Property Rights and Intellectual Property Protection, GDP growth and Individual Well-Being in Latin America

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Abstract:

A central argument for increased protections of property rights (PR) is the role they play in encouraging economic transactions, investment and economic growth. Likewise, the utilitarian justification of intellectual property laws is that such rights promote creative inventions and innovation, and thus can make a nation better off. A further argument is psychological: it has also been argued (though rarely tested) that enhanced rights contribute to increases in well-being enjoyed by a county's citizens. Many Latin American countries have made efforts to improve property rights (and their enforcement) in the recent past, with varying success. Using three data sources (the Latinobarometer, the World Bank, and the World Economic Forum's Global Competitive Index), this investigation considers the relationship between property rights and intellectual property protection, economic growth, and individual well-being. The results, which are heterogeneous with respect to labour force status, suggest that policy makers in Latin America should pursue improvements in property rights if they wish to improve citizen well-being while also promoting economic growth.

JEL codes: D23, I31, N36, O34

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1. Introduction

"[…] Property rights belong legally to individuals, but their real function is social, to benefit vast numbers of people who do not themselves exercise these rights."

(Thomas Sowell, "The 'Takings' Issue," Forbes, March 2, 1992, p. 60)

A continual effort to establish a more secure system of both property rights (PR) and intellectual property protection (IPP) has been under way in many Latin American countries. This has been undertaken through, especially, the adaption of national legislation to the standards set forth in global agreements and treaties like the Paris Convention for the Protection of Industrial Property (PCPIP), the Patent Cooperation Treaty (PCT), and the Trade Related Aspects of Intellectual Property Rights (TRIPS). Considering the modern history of Latin America, it is apparent that the region did not start out in a positive way regarding property rights. During the colonial period, indigenous groups lost most of their ancestral land as, like in any colonial system, protection of one's property from colonial powers was difficult (Reyes and Sawyer, 2015). Also, in the late 20th century, political instability threatened the protection of property rights. As just one well known example, in 1971 the Chilean Congress approved a constitutional amendment, which allowed the Chilean government led by President Salvador Allende to expropriate US copper mining companies. The expropriation caused a conflict with the US companies and government, and withdrawal of credit (Besley and Ghatak, 2009). The problem with incidents of expropriation is that they can negatively affect the regions' economic development, because foreign enterprises are less likely to invest in a country with such market conditions. As Biglaiser and Staats (2012) found, recognised and upheld PRs are the second most important FDI determinant.

Chile has now managed to establish a relatively secure system of property rights (incl. IPP) and has the highest property rights scores in Latin America (WEF, 2015 and appendix 1 below). Similarly, Peru has made it a goal to achieve well-defined and strongly protected property rights with, already, profound effects for the lives of Peruvians. One important example for such an effect has been discussed in a study by Field (2007), which examined the outcome of a national land titling program and found that it increased national labour

supply by enabling people to spend less time watching/protecting their property. Her study showed to what extent people's lives are affected property rights. Today, Peru is a signatory of many international conventions on PRs and IPP and has just recently joined two Patent Prosecution Highways (PPH): The Prosur PPH and the Pacific Alliance PPH (USTR, 2017). Although the pattern is similar across most of the Latin American countries, the region is still facing some challenges. In fact, nine Latin American countries can still be found on the United States' intellectual property watch list (USTR, 2017) and the estimates of the lost revenue due to different forms of intellectual property piracy remain high (Horan et al., 2005). A few recent concerns raised by the U.S. Trade Representative (published in April 2017) regarding Latin America include the following: the lack of IPP protection enforcement by the Argentine government; the strong increase in the number of pirated American films in Mexico; and the widespread use of unlicensed software and pirated and counterfeit products, including counterfeit tobacco, alcohol, fuel, and pharmaceutical products in the Dominican Republic (USTR, 2017).[1]

Recent efforts to improve the region's PRs and IPRs indicate that there could indeed be some benefits to individuals, as also suggested by Sowell in his quote cited above. Those benefits are commonly understood to be of an economic nature, but they could also potentially be found in greater individual well-being or life satisfaction. The latter possibility has not yet been widely investigated, but there are some potential links that could be derived from what has been found so far. For instance, in more contemporary well-being literature, some authors have associated increased IPP with lower crime, reduced conflict and easier access to pharmaceuticals to improve the health of citizens, all of which have been positively linked to greater subjective well-being. This is discussed further in section 2.2.

