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Intellectual Property Protection and US Foreign Direct Investment in Emerging Economies

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Do intellectual property rights (IPR) affect foreign direct investment (FDI) into emerging economies? While conventional wisdom supports a strong IPR-FDI relationship, the empirical evidence is both mixed and suffers from several shortcomings. To help resolve this paradox, this article investigates the effects of IPR on US FDI in 22 emerging economies using data from 2006 to 2008. It tests two competing, independent measures of IPR protection, as well as disaggregated FDI data to investigate the effects of IPR protection on investments across nine industries economy-wide, and across eight sectors within the manufacturing industry. The empirical results consistently fail to support the hypothesis that IPR protection strongly affects advanced country FDI into emerging economies. Therefore, developing countries may have considerable leeway in IPR design and enforcement; IPR regimes can be tailored to fit a developing country's domestic socio-economic and cultural conditions without affecting it as a destination for foreign investment. IPRs are not an end-in-themselves, rather they are a means by which to increase investment in innovative activity; they should therefore be designed and enforced with this goal in mind.

Keywords: Patents, development, technology, innovation, investment

Recently, several researchers have begun to explore the relationship between foreign direct investment (FDI) and intellectual property rights (IPR). Some contributors have pointed out that FDI brings with it vital inputs of advanced technology and financial capital into developing countries, especially in new industries such as biotechnology.[1] This has lead others to argue that, since advanced countries are hesitant to expose their R&D investments to local imitation, weak IPR regimes will result in lower levels of FDI.[2] Still other contributors contend that properly structured IPRs can foster technology transfer via FDI (amongst other mechanisms).[3] It is argued in the paper that IPRs do not strongly determine FDI flow into developing countries, therefore developing countries have considerable leeway in IPR design and enforcement. IPR regimes can be tailored to fit a developing country's domestic socio-economic and cultural conditions without affecting it as a destination for foreign investment. That is, IPRs are not an end-in-themselves; rather they are a means by which to increase investment in innovative activity, they should therefore be designed and enforced with this goal always in mind.

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IPR protection represents a tradeoff between the benefits of innovation and the costs of exclusivity. IPRs encourage the development and production of new technology by protecting its owners from competition. In developing economies, strong IPR regimes can protect advanced foreign producers against low-cost imitation by local competitors. By protecting costly investments in R&D, strong IPR may thereby foster greater foreign investment in local production and research facilities. However, many developing countries are hesitant to strengthen the protection of IPR within their countries in fear that the negative effects resulting from such action would outweigh the benefits. The creation, production, and diffusion of new technology are often too risky and capital intensive for less developed countries to do alone. Also, competition from producers in advanced economies can further erase the profits necessary to make such investments worthwhile. Therefore, weaker IPR regimes can give a developing country's firms and consumers an advantage when faced with the near monopoly position held in high technology by firms in advanced economies. Also IPR regimes created in advanced countries may be a poor fit for the very different social conditions present in the developed world. But will weak IPR regimes drive

away the foreign investment which policymakers in developing countries seek so urgently to attract?

There are several gaps in the research literature which investigates this question regarding the effects of IPR protection on FDI. Firstly, there are mixed empirical results, with some scholars finding that a positive relationship exists between IPR and FDI, while other scholars have argued that the relationship between IPR and FDI is ambiguous. Still other scholars believe that weak protection of IPR deters FDI only in technology-intensive sectors that heavily rely on IPR. Therefore, studies which find a weak or ambiguous IPR-FDI relationship are simply not taking into account the industry mix in the recipient country. Furthermore, the data and analysis in many of these studies are incomplete, raise construct validity problems, or require updating. The analysis presented here attempts to address these weaknesses.

The purpose of this article is to investigate the effects of IPR on the volume and composition of FDI from advanced countries into emerging economies. The US possesses one of the most protective IPR regimes which it aggressively defends in negotiations with international partners. Hence, if emerging economy IPRs systematically affect the volume or character of advanced country FDI, then this relationship should be most visible in the US data. However, even when using competing measures of IPR on industry level data for 22 emerging economies, the analysis below fails to find any such IPR-FDI relationship. The contention is not that IPRs have no relationship with FDI, but that the relationship is neither as strong nor simple as most IPR advocates in advanced countries suggest.

FDI and IPR: Different Schools of Thought

There are three major schools of thought regarding the relationship between FDI and IPR. The oldest is the 'positive relationship' school, which argues that strong IPR protection is necessary to attract foreign investment in all sectors because weak protection of intellectual property increases the probability of local imitation. Firms will therefore, be reluctant to invest in a developing country since their intellectual assets and financial investments will not be protected. Thus, weak protection of intellectual property rights makes a country less attractive to FDI. This is also the line of argument taken up by many advanced country firms and policymakers who seek to protect their intellectual property, as well as their technological competitive advantage, when investing abroad.

Supporting this argument are empirical analyses by several researchers using different types of IPR and FDI data. During the 1990s, statistical analysis of survey responses and questionnaires of firms and IPR experts appeared to support a strong IPR-FDI relationship. One prominent study used survey and FDI data from 14 developing countries,[4] while another utilized data combined from 27 less-developed, newly industrialized, and developed countries.[5] However, much of this evidence was based on subjective judgments of levels of IPR protection. Also, many 'positive relationship' studies covered only wealthy countries in the Organization for Economic Cooperation and Development (OECD),[6] or were restricted to particular countries or geographic regions.[7]

A more recent, second school of thought contends that the relationship between intellectual property protection and FDI is ambiguous. Scholars from this school argue that, while there are indications that strong IPR can be an effective incentive for FDI, IPRs are only one of a broad set of factors that influence a firm's decision to invest in a foreign country. One theory holds that strong intellectual property protection may be unnecessary for attracting FDI due to more important location advantages.[8] Such location advantages might include low tax rates, low labour costs, high education levels, large market size, etc. Some scholars argue that the location advantages in a developing country can be large enough to compensate for weak intellectual property protections.[9] Scholars further theorize that strong IPR protections might even negatively affect FDI by creating incentives for multinational firms to replace FDI in developing countries with licensing agreements for local producers.[9,10]

This 'ambiguous relationship' argument is also supported by empirical evidence. For example, a recent World Bank compilation of studies finds only mixed evidence that IPRs affect FDI in developing countries.[11] Analysis of US affiliate sales in foreign countries has revealed no relationship to that country's participation in international patent or copyright treaties.[12] Also, qualitative analysis has shown that strong IPRs have not been necessary to attract large levels of FDI in China, nor has the level of FDI there been affected to any significant degree by the large number of IPR infringements.[8] Instead, drastically lower production costs, large domestic market size, economic system efficiency, and preferential treatment of foreign investors have been the strongest

factors that have attracted FDI to China and these factors have offset the country's weak intellectual property protection.

