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Growth vs. Development in the Indian Software Industry

By Aparna Kumar

Located in south-central India, Bangalore, the medium-size capital city of Karnataka state, is renowned for its beautiful gardens, ancient temples, fresh air and cool summers. For those like myself who have not visited Bangalore in the past five years, it might be difficult to imagine how this city has since come to be known around the world as the "Silicon Valley of India." *Time* has already pointed out that Bangalore is currently the fastest growing city in all of Asia. (Stremlau 160). This sudden transformation was ushered in by a dramatic boom in India's export-oriented software industry. Spurred by the central government's trade liberalization policy in 1991, which sought to reduce its deficit through a new emphasis on exports and foreign direct investment, India's software sector marked a 53% increase in exports between 1990 and 1996 and generated $500 million in sales between 1994-5 alone. (Stremlau 153).

Eager to take advantage of the Indian government's sudden friendliness towards foreign business and anxious to place a foothold in one of the world's largest "virgin" markets, several multinational corporations raced to establish operations in India. To many industry-watchers around the world, the Bangalore software boom is an early indication that, after 40 years of bankrupt state planning, India may well become a leader of the next century's global economy. Research done by the National Association of Software and Service Companies has projected Indian industry sales reaching $5 billion by the year 2000 (153).

Unfortunately, this growth has not come without strings attached. Although the boom has created thousands of well-paid jobs and has reduced the inertia propelling India's technically-skilled elite to emigrate, it has also brought into the city huge inflows of job-seekers and has overburdened its already-crumbling infrastructure. Pollution, overcrowding, and a widening gap between the rich and poor have become the bane of a city that was once considered a "pensioner's paradise" (161). Still, there is reluctance to pressure tax-evading multinationals to pay their due for fear that they will just as soon pack up and leave India. In fact, there is little assurance that the growth, which is largely powered by foreign investment, can be sustained even into the near future. Moreover, the fact that the Bangalore software sector is export-oriented and dominated by foreign multinationals has meant that the domestic market remains [illegible] underdeveloped. The paradox of the "Bangalore boom" is an ideal case-study to show how globalization, "free trade", and export-oriented production can generate high growth and be antithetical to development at the same time.

EFFECTS OF GLOBALIZATION

In the last two decades, the term "economic globalization" has rapidly been gaining currency as a convenient buzzword for politicians, business executives, and union organizers alike. The concept of globalization, which describes the growing trend of an international amalgam of resources, trade based on comparative advantages

and virtually boundless transnational markets, has been blamed for the loss of jobs home to overseas contractors while being triumphed by neo-liberal thinkers who claim that it is inevitable and in the interests of the aggregate good of nations. However leaving ethics aside, there is no doubt that economic globalization and the free trade policies it motivates are in the best interests of large, profit-maximizing corporations.

Likewise, the rise of free-market capitalism around the world goes to show that, as the trend of globalization continues, it is becoming increasingly difficult for countries to develop under economic isolation. As different countries exhibit different location costs and benefits for production of various goods and services, large corporations diffuse themselves throughout the world in search of the most efficient sites from which to conduct their business. As tasks within one corporation are divided between various sites around the world, a "new international division of labor" arises and corporations come to resemble virtually autonomous entities known as multinational or transnational corporations.

The information technology industry, which encompasses both wire and satellite telecommunications and computer networks such as the Internet, has an especially complementary relationship to economic globalization. For, as corporations become decentralized and markets become diffuse, there is a more fundamental need for a strong communications network between production sites and overseas management. As this trend continues, there is a more urgent need for computer components and software to be compatible with each other in order to ensure maximum efficiency and so that various networks can communicate with each other. Just as the information technology industry aids globalization, globalization has aided the growth of the information technology industry. As Asian markets gradually began to open their doors to foreign direct investment in recent decades, many industry heavyweights, motivated by rising production costs and a dearth of software experts in developed countries, began to extend their production sites into Asia.

COMPARATIVE ADVANTAGES

India, a country which has more people than it knows what to do with, seems perfectly-suited to the software industry, which, unlike most high-tech industries, involves work which is labor-intensive rather than capital-intensive (Correa 172). Apparently, "amongst the Asian locations — Hong Kong, Singapore, Taiwan, Thailand and the Philippines — India is at the forefront because of its low production costs and large reservoir of competent scientific and technical personnel" (Lakha 382). More specifically, Bangalore, with its "3 universities, 14 engineering colleges, 47 polytechnic schools, and a plethora of research institutions devoted to science," is the most promising location for multinationals wishing to tap into the Indian labor market (Stremlau 157).

Although India's comparative advantage in human resources is clear enough, what makes the Bangalore software boom so remarkable is that it occurred in spite of the fact that India apparently has the "lowest concentration of computers and some of the poorest telephone networks in the world" (158). In fact, this rapid rise to success is quite unprecedented in the arena of high-technology. As Stremlau observes, "Bangalore has challenged the established economic principle that in order to succeed internationally in a sector of advanced technology, there must be a strong domestic market in that sector" (158).

