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# How Patent Rights Affect Vietnam's Importation

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**Abstract:** Stronger patent rights (PRs) will help innovators to protect their inventions in domestic and export markets, however stronger patent right exporting decisions depend on market expansion and market power effects. Although it is quite late to promulgate patent law, Vietnam began to record patent applications and granted them for both domestic and foreign firms in 1981 (patent law was enacted in 2005). However the number of foreign patent applications is different among Vietnam's trade partners. The author used a number of patent applications of Japan, the United States, the United Kingdom, Germany, and France to analyze the relationship between trade inflow from those countries and PRs and have found that Japan applied for the greatest number of patents, which have increased over time. Japanese exports to Vietnam are dominated by market power effects, while other countries' patent application numbers tend to fluctuate or increases insignificantly over time, with exports being dominated by market expansion effects.

*Keywords:* Patent right, market power effects, market expansion effects, Vietnamese importation.

## 1. Introduction

"Productivity differences explain a large part of the variation in incomes across countries, and technology plays a key role in determining productivity… International technology diffusion is important because it determines the pace at which the world's technology frontier may expand in the future… These external effects of technological investments are called technology, or knowledge, spillovers. As an example, the introduction of one product might speed up the invention of a competing product, because the second inventor can learn from the first by carefully studying the product or its product design (the "blueprint")" [1].

Technology diffusion from advanced countries helps developing countries increase their productivity and GDP per capita. In turn they invest more in technologies that help innovation occur and reduce their import flows from highly-developed countries in the long run. Technology diffusion occurs through six channels: international patenting, trade in goods, foreign direct investment (FDI), technology licensing, migration of skilled workers and product imitation [2]. Learning-by-importing effects: importing countries can imitate through the goods they import as found by Potterie and Lichtenberg (2001) [3]. They calculate import-embodied foreign R&D capital

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stock, then estimate the relationship between TFP and imports combining other explanatory variables. However, advanced countries worry their innovations will be imitated by countries with strong imitative ability. They will choose the destinations in order to reduce the probability that innovations are imitated. This causes trade flows to be distorted. After the TRIPs[1] agreement was signed in 1995, it helped member countries improve their levels of patent protection and the effect of bilateral trade flows.

A nation that strengthens its patent laws could experience higher or lower values of importation. These values depend on market expansion and the market power effect. Market expansion effects imply that exporters will decide to increase the quantities exported because their costs of detection of imitations from importing countries is reduced when PRs are strengthened. Market power effects means that exporters decide to decrease the quantities exported because stronger PRs in importing countries could help exporters acting as monopolists in the export market.

Maskus and Penubarti (1995) [4] used U.S. bilateral export data in 1984 with 22 OECD nations and 25 additional developing countries. They separated 28 manufacturing sectors into 3 categories: a priori the most patent-sensitive sectors, a priori the least patent-sensitive sectors and other sectors. Importing countries are split into 2 subgroups: those with high and low development bases on GDP per capita. The former group represents strong imitation and the latter represents weak imitation. Increasing patent protection has a positive impact on bilateral manufacturing imports into both small and large developing economies. Smith (1999) [5] used threat of imitation to estimate the impact of intellectual PRs on trade flows. Threat of imitation is calculated on weak or strong intellectual property rights (IPRs) and weak or strong imitation. Countries importing are divided into four groups, strong IPRs and strong imitation, weak IPRs and strong

imitation, strong IPRs and weak imitation, and weak IPRs and weak imitation. Market expansion effects are determined clearly in group 2 and market power effects are determined clearly in group 3. The author uses the data from the 50 US states plus the District of Columbia and 96 other countries (industrialized, developing, and transition economies) and estimates the impact of IPRs on exports for each of the industry and patent-sensitive sectors. She finds that weak PRs are a barrier to U.S. exports in the case that countries pose a strong threat of imitation (e.g. China). The U.S. increases its exports to those countries if they strengthen their PRs. Smith also finds market power dominates in countries that pose a weak threat-of-imitation.

