

Armenia's software advantage

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Armenia's IT services and software sector could lead the way in improving the country's economy.



Geopolitical problems and macro-economic reforms are currently preoccupying Armenia, but to achieve long-term growth and lift itself out of poverty the former Soviet republic must also grapple with microeconomic policy. Armenia should focus on developing the industry sectors that have the best chance of competing globally and on eliminating any

barriers to productivity within them. Our study of this landlocked economy in the Caucasus (Exhibit 1) suggests that software and IT services are among its most promising sectors.

With annual growth of more than 20 percent since 1999, software and IT companies now account for 2 percent of Armenia's GDP—a proportion comparable to that of India, the world's leading offshore IT destination. Businesses in this sector achieve much higher productivity than the average for Armenia's economy as a whole (11.5 percent of the US level). Why the relatively strong performance? The software and IT services sector is especially suited to exploit Armenia's three competitive advantages. First, it has a well-educated workforce with an emphasis on science, a result of the country's heritage as the Soviet Union's high-tech center. The second advantage is low wages: a software and IT services specialist earns \$2,400 to \$6,000 a year, a quarter of the average salary such a worker receives in India. The third is a five million-strong diaspora across Europe and North America. Many of these overseas Armenians are successful businesspeople and professionals in the IT and software field and provide access to international business networks as well as funding for Armenia's development.

EXHIBIT I

Armenia in context

Major economic indicators, 2002



Land area: ~18,500 sq miles	GDP ¹ : \$11.6 billion	Current-account deficit: 8.7% of GDP
Population: 3,002,000	GDP per capita ¹ : \$3,850	Average annual inflation (consumer price index), 1999–2002: 2.5%
Merchandise exports: \$507 million	Compound annual growth rate of real GDP, 1998–2002: 7.8%	

¹ At purchasing power parity.
Source: Armenia National Statistics Service; International Monetary Fund

Foreign-owned and domestic companies in Armenia's software and IT sector have different average levels of productivity and somewhat different barriers to raising it. Some 25 foreign software companies, owned mostly by businesspeople of Armenian descent, have set up offshore subsidiaries in the country to develop customized applications for their corporate parents. To attract the best programmers and thus achieve the best labor productivity, these foreign units offer salaries twice as

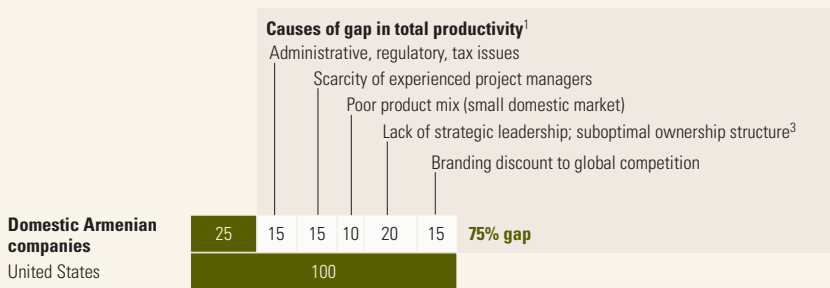
high as domestic IT firms do. But labor productivity is still only half of the US level, partly as a result of the shortcomings of Armenia's higher-education system, which produces excellent programmers but not enough skilled project managers. For the 85 or so domestic companies that develop, program, market, and sell packaged software at home and abroad, improving total productivity—which currently stands at 25 percent of the US level—is even more crucial. Among the

EXHIBIT 2

Armenia's productivity gap

Estimated labor productivity; index: total productivity for software/IT sector in United States = 100

Software/IT sector		Programming productivity	+ Product generation, marketing/sales productivity	= Total productivity
United States		40	60	100
Armenia	Domestic companies	10	15	25
	Foreign-owned companies	20	N/A	N/A



¹At purchasing power parity; for foreign-owned companies, only programming productivity can be compared, since other value-creation steps are executed abroad.

²For example, influence on pricing of state-licensed monopoly ArmenTel.

³Single-owner company structure, predominant in Armenia, offers little incentive to maximize value.

Source: Interviews; McKinsey analysis

managerial shortcomings these companies face is a lack of market knowledge and business know-how. Furthermore, they don't always know what higher-value-added products to make for international markets, and they sometimes don't possess the business skills needed to market and sell sophisticated products abroad (Exhibit 2, on the previous page).

We recommend a series of steps in two areas to remove productivity barriers and stimulate the growth of Armenia's software and IT sector. First, increasing the capacity and quality of the educational system is critical for delivering the highly qualified graduates needed to improve the sector's programming and management skills. To this end, the government should try to attract and retain teachers, professors, and researchers by raising their salaries, which at \$100 to \$200 a month are low even by domestic standards. Partnerships between companies and universities can also help. A large foreign-owned software company, for example, currently supports a multidisciplinary university course that combines semiconductor design and IT programming—important for the development of higher-value-added products. One university cooperates closely with IT start-ups by providing them with work space on its premises. Computer science curricula should be modernized so that technical courses are enriched by business know-how, such as project management and business-case writing. Second, the government and the domestic financial and high-tech sectors should team up to establish a major investment fund and a promotional agency to channel private equity money from the diaspora and other foreign sources into the software and IT sector and thereby stimulate its growth.

Increasing the productivity of software and IT services alone won't carry Armenia's economy to the next level, however. A handful of other sectors—diamonds and jewelry, tourism, and health care—should also be development priorities. Successful initiatives in the four sectors could double their productivity, generate double-digit increases in revenues annually through 2010, and raise their aggregate employment to 102,000, from 71,000. By first focusing on these potentially high-growth sectors, Armenia could increase its foreign earnings and use the influx of cash to raise domestic demand and boost other parts of the economy.

Armenia must still resolve its conflict with neighboring Azerbaijan over the disputed Nagorno-Karabakh region and carry out macroeconomic reforms to complete the transition to a market economy. But concentrating on specific sectors such as software and IT services should allow Armenia to move beyond basic stabilization and take the next steps on the road to prosperity.

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