Peter Evans has argued that the Indian software boom is illustrative of a new

definition of comparative advantage that empowers less-developed countries to pursue leap-frog strategies of development. In contrast to traditional comparative advantage theory, in which a country's capabilities are pre-determined by its physical endowments, he identifies a new form of comparative advantage that is based on acquired skills. According to Evans, traditional comparative advantage theory is becoming increasingly irrelevant "in a world where international trade [no longer] consists of unprocessed raw materials... and where manufacturers dominate global trade and even services are...considered tradeables" (Evans 8). On the other hand, a more broadly-defined comparative advantage that allows for the creation of skill-based capabilities transforms the "global division of labor [into] an opportunity for agency, not just an exogenous constraint" (9).

Out of this new perception of the global division of labor emerges what Evans calls the "commodity chain." In this model, it becomes apparent that those countries that occupy the leading sectors are the developed set. The pressing desire to become—at least nominally—part of the developed set, or the "core," partially explains why "peripheral" countries undertake risky attempts to develop their own high-tech sectors before they have even successfully achieved general industrialization, as in the case of the Indian software industry.

There are several more obvious inducements for developing countries to try their luck in the information technology arena. Most importantly, information technology (IT), has been singled out as the "master industry of the late 20th century," earning a rapidly growing proportion of total output in all developed countries (Evans 95). The information technology industry also happens to be the largest, high-paying employer of people with technical training. Consequently, the development of a local IT sector reduces the size of "brain drain," with its creation of well-paid jobs for those with the requisite skills in their own country (97).

In fact, the recent spread of the software industry into the developing world illustrates that the assumption that jobs created through out-sourced labor arrangements are always low-skilled and low-paid is no longer universally valid (Castells 19). This contrasts with conventional formulations of the international division of labor theory, which assumes that out-sourcing of labor is fundamentally exploitative, resulting in "upper level functions of high technology industries [remaining] in the core while unskilled manufacturing would proliferate in a new industrializing, dependent periphery" (17).

For the most part, this has been the case with American-based electronics companies in Asia, where low-skilled tasks such as operations and assembly are carried out in Malaysia and Singapore while higher-skilled jobs such as those within research and development remain in the US or Japan. On the other hand, in Bangalore in particular, the high-level of skill of Indian computer programmers as well as their fluency in the English language has made it an attractive site for corporate functions above routine programming or assembly. Although Indian computer programmers currently make only one-fourth of the salary that their American peers receive for the same work, the industry average of $10,000 a year is impressive by Indian standards (Stremlau 154). In spite of the fact that India produces 20,000 new computer science graduates annually, demand for software engineers is so great that industry wages continue to rise at the rate of 20% per year (*Economist* 3/23/96 67).

Some proponents of software industry expansion in India argue that the development of an IT sector also leads directly to the expansion of a "modern, middle class," a social objective that no doubt carries a lot of weight in the minds of Indian policy-makers. However, as Stremlau observes, the software sector in Bangalore has

already overshot this goal and has had the adverse effect of worsening present income disparities within the city.

> A conspicuous class of software entrepreneurs has [already] emerged in Bangalore, running firms that have made them multimillionaires. Ironically, the intensifying competition in information technology may narrow certain income gaps between nations while deepening disparities within them, producing a new transnational elite of well-paid 'infocrats" (Stremlau 155).

On top of this problem, the Karnataka State Chamber of Commerce has already predicted the "'collapse' of Bangalore if growth continues at current rates and no major **infrastructure** improvements are made" (Stremlau 162). As observations such as these demonstrate, to acknowledge the tremendous growth potential of the Indian software industry or to point out that it will continue to raise India's total output is too simple. In the case of the Bangalore boom, growth continues to expand but development has yet to follow suit.

POPULAR PERCEPTIONS

Most troubling is the fact that this state of affairs seems unlikely to improve given the outward-oriented structure of the Bangalore industry. This view is not uncontroversial: many Indian economists in favor of liberalization desperately want to believe that growth in the Indian software industry translates directly into greater economic autonomy. To this effect, Salim Lahka has argued that, although India's export-oriented software has promoted its inclusion in the global division of labor, the industry must not be viewed as "merely an export enclave of the TNCs but is articulated with [sic] the local economy" (Lakha 382). Interestingly, the evidence upon which Lakha bases this confident assertion is conspicuously missing from his article.