Plasmans and Tan, (2004) [6] used Chinese import data to analyze the effect of strengthening IPR on exports from U.S. and Japan. They use another patent right index as the ratio of number of foreign patent applications and number of domestic patent applications to distinguish law-in-book and law enforcement. They find that strengthening IPR will help China import more high-technology and less low-tech (trademark-sensitive) products. Liu and Lin (2005) [7] analyzed Taiwan data in three industries and add one hypothesis of separating importing countries into two groups - one stronger in R&D, and the other weaker in R&D. They found that if importers have a stronger R&D ability than Taiwan and strengthen their IPRs, Taiwan increases exports to them as outsourcing contracts. If importers have a weaker R&D ability than Taiwan, and strengthen their IPRs, the results are the same as found by Smith (1999) [5]. Falvey, Foster and Greenaway (2009) [2] divide the total manufacturing sector of five OECD countries into 9 two-digit sectors and use the threshold model. They find that the market expansion effects are prevalent and either occur in all regimes or above a relevant threshold (with few exceptions). Market power effects are only limited evidence. In summary, they conclude that strengthening IPRs can lead

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[1] The Agreement on Trade-Related Aspects of Intellectual Property Rights.

to market power effects for some trade flows, particularly for importing markets where the threat of imitation is small (due to a small market, limited capacity for imitation or an existing high level of IPRs). Foster (2014) [8] analyzed the relationship between IPR and trade margins (extensive and intensive margins) to solve the ambiguous results of the trade-IPR relationship. He proves that there is a positive effect on extensive causes and a negative effect on intensive causes by IPR. He also splits countries according to market sizes, development, and imitative ability and finds that the effect of IPR on trade is the strongest in less-developed countries, larger countries and those with stronger imitation. Boring (2015) [9] focused on one industry that is affected by improvement of IPR in developing countries. That industry is pharmacy. The export value of pharmaceutical products increases if developing countries strengthen their IPR.

Vietnam enacted a patent law in 2005 and joined the WTO in 2007 meaning that TRIPs agreements are automatically applied. Does joining the WTO help Vietnam to strengthen its PRs? How does strengthening PRs protection affect Vietnam's importations? In this paper I estimate the relationship between Vietnam's imports from G5 countries and IPRs. G5 countries include the United States of America, Japan, Great Britain, France, and Germany. I use those countries because their R&D expenditures are the highest and export data recorded from them are of high quality [2]. R&D information from developing countries, especially Vietnam, seems unavailable, so I use the number of patent applications from those countries as an indicator of the level of PRs (strong or weak in Vietnam). If a country applies patents for their innovations increasingly over time in Vietnam, it implies that country believes the PRs of Vietnam are stronger. If a country applies patents for their innovations either fluctuating or decreasing over time, this implies that country does not believe the PRs of Vietnam are stronger (PRs of Vietnam are weak). From the number of patent

applications of those countries, I separate five countries into two groups: group 1 is Japan and the rest of the countries are in group 2. Group 1 believes that the PRs of Vietnam are strong. Combined with weak imitation, Vietnam is a market with a weak threat of imitation. Group 2 believes the PRs of Vietnam are weak. Combined with weak imitation, Vietnam is a market with a moderate threat of imitation. I find that group ones' export decisions for Vietnam have a prevalence of market power effects for all industries and sectors (except the least patent-sensitive sectors), while market expansion effects dominate the export decisions of the other group. To evaluate the effect of joining the WTO (TRIP's agreements automatically are in force in Vietnam) to import volume from those countries, I separate data into two sub-periods by adding two time dummies. One represents data from 2003-2006 and the other data from 2007-2015. The outcomes provide clear evidence of the effect of IPRs on trade inflow by market power and market expansion effects from Vietnam trade partners.

The rest of the paper is organized as follows: Part 2 describes the threat of imitation of Vietnam; part 3 mentions data sources and methodology; part 4 is estimation results and the last part is conclusion.

