per capita GDP figures were adjusted for purchasing power parity (PPP).[7]

The results of this analysis are presented in Table 2. Three ordinary least squares (OLS) regressions were estimated. The first two models cover all four summer Olympics from 1992 to 2004. These models use a sparse set of independent variables. For the third model – which considers a larger group of independent variables – we had to exclude the 2004 Olympics, because data for many of these independent variables were simply not available.[8]

The first two models support the notion that larger and wealthier countries win more medals. Model 1 looks only at population size. This variable is clearly significant for the explanation, but only a very small part of the variation is explained. Model 2 looks jointly at GDP per capita and population size. A greater but still quite small part of the variation is explained. Interpreting these results, one learns that a country can be expected to win an additional 0.34 per cent of all medals for every 1 per cent increase in its population size. Raising the per capita GDP by 1,000 dollars yields an additional 0.06 per cent of the available medals.

Model 3 considers a larger group of variable. Correspondingly, it explains a much greater proportion of the variation. Population size remains significant when the additional variables are considered, but GDP per capita loses its significance. Instead, radios per 1,000 Population and per cent urban gain significance along with a dummy variable for the host country.[9]

While population remains an important predictor of Olympic success, we can no longer reject the hypothesis that per capita GDP has no effect on a country's share of medals; instead, radio ownership is strongly and positively associated with Olympic success.[10] Increasing the number of radio receivers in a country by 10 per 1,000 residents yields a 0.02 per cent increase in the share of medals won. Stronger effects became visible in a different model, discussed below.

Table 3 demonstrates the improved predictive power of Model 3. Data from the 1996 Olympics are used here, because that was the most recent Olympics for which the data on radios per 1,000 residents are also available. The first two columns in this table are similar to the first two columns of Table 1, showing a predicted medals tally calculated on the basis, respectively, of population size and population-plus-per capita GDP. In addition, a new column has been added, showing predicted medal tallies based on the full regression model, which incorporates the larger set of independent variables. The predictions improve significantly when in addition to population and GDP per capita, radio ownership and urban percentage are also considered in the analysis. The average discrepancy between predicted and actual medals falls further to 12.65.

Since life expectancy, school enrolment, radio ownership and infrastructure can presumably increase together with per capita income, an obvious concern with these results is about collinearity. However, tests showed that collinearity is not a serious concern here.[11]

Table 3: Predicted and Actual Medal Totals for the 1996 Olympics

Country	Prediction I (Population)	Prediction II (Population and GDP)	Prediction III (Full Model)	Medals Actually Won
China	176	17	19	50
India	137	16	14	1
United States	39	30	81	101
Indonesia	28	12	10	4
Brazil	24	14	13	15
Pakistan	18	10	8	0
Russian Federation	21	13	13	63
Bangladesh	17	9	7	0
Nigeria	15	9	10	6
Japan	18	25	25	14
Mexico	13	13	9	1
Germany	12	22	23	65
Vietnam	11	8	6	0
Philippines	10	9	6	1
Egypt	9	8	9	0
Turkey	9	10	6	6
Ethiopia	8	7	9	3
Iran	9	10	7	3
Thailand	9	11	8	2
France	8	21	22	37
Average difference between predicted and actual medal tally	29.55	16.5	12.65	

We move now to a second specification of regression models, where using probit analysis, we identified factors that are significantly associated with winning any medals at all. In 2004, the available 929 medals were captured by only 75 countries, i e, less than 40 per cent of all countries of the world. In order to estimate the likelihood of a country winning at least one medal, a probit model was run. The same independent variables were considered as are included in the full OLS model above.

The results of the probit analysis (presented in Table 4) are similar to what was derived above in the OLS analysis. Population, GDP per capita, and radios per 1,000 residents are all associated with a significantly greater likelihood of winning at least one Olympic medal. All other variables have no explanatory value.

