Reviving US Manufacturing: the German Model

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During the 20th century, millions of immigrants chose major industrial cities like Detroit, Chicago, and Pittsburgh because of their vibrant ethnic communities and the availability of jobs. These immigrants worked long hours on "the line" at highly repetitive, unskilled jobs that required only a marginal knowledge of English. The union-negotiated pay was excellent; the defined benefit plans provided for a comfortable retirement. On the foundation of these workers, the US created a large, upwardly mobile middle class.

Today, most of these jobs have moved off-shore, or do not have nearly as generous pay packages. Employers have cut benefits, and underfunded or eliminated pensions. Union membership has declined. Most economists agree that the days of high-paying, unskilled jobs in the US are over - these jobs have gone overseas and are not coming back.[1] With them the backbone of the US economy, the middle class has declined and weakened. The disparity between the highly paid workers and those at the lower levels has widened significantly.[2]

For years, US policy makers have struggled to come up with a substitute for the lost manufacturing jobs and with it, the basis for a resurgence of the middle class. Many have looked to the rise of China as the model of a global manufacturing superpower. They have tried to find ways to clone the China model in the US with little success. Low-paying jobs and direct government subsidies[3] do not fit into the US business and policy model.

Others have focused on innovation. Although the US is a prolific recipient of patents, second only to Japan,[4] it only ranks 8th in the world in terms of innovation leadership.[5]

Germany, on the other hand, provides an interesting contrast. The average direct wage that German manufacturing workers earn is $37.67 per hour while those in the US earn $24.77,[6] and in China only $1.37[7] Taxes and social insurance costs are $8.25 per hour in Germany and $5.42 in the US.[8] German workers are *legally entitled* to 34 days of paid annual leave, while US workers are *not legally entitled* to any paid leave, and average only 18 vacation days per year.[9] German companies must offer 14 weeks of *fully-paid* maternity leave, which increases to 18 weeks in the case of multiple births; US companies do not have to provide any paid maternity leave. US workers are the second most productive in the world, while those in Germany are 23rd.[10]

Germany has the world's oldest comprehensive health care system, which Chancellor Otto von Bismarck established in 1883. The US is just taking the first steps towards a comprehensive health care system.[11] German corporate taxes average 29.4%, while those in the US average 25.6% and in China 16.8%.[12]

Unionized workers comprise 26% of the German labor force[13] and unions have a strong voice with a legally-mandated presence on corporate boards.[14] US union worker representation has fallen to 12.3% of the workforce[15] and the influence of unions is declining.[16] It is difficult to terminate German workers, with Germany ranking at the bottom, 133 out of 139, in global hiring and firing practices. The US, on the other hand, ranks near the top, in sixth place.[17] Germany has some of the strictest environmental

regulations in the world, and has ratified the Kyoto Protocol. The US and China have not subscribed to the Kyoto Protocol, and China has been following a "produce now, clean up later" strategy, rarely penalizing environmental infractions.[18] Based on these data, virtually any economic analysis would conclude that Germany could not possibly be a strong global competitor.

Germany, however, is second largest exporter in the world in terms of value, and the largest on a *per capita* basis, while the US is third.[19] In 2009, China and Germany had trade *surpluses* of $198B and $136B respectively, while the US had a trade *deficit* of $375B. German exports are highly sophisticated, precision products, while those from China target the low-cost mass markets, where price is the driving differentiator. Germany's unemployment rate is 7.3%, while that in the US is 9.5% (July 2010).[20] Germany has managed to maintain such leadership in spite of having to spend almost *2 trillion* dollars since October 1990 on costs associated with *Wiedervereinigung* or the process of reunification.[21]

In spite of the high labor costs, generous benefits, government mandated health care, stringent environmental regulations, and relatively high corporate taxes, German companies have maintained global leadership across broad industrial sectors: luxury automobiles (Porsche, Daimler, BMW, and Audi), mid-range automobiles (Volkswagen), steel (ThyssenKrupp), high-power lasers (Trumpf), semiconductors (Infineon Technologies), medical equipment (Siemens), lighting (Osram), chemicals (BASF), materials (Bayer Group), optics (Carl Zeiss), glass (Schott), automobile components (Bosch), cameras (Leica), pharmaceuticals (Merck), athletic wear (Adidas, Puma), computer software (SAP) . . . .