The third school of thought posits that the strength of the IPR-FDI relationship depends on the type of industry receiving the investment. Several scholars believe that weak protection of IPR primarily deters FDI in high-tech industries since profits in these sectors heavily rely on IPRs. Therefore industry characteristics should be taken into account when testing the relationship between IPR and FDI.[9,10] Surveys of multinational firms' perceptions of the importance of IPR on investment decisions appear to support this claim.[13] Also, analysis of sectorally disaggregated FDI data shows that the effects of IPR protection are strongest in human capital and high-technology intensive industries such as machinery and transport equipment, but weakest in low-technology intensive industries.[14] Even scholars within competing schools of thought admit the possibility that the effects of IPR might vary by industry. For example, a study which shows a strong IPR-FDI relationship in Eastern Europe and the former Soviet Union also found that weak IPR protection especially deters FDI in high-technology sectors.[7] Others have found that, in regard to investment decisions, firms in the chemicals, pharmaceuticals, electrical equipment, and machinery industries placed a larger emphasis on IPR protection than other industries regardless of the country.[4]

Despite these valuable contributions to the debate, gaps remain in the empirical research literature. First, several prior studies use subjective measurements of IPR protection. They are therefore, vulnerable to considerable respondent bias, cross-respondent inconsistency, and measurement error. Also, many studies only examine a single country or geographic region, and therefore, may not be generic to other countries or regions. Third, few empirical studies use disaggregated FDI data to investigate and measure the effects of IPR protection on FDI in different industries. Those few studies that do use disaggregated data often test the effects of IPR only in particular industries or sectors of the economy. Finally, there have been few empirical studies on the IPR-FDI relationship since 2000. During the last decade, there has occurred both rapid globalization and technological innovation in the developing world. Hence the IPR-FDI relationship may have strengthened or changed direction. The analysis presented below attempts to address these issues by using competing measures of IPR to corroborate results, both aggregated and disaggregated FDI data to test economy-wide and sector-specific hypotheses, a large cross-national dataset, and the most recent data available.

Hypotheses

The empirical analyses in this study will test three common hypotheses. The first 'positive relationship' hypothesis is that, all else equal, strong IPR protection positively affects the volume of FDI from an advanced economy to an emerging economy. Inversely, this hypothesis holds that the volume of FDI into a developing country will be negatively affected by weak IPR protection.

The second hypothesis is that intellectual property protection has a greater effect on FDI in industries typified by high-technology products and processes than in other industries and can therefore, affect the composition of FDI within a developing country. More specifically, given the higher levels of technology involved, the hypothesis is that the level of FDI in manufacturing, wholesale trade, and information industries within a country will be negatively affected by the weak intellectual property protection.

The third hypothesis is that, within emerging economies, weak IPR protection will negatively affect FDI in those manufacturing sectors which require large investments in high-technology products or processes. That is, the manufacturing industry is looked at to investigate whether weak intellectual property protection affects the level of FDI in these sectors, namely, chemicals; machinery; computer and electronic products; electrical equipment appliances and components; and transportation equipment. The authors believe that these industries will be negatively affected by weak IPR protection, because they are technological intensive. Finally, it is also hypothesized that IPR protection will not affect the level of FDI in the food and metals sectors of the manufacturing industry, because these sectors are less technologically intensive. Unfortunately, while recent contributors to this journal have focused on investment in biotechnology and pharmaceuticals, the datasets used below do not yet allow specification of those particular sectors.[1,15]

Testing of Hypotheses: Methods

In order to test the above hypotheses, a statistical regression analysis of data on United States outward FDI during the 2006-2008 period was performed. Although time-series cross-sectional regressions would be ideal here, the presence of rarely changing independent variables over time creates multi-collinearity issues, especially when used with country fixed effects. Also the small time dimension, especially alongside a far larger cross-section, suggests that temporal variations might be drowned out in this case. Therefore ordinary least squares (OLS) regression analysis is followed , using year dummies and Huber-White estimates of the standard errors.

The selection of the US to represent advanced country FDI behavior is motivated by several concerns and has favorable characteristics. From a data perspective, the US affords researchers considerable ease of access to a complete set of both aggregated and disaggregated FDI data using uniform definitions and measures. More importantly, the US is a major source of FDI in the developing world, as well as one of the most technologically advanced economies. The US also possesses one of the most protective IPR regimes which it aggressively defends in negotiations with international partners. Therefore if emerging economy IPRs systematically affect the volume or character of advanced country FDI, then this relationship should be most visible in the US data.

Amongst the recipients of US FDI, data on the twenty-two countries identified by the 2009 MSCI-Barra Emerging Markets Index as emerging economies, was compiled. These nations include: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Russia, South Africa, South Korea, Taiwan, Thailand, and Turkey. This set of countries offers a wide range of both IPR protection and US FDI levels, and therefore provides considerable variation in the primary independent and dependent variables. These economies also display wide variation in additional control variables, which will allow further findings. While these countries may not contain the universe of all developing economies (e.g. least-developed countries were omitted due to data scarcity and potential inaccuracy), it is argued that the countries included in this analysis constitute a representative sample of developing economies. Therefore the results from this study should be externally valid and generalizable to other developing countries.

