

# Piracy and Economic Development

by

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## Introduction

Counterfeiting is perhaps the world's fastest growing and most profitable business. It is estimated that counterfeiting sales account for about 10-20% of the total sales of most industries. In 1997 total loss caused by piracy in the software industry alone amounted to \$11.6 billion according to BSA (1998).

What is counterfeiting? Counterfeiting is "the unauthorized use of a registered trademark on a product that is identical or similar to the product for which the trademark is registered and used", see Grossman and Shapiro (1988a, p. 60). Technology is helping counterfeiting too. Even human being can be cloned, not to mention plagiarism in the academics.

Counterfeiting products appear in any kind of industries, but most notably in the entertainment, and software industries. Why are these industries more vulnerable?

Counterfeiting occurs in at least three areas: patented products, status goods with trademarks, and intellectual properties. The way of counterfeiting and the method of combating is very different in each area. Most counterfeiting products are sold by deception, i.e. sold as if they were genuine. Some have devastating effect to consumers. Some counterfeits are as good as the genuine or even better, only to make use of the "brand-name" effect.

Products granted with patent enjoy basically a monopoly power for a certain duration. Patent holders are protected by law, hence they can easily exercise their rights and prevent others from entering its realm. Barton (1992) lists a lot of successful cases where violators were heavily penalized. However, developing countries are complaining that too much patent protection hinders their development, see Vaitsos (1976) and Almeida (1995).

For products without patents consumers determine the extent of counterfeiting. Grossman and Shapiro (1988b) point out that consumers are heterogeneous. Some like quality products, some like cheap products. Still some like quality products with low prices. Thus counterfeiting survives.

For most intellectual products, like software and CDs, the marginal cost of counterfeiting is constant and small. Thus the market is usually flooded with counterfeiting goods. This is the area where the most damage were made by piracy.

What factors determine counterfeiting? Will counterfeiting go away as economic development moves

up? Or will it stay even in the developed countries?

## Literature Review

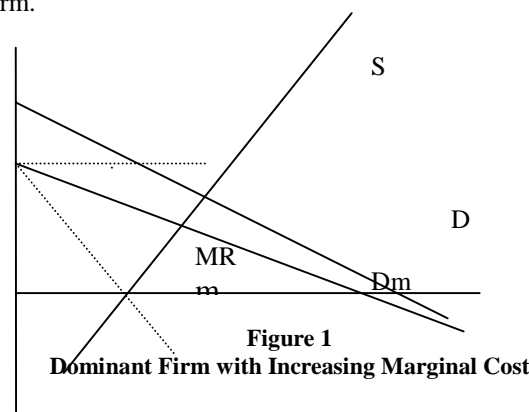
[Not included because of space limitation, full paper available from the author.]

## Economic Explanations of Counterfeiting

Counterfeiting trade is a market transaction, where demand meets supply. Counterfeiting creates consumers' and producers' surplus. Counterfeiting happens in developing countries as well as developed countries. Authorities of some countries hold a blind eye on counterfeiting, on the ground that it helps technology transfer and is necessary in early stage of development. Some legitimate firms allow counterfeiting products to be sold along side with their own ones, believing that they are doing free advertising for them.

BSA's estimate indicates that piracy rate could be over 90% in some countries, most notable Far East, East Europe, and South American. Most models on counterfeit trade rely on the dominant firm model. In countries with 90% piracy, counterfeit producers are the dominant firms, not the legitimate firms. What model will explain this?

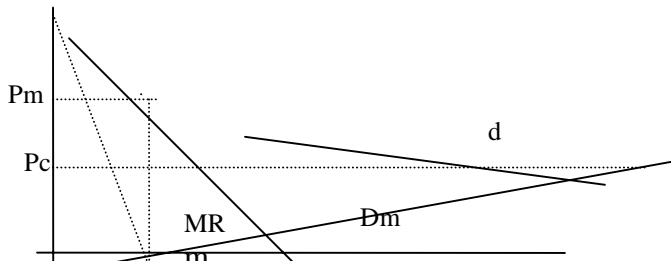
Let us consider the dominant firm model first. In Figure 1 let  $D$  be the market demand for CDs. There is one big legitimate firm, and many small counterfeiting firms. The counterfeiting firms are competitive, together they have a supply curve derived from the marginal cost,  $S$ . The dominant firm takes  $S$  as given, and calculate its own demand by deducting  $S$  from the total demand. Thus  $D_m$  is the resulting demand faced by the dominant firm.