One reason for Germany's success is their primary and secondary education system. Germans divide students into two separate tracks as early as fourth grade.[22] One group of students follows an academic track, while the other moves into *Berufsfachschulen* to pursue vocational programs. About two-thirds of German students follow the vocational track,[23] and only one quarter goes on to college.[24] Germans respect and value both groups. There is no social stigma associated with bypassing college; vocational students undertake a rigorous apprenticeship program and receive a diploma, the *Meisterbrief*.[25]

In the US, on the other hand, most secondary schools and parents focus on getting their children into college. Over 70% of high school graduates go on to college, and the number is increasing.[26] Society, on the other hand, disparages and considers vocational training[27]inferior.[28] Students that would rather pursue life in the "trades" see little relevance in what they learn in high school[29] and often drop out. US ranks 20th out of 30 industrialized nations in terms of high school graduation with a graduation rate of only 77.5%, while Germany ranks first with a rate of 99.5%.[30] The No Child Left Behind Act does little to promote vocational education, and in fact, vocational educators see it as a detriment.[31]

Although 93% of comprehensive high schools,[32] most community colleges, some four-year colleges, and a number of for-profit training schools offer some vocational courses, less than 20% of US students choose to follow a vocational career.[33] The US Department of Labor's Office of Apprenticeships[34] coordinates and sets guidance standards[35] for much of the apprenticeship activity in the US. Individuals can join apprenticeship programs as early as age 16, but most programs require apprentices to be at least 18 years old.[36] By that time, however, many students have become frustrated and bored with the educational system and have dropped out.[37]

Most US manufacturing job growth is in the nimble small businesses that feed into the larger systems houses. These small businesses need highly skilled workers, but cannot afford the resources necessary to support in-house apprenticeship programs. Furthermore, once trained, apprentices become highly mobile and can easily move on to a competitor. [38] Employers and news reports[39] indicate that many such manufacturing entities want to hire workers, but there is a shortage of workers with the requisite skills. These skills do not require a college degree, but rather an extensive array of skills.[40]

Aspects of the German multi-track educational model, with a focus on apprenticeship, may serve the US well. With the influx of highly skilled workers, the manufacturing sector can recover. Although the American Recovery and Reinvestment Act of 2009 provided competitive grants for green job training,[41] a much broader effort, targeting students at a much younger age, is necessary.

Job training is often the provenance of trade schools. There is a vast difference between the economic drivers of trade schools and that of apprenticeship programs. Most trade schools are for-profit and their primary duty is to the shareholders.[42] The trades and companies, on the other hand, run apprenticeship programs, and their interest lies in developing the most qualified workers for the trade or employer. Apprenticeship program drivers, therefore, more closely align with student and community interests.

A Government-led policy implementation can start to producing highly skilled apprentices in as little as two years, yielding measurable results.[43] A focus on giving student the option of pursuing an apprenticeship track that commences *early in the education process* will benefit students and a wide range of industries, lead to high-paying jobs, and can help revive the faltering middle class.

1 Bruce Springsteen, lyrics to My Hometown. <http://www.sing365.com/music/lyric.nsf/My-Hometown-lyrics-Bruce-Springsteen/527ADDDCDBE5CBB0482568710011C307>.

2 Claudia Golden and Lawrence Katz, "Long-Run Changes in the U.S. Wage Structure: Narrowing, Widening, Polarizing" Brookings Panel on Economic Activity, September 6 and 7, 2007, < http://www.brookings.edu/es/commentary/journals/bpea_macro/forum/200709goldin_katz.pdf>.