The research on economic benefits, on the other hand, is far more established. Besley and Ghatak (2009;2011) sum up the four main channels through which property rights influence economic activity as the security channel, the efficiency channel, the reduced protection cost channel, and the transactions facilitation channel. Their results are in line with the

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[1] Relatedly, in early 2018 the European Commission announced that it will establish its first world-wide "Counterfeit and Piracy watch-list", acknowledging the prevalence of such issues around the world. http://trade.ec.europa.eu/doclib/press/index.cfm?id=1786

results of many other authors who have investigated these economic benefits and are discussed further in section 2.3.

In summary, this investigation inspects whether the benefits that Thomas Sowell referred to in the epigraph could refer to increases in individual well-being as well as the oft-found benefits for economic growth. The remainder of this article is organised as follows. Section 2 discusses property rights and intellectual property protection generally, as well as in the Latin American context, and makes links to both economic growth and life satisfaction. Here we discuss historic, as well as more modern, arguments and literature. Furthermore, we provide a brief and general discussion on why these associations can be expected to differ dependent upon an individual's labour force status. Section 3 explains the three sources of data used, provides basic descriptive statistics, and offers methodological comments. Section 4 presents the results. Section 5 discusses these results in the context of the prior literature review (section 2). Finally, section 6 offers concluding remarks.

2. Property Rights and Intellectual Property Protection

One of the most common root causes of both violent international and intranational conflict has been argued to be scarcity (Hume, 1751, pp. 14-34). If our indefinite needs were equal to unlimited resources, then there would be no basis for conflicts over possessions. To alleviate the problem of scarcity and thus reduce conflict, it is necessary for a nation to establish a set of rules that will govern the usage of scarce resources. Property rights can fulfil this function and encourage individuals to utilize available resources effectively (Meinzen-Dick and Knox, 1999). A country's system of property rights plays an important role in determining the level of development in that country and is often defined as a bundle of different rights (see e.g. Alchian and Demsetz, 1973; Eggertsson, 1990; Everest-Phillips, 2008; Besley and Ghatak, 2009). Property rights themselves are often considered to comprise four main components: the right to use and possibly exclude others from using the property; the right to modify the property; the right to transfer it to somebody else; and finally, the right to sell and generate revenue that the individual can claim for herself.

With respect to IPP, patents protect new ideas and give the inventor or patent holder a (temporary) monopolistic position. Other important instruments for IPP include copyright law, trademark law, and trade-secret law; these instruments are often used to prevent and combat counterfeiting (Fisher, 2001). According to article 7 of the TRIPS agreement, the main objectives of IPP are described as follows: "The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge in a manner conducive to social and economic welfare, and to a balance of rights and obligations." (TRIPS, Article 7). In most Latin American countries, the full enforcement of the TRIPS agreement has brought about many changes in the intellectual property right regimes. Reforms have extended protection of intellectual property to new fields (e.g. software piracy) and exclusive rights have been strengthened (Correa, 1997; Son and Lee, 2017).

2.2 Property Rights, Intellectual Property Protection, and Life Satisfaction

To investigate any potential association between PR and IPP and how individuals experience their lives, we make use of the, now well established and validated, economics of life satisfaction research area (Oswald 1997; van Praag and Ferrer-i-Carbonell, 2005). A popular area of economic enquiry, which has been studied in relation to many different phenomena. Diverse examples include unemployment and inflation, as well as economic development, overeducation, self-employment, and culture. (Respectively: Di Tella et al., 2003; Mikucka et al. 2017; Piper, 2015a; Hetschko, 2016; Hand, 2017) For reviews see Veenhoven (1996), Frey and Stutzer (2008), Weimann et al. (2015) and Clark (2018). A handbook discussing well-being in the context of Latin America has also been recently published (Rojas, 2016). The link between PRs and IPP and life satisfaction has, until now, received little attention and just below potential links are presented. These links look to the past, as well as the modern economics of life satisfaction research area.

