INTELLECTUAL PROPERTY AND ECONOMIC GROWTH
A REVIEW OF EMPIRICAL STUDIES

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Abstract
In recent decades the issue of Intellectual property rights (IPRs) protection has been at the center of public policy debates. Today, IP rights are recognized as an important economic mechanism, an ‘intellectual currency’ of sorts, that encourages research and development (R&D), creation and innovation in several significant ways. So innovation is important for economic growth, but IPR protection is important for innovation, this way IPR protection becomes important for the economic growth too. The aim of the paper is to make a review of the empirical studies done by different scholars, to show evidence of the relation that exists between IPR protection and economic growth, in developed and developing countries. What happens when strengthening the IPR protection for these countries? At the end the paper concludes that the relationship between intellectual property and economic growth is not so clear. IPR protection impacts on growth rates will differ across countries, depending on their level of development. Not all empirical studies conclude in a positive impact between IPR protection and growth.

Keywords: Intellectual Property Rights, IPR Protection, Economic Growth, Innovation, R&D

INTRODUCTION
Intellectual property rights (IPR) - the copyrights, patents, trademarks and similar rights upon which the lion’s share of creative and innovative products and services rely—have a vital role in growing the economies of developed and developing countries all over the world, in spurring innovation, in giving large and small firms a range of tools to help drive their success, and in benefiting consumers and society through a continuous stream of innovative, competitive
products and services and an expansion of society’s overall state of knowledge. Intellectual property rights protection works in five main areas:

1. Intellectual Property benefits the economy
2. Intellectual Property protection promotes innovation
3. Intellectual Property protection helps firms monetize their innovations and grow
4. Intellectual Property protection help SMEs
5. Intellectual Property protection benefits consumers and society

As the ‘knowledge economy’ advances, more and more of the value that firms and the overall economy achieve will come from high value-added intangibles—including IP in inventions, brands and works. In many companies even now, 80% or more of their market value is attributable to intangibles, including IP. In some small companies, the only value is the intellectual property they own in an exciting new innovation that they have developed. IPR has truly become an ‘intellectual currency’ helping to promote economic growth, company competitiveness and innovation world-wide (ICC, 2003).

What is the Relationship between IPR Protection and Economic Growth?

The different forms of intellectual property—patent, copyright, trademark and various other similar legal rights—traditionally were viewed as state protections of natural or moral rights. Today, however, IP rights are recognized as an important economic mechanism, an ‘intellectual currency’ of sorts, that encourages research and development (R&D), creation and innovation in several significant ways (Guellec, 2007).

IPR promotes innovation by providing the legal and economic framework for market-based incentives and rewards that:
- pay for research and development,
- support the promotion and distribution of the innovations that are thus developed, in the form of products, services and processes in the market,
- promote cultural expression and diversity,
- make technologies more widely available through the mechanism of licensing,
- Increase society’s overall State of knowledge through the information disclosed in patent applications and publications,
- promote technology transfers, and
- broaden the dissemination of government-funded R&D.

The link between IPR protection and growth passes through innovation. So innovation is important for economic growth, but IPR protection is important for innovation, this way IPR protection becomes important for the economic growth too.
Countries tend to acquire improved technologies, through a variety of channels like: Domestic innovation; Trade; FDI; Licensing; Imitation; Piracy.

High, middle and low-income countries differ between them among other things, on the relative importance of these channels. So their level of development determines the way they get the improved technology. What happens when strengthening the IPR protection for these countries? This will impact these channels in different ways and its impact on growth rates will differ across countries, depending on their level of development.

**IPRS Protection and Economic Growth: Empirical Evidence**

A few studies have investigated the impact of IPR protection on cross-country growth. Falvey et al., (2004) in their study use panel data for 80 countries and for four five-year periods to address the impact of IPR protection on economic growth. Including an index of IPR protection in a standard empirical growth model they find that there is a positive and generally significant relationship between the extent of IPR protection in a country and its growth rate.

They use threshold regression techniques to examine if the relationship between IPR protection and output growth depends upon a third factor. Their results suggest that the relationship between IPR protection and growth depends upon level of development, with proxy by initial GDP per capita. For low- and high-income countries they find that stronger IPR protection significantly improves growth, but for middle-income countries no such relationship is found.

As authors state the results for high-income countries are largely as expected, because in these countries undertake innovation, so to encourage further innovation, innovators should be allowed to profit from their inventions.

In low-income countries strong IPR protection encourages imports and inward FDI that encourage growth without adversely affecting domestic imitative activities.

Middle income countries do not engage in innovative activities, they rely on imitative activities. The lack of a relationship between IPR protection and growth in these countries is likely to reflect two opposing forces.

The positive impact of IPR protection on growth that works indirectly through trade and FDI is being offset by a negative impact slowing knowledge diffusion and discouraging imitation. Despite the lack of evidence for a significant relationship between IPR protection and growth for middle income countries in no case do they find evidence of a negative relationship between IPR protection and growth.