The primary independent variable used in each of the three sets of tests below is the level of IPR protection. To measure IPR protection two competing indices are used which allow to triangulate the results by confirming findings across both measures. First, the Ginarte-Park (GP) index incorporates five measures related to national patent laws: the extent of coverage of patent protection, membership in international patent agreements, provisions for loss of protection, enforcement mechanisms, and the duration of protection.[16] The GP data used below includes the most recent IPR index for 122 countries for 2005. In the models below, GPi refers to the Ginarte-Park index in 2005 for the ith country.[17]

In order to corroborate tests using the GP index, second IPR index is also used which is taken from the World Economic Forum's (WEF) Global Competiveness Reports from 2006, 2007, and 2008. The WEF's Global Competitiveness Reports provides an index of IPR protection for more than 125 countries. The WEF IPR index is drawn from a combination of publicly available data and the results of their Executive Opinion Survey, which is a comprehensive survey conducted on an annual basis by the WEF in the countries covered in the report. The survey asked 'how would you rate intellectual property protection, including anti-counterfeiting measures, in your country?' A score of one corresponded to very weak intellectual property protection, and a score of seven corresponded to very strong intellectual property protection. In the regression models, WEF_i refers to the WEF IPR index. It is important to note that the Ginarte-Park index is mainly a measure of intellectual property protection based on the formal IPR laws within a country. The WEF IPR index is based on survey data and takes enforcement problems into account in addition to formal IPR laws**.**

To test the first hypothesis (the effects of IPR on overall FDI), an ordinary least squares regression model of the determinants of FDI is estimated in the following form:

$$FDI_i = \beta_0 + \beta_1(IPR_i) + \beta_2(LABOUR_i) + \beta_3(TAX_i) + \beta_4(POPULATION_i) + \beta_5(PRIORFDI_i) + \beta_6(INDUST_i) + \beta_7(POLSTABILITY_i) + \beta_8(TERTIARY_i) + \beta_9(MEXICO) + \beta_{10}(2007) + \beta_{11}(2008)$$

FDI_i is the dependent variable in the first regression analysis and corresponds to the volume of US FDI to the i^{th} country. FDI_i is measured in millions of US dollars. The data comes from the Bureau of Economic Analysis (BEA) aggregated dataset on US FDI stocks for the twenty-two selected countries for the years 2006 to 2008.

The second set of regression analyses retains the same independent variables, but changes the dependent variable from FDI_i to FDI_{ij}, where the latter represents the industry composition of FDI. Here FDI data used is disaggregated across nine industries (denoted by subscript j): mining; manufacturing; wholesale trade; information; depository industries; finance and insurance (except depository institutions); professional, scientific, and technical services; holding companies (nonbank); and other industries. This data comes from the US Bureau of Economic Analysis data on International Economic Accounts which provides disaggregated data on US FDI stocks in 166 countries.

The third set of regression analyses retains the same independent variables, but changes the dependent variable from FDI_i to FDI_{ik}, where the latter represents the composition of FDI across different manufacturing sectors. The data on FDI in the manufacturing industry is disaggregated into eight sub-groups (denoted by subscript k): food; chemicals; primary and fabricated metals; machinery; computers and electronic products; electrical equipment appliances and components; transportation equipment; and other manufacturing.

Table 1 lists the additional control variables used in the regressions and the data sources. $LABOUR_i$, TAX_i, $POPULATION_i$, $PRIORFDI_i$, $INDUSTRIALIZATION_i$, $POLSTABILITY_i$, and $TERTIARY_i$ are included in the regression model because they are commonly used in theoretical and empirical models of the IPR-FDI relationship by other scholars of the subject. Many of these variables have been shown in prior research to have a significant effect on FDI flows and therefore should be controlled for statistically. In each case, the subscript 'I' indicates the value of the variable in the i^{th} country.

Labour costs and corporate tax rates are included because, according to theorists, these factors can provide location advantages to firms in the country.[18] A country with low costs of labour and low corporate tax rates should attract higher levels of FDI than a country with higher values for these two variables holding all other variables constant. The variable for population is also included because countries with larger domestic markets should, theoretically, experience higher volumes of FDI than countries with smaller markets. Firms will choose to invest in countries where there is a large market for their product holding other factors constant.

$INDUSTRIALIZATION_i$ is included because it is a measure of development in a country. More industrialized countries should experience higher levels of FDI compared to less industrialized countries holding other factors constant. Also, empirical evidence and economic theories of agglomeration and clusters show that regions that have high levels of FDI are likely to continue to experience high levels of FDI holding other factors constant.[9] The agglomeration of firms provides advantages such as economies of scale and network effects. Additionally, high levels of existing FDI and industrialization in a country are location advantages that firms will take into account when making investment decisions. The variables of $PRIORFDI_i$ and $INDUSTRIALIZATION_i$ are also included, because a study of US FDI in forty-two countries from 1982-1988 have found that these variables can have a significant effect.[19]

$POLSTABILITY_i$ is included because political instability exposes foreign firms' investment to financial risk. Therefore an unstable political system in a country should deter FDI, holding other factors constant. High levels of human capital in a country can signify a skilled workforce within a country and thereby attract FDI.[9] Alternately, high levels of human capital can also reflect a strong imitative capacity of a population and can deter FDI. Tertiary education controls for the level of human capital.

The variable $MEXICO_i$ is a dichotomous or dummy variable for Mexico. Intuitively, due to its close proximity to the United States, Mexico should experience higher levels of US FDI holding other factors constant, and it is necessary to control for this factor in the regression models.

Year dummy variables are also included for 2007 and 2008. These allow control for year-specific events such as elections, financial events, natural disasters, etc. that might affect FDI that year. The year 2006 is omitted and will serve as the base year. The summary statistics of all the variables are summarized in Table 2.

In a preliminary model (not shown), variables were also included for the level of exports from the US,

Table 1—Variables list

Dependent Variable	Measure of…	Source	Unit of Measure
FDI	Foreign Direct Investment received from US	US Bureau of Economic Analysis	US$ millions
Independent Variables	**Controls for…**	**Source**	**Unit of Measure**
GP	Intellectual property rights	Ginarte-Park	Index
WEF	Intellectual property rights	World Economic Forum	Index
Labour	Cost of labour	World Bank	Average hourly wage rate ($ US)
Tax	Corporate tax rate	KPMG's 2009 Corporate and Indirect Tax Rate Survey	Taxation rate (%) at highest marginal tax bracket
Population	Size of national market	International Monetary Fund	Millions of people
PriorFDI	Foreign Direct Investment received from US in previous year	US Bureau of Economic Analysis	US$ millions
INDUST	Industrialization	World Bank	Industry value-added as % of GDP
PolStability	Political Stability	World Bank	Index
Tertiary	Tertiary education level	United Nations (UNESCO)	Enrollment rate
Mexico	Border country with potentially special relationship with US		Dummy variable for Mexico
Y2007	Year specific events		Dummy variable for 2007
Y2008	Year specific events		Dummy variable for 2008

level of corruption in the recipient country, and the level of economic freedom in the recipient country. However, when these variables were included in the model, variance inflation factor tests identified a high level of multi-collinearity within the model. The variable for exports was highly correlated with population, the variable for corruption was highly correlated with political stability, and the variable for economic freedom was highly correlated with the IPR indexes. As a result of their high correlation with other independent variables, these three variables were excluded.

