ECONOMIC CONSEQUENCES OF SOFTWARE PIRACY ON CALIFORNIA

Authored by:
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EXECUTIVE SUMMARY

- The IT and Computer Software cluster is a large and growing driver of the California economy, and health of this sector is essential to meaningful economic recovery in the State.

- National and global software piracy disproportionately hurts California because Software/IT employment and economic benefits are concentrated in the state.

- California workers lose billions in wages due to piracy. Loss in business revenues translates to the inability for businesses to expand and hire more workers and increase compensation for their current workforce.

- Software Piracy negatively impacts economic activity, job creation, job retention, and tax revenues.

- In addition to direct impacts on the economy and jobs, the potential for additional damage to the California economy is enormous.

  - Software Piracy is a competitiveness issue for California, including manufacturing and construction employment retention and attraction efforts.

  - Chilling effect that a lax software piracy policy framework has on California’s R&D, knowledge, investment, innovation, and economic drivers.
Software piracy in California cost software vendors an estimated $1.36 billion, the highest of any state and higher than the national figure for ninety-eight other countries. Lost revenues to a wider group of software distributors and service providers cost an additional $3.88 billion, enough to hire nearly 16,000 tech workers. The lost state and local tax revenues in California would have been enough to hire more than 7,500 experienced police officers.  

California’s Software/IT industry contribution to the regional economy is essential to California’s economic recovery. IT occupations have higher wages and multiplier effects than most other occupations and therefore growth in California’s Software/IT industry translates to increased economic activity across a variety of support industries and throughout the California economy.

A 2010 report by the Business Software Alliance highlights that reducing the global software piracy rate by 10 percentage points over four years would create $142 billion in new economic activity while adding nearly 500,000 new high-tech jobs and generating around $32 billion in new tax revenue by 2013. In the United States, reducing piracy by 10% over four years would generate nearly $38 billion in the new economic activity, create 25,000 new IT jobs and create more than $6 billion in additional tax revenues by 2013. Estimates for California would translate into over $4 billion in new economic activity and $660 million in additional tax revenue in the state.

Reducing software piracy by 10 percentage points in half the time (two years), would increase economic benefits by 36%, returning $193 billion in new economic activity and generating $43 billion in new tax revenues and 680,000 new jobs. In the U.S. alone this would translate to more than $52 billion in new economic activity, more than $8 billion in new tax revenues, and 34,000 new jobs. California’s share would be over $5.7 billion in new economic activity and $880 million in additional tax revenue.

California would benefit substantially from effectively addressing software piracy, as the IT and software sector is highly concentrated in the state. Software/IT firms would benefit from higher levels of revenue and therefore be able to circulate these additional gains into employing a larger workforce, increasing wages, and increased funding for R&D; all of which present additional income in the form of tax revenues for local and state governments. In essence, the increased economic activity due to reductions in piracy would increase revenues to firms allowing for additional investment in a variety of business sectors translating to additional tax revenues to local and state governments, speeding up the rate of economic recovery for California.

Reducing piracy would result in significant increases in tax revenues to state and local governments in California which in turn would increase their overall budget and allow for increased spending on new construction and infrastructure projects such as additional housing projects, roadway maintenance, low-carbon green efficiency improvements to existing buildings, improving educational facilities, improving trade infrastructure, etc.

1 Business Software Alliance
CALIFORNIA HAS ALMOST 20% OF NATION’S IT/SOFTWARE EMPLOYMENT

National and global software piracy disproportionately hurts California because the Information Technology/Software industry is highly concentrated here and has become a major California job generator. Retaining and growing this sector is key to California’s employment growth and economic recovery.

The health and competitiveness of Software and Information Technology (IT) sector in California is a significant issue for the state’s economic and fiscal health. Software/IT is one of the few areas of growth since the economic downturn. The annual average growth rate of employment of Software/IT employment Publishers was 4.89% between 1990-2010, compared to overall California employment growth of only 0.50% annually during the same time period (Employment Development Department, State of California).

Software/IT are significant drivers of the state’s projected future job growth. The California Community Colleges Centers of Excellence projects that the Information and Communication Technologies (ICT) sector will grow 8.5% over the next 2 years, compared to a decline of 0.4% in California non-ICT employment. The Information and Communication Technologies (ICT) sector is defined by the COECCC as “…all rapidly emerging, evolving, and converging computer, software, networking, telecommunications, Internet, programming, and information system technologies.”