## 2. Some characteristics of Vietnam

Before giving the characteristics of PRs and imitation in Vietnam, let me briefly explain the relationship between PRs and trade and the relationship between literacy level and imitation from those papers I have mentioned above. They are also the reasons why I choose G5 trade to estimate the trade-IPR in Vietnam.

Stronger IPR can directly affect importation of a country in the following two ways, if market power effects are dominant then import value decreases, and if market expansion effects are dominant then import values increase. There is a ''trade-off between the enhanced market

power of the firm created by stronger patents and the larger effective market size generated by reduced abilities of local firms to imitate the product'' (Maskus and Penubarti, 1995, p. 229). The effect of IPR on imports depends on the characteristics of importers, exporters, and the characteristics of industries. The characteristics of import markets include the market size (as a proxy skill of imitation in Maskus and Penubarti (1995) [4]. The larger the market size the greater IPR affects imports; the threat of imitation as Smith (1999) concludes [5]. Threat of imitation is calculated by combining the skill of imitation and the IPR index. The threat of imitation is divided into four groups and the effect of IPR on trade is as in Fig.1. The effects are unambiguous in groups 2 and 3, and ambiguous in otherwise.

|  | Weak PRs | Strong PRs |
|---|---|---|
| **Weak imitative ability** | 1. Moderate imitative ability Ambiguous Effects (+/-) | 2. Weak in imitation; Market power effect (-) |
| **Strong imitative ability** | 3. Strong threat of imitation; Market expansion effects (+) | 4. Moderate in imitation; Ambiguous effects (+/-) |

Figure 1. The threat of imitation classified by Smith (1999).

However the characteristics of importer effect on exporters' decisions depends on the breaking points of development and imitation of importers as suggested by Falvey, Foster and Greenaway (2009) [2]. Market power or market expansion effects dominating depend on the importer overcoming a threshold of development and imitation. This means that the trade-PRs relationship may be different when an importer moves to another threshold of development and imitation.

Trade-IPR relationships also depend on the exporters as Liu and Lin (2005) [7] suggested. If an exporter's R&D is less than an importer's R&D its export decision is less likely to

embody new technology and IPR should be relatively unimportant for trade, hence our decision to concentrate on exports from those countries that are important producers of new knowledge. The last effect on the trade-IPR relationship is the characteristics of the industry or product. Maskus and Penubarti (1995) [4] separate manufactured goods into three groups, while Plasmans and Tan (2004 [6] separate data into two groups-high tech and low tech, and Falvey and Greenaway (2009) [2] separate manufactured goods into nine subgroups, and Fink and Primo-Braga (1999) [10] also divided data into two groups. Why should we do that? Some products are easier to imitate than others and the significant effect of stronger IPR can be discovered if we use individual industries. However the trade-IRP relationship may be difficult to predict if products exported are hard to imitate. Foreigners might choose another way to serve the domestic markets such as FDI and licensing.

Imitation is a behavior whereby an individual observes and replicates another's behavior. Imitative ability can be measured in a number of ways as Falvey, Foster and Greenaway (2009) [2] and Smith (1999) [5] suggested. They include scientists, engineers, and technicians engaged in R&D (total numbers and per capita), and R&D expenditure as a percent of GNP or the education attainment of people. Falvey suggests that the attainment of a tertiary level is used to innovate, to calculate imitative ability and it should be better to use than the average of secondary school attainment.

Before enacting Law on Intellectual Property in 2005, Vietnam's law system also had regulations relating to PRs such as the promulgated Vietnamese government Decree No. 31-CP of January 23rd, 1981 on innovations to affect technical improvement and rationalization in production and on inventions, or Decree No. 201-HDBT of December 28th, 1988 on licensing. And the important milestone on Intellectual Property was the Civil Code that was enacted in 1995. In this Civil Code,

