

6 THE ECONOMIC IMPACT OF THE TRIPS-PLUS PROVISION IN THE JORDAN-UNITED STATES FREE TRADE AGREEMENT

*Dr Taleb Awad Warrad

ABSTRACT

Despite the extensiveness of the World Trade Organization's (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), the increase in the international standards of intellectual property (IP) protection resumed following TRIPS through bilateral means. Developed countries that export a great deal of IP, in particular the United States and European Union, pursue a policy of negotiating bilateral free-trade agreements (FTAs) that require IP protection far beyond TRIPS-mandated standards, termed 'TRIPS-Plus' FTAs. Such agreements, which include more extensive IP obligations than TRIPS (TRIPS-Plus), have an impact on public health and access to medicines, particularly upon developing countries.

The main objective of this paper is to investigate the macroeconomic impacts of TRIPS-Plus sub-agreements included in the FTAs Jordan has signed and applied. The paper explores TRIPS-Plus requirements in those FTAs and analyses the relationship between intellectual property rights (IPRs) and technology transfer. Furthermore, it examines the development of IPRs in Jordan and provides an assessment of the economic impact of TRIPS-Plus provisions.

I. INTRODUCTION

The Uruguay Round of Trade Negotiations in 1994 resulted in the birth of the WTO, TRIPS, and the international recognition of IP's impact on public health. The 1994 TRIPS Agreement established obligations of WTO Member States to comply with certain international rules protecting the rights of owners of patents and copyrights. By construction, the TRIPS Agreement was flexible and allowed governments to violate patent rights under some conditions. For example, TRIPS permits countries to seize patents and issue compulsory licences—authorizing a domestic firm to produce and sell generic equivalents of a brand name drug without permission from the foreign inventor—under 'a national emergency or other circumstances of

extreme urgency' and for certain other uses. In addition, TRIPS provisions such as Article 73(b) establish a general exception for any measures a Member feels are necessary for its security interests.¹ However, despite the extensiveness of TRIPS, the increase in the international standards of IP protection resumed following TRIPS through bilateral means. Developed countries that export a great deal of IP, in particular the United States and European Union pursue a policy of negotiating bilateral FTAs that require IP protection far in excess of TRIPS-mandated standards, termed 'TRIPS-Plus' FTAs. Such agreements, which include more extensive IP obligations than TRIPS (TRIPS-Plus), have an impact on public health and access to medicines, particularly upon developing countries.

The main objective of this paper is to investigate the macroeconomic impacts of TRIPS-Plus sub-agreements included in the FTAs Jordan has signed and applied. Although patents are a crucial factor in spurring development of new technologies and therefore must be protected, granting protection can prevent access by those who need the technology most. For example, many scholars believe that IP protection should not be a barrier to the distribution of pharmaceuticals in areas facing a human-health crisis. The TRIPS Agreement tries to mitigate this tension, offering flexibilities in IP protection, when necessary, to safeguard human health. Section II reviews briefly the TRIPS Agreement; section III analyses the economics of TRIPS; TRIPS-Plus is discussed in section IV, followed by an analysis in section V of the relationship between IPRs and technology transfer. Section VI explores the development of IPRs in Jordan, along with an assessment of the impact of TRIPS-Plus provisions on economic growth; sections VII and VIII contain concluding thoughts and remarks.

II. THE TRIPS AGREEMENT

The preparation of new, binding international norms began in two forums within GATT, in the framework of the Uruguay Round negotiations, and at the World Intellectual Property Organization (WIPO). After the end of the Uruguay Round and the birth of the WTO, the TRIPS Agreement was adopted in 1995. TRIPS is the most comprehensive agreement in the field of IPRs. Consisting of seven parts and 73 articles, TRIPS contains provisions which provide minimum standards of protection for each branch of IP, including the protection of copyrights, patents, trademarks, geographical indications, lay-out designs, and trade secrets, as well as unfair competition. Under TRIPS, each of these branches is defined by three characteristics: the subject matter to be protected, the rights to be conferred and

* Dr Taleb Awad Warrad (Jordan) is Professor of International Economics, Faculty of Business, Department of Business Economics, at the University of Jordan: tawad@ju.edu.jo. A first draft of this paper was presented at the 10th WIPO-WTO Colloquium for Teachers of Intellectual Property held in Geneva from 16 to 28 June 2013. The author wishes to thank all those who provided valuable inputs, comments and observations on the first draft and particularly to participants and experts from both WIPO and WTO.

