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Wiederhold, Gio

Stanford University

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Follow the Intellectual Property,

How does Industry pay Programmers' Salaries when they move the related IP rights to offshore taxhavens?"

By Gio Wiederhold

Stanford University, Departments of Computer Science, Electrical Engineering, and Medicine
Gio@cs.stanford.edu

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In the ongoing discussion about offshoring in the computer and data-processing industries, the 2006 ACM report *Globalization and Offshoring of Software* addressed job shifts due to globalization in the software industry [1 ACM:06]. But jobs represent only half of the labor and capital equation in business. In today's high-technology industries, intellectual property (IP) supplies the other half**,** the capital complement. Offshoring IP always accompanies offshoring jobs and, while less visible, may be a major driver of job transfer. The underlying economic model—involving ownership of profits, taxation, and compensation of workers from the revenue their products generate—has not been explicated and is largely unknown in the computer science community. This article presents the issue of software income allocation and the role IP plays in offshoring. It also tries to explain why computer experts lack insight into the economics of software, from investments made, to profits accumulated, to capital becoming available for investment in new projects and jobs.

My intent is to make computer scientists aware of the relationship of the flow of jobs in computing and the flow of pre-existing IP. The ability to create valuable software greatly depends on prior technological prowess. The processes that allow IP to be moved offshore, beyond where the software was created are formally legal. The resulting accumulation of massive capital in taxhavens has drawn governmental attention and putting pressure officials to change U.S.**??** tax regulations [1[1 ACM:06]. However, the changes proposed in these discussions ignore IP's crucial role in generating such capital and, even if enacted, would be ineffective**.** Transparency is needed to gain public support for any effective change. In addition to advocating transparency about IP transfer processes, I also offer a radical suggestion—eliminate corporate taxation as a way to avoid the distortion now driving the outflow of IP and providing much of the motivation for keeping capital and IP offshore.

I do not address the risk of misappropriation of IP when offshoring, a related but orthogonal issue, covering instead only the processes that are legal. The risk of loss was addressed throughout the 2006 ACM report [1 ACM:06]. Tax incentives, a much larger economic factor for businesses than misappropriation of IP, were also cited in the report. The role of taxhavens was ignored.

> The notion of a taxhaven is a concept in ordinary discourse and a crucial aspect of this article. Moreover, using a one-word term simplifies the specification and parsing of subsets, as in "primary taxhavens" and "semi-taxhavens."

Programmers and the computer scientists supporting their work have traditionally focused on producing quality high-performance software on time and at an affordable cost [4 Boehm:81]. They are rarely concerned with the sales and pricing of software, questioning financial policies only when the company employing them goes broke. There is actually a strong sense in the profession that software should be a free good 2 Gay:02]. Implicit in this view is that government, universities, and foundations should pay for software development, rather than the users benefitting from it**.** In this model, programmers see themselves as artists creating beauty and benefits for all mankind. But consider the size of the software industry. Its revenue is $121 billion per year in the U.S. alone, well over 1% of U.S. GDP [7 Compustat:02]. An even larger amount is spent internally by non-software companies for business-specific software development and maintenance. The more than 4.8 million people employed in this and directly related fields earn nearly $333 billion annually [5 BLS:07]. It is hence unlikely that universal free software is an achievable or even desirable goal. Appropriately, open-source initiatives focus on software that deserves wide public use (such as editors, compilers, and operating systems) and should be freely available to students and innovators.

Flow of Money

Since economics is the focus of this article, and the economic model of open-source software is not well understood, it is limited to the flow of money related to commercial software, or software written to make a profit, either by selling it or by making enterprises more efficient. Part of the income generated by commercial software is used to pay programmers' salaries. Other portions go to grow the business, to investors, and to taxes that are due and support the needed infrastructure. Figure 1 sketches the two loops—on top, the flow without IP, and, on bottom, the gains due to having and using IP.