Intellectual Property is defined as a civil right and is protected by law. Beside those regulations, there are a lot of other regulations relating to Intellectual Property. Remarkable in the new developing process in promoting intellectual patent protection and international integration was the issue of the Patent law in 2005. Then the TRIPs agreement was automatically enforced after joining the WTO in 2007, which means Vietnam must obey global standards in patent protection. Patent activities were implemented before 2005, however they have been recorded since 1981, (annual report 2007). To evaluate the patent right index, some authors use Rapp and Rozek's index or the Ginarte and Park index, and Plasmans and Tan (2004) [6] suggested another patent index to avoid "law–on–book" in some countries. This index is calculated as the ratio of the number of foreign patent applications and domestic patent applications to distinguish between de jure and de facto enforcement in some developing countries. The meaning of this index can be explained by foreign firms applying for greater numbers of patents because they have more trust in enforcement of the patent law system. The system can protect their patents, and the greater the number of domestic firms applying, the higher the domestic awareness on patent protection. I also use this index to investigate the relationship between IPRs and import flow in Vietnam.

Before 2003, the number of patent applications for both foreign and domestic firms fluctuated. In some years they increased and in others they decreased (Figure 2). After 2003 domestic applications increased over time. Foreign applications (total number) also increased (except when the 2009-global financial crisis occurred) and G5 applications have the same trend as the foreigners' generally from 1997. I use import data from those to find the trade-PR's relationship because the percentage of the number of G5 patent applications is nearly 60% to above 70% of foreigner applications in Vietnam where Japan,

the U.S., and Germany are three of the top countries that increased applications during the 2000-2015 period (annual report of National Office of Intellectual Property of Vietnam - NOIP). I only use the data from 2003-2015 because it has an extreme change in the number of applications compared with the previous period. Only Japan's patent applications increase over time after 2003; U.S. patent applications fluctuate; Germany, the United Kingdom and France's applications change a little (Figure 3). So I separate five countries into two groups, group one so-called high application group (Japan) and the other the so-called low application group.
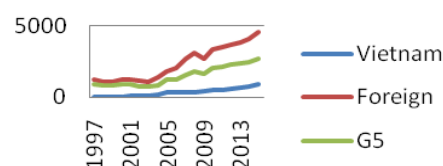


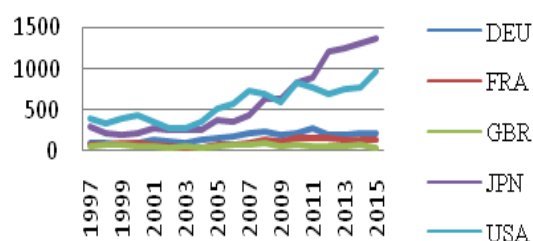Figure 2. Number of patent applications.
*Source*: NOIP.



Figure 3. Number of G5's patent applications.
*Source*: NOIP.

DEU, FRA, GBR, JPN, and USA represent Germany, France, the United Kingdom, Japan, and the United States of America, respectively.

*How about the imitative ability?* To find Vietnam's R&D expenditure data is quite difficult. I use the average of secondary school attainment to evaluate Vietnam's imitation and data taken from the Human Development Index (as Falvey at al., 2009). Data of Vietnam secondary school attainment is missing for some years, so I compare the average years of school and gross enrolment in tertiary

education, in order to know the trend of the enrolment in secondary schooling. Comparing with other countries to know where Vietnam's imitation stands, I rank the average years of school and the gross enrolment in tertiary education with all other countries. The rank 2 increases when indexes are lower than those in other years as in Fig.4 and Fig.5. The fluctuation of those indexes looks similar over time, if the rank of gross enrolment in tertiary education increases the rank of average school years increases in the same time. The rank of average years of school rises from the gross enrolment in tertiary education. We can infer that the average years of secondary school attainment are unchanged during this period. Vietnam's imitation is still quite weak over time.
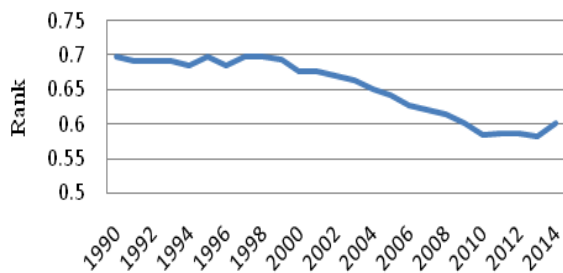