¹ TRIPS Agreement: http://www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm

permissible exceptions to those rights, and the minimum duration of protection periods.²

One of TRIPS's strengths lies in its enhanced enforcement provisions and its incorporation of the WTO dispute-settlement procedure. All pre-TRIPS IP agreements lacked detailed rules on transparency and enforcement of IPRs before both national and international judicial and administrative authorities.³ TRIPS built upon some of the existing international agreements in the IP field, including the Paris and Berne Conventions.⁴

However, despite the comprehensive coverage of TRIPS, the Agreement did not put an end to the global regulation of IP. Efforts by WIPO continued to deal with problems not addressed by the TRIPS Agreement. To this end, in 1996 the WIPO Diplomatic Conference on Certain Copyright and Related Rights Questions adopted two treaties: the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT).⁵ In addition, efforts by developed countries, who traditionally were in favour of raising the levels and standards of IP protection, continued after the conclusion of the Agreement. In particular, the European Union and the United States intensified their efforts through various unilateral and bilateral initiatives to raise the levels of IP protection beyond those prescribed under TRIPS, hence resulting in the so-called 'TRIPS-Plus effect.'⁶ This paper will focus on TRIPS-Plus development that comes within the framework of US and EU FTA agreements.

III. ECONOMICS OF TRIPS

Economists usually prefer the free working of markets with minimum government intervention so long as no market failures exist. However, more frequently, especially in the case of developing countries, multiple market distortions exist. One such common failure is the existence of public goods. In particular, the spread of knowledge is non-rivalrous and non-excludable, which means such spread can be enjoyed by anyone through file-

sharing technology. In such cases, it is difficult to prevent people from obtaining the benefit of public goods or services. In the absence of government subsidies or IPR enforcement, such goods or services will be under produced and under supplied relative to a socially optimal level. This is due to the fact that potential producers will not be able to realize a profit (since the good can be obtained for free) sufficient enough to justify the costs of production. To reach the optimal level of knowledge crucial for development, knowledge producers must be either financially compensated or protected by IPR law enforcement.

On the other hand, the enforcement of IPR law increases social costs, because it limits competition and introduces monopoly pricing, thereby raising the cost of research and development for follow-on inventors. Therefore, it is crucial for a country to be able to choose the proper strength of IPR protection, in order to maximize innovations and technological progress, economic growth and ultimately its social welfare.

Furthermore, since economies differ in their stage of development, economists believe that the optimal strength of IPRs will be different between developing and developed countries.⁷ As shown in Figure 6.1, to maximize social welfare, developing countries require much weaker IPRs compared to developed countries. This implies the existence of interest conflicts between the two groups of countries in terms of the desired strength of IPRs.

² *ibid.*

³ For example, the Paris and Berne Conventions allowed recourse only to the International Court of Justice (ICJ), which was non-binding on member states.

⁴ TRIPS standards concerning the availability, scope and use of intellectual property refer to and reproduce Articles 1–12 and 19 of the Paris Convention, Articles 1–21 of the Berne Convention and Articles 2–7 and 16 of the Washington Convention. TRIPS also refers to the above-mentioned conventions with regard to the enforcement of intellectual property as well as the acquisition and maintenance of these rights.

⁵ Details of these agreement can be found online: <http://www.wipo.int/meetings/en/topic.jsp?group_id=23>

⁶ Pete Drahos, 'BITS and BIPS: Bilateralism in Intellectual Property' [2001] *Journal of World Intellectual Property* (4), pp. 791–808.

⁷ Grossman and Lai [2004]; Kim, Lee, Park, and Choo [2012].