3 K. Bradsher, "On Clean Energy, China Skirts Rules," *New York Times*, September 8, 2010. <http://www.nytimes.com/2010/09/09/business/global/09trade.html?_r=1&th&emc=th>

4 World Intellectual Property Organization, "World Patent Report: A Statistical Review (2008)" <http://www.wipo.int/ipstats/en/statistics/patents/wipo_pub_931.html>.

5 http://www.america.gov/st/scitech-english/2009/November/20091106151558ebyessedo0.3619305.html

6 <ftp//ftp.bls.gov/pub/suppl/ichcc.ichccaesuppt2_2.txt>.

7 <http://www.bls.gov/news.release/pdf/ichcc.pdf>.

8 <ftp//ftp.bls.gov/pub/suppl/ichcc.ichccaesuppt4_4.txt>.

9 Rebecca Ray and John Schmitt, "No Vacation Nation," Center for Economic and Policy Research, May 2007, <http://www.cepr.net/documents/publications/2007-05-no-vacation-nation.pdf>.

10 Lee Hyo-sik, "Korea Ranks 33rd in Global Labor Productivity Ranking," *The Korea Times*, February 11, 2010. <http://www.koreatimes.co.kr/www/news/biz/2010/07/123_60695.html>.

11 Anita Raghaven, "Beyond Hysterics: The Health Care Model That Works," Forbes.com September 21, 2009. <http://www.forbes.com/forbes/2009/0921/health-obama-germany-health-care-model-that-works_print.html>.

12 Kevin Markle and Douglas Shakelford, "Corporate Income Tax Burdens at Home and Abroad," ITPF/Urban-Brookings Tax Policy Center Conference, February 20, 2009, Washington DC <http://www.brookings.edu/~/media/Files/events/2009/0220_corporate_tax/0220_corporate_tax_sullivan.pdf>.

13 http://www.nationmaster.com/country/gm-germany/lab-labor

[14] Larry Fauver and Michel Fuerst, "Does good corporate governance include employee representation? Evidence from German corporate boards," Journal of Financial Economics 82 (2006) 673–710. <http://corpgovcenter.utk.edu/Research/FauverandFuerstJFEGermanLaborPaper.pdf>.

[15] http://www.bls.gov/news.release/union2.nr0.htm

[16] Gerald Mayer, "Union Membership Trends in the United States," Congressional Research Service Report RL32553, August 31, 2004. <http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1176&context=key_workplace>.

[17] World Economic Forum, "The Global Competitiveness Report 2010 – 2011" at p. 447. <http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2010-11.pdf>

[18] Charles McElwee II, "Who's Cleaning Up this Mess?" *The China Business Review Online*, <http://www.chinabusinessreview.com/public/0801/mcelwee.html>.

[19] https://www.cia.gov/library/publications/the-world-factbook/rankorder/2078rank.html

[20] <http://www.bls.gov/fls/#laborforce>

[21] "Germany celebrates 20th anniversary of reunification," Newsahead International, October 3, 2010. <http://www.newsahead.com/preview/2010/10/03/germany-3-oct-2010-germany-celebrates-20th-anniversary-of-reunification/index.php>

[22] Federal Ministry of Education and Research, "Germany's Vocational Education at a Glance; Basic Elements of the Dual System," <http://www.bmbf.de/pub/germanys_vocational_education_at_a_glance.pdf>

[23] <http://www.germanculture.com.ua/library/facts/bl_vocational_education.htm>

[24] Andreas Hadjar, Rolf Becker: "Die Bildungsexpansion: Erwartete und unerwartete Folgen. 2006. VS *Verlag für Sozialwissenschaften*; p. 32/33

[25] <http://www.kmk.org/fileadmin/doc/Dokumentation/Bildungswesen_en_pdfs/en-2009.pdf>; <http://www.bildungsserver.de/zeigen_e.html?seite=4112>.

[26] Bureau of Labor Statistics, "College Enrollment and Work Activity of 2009 High School Graduates," USDL-10-0533, April 27, 2009. <http://www.bls.gov/news.release/hsgec.nr0.htm>.