There are currently 46,000 California ICT firms, mostly small, family-owned businesses. ²

Employment in Primary ICT occupations in California totaled 632,500 in 2010 and over 1,680,500 ICT support occupations.²

Software, IT, and other Intellectual Property (IP) sectors drive California and national economic growth, especially in the retention and growth of California’s manufacturing sector. U.S. Intellectual Property (IP) companies in manufacturing and nonmanufacturing sectors generated almost $7.7 trillion in gross output, or 33.1% of total U.S. GDP in 2008 and accounted for around 60% of total U.S. exports.

Software piracy > loss of innovation > loss of ability to firm to stay competitive in evolving market). Many studies conducted by the Business Software Alliance and others find that the main reason software piracy effects manufacturing competitiveness is because piracy reduces innovation (or drive of firms to innovate); therefore, companies who lose innovation lose their ability to compete with other firms.

With California manufacturing employment just starting to recover, and the state benefitting from two of the largest ports in the world, the economic impact to California of Software/IT is substantial to exports and California manufacturing employment.³

² Estimates by California Employment Development Department and Centers of Excellence, An Initiative of Economic and Workforce Development by California Community Colleges 2010 Environmental Scan, ICT, Information and Communications Technologies in California.

Software/IT occupations pay well and the associated benefits ripple throughout the California economy. According to the Centers of Excellence California Community Colleges, primary ICT occupations had wages of $116,090 in California in 2010, with secondary (support) ICT occupations earning $86,224 creating an average of $109,617 for both primary and secondary ICT occupations. Looking specifically at the Information sector as highlighted by the California Employment Development Department the average wages for 2009 were $92,872, much higher than the current average California wage of $51,334 as reported by EDD. With high wages and high multiplier effects the benefits of the Software IT sector significantly positively ripple throughout the rest of the California economy.

### Various Wage Estimates (Q1, 2010)

<table>
<thead>
<tr>
<th>Occupation/Source</th>
<th>Wages:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary ICT</td>
<td>$116,090</td>
</tr>
<tr>
<td>Secondary ICT</td>
<td>$86,224</td>
</tr>
<tr>
<td>Aggregate ICT</td>
<td>$109,617</td>
</tr>
<tr>
<td>Software Publishers</td>
<td>$134,374</td>
</tr>
<tr>
<td>Computer Software Engineers, Applications</td>
<td>$103,730</td>
</tr>
<tr>
<td>Computer Software Engineers, System Software</td>
<td>$111,446</td>
</tr>
<tr>
<td>Information Industry</td>
<td>$92,872</td>
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</tbody>
</table>

Information Technology/Software occupations have considerably higher multiplier effects than traditional industries and, meaning jobs created, retained, and/or saved in the Software/IT sector have significant positive impacts and benefits that multiply many times over throughout the rest of the California economy, including significant positive impacts to the California manufacturing and service sectors:

### RIMS II- Final Demand Multipliers

<table>
<thead>
<tr>
<th>Sector</th>
<th>Output</th>
<th>Earnings</th>
<th>Employment</th>
<th>Value-Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Publishers</td>
<td>2.1882</td>
<td>.7143</td>
<td>12.6920</td>
<td>1.3726</td>
</tr>
<tr>
<td>Information Sector</td>
<td>2.5629</td>
<td>.9932</td>
<td>21.6924</td>
<td>1.5149</td>
</tr>
</tbody>
</table>

These multipliers were created using the federal government’s Regional Input-Output Modeling System (RIMS II), U.S. Bureau of Economic Analysis. For Software Publishers, every dollar in spending creates $2.1882 in output and $.7143 in additional wages/earnings. For every additional $1 million dollars created in this sector, an additional 12.6920 jobs are created. Looking at the Information sector overall, every dollar creates an additional $2.5629 in output and $.9932 in earnings and for every $1 million dollars 21.6924 jobs are created.\(^5\)

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\(^4\)California Employment Development Department and Centers of Excellence An Initiative of Economic and Workforce Development by California Community Colleges 2010 Environmental Scan, ICT, Information and Communications Technologies in California

\(^5\)U.S. Bureau of Economic Analysis, U.S. Department of Commerce
Measuring the full current and potential economic impacts of software piracy, while complicated, is by any measure extremely substantial and negatively effects every California worker, business, and the California economy in meaningful ways. These effects take shape in the form of significant job losses, lost economic activity, loss of state and regional tax revenues, and perhaps most importantly, potential threats to California’s culture of innovation that has been the state’s post-World War 2 economic engine for the state.