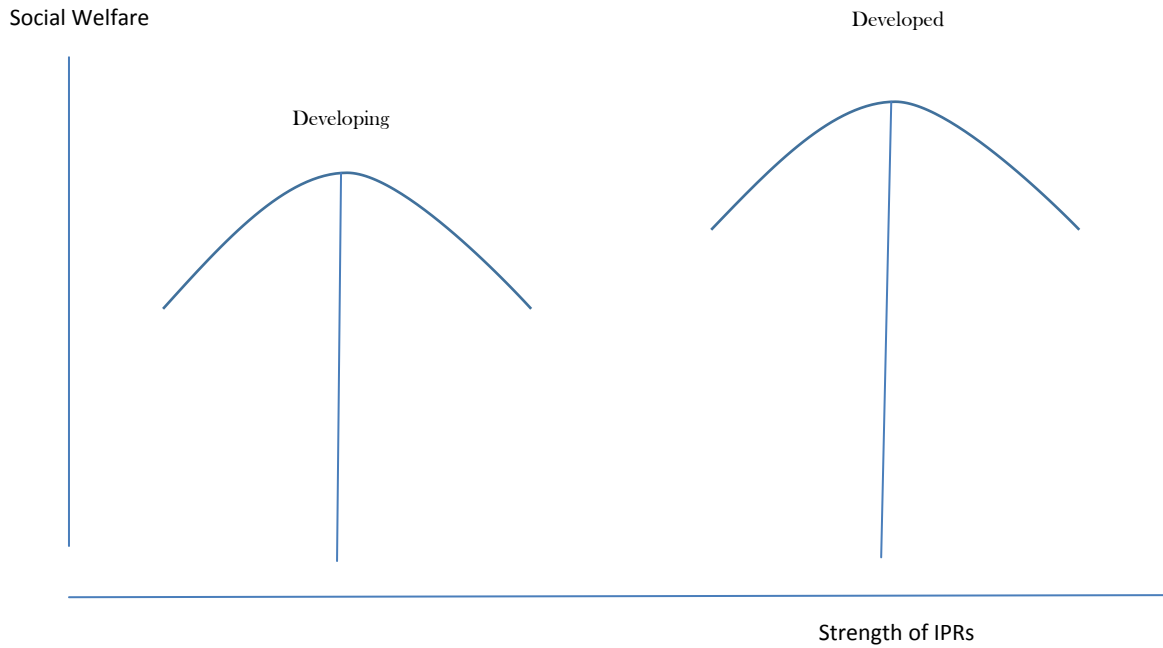


Figure 6.1 Relationship between the strength of IPRs and level of development

Indeed, many of the developed countries have used bilateral FTAs to achieve higher levels of IPR protection, or what has become known as TRIPS-Plus FTAs, at the expense of developing countries.

Furthermore, since developed countries are the main exporters of knowledge-intensive products, their potential gains from stronger IPRs increase in cases of demand for inelastic goods such as medicine. To illustrate this point, Figure 6.2 depicts the market equilibrium for certain medical goods which are characterized by an inelastic demand curve. As higher levels of IPRs are expected to cut down the production and supply of that good, it will induce sharp price increases—due to inelastic demand—and will greatly benefit the exporting developed country at the expense of the importing developing country.

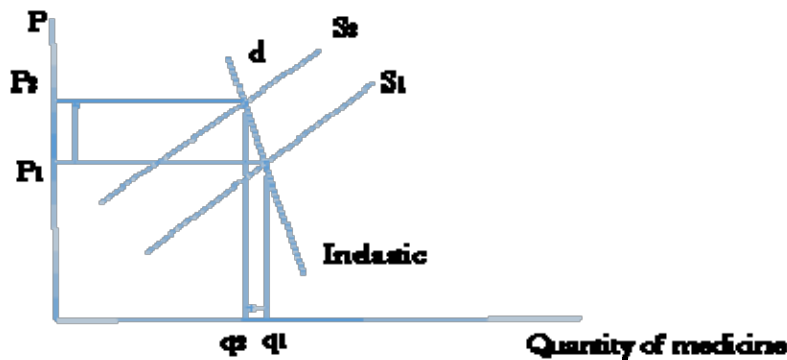


Figure 6.2 Market equilibrium of demand-inelastic good (medicine)

The above analysis provides one explanation for the underlying drivers behind developed countries' push for TRIPS-Plus FTAs. Another explanation for the push for TRIPS-Plus is what has become known in regulation theory as regulatory capture or revolving door. According to this explanation, IP is a highly complex subject: it involves interests of policymakers, courts, and attorneys and agents of IP owners' associations. According to Stigler, regulations tend to be acquired, designed and operated for the benefit of large industries and with collusion of the relevant state agencies.⁸ According to this approach, TRIPS-Plus provisions maximize private welfare, not social welfare.

IV. FREE TRADE AGREEMENTS AND TRIPS-PLUS

Jordan has followed a consistent and active strategy of trade liberalization. It has promoted policies of both regional and bilateral trade agreements during the last two decades, based mainly on economic considerations. Its trade-opening policy has not been limited to the Arab region, but has expanded to major partners in Europe, the United States, and most recently to Turkey and Canada.