Definitions. Since the revenue aspect of software economics has been is ignored in CS curricula, this article introduces several concepts from the literature of business economics and IP generation and exploitation [24 SmithP:05]. Within the context of software, many general definitions can be simplified; for instance, manufacturing costs can be ignored, since software products are easy to copy. The cost of equipment is minor when developing and producing

software. For tangible products (such as computers), material costs are significant, but for software the cost of its tangible media is negligible. The value of software is hence assignable solely to the intellectual effort of its designers, implementers, and marketers. Even the content of a tangible master file and the content in the memory in a cellphone is an intangible. Everything inside the dashed lines of Figure 1 is intangible; only the money surrounding it is real.

If an owner of software protects that ownership, the software is considered IP. To protect its IP an enterprise would disallow purchasers of copies to make further copies that might be sold. The means of protection vary, including asserting copyrights, registering trademarks, making copying difficult, only releasing binary images of the code, and threatening prosecution. The IP held within the owning enterprise is primarily protected by keeping the source code secret.

Employees and contractors in the software industry are routinely required to sign nondisclosure agreements in order to protect trade secrets. Trade secrets cover the majority of the IP owned by companies developing software. Patents can protect visible processes (such as one-click-ordering). But patenting internal processes that contribute to the creation of quality software would require revealing the methods, records, and documents employed. These are best protected as trade secrets [10 Damodaran:06]. For companies that market software, trademarks represent a complementary component of corporate IP. Trademarks are visible and will be registered and their use defended. The value of trademarks derives from a combination of having excellent products in the market, marketing methods to grow sales, and advertising to spread the word. For products that benefit from ongoing sales, customer lists are also of value and protected as a trade secret. Employees are motivated to keep trade secrets by the contribution to their collective job security provided by these constraints.

Without protected IP, a company's income would be at the routine level provided by commodity products, with margins after production and distribution of, say, 10%, insufficient to invest in innovation. Having IP without a knowledgeable staff to exploit it is equally futile [16 Kiesewetter:10]. When a high-tech company is acquired, senior staff are typically required to remain until its processes are solidly embedded within the purchaser. Even a startup, with no identifiable IP, will have some specific ideas and concepts in the minds of its founders that form the seeds of growth. Time and money are required for such seeds to mature into IP and then into salable products, a delay referred to as "economic gestation time" or "lag" [29 Wiederhold:08].

Protected IP and the knowledge and expertise of staff within a company are the intangibles that together represent the enterprise's IP. The employees who know how to exploit the IP complement the IP, and such integration is essential for success. The combination of labor and IP leads to non-routine profits. The margins are then typically greater than 50%, even after spending on R&D, allowing further investment and growth.

IP and Jobs

All subsequent developers on a software project benefit from the work that has gone before, that is, from the IP already in place. That IP complements the knowledge due to education and prior experience new employees bring to the job.

The importance of IP to employee productivity becomes clear when companies grow to a size that offshore-outsourcing of jobs is considered. The new offshore workers, whether testers providing quality assurance, maintenance programmers, sales staff, or call-center employees, receive material representing IP that exists in the parent company at the time. Offshore researchers also build on requirements for innovation and the experience collected by the parent company.

Splitting Intellectual Capital

Intellectual capital is the know-how of the work force and the IP it has generated. As a company matures its IP grows and becomes its major asset. Risk of IP loss due to employee turnover becomes less critical. To gain financial flexibility, a company can identify and isolate its IP. The rights to identified IP, as trademarks and technology, can be moved to a distinct subcorporation. Separating the IP is an initial phase in setting up an offshored operation whenever significant IP is involved [28 WTGS:09]. To be productive, the extant technology still has to be made available to the creative workers, by having the productive corporate divisions pay license fees to the subcorporation holding the technology IP; see the sidebar "Property Rights" for an illustrative example clarifying the process of splitting rights from the property itself.