According to Falvey et al., (2004) the last conclusion is important because the TRIPS Agreement imposes minimum standards of IPR protection on WTO members (during The
Uruguay Round in 1994, when WTO was established from GATT, more specifically the TRIPS agreement was signed, whose aim was to establish minimum standards of IPR protection by all WTO members up to 2006. On this evidence at least, developing countries joining WTO should be able to take advantage of broad benefits of freer trade without sacrificing growth in order to meet the accompanying TRIPs obligations.

Gould and Gruben (1996) estimate a growth model on a cross-section of up to 95 countries with data averaged over the period 1960-88, including in their regression the IPR measure of Rapp and Rozek (1990). They find IPR protection has a significant positive impact on growth.

Gould and Gruben (1996) examine whether IPR protection affects growth in open versus closed economies differently, by interacting their measure of IPRs with three measures of a country’s trade orientation. Their results suggest that IPR protection can have a slightly larger impact on growth in open economies, but only for one measure is the coefficient ever significant and even then its significance is not robust to the inclusion of other variables.

Thompson and Rushing (1996) estimate cross-section growth regressions including up to 112 countries for the period 1970-85, again using the Rapp and Rozek measure. While they find positive coefficients on the IPR variable, they are never significant. Both these studies also consider non-linearity in the growth-IPR relationship.

Thompson & Rushing (1996) employ a switching regression model to examine whether increased IPR protection (more specifically patent protection) is more beneficial once a country has reached a particular level of development, as measured by initial GDP per capita. Their results indicate a break point at an initial level of GDP of $3,400 (with 1980 dollars). For countries below this no relationship between IPR protection and growth is found, but above it a positive and significant relationship is found.

Thompson and Rushing (1999) in their extended study of 1996, include data from 55 countries, using regression techniques on a cross-section of data over the period 1971-1990. As dependent variable they use growth of real GDP per capita; ratio of total factor productivity (TFP is a derived measure of technology change) in 1971 to that in 1990; and the Rapp and Rozek Index of IPRs.

They conclude IPR protection has a positive impact on TFP in relatively rich countries, which in turn impacts positively upon output growth.

More recently (Kanwar & Evenson,( 2003) estimate a panel model for two periods and up to 32 countries using the Ginarte and Park (1997) index of IPRs. They aim to measure the impact of IPR protection on innovation directly using as their explanatory variable R&D investment as a proportion of GNP. They find that IPRs have a positive and significant impact
on R&D investment and conclude that stronger IPR protection can help spur innovation and technological progress, which in turn should positively impact on growth.

Chen & Puttitanun (2005) in their study argue that IP protection impacts on developing countries because it can encourage domestic innovative activities (they measured it by patent applications). According to them, domestic innovations have a U-shaped relationship with Gross National Products (GNP) and IPP. The possible existence of an empirical U-shaped curve between IPRs and per capita GNP has been noticed also, by Maskus (2000) and by Primo Braga et al. (2000).

Initially, when a country has a low level of economic development, technological abilities will not have reached the level to allow for creativity, and such countries’ focus will therefore be primarily imitating foreign technologies, and a low level IPP policy is appropriate. However, when technological abilities increases to a certain level, increased protection is needed to encourage domestic innovation activities.

The study empirically tested 64 developing countries (1975-2000), and this result is in line with earlier studies about the impact of IP on economic growth. (Chen & Puttitanun, 2005). These authors conclude that IP protection does not impact on economic growth independently or directly, but interacts with variables such as trade openness, national competitiveness, IP Index, human capital, FDI and government policy.

Leger (2006) also analyzed the relationship between IPRs and innovation using a novel panel data-set of least developed countries and industrialized countries and found that IP protection was significant only at a low level for developing countries.

Table 1: Empirical studies on the relationship between IPR protection and economic growth

