PCIC Personal Computing Industry Center
An Alfred P. Sloan Foundation Center

Innovation and Job Creation in a Global Economy: The Case of Apple's iPod

Greg Linden, Jason Dedrick and Kenneth L. Kraemer

Personal Computing Industry Center, UC Irvine
5251 California Avenue, Suite 250
Irvine, CA 92697-4650

January 2009

The Personal Computing Industry Center is supported by grants from the Alfred P. Sloan Foundation, the U.S. National Science Foundation, industry sponsors, and University of California, Irvine (California Institute of Information Technology and Telecommunications, The Paul Merage School of Business, and the Vice Chancellor for Research). Online at http://pcic.merage.uci.edu. For information, contact Jason Dedrick (949/824-2863) or Kenneth L. Kraemer (949/824-5246).

UCIrvine | The Paul Merage School of Business

Innovation and Job Creation in a Global Economy: The Case of Apple's iPod

Greg Linden, Jason Dedrick and Kenneth L. Kraemer
Personal Computing Industry Center, UC Irvine
January 2009

Executive Summary

Globalization has been a contentious issue for some time. Advocates have touted free trade as bringing low prices in the U.S. while spreading economic development to new markets, whereas skeptics have argued that these benefits are outweighed by job losses and lower earnings for U.S. workers.

In the current economic downturn, the global nature of many industries complicates government efforts to revive the economy. For instance, there are calls to invest in new technologies and infrastructure to stimulate growth and create jobs as well as to drive productivity and innovation in the future. Yet it is possible that such investment will create more jobs outside the U.S., because many high-tech products currently are manufactured offshore. The same could turn out to be true of alternative energy, hybrid/electric cars, and other new technologies. While these investments have other merits beyond their job-creation potential, it is worth looking at how innovation in a global economy creates jobs in the U.S. and elsewhere.

To shed some light on the issue, we look at one of the most global of all industries, the production of computers and peripherals. Although U.S. output of computer products has fallen, U.S. companies remain leaders in PCs and related products such as portable music players by using Asia-centric global value chains to manufacture their products.

Using the iPod as an example of a recent innovation in this industry, we estimated that the iPod and its components accounted for about 41,000 jobs worldwide in 2006, of which about 27,000 were outside the U.S. and 14,000 in the U.S. (Table ES1). The offshore jobs are mostly in low-wage manufacturing, while the jobs in the U.S. are more evenly divided between high wage engineers and managers and lower wage retail and non-professional workers.

Table ES1. iPod-related jobs by country and category, 2006

	Production	Retail and other non-professional	Engineering and other professional	Total
U.S.	30	7,789	6,101	13,920
Non-U.S.	19,160	4,825	3,265	27,250
Total	**19,190**	**12,614**	**9,366**	**41,170**

As a result of this, and of cross-country wage differences, U.S. workers earned $753 million, while workers outside the U.S. earned $318 million (Table ES2). While China accounts for the largest number of jobs outside the U.S., Japan earns by far the largest share of the non-U.S. wage bill ($102,380,000) because of its role in supplying key components like small hard-drives and displays.

Table ES2. Total compensation by country, 2006

	Production	Retail and other non-professional	Engineering and other professional	Total
Total U.S.	$1,429,200	$220,183,310	$562,191,318	$753,287,510
Total non-U.S.	$90,236,050	$96,500,000	$131,750,000	$318,486,050

To summarize, the iPod supports nearly twice as many jobs offshore as in the U.S., yet wages paid in the U.S. are over twice as much as those paid overseas. Apple keeps most of its R&D, marketing, top management and corporate support functions in the U.S., creating over 5,800 professional and engineering jobs that can be attributed to the success of the iPod. The iPod also supports thousands of U.S. non-professional jobs, mostly in retail, although those jobs are not dependent on the national origin of the brand whose products are being sold.

So it appears that innovation by a U.S. company <u>can</u> benefit both the company and U.S. workers, even if production is offshore and foreign suppliers provide most of the inputs. However, there is no guarantee that U.S. firms will keep engineering and other white collar jobs in the U.S. in the future.