The pricing policy of the dominant firm determines the existence of the counterfeit firms. If the dominant firm set the price high enough, counterfeiting exist. If price is set below  $MC$ , counterfeit will be driven out of business.

The dominant firm model assumes counterfeiting firms have higher marginal cost. If the marginal cost is a

horizontal line and is the same for both the dominant firm and the counterfeiting ones, there is no way that the legitimate firm can set price below the marginal cost of the counterfeiting firms. The legitimate can never compete with them. In that case sometimes it will be forced to leave the market, see Shultz and Saporito (1996).



**Figure 2**  
**Dominant Firm with Constant Marginal Cost**

Here in Figure 2 the counterfeit firms have the same MC structure as the legitimate firm. The same MC curve serves two markets, a low-end market for the general public with a more elastic demand, and a high-end market for professionals with a less elastic demand. This explains the coexistence of both markets in some industries.

How can legitimate firm survive in the latter situation? First, it can rely on government action to increase the MC of the counterfeiting firms. For example in the software business, Microsoft and Lotus did take action against big institutions for use of piracy copies. Second, it can appeal to different customers. Bigger institutions also have less elastic demand, and are more willing to pay a higher price for legitimate products. Third, creating newer version of software and continuously upgrading hardware is also a way to increase the marginal cost of the pirate firms.

On the macro level, it is noted that consumers in developed countries demand less counterfeit, because of their affordability of legitimate products. This implies that counterfeits are inferior goods, higher income with less consumption. Developed countries also provide better legislative protection to legitimate products. Thus associated MC is higher then, and piracy rate is lower.

Inflation can also be a factor leading to higher piracy rate. In countries where inflation is high, counterfeit activities is also thriving. This is because of the chaos surrounding the price signals. Consumers will have difficulty in perceiving the correct price. Rather they play save and buy products with lower price, which is usually attached to counterfeiting products.

**The Data**

Business Software Alliance compiles every year data on piracy of all business-related software for virtually every country in the world. Countries with the highest piracy rate are: Vietnam (98%), China (96%), Indonesia (93%), Bulgaria (93%), CIS less Russia (92%). U.S.A. is the country incurred with the highest economic loss (\$2.8 mil) followed by China (\$1.5 mil).

**The Estimation**

[The tables are included here without explanation due to space limit]

**Table 1**

**Regression Results**

Dependent variable: Pricay Rate

Variable	Coeff.	t-value
Intercept	1.583	22.15
Per Capita GDP	-0.105	-16.09
CPI	0.024	4.44
Population	-0.035	-6.66

R<sup>2</sup> = 0.62

**Conclusion**

We may conclude that piracy is related to economic development. Piracy is more serious in developing countries. Eastern Europe countries, which joined the western world only recently, are among those with the highest piracy rate. Consumers with higher income and higher aspiration will prefer legitimate products more. Thus another way to combat counterfeiting is to make economic development successful. Which implies not only higher GDP, or GDP growth rate, but also stable growth with low inflation.

**Table 2**

**Summary of Average Piracy Rate with Corresponding per capita GDP Level, 1996**

Per Capita GDP	Piracy rate
939	83.60%
1947	88.27%
4986	70.18%
9716	53.14%
19847	69.38%
28728	49.21%
40746	43.25%

In Table 2 average piracy rate is compared with per capita GDP up to the level on the first column for the year 1996. Data of this table is plotted in Figure 4, which indicates that piracy rate drops a little bit on the increase of GDP at the initial level. However, it starts to climb up again with increase of per capita GDP, before it enters the sustained declining trends. The same ups and downs appear in the year 1994. This implies that piracy is especially serious when the economy is at the extreme low level and also in the intermediate level of development.

**References**

[Not included]