Table 4: Medal Winner Probit Model: Marginal Effects and Standard Errors

Variable	Marginal Effect
Log of population	0.4833295**
	(0.0631575)
GDP per capita	0.0000796**
	(0.0000213)
Life expectancy	0.0154686
	(0.0157973)
Primary school enrolment	0.011911
	(0.0074337)
Radios	0.0013561*
	(0.0005026)
Per cent urban	-0.008803
	(0.0059207)
Roads	-0.0027442
	(0.01069)
Constant	-10.42297**
	(1.254978)
Pseudo R^2	0.40
N	339

* $p<0.05$, ** $p\leq 0.001$.
Dependent Variable: Scored 1 if Country won any medal, and scored 0 otherwise.

There is a striking difference in the magnitude of the effects associated with different significant variables. The marginal effect on the probability of winning a medal of adding one radio per 1,000 residents is equal to the effect of increasing GDP per capita by 17 dollars. In other words, a single radio is worth 17,000 dollars in terms of its impact on the likelihood that a country will win any Olympic medal. Public information, using the means available to reach as many people as possible, especially ordinary people, produces results in terms of effective participation whose quantitative value is very high.

These statistical results can be illustrated by looking at individual country cases. Jamaica is an example of a country whose unusual Olympic success might at least partially be associated with its high rate of radio ownership. A small country, whose population has ranged between 2.4 and 2.6 million, Jamaica falls well below the median in terms of per capita GDP. In 1992, for example, Jamaica's GDP was $ 3,895 per person, compared to the global median figure of $ 4,743. Using only population and GDP, all of the models above would predict that Jamaica does not win a single Olympic medal. In fact, this country has performed surprisingly well, winning four, six, seven, and five medals in the last four Olympics. One reason for this success may be Jamaica's high number of radios. Jamaica had 430 radios per 1,000 residents in 1992, well above the world median figure of 258, and roughly equal to the radio ownership rate of Greece and Malaysia, both of which were much wealthier than Jamaica in terms of per capita GDP.

Portugal illustrates the opposite case. It is a relatively wealthy and populous country, but one with low radio ownership and poor Olympic performance. In 1992, despite a population of almost 10 million and a per capita GDP of $14,761, Portugal did not win a single Olympic medal. Based on its population size and its per capita GDP, our model predicted that it should have won nine Olympic medals. But in 1992, Portugal had on average only 229 radios per 1,000 residents, far lower than much poorer Jamaicans possessed at the same time. By 1996, Portugal's rate of radio ownership had risen to 303, just above that year's world median figure of 295 radios. In that year, Portugal won two of its predicted 10 medals. The same trend continued in the next two Olympics: Portugal won two of its predicted 13 medals in 2000 and three of its predicted 12 medals in 2004.

It would be unjustified to claim that increasing radio density caused this improvement in Portugal's or any other country's performance. Any such claim needs to be tested using longitudinal data.[12]

However, the observed robust association and its intuitive logic cannot be disclaimed. The fact that larger and wealthier nations have greater success in the Olympics has been well-documented by prior studies. The importance of public information, as measured here in terms of one component, radios, has been largely unappreciated so far. These crude, national-level statistics are a rather blunt instrument for examining what is undoubtedly a complicated relationship between information, effective participation and Olympic success. It is certainly plausible, however, that greater public information enables a larger portion of a nation's population to learn about the Olympic Games, understand what they entail, and figure out how one can prepare oneself to compete for a position on the national team. Public information can thereby enlarge the group of motivated athletes who can more effectively participate. Children and young adults who hear about the Olympics on the radio are more likely to become motivated by aspirations of Olympic glory.

Information matters critically. Who competes depends in the first place on who knows what there is to compete about. Effective participation rates depend crucially on there being ample public information. The consistent significance of the variable, radios, picks up on this fact.

Being rich on average is not enough. Giving the population opportunities to participate – and public information about these opportunities – is essential for bringing a larger fraction of a country's talent pool to light.