Property Rights

A company named *USco* may sell its headquarters building to a real-estate enterprise *REco*, with a provision that *REco* will lease the building back to *USco* (see the Figure here). If *USco* receives a fair value for the building, *USco*'s total tangibles remain unchanged until it starts spending the money it received for the sale. *REco* may offer an attractive lease because *REco* is located in a taxhaven. An additional strategy by *USco* is to set up *REco* so that it remains under the control of *USco*, also its tenant. Nobody moves, and few employees would notice any change. There may be a new brass plaque on the building and a sign saying "*REco*" on the door to the rooms housing the people who maintain the building. *USco*'s consolidated annual report, delivered to its shareholders and the IRS needs to list only the name and location of the controlled subcorporation *REco*; the assets of both are combined. Since the lease receipts and payments cancel out, the more complex financial flow is externally invisible.

Such transfer-of-rights transactions are even simpler when applied to IP. The rights to a company's IP or to an arbitrary fraction of that IP can be sold to a controlled foreign holding company (CFH) set up in a taxhaven. Once the rights to the IP are in the CFH the flow of income and expenses changes. The rights to the IP are bundled, so no specific patents, trade secrets, or documents are identified. The net income attributable to the fraction of the IP held in the CFH is collected in an account also held in that taxhaven. One way of collecting such income is to charge royalties or license fees for the use of the IP at the sites where the workers create saleable products, both at home and offshore. There is no risk of IP loss at the CFH, because nothing is actually kept there. To reduce the risk of IP loss where the work is performed, new offshore sites are set up as controlled foreign corporations (CFCs), rather than using contractors [28 WTGS:09]. Since IP is crucial to making non-routine profits, the royalty license fees to be paid to the CFH can be substantial and greatly reduce the profitability at the parent and at the CFCs from worldwide software product sales (see Figure 2**).**

The consolidated enterprise gains much strategic business flexibility. Work can be shifted wherever it appears to be effective, perhaps where new incentives are provided, and the needed IP can be made available there, as long as the license fees are paid to the CFH [21 Rahn:09]. Paying these fees as royalties on profits is preferred, since profits represent the ever-changing profit margins due to sales variability and to switching to cheaper labor.

The actual IP content needed to perform creative work is transferred through multiple paths: documents, code, and personal interaction by staff interchanges among the remote sites and the originating location. Most transfers are mediated by the Internet, allowing rapid interaction and feedback. The CFH does not get involved at all.

There are three types of parties involved in IP creation (as in Figure 2): the parent, the CFH, and the CFCs. Employees work a**t** and create IP at the parent and the CFCs locations. Large multinational corporations actually establish dozens of controlled entities to take advantage of different regulations and incentives in various countries.

Valuing Transferred IP

The CFH subcorporation that obtains the rights to the IP, and will profit from fees for its use, must initially purchase the IP from the prior owner. For work that is offshored, the new workers do not contribute prior proprietary knowledge, only IP subsequently. But setting a fair price for the initial IP received is difficult and risky. If it is overvalued the company selling it to the CFH will have gained too much income, on which it has to **it must??** pay taxes. If it is undervalued, excessive profits will accrue to the CFH.

How does the company document the value of the transferred IP ? The annual reports to shareholders and the 10K reports submitted annually to the U.S. Securities and Exchange Commission rarely provide estimates of the value of a company's intangible property. Only

when one company acquires another high-tech company are due diligence assessments of the IP obtained made**.** Several methods to assess the value of the transferred IP from a parent to its CFCs or CFH are available, five types of methods (used with many variations) are:

Future income. Predict the future income ceded to the CFH, subtract all expected costs, and reduce the remainder to account for routine profits. Compute the IP's net present value (NPV) over its lifetime to obtain the amount due to the IP [2 Babcock:94];
Shareholder expectations. Use shareholder expectations embodied in the company's total market capitalization, subtract the value of its tangibles, and split the remainder among the CFH and the parent [3 Becker:02];
Expected value. Search for similar public transactions where the IP transfer was among truly independent organizations, then adjust for differences, and then calculate a median value [18 LeveyWC:06];
Diminishing maintenance. Aggregate the NPV of the specific incomes expected from the products sold over their lifetimes as their initial IP contribution due to maintenance diminishes [30 Wiederhold:06];
Expected R&D margin. Extrapolate the past margin obtained from ongoing R&D investment as it provides benefits over successive years [14 GrossmanH:01].