Empirical Results

If the hypotheses above are correct, then the two IPR measures should show up as statistically significant across the different FDI regression models. However, the results generally fail to find any IPR-FDI relationship, either overall or by industry or sector. Often, both IPR measures are statistically insignificant. In those few cases where they are significant, they generally fail to corroborate one another. Even in the disaggregated FDI data, industries or sectors that are statistically significant in some regressions come up as insignificant in other regressions. For example, only within some sectors of the manufacturing industry, and only when using the GP index of IPRs is there much evidence for an IPR-FDI relationship; but these findings could not be corroborated by the WEF index of IPRs. If there was a strong IPR-FDI relationship, then this would not be the case.

Hypothesis 1: The Effect of IPR Protection on the Level of Total FDI

The estimation results do not support the first hypothesis that the volume of advanced country FDI into a developing economy is negatively affected by weak IPR protection. Instead, the results from the first set of regressions suggest that no relationship, or an ambiguous relationship, exists between the level of total FDI and the level of IPR protection in emerging economies. Table 3 presents these regression results. Columns (1) and (2) are base regressions that include only an IPR measure and the dummy variables for Mexico, 2007, and 2008. In these two base runs, neither the GP index nor the WEF IPR index is statistically significant. Thus, if there is an IPR-FDI relationship, it not strong enough to overwhelm the influence of omitted variables. The regressions in columns (3) and (4) include all of the explanatory variables from the regression model outlined above. But even after the inclusion of these additional control variables, the GP index and the WEF IPR index remain statistically insignificant. In regressions (3) and (4), the variables for population and prior FDI are both positive and statistically significant. The other explanatory variables and the dummy variables are

Table 2—Summary statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	66	2007	.823	2006	2008
FDI	66	159	19329	130	95618
Mining	51	1948	2518	-4	10171
WSTrade	65	834	805	16	3318
Information	64	511	898	-76	3603
Depository	29	1943	2397	-126	10007
Finance	61	2284	3855	-20	15736
Services	64	299	457	1	2563
Holding	46	2111	4006	-17	16865
Other	35	620	667	-57	2636
Manufact	65	5036	6398.394	78	22807
MFood	60	401	649	-9	2610
MChemicals	66	997	1378	-76	5213
MMetals	50	169	254	-10	822
MMachinery	55	287	494	1	2157
MComputer	53	1338	1986	-1655	8142
MElectronics	56	146	305	-11	1311
MTransport	52	670	1065	-95	5030
MOther	44	1361	2002	44	9209
GP Index	66	3.74	0.56	2.66	4.5
WEF Index	66	58.7	26.1	21	121
Labour	63	2.59	1.56	.63	5.97
Tax	66	27.2	5.99	16	36.9
INDUST	56	36.0	7.06	28	50
PriorFDI	66	13732	17614	130	91259
PolStability	66	36.7	22.3	7	79
Secondary	48	73.6	14.9	35	96
Tertiary	66	42.2	23.4	11.3	96.1
Population	66	172	347	6.81	1327
Mexico	66	.045	.209	0	1
Y2007	66	.33	.475	0	1
Y2008	66	.33	.475	0	1

not statistically significant in the regressions (3) and (4). These other results will be discussed further below.

Hypothesis 2: The Effect of IPR Protection on the Level of FDI by Industry

Tests of Hypothesis 2 also fail to produce consistent or rigorous supporting evidence. Tests using the GP index are not confirmed by those using the WEF index, except where the IPR-FDI relationship is negative (in the mining industry) or insignificant (in the finance, and holding company industries). Table 4 and Table 5 present these results.

Table 3—Hypothesis 1 (DV[#] = Total FDI)

	(1)	(2)	(3)	(4)
GP	-22.3		1818	
	(2335)		(1399)	
WEF		-49.1		-135
		(1709)		(996)
Labour			-255	127
			(1207)	(1203)
Tax			-27.1	65.8
			(132)	(135)
Population			7.45	7.78
			(1.79)***	(1.79)***
PriorFDI			1.00	0.97
			(0.07)***	(0.07)***
INDUST			102.3	80.4
			(86.2)	(83.7)
PolStability			-0.63	51.7
			(55.6)	(56.2)
Tertiary			15.5	11.1
			(59.8)	(60.1)
Mexico	77602	77585	5864	8385
	(6286)***	(6291)***	(6328)	(6148)
Y2007	2721	2721	363	504.3
	(3200)	(3200)	(1327)	(1325)
Y2008	3829	3818	-1165	-1110
	(3200)	(3221)	(1505)	(1499)
_cons	10248	10359	-8752	-1129
	(9002)	(7138)	(7084)	(6173)
N	66	66	56	56
R^2	0.72	0.72	0.97	0.97

[#]Dependent variable
Standard errors in parentheses: *p<.1, **p<.05, ***p<.01
Note: Regressions (1) and (3) use the Ginarte-Park Index as the independent variable; regressions (2) and (4) use the WEF IPR Index as the independent variable

Table 4 uses the GP index of IPR, Table 5 presents the estimation results using the WEF IPR index. Each column in the table presents the results for analysis of data from a different industry.

The regression results using the GP Index (Table 5) show that strong IPR protection positively affects the volume of FDI only in the wholesale trade, manufacturing, and 'other' industries within that country. For example, the regression in Column (8) shows that a 1 unit increase in the GP index of a country corresponds to a US$ 3,309 million increase in US FDI in the manufacturing industry in that country. The results from Table 4 also find that strong intellectual property protection in a country negatively affects the level of US FDI in the mining, information, and service industries. Column (1)