Other evidence – from domains other than competitive sports – shows similarly how more "connected" individuals are better able to connect their talents with opportunities in diverse domains. Newly minted software engineers are drawn disproportionately from households with two educated parents [Krishna and Brihmadesam 2006]. Rather than wealth it is information and social networking that distinguishes those who succeed in procuring a higher-paying position. In a context where institutionalised sources of career information are absent, two educated parents constitute a considerable comparative advantage. Information, rather than wealth or social status, also matters for who participates in various democratic activities [Krishna 2006].

In diverse arenas, public information might have the same effect of enlarging the ratio of effective participants. We look for these effects next within a separate arena, considering social mobility at the individual level within villages of two Indian states. While social mobility and Olympic success are hardly directly connected with one another, achievements in both fields are commonly and importantly affected by information flows.

Not only achievements, but also people's aspirations become limited when they know little about what they can potentially become. A low aspiration frontier exists in the communities that we studied. It is a result, we argue below, of a number of factors, primary among which is lack of information about available opportunities.

The provision of public information is associated, at the macro level, with Olympic success, and at the micro level, with individual mobility. The common importance of information in two such diverse arenas suggests that it would be worth exploring its effects more broadly, considering in addition other fields of human achievement.

2 Micro-Level Examination

In this part of the analysis, we examine micro-level achievements in villages of two Indian states, Rajasthan and Karnataka.

2.1 Better-Informed Individuals Achieve More

While these states are quite different in terms of diverse socio-economic indicators, they have one thing in common which bears importantly on aspiration and achievements: In order to make any real advance in life, young people need to go out from their village and obtain a position in the city.

The scope for any considerable advancement is very limited in agriculture. While productivity in non-agricultural occupations has steadily increased, per worker productivity in agriculture has remained virtually stagnant through the 1990s. In Karnataka the ratio of per worker productivity in the non-agricultural occupations to that in agricultural occupations was 8.53 in 2004-05; in the same year, this ratio in Rajasthan was 5.36. Earning differentials between city and village reflect these differences in per worker productivity. Over nearly all of India, as a recent government report observes, "the slowing down and stagnation of agricultural growth has adversely affected the income and employment of a vast majority of rural people" [GOI 2007: 13]. While productivity per worker increased only marginally in agriculture, the average area operated decreased substantially from 2.63 hectares in 1960-61 to 1.06 hectares in 2003. The terms of trade between agriculture and non-agriculture follow an almost flat trend over the last 20 years. Compared to the bundle of non-agricultural goods and services that she could purchase 20 years ago, the average rural resident can afford to purchase fewer goods and services at the present time.

Table 5a: Highest Positions Achieved in 20 Rajasthan Villages (1996-2006)

Accountant	(2)	Lineman	(2)
Clerk typist	(4)	Panchayat secretary	(2)
Doctor	(1)	Police constable	(4)
Driver	(2)	Messenger	(2)
Civil engineer	(1)	Schoolteacher	(22)
Land records assistant	(3)	Soldier (Jawan)	(9)
Lawyer	(1)	Software engineer	(1)

Source: Original data collected in 2006.

Table 5b: Highest Positions Achieved in 20 Karnataka Villages (1996-2006)

Accountant	(3)	Panchayat secretary	(2)
Clerk typist	(6)	Police constable	(11)
Doctor	(1)	Messenger	(2)
Driver	(2)	Nursing assistant	(1)
Engineer	(3)	Schoolteacher	(20)
Land records assistant	(3)	Soldier (Jawan)	8)
Lawyer	(4)	Veterinary assistant	(2)
Lineman	(2)		

Source: Original data collected in 2006.

Table 6: Percentage Reporting Different Career Aspirations (in %)

	Rajasthan	Karnataka
Relatively high-paying positions		
Accountant	>1	>1
Business manager	>1	>1
Doctor	2	2
Engineer	3	4
Lawyer	2	1
Senior government official	3	1
Other well-paid positions	1	2
Lower-Paying Positions		
Schoolteacher	43	39
Army recruit	13	5
Policeman	11	12
Other low-level government positions	15	22
Other low-paid private occupations	5	11

1,456 respondents aged between 14 and 22 years.

Talent finds very little opportunity in the countryside. In order to connect with opportunity, talented young villagers move to the city.