Figure 4. Rank of average years of school.
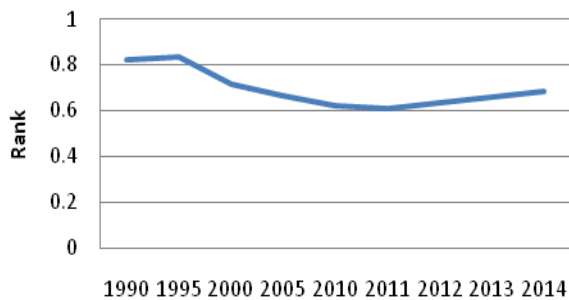*Source*: HDI reports.



Figure 5. Rank of gross enrolment of tertiary.
*Source*: HDI reports.

[2] Rank is calculated as the ratio of the order of Vietnam's education compared to all countries (no missing data).

## 3. Data and methodology

Bilateral trade data with G5 is taken from Comtrade. These data are categorized as HS products from 01 to 99 2-digit products. Then I convert data to ISIC Rev. 2. Imitation is measured by average years of secondary school attainment, which comes from the HDI annual report. However, as in part 2, the Vietnamese data is missing, so I use the gross enrolment in tertiary education and the average years of school from HDI to infer the average years of secondary school attainment. The outcomes help me conclude that the imitative ability of Vietnam is weak during 2003-2015. The PRs index comes from annual reports of NOIP. The data includes the number of patent applications for each country in the sample. The summary data are shown in Table 1. Table 1 also includes control variables used to estimate the relationship between the PRs index (P) and import value in log form (IM). Explanations of other independent variables are detailed in the methodology (see gravity model).

Table 1. Summary statistics

| Variable | Obs | Mean | Std.De. | Min | Max |
|---|---|---|---|---|---|
| limport | 1974 | 15.94 | 2.535 | 6.90 | 21.82 |
| ldist | 1974 | 9.06 | 0.423 | 8.26 | 9.52 |
| lgdp_d | 1974 | 29.10 | 0.670 | 28.24 | 30.52 |
| P | 1974 | 0.85 | 0.719 | 0.04 | 2.87 |
| high | 1974 | 0.20 | 0.400 | 0 | 1 |
| High*P | 1974 | 0.33 | 0.671 | 0 | 2.09 |
| $t_{03-06}$ | 1974 | 0.30 | 0.461 | 0 | 1 |
| $t_{07-15}$ | 1974 | 0.70 | 0.461 | 0 | 1 |

I use a gravity model to estimate the relationship between PRs and trade flows (import flow). This model was first used by Jan Tinbergen (1962). From this model, if we want to find other variables (beside economic sizes,

and distance between country pair) distorting the trade flows we add them in the right hand side of gravity model. Here I add the PRs index calculated as the ratio of the number of foreign patent applications and domestic patent applications.

$$P_{kt} = \frac{FP_{kt}}{DP_t} \quad (1)$$

$$IM_{kt} = \alpha_0 + \alpha_t + \alpha_j + \beta_1 Dist_k + \beta_2 GDP_{kt} + \beta_3 P_{kt} + \beta_4 high * P_{kt} + \mu_{kt} \quad (2)$$

$$IM_{kt} = \alpha_0 + \alpha_t + \alpha_j + \beta_1 Dist_k + \beta_2 GDP_{kt} + \beta_3 P_{kt} t_{03-06} + \beta_4 high * P_{kt} t_{03-06} + \beta_5 P_{kt} t_{07-15} + \beta_6 high * P_{kt} * t_{07-15} + \mu_{kt} \quad (3)$$

Where is the natural log of the import value of good (industry) i to Vietnam from country k (one of G5) at time t; is the log of the distance between Vietnam and country k; is the log of the GDP of country k at time t; dummy variable takes unity if the country is Japan, and zero otherwise; and $\alpha_j$ are year fixed effects and industry fixed effects, respectively; is an error term. I use Eq. 2 to estimate the impact of PRs on trade inflow for all years from 2003-2007, then apply Eq. 3 to estimate the effect of PRs on trade after TRIPs agreement are applied automatically to Vietnam by adding two time dummies, t03-06, and t07-15, which represent the data during periods 2003-2006 and 2007-2015.