- In 2007, Global Information Technology/Software piracy cost California IT firms an estimated $1.36 billion in revenue losses, an additional $3.88 billion to its support and distribution industries, and cost state governments $556 million in state and local tax revenue.

- Software piracy cost California more than 16,000 lost jobs in 2007.6

Updating these results to 2011, California lost $1.66 billion in economic activity, almost 20,000 jobs, and $697.6 million in state and local tax revenue in 2011 due to Software Piracy.

- Other sectors in California are negatively impacted by Software Piracy as well. For example, California’s manufacturing sector is also negatively impacted by piracy in terms of jobs and sales lost and overall competitiveness with foreign nations. Piracy and counterfeiting flood the market with much cheaper products and therefore divert revenue from legitimate companies, effectively lowering potential profits and through a trickle down process, inhibits companies from expanding and hiring additional production workers translating to higher unemployment and lower tax revenues for local and state governments.

Manufacturing employment in California has decreased 31% between 2000 and 2010 due a less competitive California business environment compared to neighboring states and abroad. California’s manufacturing sector is concentrated in the high-tech manufacturing sector and therefore piracy and IP is of particular importance to California manufacturers. Manufacturing employment is California is estimated around 1,242,300 as of 2010 by the National Association of Manufacturers and high-tech manufacturing is estimated at 485,900 or 19.7% of U.S. high-tech manufacturing (Milken Institute). California’s high-tech manufacturing is particularly sensitive to issues surround IP protection and piracy.7

- California innovators are also substantially impacted by piracy and counterfeiting as their products are based around Intellectual Property Rights (IPR) and the ability of governments to protect and/or enforce IPR. These innovators or IP-intensive firms are mainly small businesses who focus the majority of their time, knowledge, expertise, and investment capital on R&D efforts to create new and innovative technologies and products. These technologies and products are then licensed out to larger manufacturing-based firms and IPR infringement undermines the significant R&D costs associated with creating new innovations. If these smaller companies are unable to turn a profit because of the proliferation of their IP then they are unable to appropriate additional funding to continue R&D efforts and effectively lose their ability to innovate new products.

- NDP Consulting estimates that between 2000 and 2007, IP-intensive occupations and subsequently portions of IT occupations grew by 114,500 while the same occupations were cut by 4,800 in non-IP-intensive industries. The difference in terms of wages, economic benefits, and exports are significant when comparing 15 IP-intensive industries to 12 non-IP-intensive industries in terms of economic performance per employee.

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6Business Software Alliance, 2007 State Piracy Report and California Employment Development Department
7National Association of Manufacturers and Milken Institute
<table>
<thead>
<tr>
<th></th>
<th>Wages</th>
<th>Sales</th>
<th>Value-Added</th>
<th>Exports</th>
<th>R&amp;D Spending</th>
<th>Capital Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP-Intensive</td>
<td>$59,041</td>
<td>$485,678</td>
<td>$218,373</td>
<td>$91,607</td>
<td>$27,839</td>
<td>$15,078</td>
</tr>
<tr>
<td>Non-IP-Intensive</td>
<td>$37,202</td>
<td>$235,438</td>
<td>$115,239</td>
<td>$27,369</td>
<td>$2,164</td>
<td>$6,831</td>
</tr>
<tr>
<td>Difference</td>
<td>$21,839</td>
<td>$250,240</td>
<td>$103,134</td>
<td>$64,238</td>
<td>$25,676</td>
<td>$8,246</td>
</tr>
</tbody>
</table>


Considering the importance and value of IP-intensive jobs to the California economy, or IT focused occupations bring to the economy, if potential revenues to small, innovative firms were reduced not only would innovation be drastically reduced but valuable jobs which have high multiplier effects would be lost and subsequently the State’s economy would suffer.

Frontier Economics estimates that the total global value of counterfeit and pirated products on California could be between 82,500-90,750 jobs lost with annual wages ranging from $103,730 (Computer Software Engineers, Applications) to $111,446 (Computer Software Engineers, System Software) to $134,374 (Software Publishers). By attributing the annual average wage of the Information sector at $92,872 to the number of lost employees the result is around $7,661,940,000 to $8,428,134,000 in lost California wages. Potential lost tax revenues to California are estimated to be between $1.22 billion and $1.34 billion.