Who succeeds and who does not in these efforts to get ahead? Do all young people with the same level of education tend to perform equally well, by and large? What can be done to more effectively deploy the pool of available talent?

We undertook small-scale surveys in 2006, intended to provide some preliminary answers to these important questions. Table 5a provides data from the survey conducted in 20 villages selected at random in two districts, Ajmer and Udaipur, of Rajasthan. Table 5b provides the same information in the case of the 20 Karnataka communities, selected randomly in two districts, Dharwar and Mysore. While certainly not representative of the entire state or even of the districts concerned, these results are illustrative of the nature of opportunities available to villagers such as these.

Focus groups in each village were asked to name the three highest positions – in any walk of life – that anyone from their village had achieved within the past 10 years. The highest positions reported in the 20 Rajasthan villages are reproduced in Table 5a.

About 300 individuals in these villages graduated from high school during this period of 10 years, yet only one was able to become a software professional, one other became a civil engineer, one became a medical doctor, and one is practising as a lawyer in the district courts. In the largest numbers, the highest-ranked occupations actually achieved by young people from these villages were those of schoolteacher and soldier in the army.

Table 5b shows that within villages of Dharwar and Mysore, of Karnataka, a very similar situation has prevailed. One doctor, three engineers and four lawyers from among all of 60,000 people – these are the highest achievements in all of the past 10 years from these 20 Karnataka villages.

Aspirations for future employment that young people in these villages currently hold are similarly restricted, with mostly low-paying positions occupying people's minds. We asked each of more than 1,000 young village respondents currently attending schools what they hoped to become – what careers they wished to follow and what positions they aspired to achieve – after finishing their studies. These reported aspirations are divided in Table 6 into high-paying and low-paying ones, based on the salary levels and positional status that such positions usually tend to provide.

These results show that young villagers' career aspirations are limited in the extreme. Around 40 per cent of young adults in these Rajasthan and Karnataka villages aspire to become a schoolteacher. A second chunk aspires to become bus conductors, typists, messenger boys, and the like, and a third chunk wish to enlist in the army or police. Schoolteachers, low-level government employees, and soldiers are what they have seen other people from their village become. Indeed, these are the highest positions achieved by anyone from their communities.

A total of 87 per cent of young villagers in Rajasthan (and as many as 91 per cent in Karnataka) aim no higher. Their parents, interviewed separately, had a largely similar pattern of aspirations in regard to their sons and daughters. (Not one among these villagers interviewed expressed any desire to become an Olympic athlete or any other type of sports personality.)

Low information availability has a large part to play in explaining these occurrences. Experiences from the past along with expectations for the future combine to keep most villagers trapped within a low-level equilibrium. Very few among them have vaulted themselves into high-paying positions, and very few aspire – and fewer still plan and actively work – toward making any such move for themselves in the future.

Table 7 helps show the close relationship that exists between low information, on the one hand, and low aspiration, on the other. We asked all respondents, selected randomly among all school-going 14-22 year-olds in these villages, about what they dreamed of becoming in years to come after finishing their studies. Each respondent was also asked about which among 10 different information sources he or she usually consulted, including family members and neighbours, local officials and community meetings, newspapers, radio and television, and government officials and NGO sources. The total number of information sources was averaged separately for high-aspiring and the low-aspiring individuals. Separately, the parents of each of these individuals were also interviewed by us. These data for parents' education and information sources are also reported in Table 7.

Table 7: Aspects Related with Low and High Career Aspirations

	Rajasthan		Karnataka	
	High Aspiration	Low Aspiration	High Aspiration	Low Aspiration
Number of information sources (student)	8	5	6	3
Number of information sources (parent)	8	6	6	3
Years of education (parent)	12	5	12	5

These results show that individuals who consult a wider range of information sources are also the ones whose aspiration levels are higher. Their parents are also comparatively better informed. Most importantly, these parents are much better educated than those of respondents with lower aspirations.