These FTAs are unprecedented in many aspects, particularly with respect to TRIPS, by actually building on the international architecture of IPRs. They establish, as a major principle, that nothing in the Agreements derogates from the obligations and rights of the parties by virtue of TRIPS or other multilateral IP agreements administered by WIPO.

They enshrine the national treatment principle of non-discrimination between nationals of the two countries and, as a consequence of the most-favoured-nation principle in TRIPS, the advantages, benefits and privileges granted by the FTA are automatically accorded to the nationals of all other WTO Members. Because of the principle of non-derogation, the FTAs do not deal with all IPR-related subject matters. They focus on few but important ones. The FTAs contain detailed provisions on issues not dealt with at all in TRIPS, such as domain names on the Internet, related rights of performers and producers of phonograms, remedies against the circumvention of effective technological measures, effective legal remedies to protect rights-management information, and protection of encrypted program-carrying satellite signals. In traditional areas already covered by TRIPS, they expand the coverage of trademarks and the protection of pharmaceutical products.

On copyright, these FTAs make a distinctive difference between copyright and related rights, reflecting the different legal systems prevailing in the two countries. Most notably, for pharmaceutical products, such FTAs expand protection by different means, including⁹:

- The reinforcement of the provisions on marketing and sanitary approval;
- the adjustment of the patent term to compensate for unreasonable delays in its granting;

⁸ George J Stigler, 'The Theory of Economic Regulation' 2 The Bell Journal of Economics and Management Science 1 (1971).

⁹ The Australia–United States Free Trade Agreement (AUSFTA) <http://en.wikipedia.org/wiki/Australia%E2%80%93United_States_Free_Trade_Agreement>

- the prohibition of the use of undisclosed information about the safety and efficacy of pharmaceutical products for five years from the date of its marketing or sanitary approval;
- the extension of the patent term to compensate for unreasonable curtailment of the patent term as a result of marketing approval; and
- the granting of marketing approval to third parties requiring the consent or acquiescence of the patent owner.

By raising the strength of IPRs in developing countries, TRIPS-Plus FTAs became controversial among economists, particularly regarding whether they pushed IP strength beyond the 'optimal' level and hence negatively affected the overall economic performance of developing countries. The final impact depends on whether the resulting market power would then dominate any market expansion effects of IPRs on inward technology diffusion. The final net effect depends on the particular country's economy and can only be resolved empirically.

V. INTELLECTUAL PROPERTY RIGHTS AND TECHNOLOGY TRANSFER

A crucial question arises when discussing technology transfer from developed to developing countries: will stronger IPRs enhance the diffusion of technology? Economic analysis suggests that IPR protection can encourage technology transfer through a number of channels such as access to new products and processes via exports, foreign direct investment (FDI), and licensing by developed countries. However, the net impact is not clear-cut. It depends on the market-expansion effect compared to the resulting market-power effect of IPRs. Again, the relationship between IPRs and technology transfer is complex and non-linear. The net effect (i.e. market expansion versus market-power effect) depends on the size of market and imitative capacities of the host country.

On the one hand, stronger IPR protection could hamper the diffusion of technology, with patents preventing others from using proprietary knowledge and the increased market power of IPR holders potentially reducing the dissemination of knowledge due to lower output and higher prices. On the other hand, IPRs could play a positive role in knowledge diffusion, since the information available in patent claims is available to other potential inventors. Moreover, strong IPR protection may encourage technology transfer through increased trade in goods and services, FDI, technology licensing and

joint ventures. Though, once again, the impact of strong IPR protection has been found to depend upon other factors related to a country's imitative ability and level of development.¹⁰

Empirically, the effects of stronger IPR protection vary by industry and level of economic development of the host country. They also depend on other factors such as human capital, wages, market size, taxes, governance, and technological level. For most high-income countries, strengthening IPRs may affect growth positively due to increased innovation and technology diffusion. For middle-income countries, the evidence suggests that strengthening IPRs has little effect on growth. On one hand, a stronger IPR regime encourages both domestic innovation and technology diffusion through foreign patenting and international trade and hence may positively affect growth. On the other hand, the beneficial impact of stronger IPR protection on domestic innovation and technology diffusion is, to a certain extent, offsetting the growth-enhancing benefits otherwise obtained from imitation and now precluded by the stronger IPR regime. The IPR regimes in these countries will need to be strengthened in order to meet TRIPS standards. The policy focus of these countries should be to encourage domestic firms to shift from imitation to innovation and to facilitate other activities with growth-enhancing technology spillovers.¹¹