All valuation methods depend on data. The availability of trustworthy data determines applicability and the trustworthiness of their results. Using more than one method helps in gaining confidence of the resulting valuation of the IP. If existing trademarks are being transferred or kept after an acquisition their contribution to income requires adjustments as well. The benefits of marketing expenses tend to be short-lived. Technological IP is a mixture, some created through product improvement that drives revenue with little delay and some resulting from the fundamental R&D that takes a long time to get to market.

While valuing all the IP in a company is certainly a challenge, for the purpose of offshoring software IP, simplification of confounding items is possible, making the task easier**.** The amount of tangible property is relatively small in a high-tech company. The value of the work force can be shown from can be determined by comparison with public data of acquisitions of similar companies with little IP.

Taxhavens

Offshoring is greatly motivated by being able to avoid or reduce taxes on income by moving rights to the IP into low-tax jurisdictions, or taxhavens, which are categorized as semi-taxhavens, or countries looking to attract jobs through active external investments, and primary taxhavens. Semi-taxhavens tend to provide temporary tax benefits. Countries intent on growth like Israel and Ireland have offered tax holidays to enterprises setting up activities there, while India provides incentives for companies that export. Many Eastern European countries have set up or are considering similar initiatives. Setting up a subsidiary CFC in a semi-taxhaven requires

financial capital and significant corporate IP, helping workers be productive quickly. These resources are best provided via a primary taxhaven.

Primary taxhavens are countries with small populations that focus on attracting companies that will not use actual resources there, and with no local personnel hired. Although their role is crucial in offshoring, the jobs issue is not raised, and the services needed for remote holding companies (such as registration with local government, mail forwarding, and arranging boards-of-directors meetings) are offered by branches of global accounting firms. For example, a single well-known five-floor building in the Cayman Islands is the address for 18,000 holding companies, and the entire country, with fewer than 50,000 inhabitants, hosts more than 90,000 registered companies and banks. The income from the $3,000 annual registration fees for that many companies allows the Cayman Islands to not impose any taxes on anybody**.** Even the beach resorts, available for board of directors meetings, are not taxed.

Defining what makes a country a prime taxhaven varies but always includes negligible or no taxation and lack of transparency. A few dozen jurisdictions actively solicit and lobby for business, citing their taxhaven advantages. Reporting income and assets is often not required. Advantages can be combined; for instance, the rule that Cayman-based corporations must have one local annual meeting can be overcome by having a Cayman company be formally resident in a British Crown Colony, such as Bermuda. Often, only one CFH shareholder is fully controlled by another corporation. Cayman companies need not have external directors on their boards, and optional board meetings can be held anywhere where convenient **.** Neither audits nor annual reports are required, but for criminal cases, records are made available. At the extreme end of the taxhaven spectrum are countries identified by the OECD as uncooperative taxhavens, even sheltering fraud [19 Makhlouf:02].

The use of primary taxhavens causes a loss to the U.S. Treasury of more than $100 billion annually, a substantial amount compared to the $370 billion total actually collected as corporate tax [31 Wilson:09], [8 Cray:09]. Only $16 billion taxes were paid that year by multinational corporations in the U.S.; smaller businesses pay the greatest share [26 PIRG:09]. The actual tax rate paid by companies with taxhavens averages 5%, even as they complain about high U.S. corporate taxes. It's been estimated at a G-20 meeting that developing nations overall lose annual revenue of $125 billion due to taxhaven use [Rittel:10].

Assets in a Taxhaven

Following an IP transfer to a primary taxhaven, the taxhaven CFH will have two types of assets: more-auditable financial assets, derived from licensing and royalties for use of the IP, and the IP itself. Both will grow steadily, as outlined in Figure3**.** These assets are now freely available to initiate and grow projects in any CFC. The IP in the primary taxhaven is made available by charging license fees to projects in the semi-taxhavens, providing immediate income to the CFH. Once the projects have generated products for sale, royalties on the sales provide further income to the CFH.