Innovation and Job Creation in a Global Economy: The Case of Apple's iPod

Greg Linden, Jason Dedrick and Kenneth L. Kraemer
Personal Computing Industry Center, UC Irvine

January 2009

Introduction: Does U.S. Innovation Help U.S. Workers?

Innovation is widely touted as the key to long-term economic prosperity, and concerns have been raised as to whether the U.S. is investing enough in innovation to drive future growth (Hamm, 2009). A related but different issue is the extent to which innovation by U.S. companies will benefit American workers in an era when production and even R&D are increasingly done offshore. Concerns about the location and quality of jobs has taken on a new policy relevance in light of the proposed economic stimulus that is expected to include spending to support innovation in environmentally friendly technologies (Mandel, 2008). How many of the jobs created by innovative industries receiving public funds are likely to remain in the United States?

In order to shed some light on this issue, we look in detail at the global value chain that designs, builds and brings iPods to consumers and estimate the jobs and wages sustained by this innovative product line. Electronics is one of the most global industries, with vast quantities of goods consumed in the U.S. imported from Asia, especially China. Yet we find that most of the high-paying jobs in the iPod value chain are still in the U.S., even though more jobs overall are offshore. Furthermore, according to our estimates, the total wages paid to the U.S. workers are more than double those paid overseas. This article presents and discusses our findings.

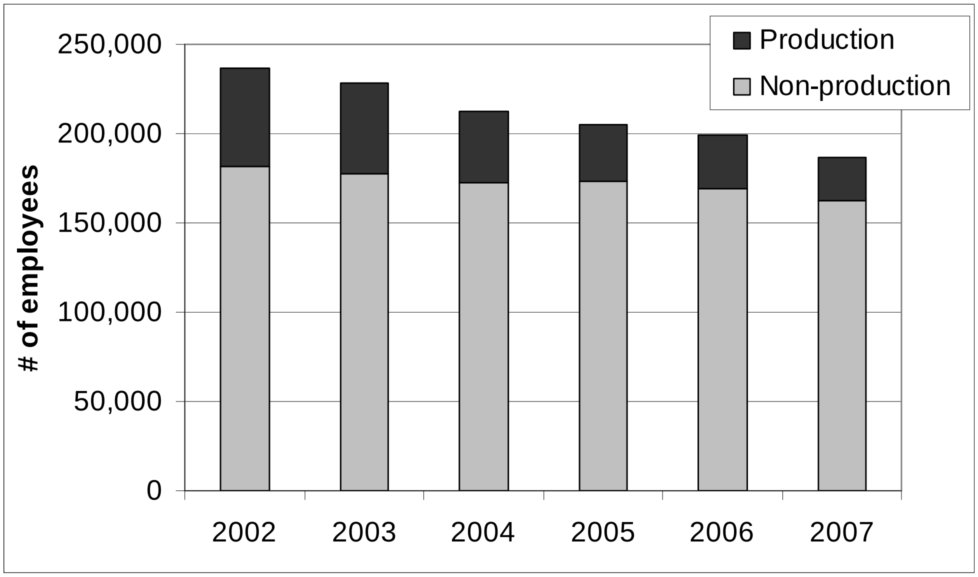
Jobs in the U.S. high-tech industry

For over two decades the U.S. economy has been marked by growing income inequality and concerns about the "vanishing middle class." The factors driving these developments are complex. For the hard-hit blue-collar sector, the causes of decline in jobs include increased use of automation and the continued expansion of manufacturing jobs in low-wage countries. Recently, white-collar workers like engineers are feeling similar pressures.

One industry that has seen a dramatic shift of manufacturing out of the U.S. is computers and peripherals. As recently as 2000, over one-third of the jobs in the U.S. computer industry were production jobs. By 2007, the number of production workers had fallen to less than one-sixth of total employment, and total production jobs had been cut in half just since 2002 (Figure 1). At the same time, white collar employment in the U.S computer industry was falling much more slowly, by about 10% in total from 2002 to 2007.