Table 4—Hypothesis 2 (DV = FDI by industry)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GP	-1553	742	-744	83.9	-70.2	-300	-718	3309	621
	(780)*	(154)***	(132)***	(973)	(430)	(89.3)***	(861)	(852)***	(187)***
Labour	-82.9	260	56.5	1491	-218	47.0	24.4	-358	-427
	(678)	(134)*	(118.0)	(829)*	(384)	(76.5)	(966)	(735)	(167)**
Tax	-110	-27.2	21.4	85.2	28.9	26.6	46.1	51.8	-18.5
	(77.0)	(14.5)*	(12.7)	(94.3)	(39.4)	(8.40)***	(93.1)	(80.5)	(17.9)
Popultn	-0.97	1.21	1.30	1.73	-0.46	1.10	-1.82	4.25	0.10
	(0.94)	(0.2) ***	(0.17)***	(1.23)	(0.50)	(0.11)***	(0.95)*	(1.09) ***	(0.25)
PriorFDI	0.06	0.03	0.02	0.08	0.20	0.00	0.13	0.44	0.03
	(0.04)	(0.01)***	(0.01)**	(0.05)	(0.02)***	(0.00)	(0.04)***	(0.04)***	(0.01)***
INDUST	144	12.2	-63.1	-46.8	-71.4	-21.2	99.8	47.7	38.8
	(48.4)***	(9.56)	(8.06)***	(58.3)	(24.2)***	(5.58)***	(45.6)**	(52.5)	(13.3)***
PolStability	-64.0	-20.9	14.6	-47.5	26.0	6.58	17.6	7.21	4.20
	(29.1) **	(6.23)***	(5.20)***	(45.3)	(16.6)	(3.58)*	(41.7)	(33.9)	(8.25)
Tertiary	34.3	-9.33	0.40	31.4	-2.15	4.35	-39.6	-16.1	15.68
	(35.1)	(6.56)	(5.77)	(43.7)	(18.5)	(3.80)	(48.0)	(36.5)	(9.52)
Mexico	-2120	-564	1455	0.00	-434	366	3404	-13927	0.00
	(3200)	(695)	(593)**	(0.00)	(1775)	(424)	(3494)	(3855)***	(0.00)
Y2007	-388	-78.4	56.9	-170	-135	-28.9	462	-377	-79.7
	(736)	(147)	(127)	(1069)	(392)	(87.5)	(836)	(808)	(196)
Y2008	-222	-156	-52.8	-607	-966	-15.2	858	-1766*	-381
	(835)	(167)	(143.7)	(1878)	(437)**	(100)	(939)	(917)*	(245)
_cons	6304	-1701	3700	-3490	1377	715	-1723	-14808	-2534
	(4082)	(782)**	(695)***	(5178)	(2096)	(454)	(4481)	(4316)***	(912)**
N	45	55	54	23	51	54	38	56	30
R^2	0.54	0.76	0.87	0.73	0.93	0.78	0.85	0.89	0.70

Standard errors in parentheses: *p<.1, **p<.05, ***p<.01

Note: The dependent variables for regressions (1) through (9) correspond with US FDI in the following industries accordingly: (1) Mining, (2) Wholesale trade, (3) Information, (4) Depository, (5) Finance (except depository institutions), (6) Services, (7) Holding, (8) Manufacturing and (9) Other

reveals that a 1 unit increase in the GP index of a country correlates with a US$ 1,553 million decrease in US FDI in the mining industry in that country. Otherwise, the results are insignificant.

The regression results in Table 5, which use the WEF IPR index, are likewise mixed. They suggest that strong IPR protection helps FDI in the depository and service industries in an emerging economy, but hurts FDI in mining. The coefficients for WEF_i are not significant in any of the other industries. Put another way, the results from the regressions in Table 5 corroborate those in Table 4 only in the mining, finance, and holding company industries, with the latter two industries consistently showing no relationship regardless of the IPR measure used. On the other hand, the two tables contradict each other in the service industry, with the coefficients on the WEF and GP indicators having opposite signs. And while the GP index was positive and significant for the wholesale trade, manufacturing, and 'other' industry categories, none of these were significant when the WEF index was used. Again, the effects of IPR regimes on FDI into emerging economies appear to be ambiguous, and highly sensitive to the IPR measure used. If IPR strongly affected FDI in particular industry, then a stronger and more rigorous statistical correlations between them should be seen.

Hypothesis 3: The Effect of IPR Protection on the Level of FDI by Sector within the Manufacturing Industry

Yet again, tests of Hypothesis 3 fail to produce consistent or rigorous supporting evidence of an IPR-FDI relationship. While regressions using the GP index of IPRs reveals some support, this evidence is contradicted by regressions using the WEF index. Table 6 and Table 7 present the regression results of tests of Hypothesis 3 concerning the effect that intellectual property protection has on FDI in different sectors within the manufacturing industry. Table 6 uses the GP index of IPR, Table 7 presents estimation results using the WEF IPR index. Each column in the table presents the results for analysis of data from a different manufacturing sector.

Table 5—Hypothesis 2 (DV = FDI by industry)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
WEF	-2011	22.5	120	1165	-307	138.4*	-936	-931	-26.6
	(562)***	(136)	(127)	(605)*	(281)	(68.9)	(677)	(690)	(185)
Labour	-124	332	-62.6	1472	-168	-0.93	56.0	130	-382
	(607)	(166)*	(156)	(724)*	(376)	(82.2)	(942)	(833)	(209)*
Tax	-78.4	-12.4	3.07	42.5	40.9	15.3	67.1	159*	-0.29
	(70.1)	(18.4)	(17.4)	(85.0)	(40.0)	(9.24)	(93.0)	(93.4)	(22.6)
Population	-0.13	1.28	1.21	2.10	-0.45	1.06	-2.00	4.71	0.08
	(0.88)	(0.25)***	(0.22)***	(1.08)*	(0.49)	(0.12)***	(0.91)**	(1.24)***	(0.31)
PriorFDI	0.07	0.02	0.03	0.08	0.19	0.00	0.12	0.40	0.02
	(0.03)**	(0.01)**	(0.01)***	(0.04)*	(0.02)***	(0.01)	(0.04)***	(0.05)***	(0.01)
INDUST	134	0.98	-53.1	-42.8	-70.2	-16.9	109	2.86	32.9
	(43.6)***	(11.5)	(10.3)***	(50.0)	(23.6)***	(5.83)***	(44.5)**	(58.0)	(16.7)*
PolStability	-50.6	-11.2	2.66	-64.9	31.1	-0.67	22.1	70.7	13.4
	(26.4)*	(7.84)	(6.97)	(37.3)	(16.3)*	(3.91)	(40.0)	(39.0)*	(11.3)
Tertiary	31.9	-6.16	-0.28	39.5	-5.66	4.51	-50.4	-11.0	19.3
	(31.4)	(8.19)	(7.69)	(38.3)	(18.5)	(4.12)	(47.3)	(41.6)	(11.9)
Mexico	-2561	239	648	0.00	-375	44.1	3564	-9965	0.00
	(2825)	(839)	(760)	(0.00)	(1699)	(445.2)	(3374)	(4260)**	(0.00)
Y2007	-341	-59.2	51.6	61.9	-143	-48.0	555	-206	-57.3
	(661)	(183)	(167)	(913)	(385)	(94.1)	(821)	(918)	(250)
Y2008	-705	-73.5	-96.2	667	-10401	-30.0	541	-1489	-284
	(752)	(207)	(188)	(1733)	(427)**	(108)	(909)	(1038)	(306)
_cons	6788	359	1295	-6600	1790	-409	-1172	-3783	-891
	(3322)**	(847)	(778)	(3931)	(1835)	(428)	(4287)	(4277)	(1060)
N	45	55	54	23	51	54	38	56	30
R^2	0.63	0.64	0.78	0.79	0.94	0.74	0.86	0.86	0.52