Initially, the income at the CFH is used to reimburse the parent company for the assumed value of the IP transferred [18 LeveyWC:06]. That amount is typically paid over several years. Moving the IP offshore early in the life of a company, when there is little documented IP, increases the leverage of the approach. The income of the CFH will also be used to pay for ongoing R&D or for the programmers at the parent company and in any IP-generating offshore location [27 Weissler:02]. U.S. taxes must be paid on such funds as they are repatriated to the U.S., since they represent due to taxable income. The funds not needed to support R&D (often more than half after the initial payback) can remain in the CFH. In each yearly cycle yet more funds flow to the holding company in the taxhaven. Additional funds may be repatriated from a CFH when a country (such as the U.S.) offers tax amnesties for capital repatriation or when the parent companies show losses, so the corporate income tax due can be offset [6 Clausing:04], [1 ACM:06].

The payments by the CFH for creative work assure that all resulting IP will belong to the CFH. While the value of the initial IP purchased diminishes over time, the total IP held in the CFH increases as the product is improved and provides a long-term IP and income stream.

Starting an Offshore Project

Money and IP accumulated in a primary taxhaven should be deployed for generating yet more income and avoiding showing excess capital on the consolidated books. Money will be needed to pay for workers on new projects, and IP will be **is??** needed to make them effective and bring the future income to non-routine levels. The period covered byn Figure 3 may extend over 10 years or more. The value of the IP needed for a new project is based on the expectation of income it will generate and will be very high for a promising project. The export of IP, just like any property export, should generate income to the provider. Such exported income, moved via a primary taxhaven, has avoided any payment of taxes. Note that only an appropriate fraction of the rights to the IP are shipped out of the taxhaven. The actual documents will be provided by the originators, wherever they might work, but the documents will be kept by the CFH in the taxhaven, which formally owns the IP.

Since the value of IP is not reported anywhere, nothing is visible to employees or shareholders, except a few financial experts in the company, or more typically, their financial advisors.

If new projects are initiated fully by the primary taxhaven and not located with the parent, both the IP exports and the resulting non-routine income enabled by IP transfers escape all taxation. In most jurisdictions no regulatory authority will check if the IP valuations and related royalties are fair [20 Parr:07]. Funding a similar new project at a taxing locale that requires visibility, as in the U.S., would be costly and awkward; for instance, profit margins would be out-of-line and raise suspicion. Investing in low-cost countries that do tax profits still provides tax benefits, since high license fees paid to a CFH greatly reduce the taxable profit in those countries.

Over time, the share of profits directly available to the parent decreases, and dividends may have to be paid out of CFH funds. These payments are taxed twice, first as part of corporate taxes and then, at a greatly reduced rate, as shareholder income. Paying few dividends out of CFH funds and starting new projects instead is an attractive alternative.

Financial and IP Assets in a Taxhaven

Several issues should be of concern to computer professionals, even though their effects are indirect. Three effects of moving IP rights to a taxhaven are instability of work opportunities, imbalance of large-versus-small companies, and loss of infrastructure support.

Having funds in a primary taxhaven provides to multinational corporations enough flexibility to take advantage to exploit global opportunities. Whenever and wherever business opportunities and incentives are available, funds can be rapidly deployed. Of course, moving work to semi-taxhavens is more advantageous than supporting work in countries that tax at typical rates. The flexibility for high-tech industries is especially great compared to industries relying on tangible assets**.** When semi-taxhaven countries attract investments in tangibles (such as a car factory), benefits are retained after the tax holiday, but IP investments can be rapidly redeployed. Only a few senior people may have to physically move . When the semi-taxhaven also has a low-wage structure, the benefits for the consolidated corporation multiply.

Countries seeking jobs for growing populations are pleased about any investment that creates jobs, even if structured to minimize local corporate profits and taxes. Governments often create semi-taxhavens to encourage new projects but rarely realize how rapidly corporations can move facilities that depend primarily on IP. Temporary tax incentives then fail to provide the long-term benefits these countries expected in return for the tax losses.