Regarding the link between property rights and life satisfaction, there are some clear reasons to believe that secure property rights might affect life satisfaction. Historically, a number of political theorists have long stressed that property rights might yield

psychological benefits, increasing individuals' satisfaction with life (for example, Jeremy Bentham; John Stuart Mill; Georg Wilhelm Friedrich Hegel; John Locke; and Immanuel Kant among others). Some of their relevant ideas are discussed below.

Bentham and Mill justify PRs (and the protection of intellectual property in particular) by referring to the social and economic conditions which they create. One related argument is that these rights create an environment beneficial for creative intellectual activities (Munzer, 2001; Mandel, 2011). A similar argument can also be found in more recent literature, where innovation is said to be driven by the protection of intellectual property, e.g., in the form of patents. Intellectual property protection ensures that the inventor of an idea is compensated for their research and development effort and prevents risk of imitation. As a result, the inventor has an incentive to further develop their product or to work on new ideas. There is a consensus among scholars that innovations bring many benefits to the economy as a whole (see section 2.3). While a considerable amount of research has been carried out on the relationship between innovation and economic growth, there have been only few empirical investigations into the relationship between innovation and subjective well-being. Many of these investigations have only established an indirect link between them through theories of economic growth (see, e.g., Grossman and Helpman, 1991; Howitt, and Aghion 1998). In contrast, Dolan and Metcalfe (2012) have used British data to investigate a direct link and concluded that there appears to be a positive association of innovations with subjective well-being. This suggests that, in Britain at least, strong IPP may contribute to subjective well-being, by protecting inventors from imitation thereby enhancing innovation. However, from a consumer's perspective the opposite might be the case: it is conceivable that better enforced IPP can raise the cost of common purchases, like those for entertainment purposes, and thus lower life satisfaction. This might be a potentially larger issue in Latin America because, as recent news reports demonstrate, while many people there consume Pay TV, few people pay for it[2]. Within Hegel's personality theory, one important concept is that of property ownership as an embodiment of the self. In this concept, he establishes a connection between the person, its labour and the object.

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[2]https://www.digitaltveurope.com/2017/07/20/piracy-is-number-three-tv-player-in-latin-america/,

https://www.rapidtvnews.com/2018040551563/latam-pay-tv-loses-8bn-a-year-to-piracy.html

Hegel also introduces the idea of "the embodiment of will". The embodiment of will suggests that when a person has an idea of a product and works on it, that person displays her intention (or will) through it. Radin argues from a similar standpoint, stating that:

"Most people possess certain objects they feel are almost part of themselves. These objects are closely bound up with personhood because they are part of the way we constitute ourselves as continuing personal entities in the world." (Radin 1982, p. 959)

Relatedly, a study indicates that pursuing goals with an intrinsic content may play a vital role in bringing about both self-realisation and happiness (Miquelon and Vallerand, 2006). Conducting a panel survey in 2015, Mingaleva and Mirskikh came to a similar conclusion, as their survey identified the possibility of self-actualisation as one of the main motives to engage in creative, scientific and research work (Mingaleva and Mirskikh, 2015). Consistent with this finding, striving toward subjectively important personal goals has been associated with self-fulfilment, structuring an individual's life and filling it with a meaning (Emmons, 2003). Since strong (intellectual) property rights offer a secure environment where individuals can pursue their life goals, it can be concluded that they may promote self-realisation of personality, with likely benefits for subjective well-being.

