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China's New Guru of Productivity

An improbable Hungarian-Israeli American is an unsung force in the country's industrial boom

By SEBASTIAN MALLABY



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Professor Gavriel Salvendy lectures to PhD students in Tsinghua University in Beijing.

After weeks of ominous debate about a global "currency war," the leaders of the world's largest economies will gather this Thursday and Friday for a G20 meeting in South Korea. The Obama administration will put a brave face on its failure to shame China into revaluing its currency, a concession that would help to tame the country's destabilizing trade surplus. But the lack of concessions from China may prove even more serious than the currency warriors realize, because a quiet revolution is stirring deep inside the country's manufacturing machine. China is advancing so rapidly in terms of productivity that a compromise on currency might serve only to slow its rise as an export juggernaut.

The story of China's productivity revolution starts with the improbable tale of Gavriel Salvendy, a Hungarian-Israeli-American high-school drop-out. Growing up in a Jewish family during the Nazi occupation, Mr. Salvendy hid in haystacks to escape deportation. Later, after his family abandoned Europe, he became the Israeli weight-lifting champion. Now 72, at well over 6 feet tall and 265 pounds, he still has the presence of a strongman.

For the past nine years, Mr. Salvendy has run the department of industrial engineering at Tsinghua University in Beijing, China's equivalent of MIT. He is an incongruous presence there—a booming maverick in a hierarchical and generally conformist culture—but he and his team of professors have helped to boost productivity at some Chinese factories by as much as 20% a year.

Mr. Salvendy's road from weight-lifting to academia involved a series of strange twists. In his youth, he took a job in a factory in London and discovered a natural flair for reorganizing manufacturing systems. A British engineering professor heard of this untutored genius and, despite his lack of formal schooling, recruited him into his graduate program at the University of Birmingham. There Mr. Salvendy earned a master's degree and a doctorate. Then in 1968 he landed an academic appointment in the U.S.

By 2001, Mr. Salvendy was a grandee of industrial engineering, known for more than 200 publications in journals, and, among friends, for his eccentricities, including an inability to remember the alphabet and a habit of losing his way on short walks. Already past his 60th birthday at that point, his big head framed by a comb-over of orangey brown hair, the professor seemed comfortably established. But then an offer came from Tsinghua, and Mr. Salvendy could not resist.

Tsinghua is the premier science university in China. A decade ago, it resolved to add to its 20 or so engineering departments, creating a new center for industrial engineering—the study of how machines and workers can be combined effectively. Chinese plants were running flat out just to make things. Trying to make things *better*, with fewer wasted hours, felt like a project that could wait.

Tsinghua asked Mr. Salvendy to head its new department of industrial engineering, an invitation that was a

minor revolution. No other foreigner headed a Tsinghua department. To show how serious it was about getting China on the road to higher productivity, the university tore up its salary scale, offering Mr. Salvendy fully 20 times the standard pay package for a Chinese professor.

Mr. Salvendy accepted the offer, and the revolution began. Chinese professors were accustomed to hierarchy; Mr. Salvendy insisted on open-collared informality. He wanted professors to publish in the top peer-reviewed American journals, so they started to write and teach in English. Dividing his time between Beijing and Purdue University in Indiana, Mr. Salvendy quickly built up a department of some 25 professors, most of whom had Ph.D.s from the U.S.

China's deputy minister of education, who had a hand in Mr. Salvendy's recruitment, watched his success with interest. The country's leadership was eager to encourage its over-pressured, conformist students to think more imaginatively, anticipating the day when China's catch-up growth would come to an end. Mr. Salvendy's discussion-based teaching methods seemed designed to foster lateral thinking. The ministry let it be known that if Tsinghua could demonstrate results, its approach would be adopted at other universities.

In 2008, Mr. Salvendy began to garner attention from China's manufacturing chiefs. The global financial crunch caused the steepest decline in world trade since the 1930s, and China's sprinting exporters were forced to slow down and cut costs. The shock came on top of a government decision to encourage more generous wages. In the province of Guangdong, home to legions of low-margin factories that depended on cheap labor, thousands of companies shut their doors. But Zhang Hua Rong, the founder of a shoe manufacturer named Hua Jian, saw a way out of his predicament. He made the 1,400-mile trip to Beijing and asked Mr. Salvendy's engineers to help.

In the summer of 2009, a team from Tsinghua descended on Hua Jian and found an industrial engineer's paradise—production lines so dysfunctional that startling gains in productivity were within easy reach. The factory kept months' worth of raw materials in its warehouse, wastefully tying up capital. Its tools were designed with obvious inefficiencies.

Within a few months, the Tsinghua delegation boosted Hua Jian's productivity by 20%. In the West, gains on this scale are almost unthinkable. Productivity in a fast-improving U.S. factory might rise by 5% a year. And as they returned repeatedly to Hua Jian, the engineers conceived a new ambition: to rethink the standard ideas about production-line balancing that were hatched in U.S. factories in the 1950s and 1960s.

At Hua Jian, most workers arrived fresh from the countryside and then quit after a year or so; the level of training was both low and uneven. Because skills were minimal, the tasks had to be split up more, so that each worker was required to master a single simple function. But because skills were uneven, workers at some stations might complete their task in 30 seconds while others took a full minute. The least productive workers would determine the speed of the conveyor belt, while the most productive ones would spend half the shift idle.

This past summer, the Tsinghua team devised a way to balance out the tasks on the production lines to minimize wastage. Hua Jian's productivity registered a further 20% gain.

Traditionally, economists have fingered poor infrastructure, low levels of education and excessive regulation as the chief impediments to continued growth in productivity. But the technical literature on the subject increasingly points to poor management as a serious obstacle.

Mr. Salvendy's achievements at Tsinghua suggest that China will increasingly realize its productivity potential. His department has cycled more than 1,500 Chinese managers through its executive training programs, and thousands more are being minted by the 200 industrial engineering programs that have sprung up around China in imitation of Tsinghua. Every year, more of Mr. Salvendy's disciples fan out across the country, spreading the lessons of lean manufacturing, quality circles and supply-chain management—techniques that have powered industrial success since the time of Henry Ford.

Sooner or later, world leaders will have to wake up to this revolution, because its impact on flows of goods and capital is bound to be global. Mr. Salvendy and his followers are set to transform a country that has more than 100 million factory workers—double the total number employed in manufacturing in the G7 club of rich economies combined.

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