Richard Heeks and others have made a more convincing argument to the contrary, one which tends to paint a picture of the Indian software industry that is in fact "an enclave of the TNCs, [not] articulated within the local economy," by pointing out that, thus far, the industry in Bangalore has yet to bestow any positive externalities on the rest of the economy. As Heeks observes:

> India has been seen by foreign collaborators, especially investors, as a source of software labor. Collaborations have been geared to using Indian software labor for software exports, so that local skills are harnessed to create software which does not directly benefit Indian agriculture, government or industry, and which instead benefits the performance of foreign firms, some of which are competitors to other Indian companies (Heeks 260-2).

In general, there has been little indication that the sector's multinational patrons have any intention of developing the Indian industry as a leading producer in its own rigM' Heeks points out that "foreign contracting agencies have not generally invested in ski of technology for their Indian collaborators" (260). For their part, the Indian government has done more to appease foreign corporations in their burgeoning software industry, through tax and tariff concessions alone, than it has done to ensure that the sector is "articulated in [its] own economy." When seen within the macro-

context of the imbalance of power between developing countries and foreign multinationals (whose interests coincide to the extent of generating profits but diverge on the issue of the channeling of those profits) the case of the Indian software industry Remonstrates how developing countries relying on foreign investment come to function mainly as "enclaves of TNCs".

CONCLUSION

In a country like India, which cannot yet claim the status of an industrialized nation, even the slimmest prospect of its becoming a leader in the high-tech industry of information technology is cause for celebration. Still, Indian policy-rrtakers need to realize that, as the exponential growth of Bangalore's software sector continues, it is necessary to address the long term costs and constraints of this pattern of growth in the city as well as in India as a whole. Fundamentally, ownership within the Indian software industry will largely determine how much value will be added to the Indian economy. It is already apparent that current industry powerhouses would much rather maintain India as a low-cost production center and cling to the prospect of exploiting a huge emerging market in India than assist the development of new competitors in their field.

For now, the fact remains that India is still a small fish in the big pond of software development, an industry which is currently dominated by whales. At this point, the prospect of a self-sufficient Indian software industry is difficult to imagine. In addition to India's poor information technology infrastructure and its domination by foreign multinationals, the industry suffers from a lack of venture capital, which could encourage indigenous start-ups and innovation. Unless the Indian government manages to remedy this problem, it is difficult at this stage to envision the Indian software sector having a positive impact on the country's overall development.

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Islam and Ethnic Conflict in West Africa: The Variable Options of a Shared Identity

By Nona Zicherman

The issue of nationalism- a sense of identity and shared community among a group of people that is congruent, or aspires to be congruent, with the boundaries of a present-day state- is problematic in the reality of post-colonial Africa. There, the "modern" state is defined by boundaries drawn by Western colonial powers, that are often at odds with pre-colonial social and political groupings. African states today are almost all multilingual and ethnically heterogeneous. Traditional mechanisms for coexistence among different peoples have been disrupted bycolonial strategies of ethnic favoritism and 'divide-and-conquer/ through an uneven distribution of land and mineral resources during the colonial carve-up, and more recently because of an increasingly desperate scramble for resources given Africa's deep economic crisis and dependence on foreign aid.

In recent decades, the term "nationalism" in the African context connotes neither unity among citizens nor a mobilization of resources to meet national priorities. All too often, it has meant bloody conflict among ethnic groups, competing for the spoils of the state in a vicious zero-sum game that has resulted in civil war, genocide, authoritarian rule and military coups. Cast in the popular media as upsurges of primordial 'tribalism,' Rwanda, Burundi, Uganda and many other cases attest to the tragic consequences of this type of communal violence.

However, there seems to be "a dog that is not barking" in Africa. Relative to the rest of the continent, ethnic conflict in the French-speaking and predominately Muslim parts of West Africa is almost nonexistent. Neither the Sahelian countries of Niger and Mali nor the coastal nation of Senegal have experienced vicious competition along ethnic lines in any degree comparable to their Anglophone West African neighbors such as Liberia, Sierra Leone or Nigeria. Why should these countries, subject to essentially the same historical experiences of colonialism, imposed state boundaries, and economic marginalization, differ in this crucial respect? Demographically, Mali, Niger and Senegal all exhibit one characteristic that sets them apart from their neighbors. In all three countries, over 90% of the population identifies itself as Muslim[1] (U.S Department of State, 1993). I will argue that this is a crucial factor in explaining the lack of ethnic violence in these three countries. In most African states, ethnic identity is one of the few tools for both the elite and the masses to mobilize and make claims on the state, or is a vehicle to seek out alternative sources of sustenance when the state fails to perform its essential functions. However, I will argue that in the Majority Muslim states of Mali, Niger and Senegal, Islam represents a comparable option and thus a viable alternative to goal-oriented ethnic mobilization.

THE THEORETICAL ARGUMENT

There are two causal mechanisms by which Islam acts to minimize ethnic conflict. First, Islam is used on the state level, as a tool for elites. The fact that Islam is a religion shared by all, with institutionalized networks that the state can utilize, makes