Most of the factory jobs for high-volume electronics are gone and unlikely to return. Automation has limited the growth of manufacturing jobs worldwide even as output continues to expand.[1] Small electronic goods like iPods and cell phones use tiny components with extremely tight tolerances in fit and quality that require machine precision and thus cannot be assembled by hand.

Figure 1. U.S. employment in the computer and peripherals industry



Source: Bureau of Labor Statistics, Occupational Employment Statistics for NAICS 334100 (Computer and Peripheral Equipment Manufacturing), various years.

Yet, despite the decline in U.S.-located manufacturing of computers and peripherals from $90 billion in 2000 to just $56 billion in 2006 (Reed Electronics, 2008), U.S. companies continued to be leaders in PCs, printers, networking equipment, and in new categories such as portable music players. U.S. companies such as Apple and Hewlett-Packard have successfully coordinated global value chains to develop and manufacture their products while focusing their own efforts on design, marketing, branding, and distribution.

What is not known is whether innovative U.S. companies will continue to keep white-collar jobs in the U.S. while outsourcing production overseas. If so, then innovation can serve as a driver of high-wage employment in the U.S. But if globalization leads to a hollowing out of professional jobs as well as manufacturing, then innovation will only benefit shareholders, consumers, and a small number of top managers and professionals in the U.S.

Data at the national level, such as Figure 1, point to trends in U.S. employment, but don't allow us to understand it in a global context. To develop a better understanding of how the value of innovation is distributed across the global value chains of high-tech companies, we have conducted a two-stage study of the distribution of value in the global value chain of Apple's iPod product line.

[1] Economic studies of the negative impact of automation on jobs for less-educated workers is typically found to be several times that of trade or outsourcing. See for example Paul and Siegel (2001).

In the first stage, we looked at which companies and countries capture *financial value*, using higher-end Apple iPods as a case study (Linden et al., 2008). We found that the largest share of financial value (defined as gross margin) went to Apple, which captures a large margin on each iPod. Although the iPod is assembled in China, the value added in China is very low.

In the current stage of our research, we examine the value of innovation defined in terms of *jobs and wages* associated with the design, manufacturing and distribution of all Apple iPods and major components in 2006. In this report, we estimate the number of jobs supported by the iPod in the U.S. and overseas, broken down as production, non-professional and professional jobs. We also estimate the total earnings paid to workers in each of those categories by country.

Jobs in the iPod value chain

Table 1 presents our estimates, made without any participation by Apple Inc., of jobs at various steps of the iPod value chain by country. We estimate that there are nearly 14,000 U.S. jobs, mostly Apple employees and workers in the retail channel. Outside the U.S., there are about 27,000 jobs mostly in China and elsewhere in the Asia-Pacific region where the iPod and its components are manufactured, and also in countries where the iPod is sold and distributed.

Table 1. iPod-related jobs in the value chain, 2006

	U.S.	Non- U.S.	Locations
Hard drive (HDD) manufacturing	0	2,200	China
		2,200	Philippines
HDD inputs	0	2,550	China
		2,550	Philippines
		840	Japan
		800	Thailand
		800	Singapore
Flash memory	0	1,200	Korea
		20	China
Other chips	110	140	Taiwan
		25	Various
PCB assembly and test	0	600	China
Display panels and modules	0	900	Japan
Other inputs	0	3,500	China
		100	Japan
		100	Taiwan
Final iPod assembly	0	3,400	China
		100	Taiwan
Apple engineers	700		U.S.
Apple managers/professionals	5,046	75	Singapore
		75	Various
Apple non-professional	1,554	75	Singapore
		75	Various
Distribution	150	150	Various
Freight	250	250	Various
Apple stores	1,785	200	Various
Other retailers	3,675	3,675	Various
3rd party online sales	650	650	Various
Totals	**13,920**	**27,250**	

Source: Authors' calculations. See Appendix for methodology.