Standard errors in parentheses: *p<.1, **p<.05, ***p<.01

Note: The dependent variables for regressions (1) through (9) correspond with US FDI in the following industries accordingly: (1) Mining, (2) Wholesale trade, (3) Information, (4) Depository, (5) Finance (except depository institutions), (6) Services, (7) Holding, (8) Manufacturing and (9) Other

The regression results in Table 6, which use the GP index, find that weak IPR protection in a country negatively affects the volume of US FDI in the chemical, computer and electronic products, electrical equipment appliances and components, and the transportation equipment sectors of the manufacturing industry within an emerging economy. The coefficients on GP_i for these sectors are all positive and significant. The coefficients on the GP_i are the largest for the chemical and computer and electronic product sectors. The regression in columns (2) and (5) reveal that a 1 unit increase in the GP index of a country corresponds with a US$ 656 million and US$ 1,651 million increase in US FDI into the chemical and the computer and electronic sectors respectively in the average emerging economy. The large coefficients on these two industries suggest that these industries rely heavily on IPR protection. The results also show that US FDI in the metals industry is negatively affected by strong intellectual property protection. These results generally support the hypotheses that the volume of FDI in more technology oriented sectors within an emerging economy is negatively affected by weak intellectual property protection. The results do not support the authors' hypothesis that US FDI within the metals industry is unaffected by IPR protection. Rather, the third regression finds a significant negative relationship. Finally, the first regression in Table 6 supports the author's hypothesis that the US FDI in the food sector of the manufacturing is not affected by different levels of IPR protection.

However, the regression results in Table 7, which use the WEF IPR index, again fail to corroborate those using the GP Index (Table 6). The coefficient on WEFi is not significant and positive for any of the different manufacturing sectors. Instead these regression results found that strong IPR protection in an emerging economy negatively affects the volume

Table 6—Hypothesis 3 (DV = FDI by sector of manufacturing industry)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GP	111	656	-127	127	1651	85.3	361	-898
	(75.5)	(198)***	(52.6)**	(80.5)	(374)***	(26.9)***	(194)*	(423)**
Labour	-106.0	-103	-24.5	-5.42	124	21.7	106	-12.7
	(67.9)	(170)	(30.3)	(67.5)	(312)	(23.8)	(135)	(263)
Tax	4.52	-9.82	9.85	-2.64	26.2	2.76	8.61	40.1
	(7.59)	(18.7)	(3.54)***	(7.82)	(33.9)	(2.53)	(15.8)	(30.2)
Population	0.09	1.09	0.45	0.38	2.10	0.28	0.47	1.61
	(0.10)	(0.25)***	(0.08)***	(0.10)***	(0.50)***	(0.03)***	(0.26)*	(0.63)**
PriorFDI	0.03	0.10	0.01	0.04	0.07	0.00	0.04	0.12
	(0.00)***	(0.01)***	(0.00)***	(0.00)***	(0.02)***	(0.00)*	(0.01)***	(0.02)***
INDUST	-11.1**	-2.37	-15.0	-11.6	122	6.52	5.73	-90.2
	(4.84)	(12.2)	(3.17)***	(4.76)**	(24.3)***	(1.84)***	(12.3)	(26.9)***
PolStability	1.64	1.27	5.82	2.08	-28.6	-0.14	4.11	19.6
	(3.24)	(7.85)	(1.41)***	(3.18)	(15.4)*	(1.04)	(6.00)	(12.3)
Tertiary	9.87	-13.5	1.79	-8.38	-1.04	-0.05	-10.2	6.30
	(3.37)***	(8.45)	(1.49)	(3.35)**	(15.1)	(1.11)	(6.19)	(12.7)
Mexico	373	-4203	1.93	-2220	-7597	993	767	-992
	(344)	(893)***	(167)	(372)***	(1743)***	(118)***	(750)	(1567)
Y2007	-36.4	-57.8	-27.2	-1.00	91.9	8.81	71.8	-337
	(74.1)	(187)	(33.7)	(78.6)	(381)	(25.4)	(154)	(304)
Y2008	-163.4	-443	3.49	-161.44	-86.3	16.8	-7.66	-648
	(88.5)*	(213)**	(45.9)	(89.9)*	(416)	(30.6)	(185)	(366)*
_cons	-318	-1591	509.6	59.0	-10625	-672	-1830	4608
	(392)	(1000)	(238)**	(450)	(1886)***	(131)***	(1001.82)*	(2072)**
N	50	56	41	47	44	49	43	36
R^2	0.92	0.87	0.92	0.87	0.79	0.96	0.90	0.92

Standard errors in parentheses: * p<.1, ** p<.05, *** p<.01

Note: The dependent variables for regressions (1) through (8) correspond with US FDI in the following manufacturing sectors accordingly: (1) Food, (2) Chemicals, (3) Metals, (4) Machinery, (5) Computer and electronics, (6) Electrical equipment and appliances, (7) Transportation equipment and (8) Other

of FDI in the food and chemical sectors of the manufacturing industry in emerging economies. This latter result contradicts that found using the GP index. These regression results generally fail to support the hypothesis that the effects of IPR protection on FDI vary according to the manufacturing sector. Yet again, the effect of IPR regimes on FDI into emerging economies appears to be ambiguous, and highly sensitive to the IPR measure used.

Data Triangulation

What is the explanation to the different findings for the two IPR measures? These differences could represent a distinction between *de jure* formal IPR laws (best captured by the GP Index) and the *de facto* provision of IPR protections (best captured by the WEF Index). If this were the case, then it might be expected the WEF measure to correlate better with FDI than does the GP measure since the former more closely reflects the judgments of the investing business community. Alternately, if it is believed that formal IPRs act to lure investment then FDI should correlate well with the GP measure, but not with the WEF measure since actual enforcement can fall short of formal legal promises. Yet neither of these patterns is observed in the results for overall FDI (Table 3).