[27] Educators and researchers are replacing the term "vocational training" with "career and technical training" because of the stigma associated with the previous term.

[28] "Too Narrow, Too Soon? America's misplaced disdain for vocational education," *The Economist*, June 17, 2010. <http://www.economist.com/node/16380980?story_id=16380980>.

[29] Mitchell Landsberg, "Struggling Students Want Vocational Education, Poll Shows" The Los Angeles Times, April 6, 2006 <http://articles.latimes.com/2006/apr/06/local/me-voced6>

[30] Organization for Economic Cooperation and Development, Education at a Glance: 2009, p. 56.

[31] A. C. Lewis, "Career/Tech and NCLB," *Tech Directions*, 63(10) May 2004, at p. 6.

[32] Edward Fletcher Jr., "No Curriculum Left Behind: The Effects of the No Child Left Behind Legislation on Career and Technical Education," *Career and Technical Education Research, 31(3), pp. 157-174 (2006), at p. 163. <http://scholar.lib.vt.edu/ejournals/CTER/v31n3/pdf/fletcher.pdf>.*

[33] *The Economist, supra.*

[34] <http://www.doleta.gov/oa/>

[35] <http://www.doleta.gov/oa/guidance.cfm>

[36] <http://www.doleta.gov/oa/faqs.cfm>

[37] John M. Bridgeland, John J. DiIulio, Jr., and Karen Burke Morison, "The Silent Epidemic, Perspectives of High School Dropouts" March 2006, p. 4. A report by Civic Enterprises in association with Peter D. Hart Research Associates for the Bill & Melinda Gates Foundation. <http://www.civicenterprises.net/pdfs/thesilentepidemic3-06.pdf>

[38] R. Dionesius, *et al.* "Cost and Benefit of Apprenticeship Training: A Comparison of Germany and Switzerland," IZA Discussion Paper No. 3465, April 2008, pp. 15-16 <http://ftp.iza.org/dp3465.pdf>.

[39] Interview with Norbert Kozar, President and CEO of Precision Swiss Products, Milpitas CA, September 8, 2010; Michael Sauter, "The Real Labor Shortage: Skilled Blue-Collar Workers," August 25, 2010. <http://247wallst.com/2010/08/25/the-real-labor-shortage-skilled-blue-collar-workers/>; Hao Li, Developed Countries Face Skilled Labor Shortage," *International Business Times,* August 25, 2010. <http://www.ibtimes.com/articles/46229/20100825/skilled-labor-shortage-in-developed-countries.htm>.

[40] REFERENCE NEEDED.

[41] <http://wdr.doleta.gov/directives/corr_doc.cfm?DOCN=2755>

[42] ITT Technical Institute, NYSE symbol ESI; DeVry University, NYSE symbol DV; Universal Technical Institute NYSE symbol UTI; Colorado Technical University, International Academy of Design & Technology and Le Cordon Bleu College of Culinary Arts, NASDAQ symbol CECO; Lincoln Technical Institute, Lincoln College of Technology, Lincoln College of New England, Nashville Auto-Diesel College, Southwestern College, Clemens College, and Euphoria Institute of Beauty Arts and Sciences NASDAQ symbol LINC

[43] "How Long Is Apprenticeship Training Typically?" Degreedirectory.org, <http://degreedirectory.org/articles/How_Long_is_Apprenticeship_Training_Typically.html>.

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When compared to the United States, Germany has higher manufacturing labor and social costs to the employer per worker, higher rate of unionization, stricter regulatory environment relative to worker rights, higher corporate tax rates, and a more generous mandatory leave policy than the United States. Furthermore, Germany has had comprehensive health care since 1883. Notwithstanding these differences, which would indicate an unattractive business climate, Germany is the number one per capita exporter in the world, and carries a high positive balance of trade compared to the high negative balance of the United States. It is the world leader in most high-value manufactured products sectors. This paper identifies major differences in the countries' education systems and proposes them as one possible reason for Germany's success.

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