Table 2 shows how those jobs are distributed by country and category. In the U.S., there are 7,789 non-professional jobs (primarily in retail and distribution) and 6,101 professional jobs (primarily at Apple's headquarters) including management, engineering, computer support and a variety of other categories. The 30 production jobs (and a similar number of the professional jobs) reflect the fabrication of some of the iPod's chips in U.S. plants.

The retail and distribution jobs aren't all attributable to Apple's innovation since retailers would be selling something else, possibly from a non-U.S. company, if iPods didn't exist. The majority of the professional jobs, however, can be attributed to the fact that Apple is a U.S.-headquartered company with a high concentration of managerial and R&D activities in the U.S.

In the Asia-Pacific region, there are over 19,000 production jobs and over 3,000 professional jobs. In Asia, Europe, and elsewhere, we estimated another 4,825 jobs in distribution, retail, transportation, and other post-manufacturing activities.

Table 2. iPod-related jobs by country and category

	Production	**Retail and other non-professional**	**Engineering and other professional**	**Total**
U.S.	30	7,789	6,101	13,920
China	11,715	*	555	12,270
Philippines	4,500	*	250	4,750
Japan	700	*	1,140	1,840
Singapore	825	*	100	925
Korea	600	*	600	1,200
Thailand	750	*	50	800
Taiwan	70	*	270	340
Other	0	4,825*	300	5,125
Total	**19,190**	**12,614**	**9,366**	**41,170**

*Includes all non-U.S. retail and other non-professionals.

Earnings in the iPod value chain

Next we look at the wages earned by the estimated 41,170 workers involved with the iPod. For production workers, we use international comparative rates compiled by the U.S. Bureau of Labor Statistics (BLS). Average professional and non-professional wages were found in various sources detailed in the Appendix. Table 3 presents average earnings for the U.S. and Asia-Pacific countries in each category. Wages for Apple employees used a more fine-grained estimation procedure also described in the Appendix.

Table 3. Average annual employee earnings by job category, 2006

	Production	Other non-professional	Engineering and other professional
U.S.	$47,640	$25,580	$85,000
Japan	$40,400	$20,000	$65,000
Korea	$29,440	$15,000	$30,000
Taiwan	$12,860	$7,000	$20,000
Singapore	$17,110	$9,000	$20,000
Philippines/Thailand	$2,140	$1,500	$15,000
China	$1,540	$1,000	$10,000

Sources: See Appendix.

Table 4 uses the job and wage estimates, with adjustments detailed in the Appendix, to calculate the total earnings paid by country and category. We estimate that workers received over $1 billion in earnings from iPod-related jobs in 2006, or about $25 per unit sold. Of this total, nearly $750 million went to U.S. workers and about $320 million, less than half as much, to workers outside the U.S.

Over two-thirds ($525 million) of the earnings in the U.S. went to professional workers, and an additional $220 million to non-professional workers. While most of the non-professional jobs were relatively low-paying retail positions, we estimate that nearly $50 million went to administrative jobs at Apple for which we used the national average wage of $38,000 a year; actual Silicon Valley wages were probably even higher.

Outside the U.S., total earnings were divided more evenly between the production and professional categories. Over half the professional earnings were paid in Japan and Korea, where the suppliers of most of the high-value components (hard drives, flash memory, and displays) are headquartered. Retail and distribution jobs are spread around the world in countries where the iPod is sold.

Table 4. iPod-related wages by country and category, 2006

	Production	Other non-professional	Engineering and other professional	Total
Apple (overhead)	0	61,728,000	488,410,000	550,138,000
Apple stores	0	43,486,000	7,225,000	50,711,000
Other U.S.	1,429,200	114,010,060	29,580,000	145,019,260
Total U.S.	**$1,429,200**	**$219,224,060**	**$525,215,000**	**$745,868,260**
Japan	28,280,000	0	74,100,000	102,380,000
Korea	17,664,000	0	18,000,000	35,664,000
Taiwan	900,200	0	8,100,000	9,000,200
Singapore	14,115,750	0	2,000,000	16,115,750
Philippines	9,630,000	0	3,750,000	13,380,000
Thailand	1,605,000	0	750,000	2,355,000
China	18,041,100	0	5,550,000	23,591,100
Other	0	96,500,000*	19,500,000	116,000,000
Total non-U.S.	**$90,236,050**	**$96,500,000**	**$131,750,000**	**$318,486,050**

*Includes all non-U.S. retail and other non-professionals.
Source: Authors' calculations. See Appendix.