Educated parents make a big difference because no career counselling services or employment exchanges operate in any of these rural areas. Information about career possibilities is circulated by word-of-mouth, and individuals whose parents are more educated get plugged into more and better information networks, becoming more knowledgeable about a wider range of possibilities. The education levels of the adults in a family are consistently significant, therefore, in explaining higher educational attainment. More educated, better informed, and somewhat better off parents separate the thin slice of high aspirers from the large bulk of low aspirers in Indian villages.

Remedying this unfortunate situation – through making available institutional sources of information and career guidance – will be important for making better opportunities available, especially to the more talented and harder-working. Among educated young people in villages, only a tiny few aspire to belong to what Castells (2004: 3) refers to as "the network society," implying by this term a social structure "made of networks powered by microelectronics-based information and communications technologies".

Raising the aspirations of young people in villages will require connecting them better to diverse sources of information about employment opportunities. Making information more easily and regularly available is a critical remaining task.

3 Discussion

We commenced this article by discussing the question of what national characteristics help explain success in the summer Olympic Games. The question was posed in two separate ways: (1) How many of the available medals should a country expect to win given its levels of population, wealth, health, education, public information, and connectedness? And (2) What factors raise the probability that a country will win at least one medal? The answer to the first question seems to be that a larger population, greater public information, and lack of urbanisation contribute to an increasing share of medals. The answer to the second question is that a larger population, greater wealth, and more public information increase the likelihood that a country will send at least one athlete to the medal podium. Public information along with population size stands out as the consistently significant factor.

Although much remains unexplained in the relationship between public information and Olympic success, these results offer a basis for future research and policy experimentation. On the research side, studies similar to this one could benefit from more complete data covering a longer period of time. Testing these findings with more precision and nuance will become increasingly possible as more and higher quality data become available. One particular issue worth examining in more detail is the dimension of time. If certain country characteristics are favourable for the development of an athlete, their effect on Olympic success would presumably not appear for a number of years because of the amount of time it takes to develop an Olympic athlete. The overall strength of the analysis could be dramatically improved by undertaking a longitudinal study rather than the simple cross sectional analysis developed here. Additionally, the hypotheses related to effective participation rates might usefully be applied as well to other, non-athletic pursuits, such as patent applications and artistic achievement.

The Olympic Games, while important enough in and of themselves, also served here as a useful metaphor, a starting point for an analysis concerning other and more pressing livelihood concerns. Thus, we view success in the Olympics as an indicator more broadly of the provision of opportunity to a country's populations. Countries which enable a higher fraction of potential athletes to achieve the ultimate success of winning an Olympic medal are likely to be similarly successful in developing and fostering talent in other areas. Where the fraction of effective contestants for positions in national sports teams is very low, the prospects of social mobility generally are also likely to be disappointing.

The micro-level findings presented above also point to connectedness – through roads and the provision of public information – as a potentially fruitful way for developing countries to access the stock of largely untapped talent among their populations. Other analyses have provided results that point toward similar policy interventions, showing how more connectedness, including better information about available opportunities, can similarly help develop the talents of potential doctors, engineers, or entrepreneurs.[13] Through enhancing connectedness, the share of effective participants can be raised in diverse arenas of human achievement.

4 Lessons for Social Mobility and Poverty Reduction

These results have important consequences for social mobility in general. In fact, a case can be made for promoting mobility as the wider objective, with poverty reduction being subsumed as a component part.

Poverty reduction, while an improvement on earlier perspectives that saw development purely as a challenge of increasing capital stock, increasing employment, or raising the national income, nevertheless still has two important limitations when used an index for assessing development success. First, poverty is famously difficult to comprehensively define and measure. It is both absolute (in terms of meeting basic human needs) and relative (in terms of one person's poverty with respect to another's). It is a dynamic and multidimensional phenomenon that is properly applied at the level of individuals, but is almost always measured and assessed in the aggregate. Efforts to reduce poverty on a large scale must invariably answer difficult questions about whether rising GDP per capita or numbers of people living on less than a dollar per day are valid indicators of success. Do as many individuals actually experience escapes from poverty and its attendant conditions?