VI. DEVELOPMENT OF INTELLECTUAL PROPERTY RIGHTS IN JORDAN

Intellectual property standards in Jordan have been steadily developed and strengthened through various international agreements. Initially the accession to the WTO raised IP standards in Jordan to meet the WTO's TRIPS standards. Later on the Jordan-United States Free Trade Agreement (JUSFTA) followed by the Jordan-European Union Association Agreement (JEUAA) added more requirements. The following will briefly review the additional commitments (including TRIPS-Plus FTAs) resulting from these FTA agreements.

A. JUSFTA

JUSFTA, which was signed on 24 October 2000 and became effective on 17 December 2001, states that its IP requirements are merely the minimum required, and that each State is free—indeed encouraged—to continue to seek higher and more stringent protections. The current minimal

¹⁰ Leverhulme Falvey, Neil Foster and Olga Memedovic, 'The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence' (UNIDO working papers 2006).

¹¹ *ibid.*

requirements, include obliging both parties to adopt articles from the Joint Recommendation Concerning Provisions on the Protection of Well-Known Marks (1999), the International Convention for the Protection of New Varieties of Plants (1991) (UPOV Convention), the WIPO Copyright Treaty (WCT) (1996), and the WIPO Performance and Phonograms Treaty (WPPT) (1996). Additionally, each party is required to use its best efforts to ratify the Patent Cooperation Treaty (PCT) (1984) and the Madrid Protocol Concerning the International Registration of Marks (1989).¹²

The following is a brief description of the new requirements imposed on some of the main IP areas under the JUSFTA, all of which exceed those required under TRIPS. In particular, the agreement contains several TRIPS-Plus provisions that directly impact public health and access to medicines within the countries. These may be summarized as follows¹³:

(a) Data exclusivity protection. JUSFTA obliges Jordan to provide legal protection for data exclusivity for a period which may be extended up to eight years.

(b) 'New use' legal protection for chemical entities. Although the TRIPS Agreement does not oblige Member States to provide legal protection for new use, JUSFTA references to this type of protection.

(c) Patent term extension. Article 33 of the TRIPS Agreement provides that legal protection shall be granted to patents for a period of 20 years from the date of filing. JUSFTA further extends this period in order to compensate the applicant for the time spent during the examination of the application and/or marketing authorization.

(d) Restrictions on compulsory licensing. The TRIPS Agreement on compulsory licensing gives the government the authority to use a patent without the patent holder's authorization in return for just compensation. However, the Agreement does not list or specify the grounds whereby such licences may be granted, but instead awards Member States the discretion to define such grounds. On the other hand, JUSFTA lists the grounds where such licences may be granted, hence limiting the policy space available to Jordan by broadly defining these grounds.

(e) Trademarks and geographical indications. JUSFTA removed the previously existing requirement that a trademark must be registered in Jordan, in order for the trademark holder to assert any rights under the

trademark and raised the maximum criminal fine for an IP violation to JOD 6000.

(f) Copyrights and Related Rights. The JUSFTA added significant requirements, and thus higher standards, for copyright protection including:

- (i) Giving performers and producers of phonograms the right to prohibit unauthorized broadcasting of their works;
- (ii) giving right holders control over allowing or denying the importation of protected work(s), whether the work is pirated or an authorized version;
- (iii) asking the signatories to combat technology that is intended to circumvent the effective technological measures that are used by performers or producers in connection with the exercise of their rights in accordance with Article 11 of WCT and Article 18 of WPPT;
- (iv) asking governmental agencies to use only computer software authorized for intended use. Both parties must actively regulate the acquisition and management of software for government use;
- (v) requiring 'that statutory maximum fines are sufficiently high to deter future acts of infringement with a policy of removing the monetary incentive to the infringer.'

The criminal fines were increased to a maximum of JD 6000, and provisions were added to protect performers.