The above likely underestimates the potential economic loss to California due to piracy. There is more at risk than just the economic impacts, jobs lost or gained, or additional tax revenues as outlined throughout this report. Not taken into account is the potential damage to the California economy in terms of economic development or attraction and retention of business and firms; namely Information Technology/Software based firms which have long been acknowledged as California’s job creation engine. Ensuring the State does everything it can retain this industry and keep California attractive to these firms will provide a platform and resource for development of new industries and job creators.

Software/IT and other high-tech based innovation firms, along with entrepreneurs and investors, have deep concerns regarding the protection of the intellectual property and trade secrets as their livelihood depends on it. Having a set of strict and enforceable intellectual property rights is a large factor in the decision-making process firms have when deciding where to locate or expand. Many firms have pulled R&D operations in foreign countries such as China because of the lack of IP protection they provide. If software piracy is perceived to be an issue in California, firms may become apprehensive about locating here. According to the BSA, in 2007 California had the second highest software piracy rate at 25% of eight states measured in the report. This higher rate of software piracy in the state acts as a deterrent for software companies to develop and locate in the region for fear of lost revenues and competitiveness with pirated products.

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* NDP Consulting The Impact of Innovation and the Role of Intellectual Property Rights on U.S. Productivity, Competitiveness, Jobs, Wages, and Exports, April 2010
* Business Software Alliance, 2007 State Piracy Study
High levels of piracy and counterfeiting work to seriously harm a region’s innovation and ability to continually produce IP and subsequently reduces overall economic activity. With IP tied to 33.1% of the total U.S. GDP in 2008 and accounting for 60% of total U.S. exports in 2007, the importance to protect IP and encourage innovation is substantial. Currently, California is one of the most innovative states in the nation with the highest percentage of high-tech occupations, R&D focused firms, and IP-intensive sectors which have all contributed to California’s economic prosperity; therefore, reduced innovation due to software piracy would severely harm California’s ability maintain or cultivate high levels of economic activity and increased software piracy protection would generated significant positive benefits. 

Ensuring there is a strict and enforced policy framework and initiative for protecting IP is essential to maintaining and expanding a region’s IT sector. A 2009 report by the International Chamber of Commerce’s Business Action to Stop Counterfeiting and Piracy initiative titled Intellectual Property: A Powerhouse for Innovation and Economic Growth highlighted how intellectual property protection promotes innovation by increasing funding for research and development. Firms that develop IP are generally more successful and have higher market value than those who do not. This is especially apparent in small and medium businesses which develop IP report much higher growth, income and employment than those that do not. Overall, this report found that “sectors that rely on IP represent a significant part of developed and developing economies, in terms of GDP, employment tax revenues and strategic importance. IP also promotes foreign direct investment and technology transfer in developed and developing counties” (BASCAP, 2009). Therefore, by protecting and enforcing IP protections, not only will it benefit the IT sector, but also will positively impact other sectors such as manufacturing and the overall California economy.

RAND’s recent report “Intellectual Property and Developing Countries” highlighted the relationship between intellectual property and the effects nation’s competitiveness. Their conclusions about the impact on nations likely holds true for impacts on states. In support for stronger intellectual property rights, RAND explains that increased IPR can create ownership advantages:

“Investment by firms can be more likely when host countries have strong IP protection, as this protection reduces the risks of limitation and leads to a relatively larger net demand for protected products...Therefore, IPRs positively affect the volume of foreign direct investment by enabling foreign firms to compete effectively with indigenous firms that possess ownership advantages.”

“Not only can IPRs positively affect the volume of FDI, but they can also influence where multinationals decide to locate that investment. IPRs are territorial in nature and hence differ across national boundaries... In this regard, stronger IPRs in some developing countries can be a location advantage that will positively affect multinationals’ decisions...On the contrary, developing countries characterized by weak IPRs can be less attractive locations for foreign firms.”

The Property Rights Alliance report “The International Property Rights Index 2011 Report” highlights the effects of intellectual and physical property rights on a countries economy. The Property Rights Alliance identifies that, based on their findings, “countries with high property rights scores tend to be nations with higher per capita incomes...[while]... countries with low property rights scores tend to have lower per capita incomes. Additionally, countries with strong property rights regimes attract more foreign direct investment... and... developing countries with strong property rights show stronger per capita GDP growth than those that fail to respect property rights.” 

IT Sector Importance to Jumpstarting Slow Economic Recovery

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12 RAND Europe, Intellectual Property and Developing Nations