I separate good (industry) i into 2 groups: manufacturing so-called high technology industry as in Plasmans and Tan (2004) and the other is low technology. Then I divide high technology industry into three categories as in Maskus (1999) - the prior most patent-sensitive sectors, the prior least patent-sensitive sectors, and other sectors. They are dependent variables in both equation (2) and equation (3). In Appendix Table 1.a is the list of industries divided into three categories.

## 4. Estimation results

Outcomes of estimates are reported in Tables 2 and 3. Signs of coefficients of control variables include distance, foreign countries' GDP in both tables as the expectation; distance

Where is the patent index at time t that country k applies in country j (Vietnam); is the number of country k patent applications at time t; is the number of Vietnamese patent applications at time t. A gravity model is used to estimate the effect of strengthening PRs on imports from G5 as follows:

increase, trade inflow decrease and importing country size increases as they export more to Vietnam.

Japanese patent applications increase over time, the rest of the countries' applications fluctuate or stay the same during the period. The coefficient of patent variables for group 2 is significantly positive for pooled industries. Net coefficients between patent and high*patent are significantly negative (-0.977 + 0.341 = -0.636). Market power effects dominate the export decisions of group 1 (Japan). They believe that Vietnam is a market with weak imitation and strong PRs. Opposite market expansion effects dominate the export decisions of group 2. They believe Vietnam is a market with weak imitation and weak PRs. Those outcomes hold for both high and low technology industries and most, least patent sensitive and other industries, although some of them are insignificant (least patent-sensitive sectors in group 1 and low technology industry, least and most patent-sensitive sectors in group 2). Japan reduces its exports to Vietnam to have a higher price for products when Japan believes stronger patent enforcement is in Vietnam, especially in the high technology industries and most patent-sensitive sectors. On the contrary, the other countries increased their exports to Vietnam during 2003-2015.

To investigate the effect of joining the WTO as the way to strengthen patent regulations on G5's export decisions I use Eq.3 to estimate and outcomes are shown in Table 3.

Table 2. The effect of patent right on Vietnam import

| Variables | (1) Pooled | (2) Hightech | (3) Lowtech | (4) Mostpatent-sensitive | (5) Leastpatent-sensitive | (6) Other |
|---|---|---|---|---|---|---|
| Dist | -2.754*** | -2.651*** | -3.319*** | -3.247*** | -1.588** | -3.060*** |
| | (0.316) | (0.328) | (0.862) | (0.475) | (0.697) | (0.505) |
| GDP | 1.381*** | 1.269*** | 1.887*** | 1.277*** | 1.118*** | 1.388*** |
| | (0.115) | (0.119) | (0.313) | (0.173) | (0.253) | (0.184) |
| P | 0.341*** | 0.329** | 0.396 | 0.0645 | 0.312 | 0.589*** |
| | (0.128) | (0.133) | (0.348) | (0.193) | (0.282) | (0.205) |
| High*P | -0.977*** | -0.982*** | -1.047* | -1.126*** | -0.552 | -1.230*** |
| | (0.219) | (0.228) | (0.597) | (0.330) | (0.484) | (0.351) |
| Observations | 1,974 | 1,597 | 377 | 520 | 510 | 567 |
| R-squared | 0.785 | 0.810 | 0.669 | 0.880 | 0.774 | 0.715 |
| Year FE | YES | YES | YES | YES | YES | YES |
| Industry FE | YES | YES | YES | YES | YES | YES |

*Note*: Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Before 2007 most coefficients in group 2 are positive, although most of them are statistically insignificant. After 2007, the condition on the TRIPs agreement was in force in Vietnam, the number of patent applications of group 2 seemed unchanged as shown in Figure 3, implying that they do not believe Vietnam is stronger with her IPRs. The market expansion effects are now statistically significant in pooled industries, high technology industries and other sectors, and the other coefficients are still positive. Group 2 increased their exports to Vietnam after TRIPs was automatically implemented in Vietnam. The results are similar to those in Falvey