(g) Patents. A new Patent Law was enacted in 1999 to comply with TRIPS obligations. In 2001, new patent regulations were introduced to help facilitate the process of filing for a patent. While the 1999 law is in compliance with the TRIPS Agreement obligations, JUSFTA introduced several TRIPS-Plus requirements in the field of patents and regulated products. The main new obligations are:

- (i) Jordan must make available an extension of the patent term to compensate the patent owner for unreasonable curtailment of the patent term as a result of the marketing approval process. Jordan has yet to meet that requirement;

¹² F K Nesheiwat (2010).

¹³ *ibid.*

- (ii) Jordan must commit to joining the PCT. Jordan has yet to meet that requirement; and
- (iii) Jordan must clarify that the exclusion from patent protection of 'mathematical methods' in Article 4(b) of Jordan's Patent Law does not include such 'methods' as business methods or computer-related inventions. The Jordan Patent Office is now accepting business methods patents applications in light of the above commitment.

B. JORDAN-EUROPEAN UNION ASSOCIATION AGREEMENT (JEUAA)

The European Union signed an Association Agreement with Jordan on 24 November 1997; it was ratified by the Jordanian Parliament in September 1999 and came into force on 1 May 2002. While the IP components of JEUAA were not as detailed as those of TRIPS or Article 4 of the JUSFTA, they are nonetheless the most constraining. Initially, the JEUAA presents several requirements for Jordan to fulfil in the area of IP, including compliance with¹⁴:

- The Berne Convention for the Protection of Literary and Artistic Works (Paris Act 1971);
- The Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (Rome 1961);
- The Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks (Geneva Act 1977 and amended in 1979);
- The Madrid Agreement Concerning the International Registration of Marks (Stockholm Act 1967, amended 1979);
- The Protocol Relating to the Madrid Agreement concerning the International Registration of Marks (Madrid 1989);
- The Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (1977, modified 1980); and
- The International Convention for the Protection of New Varieties of Plants (UPOV) (Geneva Act 1991).

Furthermore, the JEUAA requires Jordan to join the PCT within seven years of the ratification of the association agreement, echoing a similar request in the JUSFTA. It requires Jordan to adopt the highest standards and places a requirement in perpetuity to upgrade and amend its IP regulations to meet that requirement. Also, the Association Council can make Jordan accede to the new agreements or legislatively approve the new standards if Jordan is a party to the modified treaty already.

In sum, the composite of standards imposed through JUSFTA and JEUAA have significantly increased the level of protection over the baseline standards defined in TRIPS.

VII. IMPACT OF TRIPS-PLUS PROVISIONS ON ECONOMIC GROWTH

Little evidence exists that strong IPRs encourage greater research and development (R&D) in developing countries. The experience of Switzerland is a good example of a country which had no patent law during the late 19th century, but was the most innovative in that period. H. El-Said and M. El-Said (2007), analysed the TRIPS-plus provisions of the JUSFTA and found no evidence to support claims that the FTA has enhanced availability and accessibility of medicines in Jordan, attracted foreign investment, improved R&D capacity of local manufacturers, or led to more collaboration between national and multinational pharmaceutical companies. R. Malpani from Oxfam (2007), reported that medicine prices have increased significantly in Jordan since the FTA, partly as a result of TRIPS-plus rules. Stronger IP protections have produced minimal benefits to FDI, domestic R&D, or the introduction of new medicines. The report predicted that medicine prices will continue to rise in Jordan and that the country would be unable to use certain TRIPS flexibilities.

Nesheiwat (2010) examined, through the pharmaceutical sector, the claims about the positive impact of IP standards on FDI influx. He found no evidence in support of these claims.

Ryan B. Abbott and others (2012) reported that the delayed market entry of generics due to enhanced IP protection had increased total annual expenditure for medicines in Jordan by 17 per cent during the period of 1999–2004. They estimated these delays to have cost Jordanian private consumers approximately USD 18 million in 2004.

According to the 2013 IPR report, Jordan scored well above average, achieving a score of 5.8 on the 2013 intellectual property right index (IPRI). That score