Conclusions: Globalization's impact on U.S. workers

- The relationship between innovation by U.S. companies and employment in the U.S. is more complex than phrases such as the "vanishing middle class" suggest. When innovative products are designed and marketed by U.S. companies, they can create valuable jobs for American workers even if the products are manufactured offshore. Apple's tremendous success with the iPod and other innovative products in recent years has driven growth in U.S. employment, even though these products are made offshore. These jobs pay well and employ people with college degrees. They are at the high end of what might be considered middle-class jobs and appear to be less at risk of vanishing from the U.S. than production jobs.
- Production jobs are unlikely to recover in the U.S., and in any case, they form an uncertain basis for job creation in the future. Even China is losing some new factory investments to lower-cost locations like Vietnam. Production jobs can also be undermined by obsolescence in the rapidly changing electronics industry. The 12,000 jobs we estimated for iPod-related hard drive production are at risk as Apple and its customers shift to models based on flash memory, which requires far fewer workers to produce.
- It is more important than ever that all children receive an education that prepares them for 21st-century jobs. Retail jobs are no substitute for higher paying services employment. For instance, according to the BLS, the average hourly wage for "computer support specialists" is $22, while a retail salesperson makes only $12.[2] Unfortunately, the continuing loss of manufacturing jobs, which pay better than retail jobs, means fewer opportunities for non-college educated workers. Even the administrative jobs that pay reasonably well at companies such as Apple often require a higher level of education.
- Professional jobs are at risk on multiple fronts. Many U.S. high-tech companies are investing in white-collar job creation offshore to tap pools of low-cost talent and gain access to growing markets. The offshore jobs often support high-value jobs in the U.S., but this may not always be the case. Also, when U.S. companies lose their innovation leadership, foreign competitors do not typically employ many engineers or other professionals in the U.S.

Acknowledgements

This research has been supported by grants from the Alfred P. Sloan Foundation. The authors are grateful to Clair Brown and Tim Sturgeon for their comments on earlier drafts. Any opinions and conclusions are those of the authors and do not necessarily reflect the views of the Sloan Foundation or the reviewers.

References

Dedrick, Jason, and Kenneth L. Kraemer. (2008). Impact of Globalization and Offshoring On Engineering Employment In The Personal Computing Industry. In Committee on the Offshoring

[2] http://www.bls.gov/oes/current/oes_nat.htm for occupation codes 15-1041 and 41-2031.

of Engineering, National Academy of Engineering (NAE), *The Offshoring of Engineering: Facts, Unknowns, and Potential Implications*. Washington, DC: National Academies Press.

Hamm, Steve (2009). Is Silicon Valley Losing Its Magic? *Business Week*, January 12, 28-33.

Linden, Greg, Kenneth L. Kraemer and Jason Dedrick (2008). Who Captures Value in a Global Innovation Network: The Case of Apple's iPod. Personal Computing Industry Center, UC Irvine. http://pcic.merage.uci.edu/papers/2008/WhoCapturesValue.pdf

Mandel, Michael (2008). Can Obama Keep New Jobs at Home? *Business Week*, December 8, 26-29

Paul, Catherine J. Morrison, and Donald S. Siegel (2001). The Impacts of Technology, Trade and Outsourcing on Employment and Labor Composition. *Scandinavian Journal of Economics* 103(2):241-264.

Reed Electronics (2008). *Yearbook of World Electronics Data*. Reed Advanced Electronics.