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample and method</th>
<th>Dependent variable(s)</th>
<th>IPR index</th>
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<tbody>
<tr>
<td>Gould and Gruben (1996)</td>
<td>95 countries Cross section with data averaged over the period 1960-1988</td>
<td>Growth of real GDP per capita</td>
<td>Rapp and Rozek index</td>
<td>IPR protection has a positive impact on growth which is slightly stronger in more open economies.</td>
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<tr>
<td>Thompson and Rushing (1996)</td>
<td>112 countries Cross section with data averaged over the period 1970-1985</td>
<td>Growth of real GDP per capita</td>
<td>Rapp and Rozek index</td>
<td>IPR protection (patent protection) has a positive impact on growth only in countries that have reached a certain initial level of GDP per capita.</td>
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<tr>
<td>Thompson and Rushing (1999)</td>
<td>55 countries</td>
<td>Seemingly unrelated regression techniques on a cross-section of data over the period 1971-1990</td>
<td>Growth of real GDP per capita; Ratio of total factor productivity (TFP-- is a derived measure of technology change) in 1971 to that in 1990; the Rapp and Rozek Index of IPRs.</td>
<td>Rapp and Rozek index</td>
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<td>Park (1999)</td>
<td>60 countries, seemingly unrelated regression techniques on a cross-section of data over the period 1960-1990</td>
<td>Growth of real GDP, fraction of GDP invested in physical capital, fraction of GDP invested in human capital, fraction of GDP invested in R&amp;D</td>
<td>Ginarte and Park index</td>
<td>IPR protection has no direct impact on growth. IPR protection has an indirect positive impact on growth through physical capital investment and R&amp;D in the most advanced economies.</td>
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<td>Kanwar and Evenson (2003)</td>
<td>a panel model for two periods and up to 32 countries using the</td>
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<td>Falvey et al., (2004)</td>
<td>use panel data for 80 countries and for four five-year periods</td>
<td>To address the impact of IPR protection on economic growth, they use a standard empirical growth model, with a threshold regression techniques.</td>
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</tr>
</tbody>
</table>

**Is strong IP protection, always better?**

In recent decades, the broader issue of intellectual property rights (IPR) protection has been at the center of public policy debates. A major argument in favor of stronger IPR is that it stimulates economic growth by protecting innovators from imitation, thereby encouraging innovation. In fact, many countries have strengthened their protection of IPR by reforming their patent systems.
However, although this view is widely accepted, recent work, both theoretical and empirical, indicates that, in a closed economy, the relationship between IPR protection and economic growth is actually not so clear. Furukawa (2007) in his work shows that IPR protection may not enhance economic growth in an endogenous growth model with costless imitation: that is, ‘stronger is always better’ is incorrect. Not all empirical studies conclude in a positive impact IPR protection and growth.

Furukawa (2007) stated that the relationship between IPR protection and innovation has an inverted-U shape when the impact of accumulated experience on productivity is large enough.

From his work results he suggests a role for relaxing IPR protection as a growth-enhancing policy. Due to the inverted U-shaped relationship between IPR protection and growth, both too strong and too weak protection hurts innovation and the resulting growth: instead, a balanced approach is required for growth. This can provide insight into the role of IPR protection in economic growth, a topic often raised in public policy discussions.

In his paper, Furukawa, also shows that the equilibrium growth rate can be maximized when there is no IPR protection if the natural rate of imitation, which is determined by the economy's fundamentals, is low enough. Therefore, preferred growth-enhancing policies can vary across countries with different potential imitation rates: in countries where imitation hardly takes place, there is no need to protect IPR for innovation and economic growth.

Azevedo et al., (2010) after a thorough review of theoretical literature have identified some gaps in the research agenda. In general, this research does not study the direct and net effect of IPR on economic growth. In fact it only analyzes the relationship between IPR-induced factors and economic growth, or the impact of IPR on other economic indicators such as welfare, technological change, FDI, R&D, innovation, etc. This happens because a standard argumentation is adopted, maintaining a strict relation between these elements and economic growth.

Despite the divergence of results regarding theoretical studies, most empirical studies find a net positive effect, which means that positive effects of IPR protection outweigh the negative effects.

Their study supports the conclusion that there is no clear relationship between IPR and economic growth. Theoretical literature indicates that IPR protection has positive, negative or even ambiguous (or inconclusive) effects on innovation.
CONCLUDING REMARKS

IPR, in their various forms, play a crucial role in innovation systems. Firms invest in innovation activities, find new products or new processes and increase their profits. To prevent the imitation of their innovations, firms can benefit from IPR protection.

In recent decades, the broader issue of intellectual property rights (IPR) protection has been at the center of public policy debates, to enforce or not the intellectual property protection? A major argument in favor of stronger IPR is that it stimulates economic growth by protecting innovators from imitation, thereby encouraging innovation. In fact, many countries have strengthened their protection of IPR by reforming their patent systems. Several international agreements, such as the General Agreement on Tariffs and Trade (GATT), Trade-Related aspects of Intellectual Property Rights (TRIPS) and (the) World Intellectual Property Organization (WIPO) are concerned with the protection of IPRs.

However, although this view is widely accepted, recent work, both theoretical and empirical, indicates that, in a closed economy, the relationship between IPR protection and economic growth is actually not so clear. Despite the divergence of results regarding theoretical studies, most empirical studies find a net positive effect, which means that positive effects of IPR protection outweigh the negative effects.

These findings imply that it might be best to allow countries to choose their own IPR system. Specifically, they point out that when the current rich countries were developing they often had weaker IPRs, especially for foreign nationals. A phrase used to summarize this viewpoint is that the rich countries are “pulling up the ladder that helped them to climb behind them.” Given these points, any move to harmonize IPRs across countries will be controversial.

REFERENCES