The tax avoidance enabled by accumulating IP and funds in any taxhaven reduces the ability of governments of the countries where the actual work is performed to support the infrastructure needed for a healthy economy. That infrastructure includes public roads and transportation, health services, and education for the next generation. Scarcities can be seen in SiliconValley, California , Silicon Glen, Scotland**,** and Electronics City (Bangalore) [1 ACM:06], but tracing cause and effect is complex**.**

Smaller companies that have not had the opportunity to employ taxhavens are disadvantaged, even though most economists view them as the major drivers of growth. In addition to unequal taxation, they are also less likely to be able to benefit from government tax credits for R&D. Such credits enable mature corporations to offset their U.S. R&D labor costs against any taxes remaining on their profits, while the IP generated accrues to their CFH. Smaller companies are establishing tax shelters as well. Since most large companies have already established taxhavens, tax-consulting firms intent on their own growth now market taxhavens to mid-size businesses as well.

Lack of Transparency

The creators of the software, even if they care where their paycheck comes from and where the IP they produce goes, cannot follow the tortuous path from sales to salary [17 Lev:01]. Many intermediate corporate entities are involved, so tracing the sources of programmer income becomes well nigh impossible. Even corporate directors, though ultimately responsible, are not aware of specifics, other than having agreed to a tax-reduction scheme operated by their accountants. Investors and shareholders will not find in consolidated annual reports or 10-K filings any direct evidence of taxhaven usage, since regulations devised to reduce paperwork hide amounts held and internal transactions within controlled corporations. Funds transferred for R&D and dividends from taxhavens are first deposited in corporate income accounts, then taxed, but may remain eligible for government tax credits for corporate research. The taxpayers in those countries are not aware that benefits beyond salaries, that is, income from profitable IP, will not accrue to the country providing the research credits [22 Rashkin:07].

Tax-avoidance processes have been explored in many publications but not applied to corporate IP transfer [15 Johnston:03]; the adventures of movie and sports stars make more interesting reading. Promoters of corporate tax reduction, perhaps to gain more business, provide general documentation, and even address the risks of misvaluation of IP and of faulty royalty rates [18 LeveyWC:06]. The complexity of this arrangement makes it easy to cross the boundaries of legality. Misvaluations can greatly reduce the magnitude of IP exports and consequent tax benefits. The firms that provide advice for setting up tax shelters have the required broad competencies, which are not available in the critical constituencies of the computing community [1 ACM:06]. Staff of firms providing such advice often function as directors of their customers' CFH, invisibly. Most advising organizations protect themselves from legal liability by splitting themselves formally into distinct companies for each country in which they operate. These companies then rejoin by becoming members of a "club" set up under Swiss laws (*Vereinsgesetz*)**.** The member companies of such a club do not assume responsibilities for one another's work and advice. But the club can share resources, information, and income among member companies, allowing them to function as one unit.

U.S. government officials are restricted in how they can share corporate information. Rules established to protect corporate privacy prohibit the sharing of information among Internal Revenue staff regarding arrangements used by specific taxpayers to avoid taxes. Even a 2008 U.S. government report [1**1** GAO:09] had to rely on survey data and could not use corporate filings. A thorough study of IP and capital flow would require changes in the restricting regulations.

Incremental Suggestions

No matter what conclusions you may draw from this article, any follow-up will require increased transparency. U.S. Senate bill **S.506** introduced in March 2009 by Senator Carl Levin (Dem., Michigan) "To restrict the use of taxhavens…" includes measures to increase access to corporate data of companies that set up taxhavens and to the information their advisers provide**.** Its primary

goal is to tax CFHs as if they were domestic corporations. It is unclear if the bill will become law, since confounding arguments can be raised about its effects. The role of IP and jobs is not addressed in the bill, and unless the public is well-informed, meaningful reforms will have difficulty gaining traction.

Without transparency one cannot assess quantitatively the relationships of IP offshoring and jobs offshoring. While it is clear that there is an initial dependency, long-term effects are only imagined. That tax schemes create an imbalance of actual tax-rates being paid by small versus large businesses innovators is clear.