Appendix: Methodology
This appendix details our methodology for calculating estimates of iPod-related jobs and wages for Apple and its partner companies during calendar year 2006.

The firms directly involved will not provide data, and we have found no systematic third-party source of data on employment by firm or by industry. Our task is further complicated by the fact that we're looking at jobs associated not with an industry but with a single product line, which has never been done before to our knowledge. To arrive at our estimates, we are using company reports, interviews with similar companies, government data, data from industry analysts and other sources. We have been conservative about the U.S.-overseas gap by "rounding up" overseas estimates and "rounding down" for the U.S.

Job estimation
Our method begins with estimates of the number and wholesale value of iPods sold in 2006. As described in detail below, we apply these numbers to various data sources to generate our estimates of manufacturing and other lower-pay workers in the value chain. We then use percentages derived from company reports and interviews to determine the corresponding number of higher-pay workers.

For Apple, we estimated the number of total jobs by starting from iPod sales as a percentage of Apple's total sales and applying this ratio to Apple's total employment. We are still refining our distribution of jobs between higher- and lower-paying jobs, as discussed below.

We now present a more detailed description of the process:

1. We began with estimates of the number and wholesale value of iPods of various types sold in 2006. From the first stage of our research, in which we analyzed the value of the components in the iPod, we were able to calculate how many of each component was used over the course of 2006. For example, each of some 30 million Nano iPods contained eight flash memory die assembled in two packages of four die each.

2. For total employment at most points along the value chain, our estimates derive from at least one of the two following methods:

   a.) <u>Factory Fraction Method</u>: Given the quantity of a given type of component used in 2006, determine the percentage it represents of the output of a typical plant. Apply this percentage to the staff level of that plant. For example, the 240 million flash die are equivalent to the output of a medium size microchip factory, which would require a staff of roughly 1,200.

   b.) <u>Revenue Fraction Method</u>: Given the total value of a given type of component used in 2006, determine the percentage this represents of the sales of a company that specializes in that component. Apply this percentage to the company's total employment. For example, we estimate that approximately $1 billion worth of iPods were sold online globally in 2006. That year, Amazon (with $10.7 billion in sales and 13,900 employees) required roughly 1,300 employees to sell each $1 billion in goods. Using that as our benchmark, we apportioned the employees between the U.S. and overseas since iPods are sold through a variety of websites worldwide and overseas sales were about half the total of all iPod sales.

In practice, Method (a), which ignores support and overhead staff, always yields a lower number than Method (b). To the extent possible, we apply both methods and look at multiple factories or multiple firms to improve the accuracy of the estimate.

3. For higher paying engineering and management jobs, our estimates were based on firm interviews and site visits, wherein we developed ratios of engineering and management staff to manufacturing jobs. Applying these ratios to the staff estimates from step (2) enabled us to generate estimates of the number of managerial and technical people related to manufacturing. For example, in a microchip factory, roughly half the workers are highly-paid engineers and managers, so the 1,200 workers in 2a, above, are split evenly between lower-pay and higher-pay.

4. For the iPod-specific jobs at Apple itself, which include many high-paying jobs in design, software, marketing, and administration, we started from iPod sales as a percentage of Apple's total sales and applied this ratio to Apple's total employment, as in method (2b). Our method for determining the distribution of jobs among several pay grades of Apple professionals, managers, and non-professionals employees is described below under "Wage estimation."

5. The number of Apple engineers and of Apple's own retail store employees are separate in Table 1 because we had specific sources of information about these sub-categories.

Wage estimation

For non-Apple jobs, we used the following sources for the wage rates in Table 3:

Production: The production earnings were based on the hourly rates given in Table 2 of the BLS news release "International Comparisons of Hourly Compensation Costs in Manufacturing, 2006" (http://www.bls.gov/news.release/pdf/ichcc.pdf). Thailand was not listed so we assumed the same rate as the Philippines. The 2006 hourly rates were annualized by assuming 2,000 paid hours per year. For China, we used a 2004 rate reported separately on page 4 of the same document.