(2009). When in a country the threat of imitation is moderate (weak imitative ability and weak patent right), they find that when strengthening the IPR, market expansion effects are prevalent. The behavior of group 1 in export decisions did not change before and after 2007, all coefficients are statistically significant at 1% or 5% (except the least patent-sensitive sectors). After 2007, group 1 believes Vietnam is stronger with PRs. The size of market power effects are greater in this period than the previous period (coefficient sizes after 2007 are greater than coefficients sizes before 2007, except in low technology industries).

Table 3. The effect of patent right on Vietnam import before and after 2007

|  | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Variables** | **Pooled** | **Hightech** | **Lowtech** | **Mostpaten t-sensitive** | **Leastpaten t-sensitive** | **Other** |
| Dist | -3.024*** | -2.861*** | -3.817*** | -3.315*** | -1.789** | -3.414*** |
|  | (0.327) | (0.341) | (0.891) | (0.494) | (0.725) | (0.522) |
| GDP | 1.347*** | 1.216*** | 1.931*** | 1.171*** | 1.071*** | 1.380*** |
|  | (0.131) | (0.136) | (0.356) | (0.198) | (0.289) | (0.208) |
| $Pt_{03-06}$ | 0.194 | 0.216 | 0.112 | 0.0236 | 0.202 | 0.406* |
|  | (0.136) | (0.141) | (0.370) | (0.205) | (0.300) | (0.217) |
| High* $Pt_{03-06}$ | -1.204*** | -1.143*** | -1.520** | -1.133*** | -0.710 | -1.544*** |
|  | (0.242) | (0.252) | (0.658) | (0.366) | (0.536) | (0.387) |
| $Pt_{07-15}$ | 0.606*** | 0.586*** | 0.676 | 0.329 | 0.552 | 0.856*** |
|  | (0.161) | (0.167) | (0.436) | (0.243) | (0.356) | (0.257) |
| High* $Pt_{07-15}$ | -1.265*** | -1.241*** | -1.430** | -1.337*** | -0.796 | -1.548*** |
|  | (0.229) | (0.239) | (0.621) | (0.346) | (0.508) | (0.366) |
| Year FE | YES | YES | YES | YES | YES | YES |
| Industry FE | YES | YES | YES | YES | YES | YES |

*Note*: Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

## 5. Conclusions

Strengthening PRs in the integration process is inevitable and it will help domestic and foreign firms accelerate their inventions in Vietnam. When foreign firms decide to export to Vietnam they care about the fear of loss PRs or the cost to deter and detect the copying of their innovations. If Vietnam strengthens her PRs-related law system, then it might encourage foreign firms to export more. However the export decisions depend also on imitative ability and Vietnam has weak imitation abilities. The threat of Vietnamese imitations depends on how foreign firms believe the de facto implementation of the law system is functioning.

Japan has the highest number of foreign patent applications. Its export decisions are prevalent because of market power effects. They believe there is truly a strengthening of IPRs in Vietnam, especially highest in the most patent-sensitive sectors. Japan acts as a monopolist in the Vietnam market, reducing the quantity to raise the price of its export products. The other group of countries' export decision is driven by market expansion effects and they increase their exports to Vietnam because they believe the patent law system is not strong enough. Their aggregate export volumes significantly changed after Vietnam joined the TRIPs agreement.

Joining the TRIPs agreement can improve Vietnam's patent law system, as commitments

must be fulfilled, though there is the different between de jure and de facto in enforcement. To learn from importing more, Vietnam should strengthen the patent law system both the law "in-book" and in practice to make sure foreign firms believe in the patent law system. The other matter that should be learnt from importing is that Vietnam should increase the percentage of people enrolled in secondary school and tertiary education, because beside learning from importing they will also push their science and technology developments to a higher level.

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