However, the *de facto* versus *de jure* distinction might explain the regressions of the disaggregated data. In these regressions, formal IPRs (the GP index) appear to correlate well with FDI in more technologically advanced industries and sectors (manufacturing, chemicals, computer and electronics, electrical equipment and appliances, and transportation equipment). In these industries, foreign investors are able to control intellectual property via trade secrets, human capital differentials, and selective technology transfers. Hence formal IPRs might be less important for actual protection, and instead perceived more as an indication of the host government's future legal trajectory. Meanwhile, the

Table 7—Hypothesis 3 (DV = FDI by manufacturing industry)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WEF	-192	-298	-32.6	-96.6	197	16.6	-97.0	-146
	(50.2)***	(151)*	(33.3)	(59.0)	(324)	(20.7)	(115)	(252)
Labour	-81.8	9.21	-44.9	30.1	234	34.8	188	-164
	(59.5)	(182)	(31.2)	(68.7)	(394)	(26.3)	(136)	(273)
Tax	16.2	16.0	7.66	3.21	49.4	4.20	18.5	25.0
	(6.75)**	(20.4)	(3.71)**	(8.38)	(43.6)	(2.86)	(17.3)	(32.0)
Population	0.08	1.19	0.30	0.41	2.49	0.29	0.67	0.64
	(0.08)	(0.27)***	(0.07)***	(0.10)***	(0.62)***	(0.04)***	(0.24)***	(0.56)
PriorFDI	0.03	0.09	0.01	0.04	0.05**	0.00	0.04	0.14
	(0.00)***	(0.01)***	(0.00)***	(0.00) ***	(0.02)	(0.00)	(0.01)***	(0.01)***
INDUST	-10.5	-10.9	-8.87	-12.7	91.8	5.18	-4.98	-50.8
	(4.20)**	(12.7)	(2.73)***	(4.62)***	(29.5)***	(2.02)**	(11.0)	(24.7)*
PolStability	7.13	16.21	5.23	5.27	-7.74	0.34	9.62	13.4
	(2.81)**	(8.52)*	(1.55)***	(3.18)	(19.4)	(1.21)	(6.54)	(13.5)
Tertiary	9.20	-13.5	1.04	-8.68	5.41	0.25	-11.04	2.62
	(2.94)***	(9.11)	(1.61)	(3.35)**	(19.2)	(1.26)	(6.51)*	(14.2)
Mexico	599	-3372	-170	-2046	-5996	1077	1233	-2354
	(291)**	(932)***	(159)	(367)***	(2149)***	(128)***	(744)	(1558)
Y2007	-20.4	-17.4	-36.4	9.97	252	11.5	86.8	-290
	(64.7)	(201)	(36.1)	(78.4)	(478)	(28.4)	(160)	(331)
Y2008	-150	-401	-17.4	-152	58.0	31.9	-27.5	-686
	(76.3)*	(227)*	(48.4)	(89.2)*	(524)	(33.8)	(193)	(396)*
_cons	285	805	103	610	-5994	-468	-351	1497
	(316)	(936)	(165)	(362)	(1994)***	(127)***	(709)	(1515)
N	50	56	41	47	44	49	43	36
R^2	0.94	0.86	0.90	0.87	0.67	0.95	0.89	0.91

Standard errors in parentheses: *p<.1, **p<.05, ***p<.01

Note: The dependent variables for regressions (1) through (8) correspond with US FDI in the following manufacturing sectors accordingly: (1) Food, (2) Chemicals, (3) Metals, (4) Machinery, (5) Computer and electronics, (6) Electrical equipment and appliances, (7) Transportation equipment and (8) Other

regression results show that the actual enforcement of IPRs (the WEF index) matters more for depository industries and services, which do not offer to investors additional mechanisms of IP control. In these industries, *de facto* enforcement matters, therefore lack of IPR protection affects FDI decisions.

Regardless, the differing results from the two indices reinforce the primary finding, while pointing out fruitful areas for future research. That is, the assumption that each of the two IPR measures captures a mix of true signal combined with measurement error. Ideally, the errors should account for the discrepancy between the results, while the common signal should provide the areas of agreement. And the finding in which the two measures agree is that IPRs do not correlate well with overall US FDI into developing countries. Second, the two sets of IPR measures are not entirely consistent. Clearly more work needs to be done in this case, both in advancing objective IPR measures, and distinguishing between formal laws and their enforcement.

Other Findings

The coefficients for the other explanatory variables should be interpreted with caution because the regressions above were specifically designed to test relationship between IPR protection and FDI. Firm conclusions therefore should not be inferred concerning their effects on FDI without further empirical testing. Rather, these findings should be interpreted as hypotheses to be tested in future research.

As theorized, most regressions in each of the three models suggest that countries with large markets experience higher levels of US FDI. Specifically, in regressions (3) and (4) in Table 3, the coefficients on the population variable are positive and statistically significant. In Table 4 and Table 5, the coefficients on the population variable are also positive and significant for the regressions on FDI in the wholesale trade, information, service, and manufacturing industries. In Table 6 and Table 7, the coefficients on the population variable are positive and significant for the regressions on US FDI in the chemical, metal, machinery, computer and electronic products, electrical equipment and appliances, and the transportation equipment sectors.

Likewise, the statistical results concerning the effects of prior FDI support the theory that countries with previous high levels of FDI will continue to attract similar levels of FDI in future years. In regressions (3) and (4) in Table 3, the coefficients on the prior FDI variable are positive and statistically significant. In the regression results in Tables 3-7, the coefficients on the prior FDI variable are nearly always positive and statistically significant with few exceptions.

The conflicting positive and negative estimations of the coefficients on the industrialization variable across different regression models do not support the theory that countries with higher levels of industrialization always experience higher levels of FDI. Rather the effects of industrialization on FDI appear to depend on industry or sector. In the regression results for Model 1 in Table 3, the industrialization variable is not significant. In the results for Model 2 in Tables 4 and 5, the coefficient on the industrialization variable is positive and significant for the regressions on FDI in the mining and holding company industries. But, in these same tables, the coefficient on the industrialization variable is negative for the regressions on information, finance and insurance, and services industries. In the estimations of Model 3 in Table 6 and Table 7, industrialization has a positive and significant effect on FDI in the computer and electronic product and the electrical equipment appliances and components sectors. The estimations of Model 3 in Table 6 also find that industrialization has a positive effect on FDI in the transportation equipment sector. The regression results in Table 6 and 7 find that industrialization has negative effect on FDI in the food sector, chemical sector, metal sector, and machinery sector of the manufacturing industry.