Second, no matter how comprehensive one's measure of poverty, poverty reduction is ultimately an incomplete indicator of development. One can easily imagine scenarios in which poverty might be substantially reduced (or eliminated) in ways that are neither desirable nor consistent with common ideas of development.[14]

Must all poor individuals be raised to an equal level – above the poverty line – or should the smarter and harder-working ones not go higher? This study has been motivated by the need to look beyond poverty reduction as the end of development. Rather than treating poverty reduction as the hallmark of achievement, this analysis focuses on individual access to opportunity as another and perhaps more forward-looking indicator. The goal of development, in this view, is not a matter of merely meeting subsistence needs or even of achieving a more equitable distribution of wealth.

The proper objective lies in creating an environment in which individuals enjoy the greatest possible opportunity for realising their goals – where a progressively larger percentage of people can more effectively participate in diverse individual and collective endeavours. This view is rooted in and consistent with Sen's formulation of development "as a process of expanding the real freedoms that people enjoy", involving "both the processes that allow freedom of actions and decisions, and the actual opportunities that people have, given their personal and social circumstances" [Sen 1999: 3-17]. Poverty reduction may be an important component of the provision of opportunity, but when considered in isolation it is at best a partial goal.

Advancing information and enabling access are as much a critical part of raising Olympic achievement as they are of enhancing development success and other achievements. In general, information and access are crucial for effective participation. Where more people are able to participate more effectively – in the economy, in competitive sports, in public decision-making, and in other walks of life – the country will grow faster and more citizens will benefit.

NOTES

1 See http//simon.forsyth.net/Olympics.html.

2 Genetics might matter, particularly when small population subgroups are compared against one another, but the effects of race and genetics can be greatly exaggerated, especially for large and heterogeneous countries, like India.

3 This seemingly arbitrary selection of 20 countries was made only in order to make the table more manageable and easy to read. A large number of countries won no medals. Reproducing a long series of zeros would serve no purpose. In the regression analyses that follow the entire set of countries was considered.

4 Only summer Olympics are included because the winter games are heavily biased toward a small number of wealthy countries located in the upper latitudes, while the summer games draw a more inclusive sample of participants.

5 http://www.olympic.org/uk/games/index_uk.asp. Accessed on April 14, 2007.

6 Changing these assumptions, for instance, by giving a higher weight to gold medals and a lower weight to bronze medals, did not change the results in terms of which variables gained significance.

7 We recognise that the use of PPP-adjusted figures is an imperfect way of accounting for differences in the cost of living between countries [Reddy and Pogge 2002]. We use them here for lack of a better alternative.

8 The variable "Home country" is a dummy variable which captures the effects of home-turf advantage.

9 We experimented with different functional forms of the regression equation, but the same results were consistently obtained.

10 As the country examples presented below indicate, the correlation between GDP per capita and radio ownership is far from perfect. Several less wealthy countries, such as Jamaica and Cuba, have more radios per capita than other wealthier countries, such as Portugal and Spain.

11 Different tests showed the same results. For instance, none of the variance inflation factors is greater than 4.17.

12 Causation is hard to establish, given that our analysis is cross-sectional and not longitudinal in nature, so one cannot rule out the possibility that the causality might flow in the opposite direction. Countries that – for whatever reason – produce more and better Olympic athletes may also witness a higher demand for radios and other forms of public information so that their populations can follow native sons and daughters on the international stage. Intuitively, however, such reversed causation seems far-fetched.

13 For example, Fan, Hazell and Thorat (2000) show how additional government expenditure on rural roads has the largest poverty-reducing impacts among all types of public investments considered by them. Investment on rural roads is also calculated to have the largest impacts on agricultural productivity.

14 A prison, for example, might be considered an environment in which poverty is minimal. Basic subsistence needs are met, inequality is low, and prisoners' levels of wealth are likely to remain stable over time. Yet we would hardly expect countries to propose large-scale internment policies as a poverty reduction strategy. This hypothetical case suggests that poverty reduction is an incomplete and often a nebulous objective.

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