¹⁴ *ibid.*

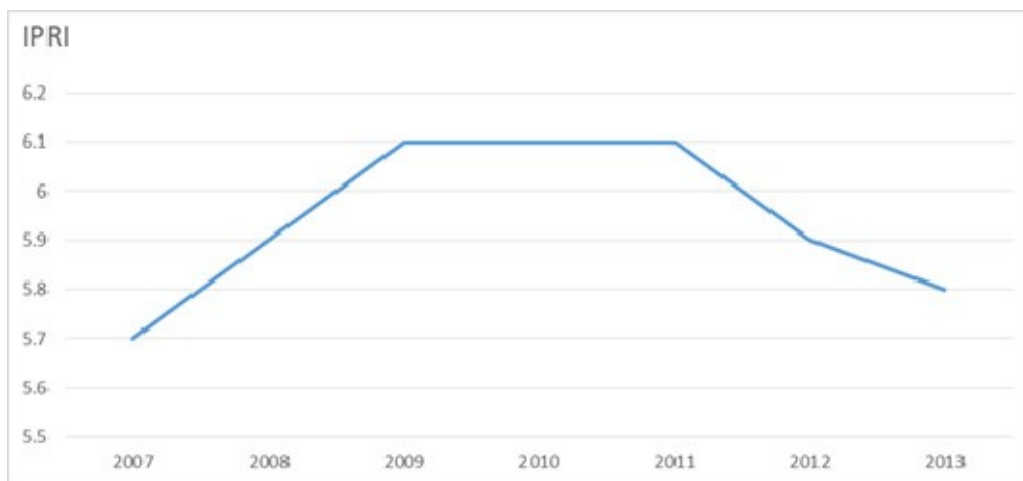
ranked 45th out of 130 globally and 7th out of 21 within the Middle East and North Africa (MENA) region. The highest IPRI sub-score in this measure is for patent protection (6.9) followed by protection of IPRs (6.4) (Table 6.1). The weakest score was for

copyright piracy which implies that Jordan can improve its performance on IPRI by simply tightening copyright protection.

Table 6.1 International Property Rights, Jordan, 2013

Category	Score	Global Rank	Regional Rank (MENA)
Intellectual Property Rights	5.8	45 of 130	7 of 21
Protection of Intellectual Property Rights	6.4	39 of 130	10 of 21
Patent Protection	6.9	45 of 130	7 of 21
Copyright Piracy	4.2	52 of 130	7 of 21

Source: The Property Rights Alliance (PRA), International Property Rights Index 2013.



Source: based on International Property Rights Index 2007-2013

Figure 6.3 Development of International Property Rights Index, Jordan, 2007 – 2011

Figure 6.3 shows that Jordan's performance according to IPRI improved steadily up to 2009, stabilized after that point until 2011, and worsened thereafter.

A. MEASURING THE IMPACT OF TRIPS-PLUS ON ECONOMIC GROWTH: METHODS AND ANALYSIS

Different empirical growth models are available depending on what economic growth theory one uses. Similar to the methodology used by Lim Gee, Abdul Ghani Azmi, and Rokiah Kulliyah (2008), Han Young, Jang Kwang-Chul (2009), and S.K. Verma and N.V. Muralidhar Rao (2009), this paper utilizes the neoclassical growth theory in which total output (measured by GDP) is determined mainly by factors of production and technology. We assume a general form production function, in which production is a function of inputs: capital, labour, and technology. The coefficients in this general specification need not sum to one (no CRS technology is assumed). The general form of production function can be expressed at time period t as follows:

$$(i) \quad Y_t = A_t F(\text{capital}, \text{labour})$$

(ii) Taking total differential of (1) and rearranging yields: $d \log Y_t = dA/A + b_1 d \log(\text{capital}) + b_2 d \log(\text{labour})$

All variables are transferred in difference logs of original variables. B_1 and B_2 are the partial unknown growth coefficients.

Hence, the technological change variable can be viewed as the sum of two effects: first the effect of policy variables mentioned above, and second, random disturbances (e_t) resulting from unobserved shocks like sudden changes in weather or resource availability and other unexplained changes. As explained earlier, other policy variables that may affect economic growth through the term dA/A may include trade openness and IPR policy.

Hence the econometric model to be estimated can be written as:

$$(iii) \quad d \log Y_t = b_0 + b_1 d \log(\text{capital}) + b_2 d \log(\text{labour}) + b_3 d \log(\text{IPR}) + b_4 (\text{policy}) + e_t$$

The coefficient of the policy variable added to the production function in equation (3) measures the impact of trade openness and/or other policy variables on technological changes. After controlling for the impact of factors of production, the variable IPRs are added to capture the impact of Jordan's IPR policy on real growth measured by the IPRI. Furthermore, to account for human capital effect on

growth, a measure for education level (educ) is added to the equation. The variable educ is measured by secondary-school enrolment. However, since data on IPRI is available only for the period 2007–2013, it is dropped from the estimated equation. In a single country analysis, the only feasible way to measure the impact of TRIP-Plus requirements introduced by the two free-trade areas Jordan has signed with (the United States and the European Union) is to use a proxy variable—a binary dummy variable that takes the value of one for all years after the agreements became effective, and the value of zero otherwise.