With more information in hand, scientists and researchers in industry might try to influence corporate policies, if they appear worrisome. While employees have few (if any) legal rights to determine corporate directions, they may well have expectations about their employers' behavior. A corporation may listen, since the motivation of its work force is a valuable asset. Corporate leaders might not have considered the long-term effect of schemes they themselves set in place to minimize taxes. However, these leaders are also under pressure to compete, nationally and internationally [1 ACM:06]. It has been suggested that international initiatives are needed to level the corporate-taxation playing field.

Change the Flow

A radical solution to problems created by tax-avoidance schemes is to do away with corporate taxation altogether and compensate the U.S. government for the loss of tax income by fully taxing dividends and capital gains, that is, by imposing taxes only when corporate profits flow to the individuals consuming the benefits. The net effect on total tax revenues in the U.S. might be modest, since, in light of current effective tax avoidance strategies**,** with corporations contributing as little as 8% to total U.S. tax revenue in 2004 [**6** Clausing:04]. Such a radical change would reduce the motivation for many distortions now seen in corporate behavior. Small businesses that cannot pay the fees and manage the complexity of dealing with taxhavens would no longer be disadvantaged.

Getting effective international agreement seems futile, and no single government can adequately regulate multinational enterprises. Unilateral alternatives to deal with countries that shelter tax-avoiding corporations are infeasible as well, even without consideration of the role of IP and malfeasance [9 Dagan:00]. An underlying problem is that the law equates a corporation with a person, allowing confusing arguments, though people have morals, motivations, and obligations that differ greatly from the obligations of corporate businesses . This equivalence is seen as a philosophical mistake by some [13 Gore:07]. For instance, humans cannot, without creating corporate entities, split themselves into multiple clones that take advantage of differing taxation regimes. In practice, not taxing corporations is such a radical change, affecting so many other aspects of the economy and public perception, that any such change is as unlikely as many other tax reforms that have been proposed [8 Cray:09].

Why Care about IP and Taxhavens?

We are proud to be part of the knowledge-based society, having brought forth a revolution of human productivity in the past 50 years, moving well beyond the industrial revolution that started more than a century earlier. Globalization is held forth as a means to distribute its benefits widely. But the growth of assets in taxhavens deprives workers worldwide of reasonably expected benefits. These hidden assets have grown to be a multiple of annual industry revenues, exceeding the assets held in the countries where the IP is being created. The presence of significant IP rights in taxhavens provides global corporations great flexibility to invest capital anywhere, and avoid income due to the IP from being taxed anywhere. The combination of reduced support for education, government research funding, and physical infrastructure, along with the increased motivation to start new initiatives in semi-taxhavens and the imbalance of small businesses versus global corporations, is bound to affect the future of enterprises in countries that initiated high-tech industries, though the rate and final magnitude is unpredictable today. The better-educated scientists will be less affected and feel the effects more slowly [25 TambeH:80]. But any industry requires a mix of related competencies. It took 50 years for the U.S. car industry to be reduced to its current state. The velocity of change, when intangibles are involved instead of tangible capabilities, may well be greater.

The large amount of capital accumulated in taxhavens encourages ever-greater investment in foreign companies. As of August 2010, such investments were reported to amount to $7.6 billion, a 168% increase from the same period in 2009 [23 Saitto:10]. The eight largest companies have $300 billion available in taxhavens**.** Cisco Systems alone reported it had $30 billion available in its taxshelters and expects to keep spending on foreign acquisitions. Such investment will create jobs all over the world, primarily in semi-taxhavens.

More support for CS education was a major emphasis of the ACM report, but where will the funding come from? The taxes on Cisco's available funds, were the funds to be used for investments in the U.S., exceed total National Science Foundation and Defense Advanced Research Projects Agency funding. And the IP, if it remains offshore, would quickly refill Cisco's coffers there. Discussions affecting future education, leading to knowledge-based industry growth, job creation, protection of retirement benefits, and the required infrastructure for growing businesses are futile if the creators of the required intellectual resources are uninformed about the interaction of IP and capital allocation. Initiating effective actions will be more difficult still.

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Gio Wiederhold (gio@cs.stanford.edu) is Professor (Emeritus) of Computer Science, Medicine, and Electrical Engineering at Stanford University, Stanford, CA; http://infolab.stanford.edu/people/gio.html