Non-professional: For the U.S., we used the average wage for "Retail Salespersons" at electronics stores from BLS "May 2006 National Industry-Specific Occupational Employment and Wage Estimates" (http://www.bls.gov/oes/2006/may/naics3_443000.htm#b41-0000). For other countries, we applied the ratio of the U.S. production and non-professional wages to the production wage of each country, rounding the result to reflect lack of precision. In practice, the only non-U.S. non-professional wage that mattered was Japan's; we applied this to the total of non-U.S. non-professional employees because it produced the largest possible total for non-U.S., and we wanted to be conservative about estimating the difference between total wages in the U.S. and in the rest of the world.

Professional: We use "Professional" to designate all higher-wage jobs, including managers. The "professional" wages in Table 3 were based on engineering salary estimates reported in Dedrick and Kraemer (2008, Table 5). For the countries not covered there (South Korea, Singapore, the Philippines, and Thailand), we extrapolated based on our knowledge of the level of development of the electronics industry in each country as well as consulting salary reports about other professional job categories. We liberally rounded the estimates upward to minimize the difference with the U.S.

Based on our research, we estimated that Apple's iPod division employed approximately 700 engineers (Software, Engineering, and Engineering Managers) in 2006.

To estimate Apple's overhead employment, including those who might not be directly related to the iPod, we looked at the ratio (about 51%) of iPod sales (but not music sales) to total sales (excluding Apple Stores, which we estimated and reported separately) and applied this to Apple's total employment (excluding Apple Stores) of 14,400. After subtracting out the 700 engineers we estimated for the iPod division, we arrived at an estimate of 6,600 overhead employees.

To estimate the distribution of these overhead employees across a range of occupations, we apportioned them based on the frequency of non-production jobs listed for NAICS 334100, Computer and Peripheral Equipment Manufacturing, in May 2006 as reported by the Bureau of Labor Statistics (http://www.bls.gov/oes/2006/may/naics4_334100.htm).

To calculate the total wage bill, we applied the national average wages for each job category in the BLS data to our employment estimates. When calculated using these national averages, which are probably lower than the actual wages paid in Silicon Valley, the average wage for engineers and the other high-salary categories worked out to be $89,978. To be conservative, we capped these job categories at the $85,000 wage listed in Table 3, which was also used to calculate the earnings of the 433 other U.S. professionals included in Table 2.

The national averages were used for the categories listed as "Non-Professional" in Table A1 since this employment, mostly office jobs, is different from the retail work of most others in the "non-professional" category, and their average annual salary works out to $39,722. The earnings of the remaining U.S. non-professionals were calculated at the $25,580 wage shown in Table 3.

Table A1. Estimated iPod-related jobs at Apple, 2006

Job category	Estimated number of employees	National average annual wage	Total wages
Engineering	352	$81,770	$28,763,679
Software (apps and system)	304	$96,945	$29,467,427
Engineering managers	44	$133,030	$5,890,105
Engineer total	**700**		**$64,107,640***
Business and financial	1,430	$73,780	$105,505,400
Computer support	1,236	$79,620	$98,410,320
Management (exc. engineering)	1,208	$125,003	$151,003,624
Sales and related	676	$83,800	$56,648,800
Life, physical, social sciences	309	$82,330	$25,439,970
Arts, design, sports, media	142	$73,500	$10,437,000
Legal	35	$136,220	$4,767,700
Training and library	6	$66,320	$397,920
Health care	4	$75,000	$300,000
Other Professional total	**5,046**		**$452,910,734***
Office and administrative support	1,240	$38,600	$47,864,000
Installation, maintenance, repair	282	$45,170	$12,737,940
Building and grounds maintenance	14	$26,170	$366,380
Construction	10	$44,520	$445,200
Protective service	8	$39,310	$314,480
Non-Professional total	**1,554**		**$61,728,000**
Grand Total	**7,300**		**$578,746,374**

* For reference only; the calculation reported in the main text used the average earnings from Table 3.
Source: Authors' calculations as described in the text.