The rate of growth in output is calculated as the log-difference of annual real GDP values; all other variables are similarly calculated with the exception of policy variables. A sample of annual data collected by the Central Bank of Jordan and the World Bank covering the period of 1980–2010 has been utilized. The estimated equation included the annual growth rate of the following variables: real GDP (ld_rgdp), gross fixed capital formation at constant prices (ld_capf), education level (ld_educ), labour force (ld_labour), and the policy dummy variable (JEUAA).

A necessary first step before turning to the model estimation: all model variables must be checked for unit root to make sure that they are stationary. The result of applying the Augmented Dickey-Fuller (ADF) Unit root test is shown in Table (6.2):

Table 6.2 ADF Unit root test

Variable	Tau- statistic with constant	p-value
ld_rgdp	-3.76682	0.003
ld_capf	-3.36	0.01
ld_labour	-2.54	0.11
ld_educ	-5.4278	0.00

The results of the ADF test show that all variables are statistically significant at 0.05 or better, with an exception for labour, which is significant at only 11 per cent. Hence, the result indicates that all variables used in OLS are stationary and assures non-spurious regression results. All included variables were transformed into log differences of the original variables except the policy variable introduced to capture the TRIPS-Plus effect. The constant was

dropped from the estimated equation consistent with the specification of the growth model.

The growth equation was estimated first by ordinary least squares and tested for both autocorrelation and heteroskedasticity. To account for heteroskedasticity the model was re-estimated with correcting for heteroskedasticity and both results are shown in Table 6.3:

Table 6.3 OLS and heteroskedasticity-corrected estimates

	OLS Coefficient	Corrected OLS Coefficient	OLS t-ratio	Corrected OLS t-ratio
ld_labour	0.56714	0.524511	3.6507	10.0016
ld_capf	0.0951643	0.115668	2.1588	7.0840
ld_edu	0.180684	0.166082	1.9471	9.3817
EUFTA	0.0415095	0.0549994	2.5287	10.8891
Adj. R-squared	0.533200	0.816846	F-statistics 9.031274	33.08419

The overall model fit is quite good as shown by a relatively high adjusted R-squared (53 per cent in OLS and 82 per cent in the corrected method) and highly significant Fisher F-tests. All estimated coefficients carry the correct expected positive sign in both methods. Although the size of coefficients are close in the two estimation methods, the model and parameter significance are much stronger in the heteroskedasticity corrected method. All other estimated coefficients are statically significant at 5 per cent or better level. The largest coefficient size is for labour (0.52), followed by education or schooling (0.17) and capital (0.12). The dummy variable coefficient is small (0.04) but highly significant at better than 1 per cent. This may be taken as an indicator of limited positive effect of TRIPS-Plus associated with both JUSFTA and JEUA. However, this last result should be taken cautiously since the proxy variable used may reflect the net impact of trade liberalization policy taken by Jordan rather than solely TRIPS-Plus. In addition, the findings of this study do not exclude the possibility of negative impacts of TRIPS-Plus rules on public health and access to medicines.

VIII. CONCLUSIONS

Economic analysis suggests that developed countries can be expected to seek stronger levels of IPRs compared to developing countries. Therefore, many of the developed countries have used bilateral FTAs to achieve higher levels of IPR protection or what has become known as TRIPS-Plus FTAs, at the expense of developing countries. Furthermore, as developed countries are the main exporters of knowledge-intensive products, their potential gains from stronger IPRs increase in cases of demand for inelastic goods such as medicine. Jordan scored well above average on the 2013 IPRI, achieving a score of 5.8, which ranked 45th out of 130 globally and 7th out of 21 within the MENA region. The performance of Jordan, according to the IPRI, improved steadily up to 2009, stabilized after that until 2011, and worsened thereafter. The regression analysis showed that real economic growth in Jordan is significantly influenced by classical production factors such as, labour, capital, and educational level. Furthermore, contrary to findings of other studies reviewed above, this analysis provides evidence of a positive—although limited—effect of TRIPS-Plus requirements built into both JUSFTA and JEUA on the real economic growth of Jordan.

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