Likewise, the conflicting positive and negative estimations of the coefficients on the political stability variable for different industries and manufacturing sectors do not support the theory that political stability would have an absolutely positive effect on the level of US FDI in a country regardless of sector or industry. The variable for political stability is not significant in the regressions of Model 1. The coefficient variable for political stability is positive and significant in the estimations of Model 2 in Table 4 for FDI in the information and services industries. The coefficient is also positive and significant in the regressions using the WEF IPR index in Table 5 for the FDI in the finance and insurance and the manufacturing industries. However, the coefficient on the variable is negative and significant for the regressions in Table 4 for FDI in the mining and wholesale trade industries, and it is also negative and significant in Table 5 for the mining industry. In Table 6, the political stability variable is positive and significant for FDI in the metals sector, and, in Table 7, it is positive and significant for FDI in the food, chemicals, and metals sectors.

The year dummies were not consistently significant across the different models. When significant, the coefficient on the dummy variable for the year 2008 was negative. The findings from these two models show that the level of US FDI in the finance and insurance industry and some sectors of the manufacturing industry was hurt during that year. These results likely reflect the effects of the global financial crisis and subsequent global economic recession on the international investment climate. The dummy variable for the year 2007 is not significant in any regression.

Within all three models, the variables for cost of labour, corporate tax rate, and tertiary enrollment rate were not found to be significant determinants of FDI based on the findings of the study. The results for the cost of labour variable are counterintuitive and do not support the theory that low labour costs is a strong location advantage that attracts FDI in general and, particularly, in the manufacturing industry. The variable for cost of labour is positive and significant only in the regressions on disaggregated FDI data (Tables 4 and 5). Here the results suggest that high labour costs attract FDI only in the information and depository institutions industries.

The variable for tertiary enrollment rate is only significant in a few regressions in each version of the test and does not appear to be a vitally important factor that influences FDI. However, a significant degree of correlation was found between the variables for tertiary enrollment rate and the cost of labour within a country while conducting variation inflation factor tests. The degree of collinearity between the two variables did not warrant the exclusion of either variable from the model, but the authors suspect that the standard errors of these variables may be biased. Since these variables are not the target of this study, the resolution of this issue is left to future research.

In the regressions in Models 2 and 3, the coefficient for the corporate tax rate is negative and significant in only one regression on FDI in the wholesale trade industry. In Models 2 and 3, the variable is significant and positive in five regressions. This finding suggests that the corporate tax rate within a developing economy is not an important factor that influences FDI.

Conclusion

Summary in Comparison to Prior Work

The statistical analysis performed above fails to support the hypothesis that emerging economy IPR protection strongly affects the level, or distribution, of advanced country FDI. Instead the results support the hypotheses that no relationship or an ambiguous relationship exists between IPRs and FDI in emerging economies. IPR protection may simply not be important for a large majority of the industries involved in FDI. Alternately, strong IPR protection may in fact provide a positive incentive for attracting FDI, but this IPR protection might be marginalized within a broader set of factors that influence firm's investment decisions. Strong location advantages may heavily outweigh the importance of IPR protection in some cases. Regardless the existence of a strong FDI-IPR relationship finds little support in recent US FDI data.

Implications for Practice

As pertains to the developing world, these findings suggest that policymakers have considerable latitude in handling IPR issues. For example, the regression results suggest domestic market size is likely a significant determinant of the level of inward FDI from advanced economies. This corroborates other recent research which recommends that developing countries need not copy advanced country IPR regimes so aggressively, but should instead customize their IPR strategy to better fit their domestic socio-economic and cultural conditions.[20] Regardless of the type of economy in question, IPRs should be designed to increase investment in innovative activity.

Also, the results above revealed an overall decrease in FDI in 2008 in the finance and insurance industries and in most sub-sectors of the manufacturing industry in emerging economies. This was likely a function of the budding US financial crisis. Hence, policymakers must remain sensitive to the fact that even India's large economy is part of a global system and vulnerable to its cycles. Developing country policymakers must therefore remain agile if their economies are to continue to advance technologically, and to attract the investment they so badly need in order to do so.

Limitations of this Research and Future Research Directions

Of course, all research suffers from weaknesses, and the current research is no exception. The findings presented here could be a result of problems with internal validity of the models utilized in the study. Omitted variable bias is a common problem when estimating regression models of complex relationships and can lead to severe bias in estimations of the effects of variables. To reduce this possibility, the models used in previous studies were rigorously examined, and the variables most often found to be significant determinants of FDI in order to develop a correct model specification. Regardless, the models specified here may yet suffer from omitted variable bias.

Another source of bias may be the focus on the US as the source of FDI. The United States may have unique historical or strategic relationships with several of the recipient states that skew the results. Also, cultural differences or similarities that might affect FDI patterns were not statistically controlled. It is argued that the solution to the problem of US bias is for scholars to run similar regressions on FDI data sourced from other advanced countries.

While the empirical approach used to examine the relationship between IPR protection and FDI in this study was an improvement upon the research designs employed in previous studies, several improvements could yet be made in future studies. This research design could be expanded to include a larger sample of countries, and it could also examine a longer time period. Also, the use of additional IPR indexes would also be beneficial to the robustness of the model. Certainly the need for more objective and accurate

measures of IPRs is clear. Finally, the need to include a control variable to measure the level of licensing by firms in a country to control for firms' substitution of licensing for FDI in countries with high levels of intellectual property protection is recognized. Currently, no data exists to provide a statistical control for this variable.

This article is by no means the last word on the subject. Further research on the causal linkages between FDI and IPR protection is necessary for the development of a clear understanding of this relationship. More and better measures of IPR and FDI can help further understanding of these phenomena. The difference between formal IPRs and their practical enforcement might be exploited to advance both data and theory. It would be especially interesting for scholars to compare the findings above with similar tests of top European and East Asian sources of FDI in order to see if the IPR-FDI relationship varies across investor nations. Likewise, the negative effects shown for IPR on FDI in the mining, information, and service industries were unpredicted and should be studied further. Regardless, it is time to move past the poorly supported and over-simplified claim that IPRs are a major determinant of advanced country FDI into emerging economies.

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