Another relevant idea comes from John Locke. In his natural rights theory, the aspect of labour involved in the creation of property is used to justify property rights: "[...] *every man has a property in his own person: this nobody has any right to but himself. The labour of his body, and the work of his hands, we may say, are properly his."* (John Locke: Second Treatise of Civil Government: Chapter 6) In other words, Locke emphasizes that it is conceivable that strong property rights play a key role in protecting personal freedom, which, in turn, has been positively associated with greater well-being in more contemporary literature (for example, Veenhoven, 1995; Helliwell and Huang, 2008; Bavetta et al., 2017). Similarly, Helliwell and Huang (2015) have found that the degree of freedom to make life choices has a large positive impact on the individual's well-being. Taken together, one possible implication of these observations is that a system of secure and well-defined property rights may lead to greater happiness by allowing individuals to act independently and thereby preserve individual freedom.

Other possible linkages between property rights and subjective well-being include financial stability, reduced crime, an enhanced feeling of safety, reduced conflict and health. The first potential link between enhanced property rights and individual well-being involves the protection of financial assets and financial stability.[3] As Bordo (2008) suggests, strong property rights constitute a key factor in financial stability, because they foster an environment favourable for both investing in and holding financial assets. Furthermore, financial stability itself has been identified as an important predictor of life satisfaction (Oishi et al., 2009; Green and Leeves, 2013). This relationship between financial stability and life satisfaction can be related to the idea of loss aversion, which describes how the pain of loss is stronger than the joy of gain. It follows that, by lowering the risk of financial expropriation, protecting individuals' financial assets, and thus enhancing financial stability, stronger property rights might positively affect life satisfaction.

Another possible linkage comes from reduced crime and a subsequent enhanced feeling of safety. Secure property rights have been associated with reduced property crime (Auerbach and Azariadis, 2015). Many studies have indicated that there could be a negative impact of fear of crime on life satisfaction (for example, Cohen, 2008; Hanslmaier, 2013; Piper, 2015b) This could make neighbourhoods safer, increasing feelings of trust, community pride as well as feelings of security all of which have been identified as important predictors of life satisfaction (Cummins, 1996; Rojas, 2007).[4] Similarly, an additional way property rights might enhance individual well-being is via a reduction in conflict. As stated before, if resources were unlimited, there would be no basis for conflicts over possessions. However, since they are limited, it is necessary for a nation to establish a set of rules that will govern the usage of scarce resources and therefore attenuate conflict. If enforced properly, property rights can fulfil this function, leading to a better quality of life and promoting individual well-being.

Finally, a last potential path through which property rights may affect well-being involves health. Labelled as the "intellectual property rights dilemma for pharmaceuticals", it is a topic that has been discussed by many scholars as it presents a serious challenge. The argument is that, from a public health perspective, IPP instruments such as patents can

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[3] More widely, issues of financial assets, including wealth and well-being are increasingly being investigated within the economics of life satisfaction research area: see Jantsch and Veenhoven (2018) for a recent synthesis.

[4] Piper (2015b) using the European Social Survey demonstrates that the fear of crime is a candidate reason why individuals living in three of Europe's capital cities are less happy than their compatriots who live elsewhere.

decelerate the diffusion of new pharmaceuticals and medical technologies (Cohen andIllingworth, 2003). As a result, the cost of health care increases, making it less accessible to people in developing countries (Sathwara and Bhandari, 2016). Many scholars in the area of life satisfaction have maintained that physical health affects subjective well-being (e.g. Andrews and Withey 1976; Diener, 1984; Ferrer-i-Carbonell and van Praag, 2002). If stronger enforcement of patents on pharmaceuticals and medical technologies makes access to health care costlier, it could be argued that IPP might have a negative influence on well-being.

However, this is considered a dilemma because it has also been argued that intellectual property protection can have a positive influence. In Latin America, the emergence of pirated pharmaceuticals, which are often not conform to industry standards, represent a serious threat to public health (Ramírez, 2012). While they are likely to be more accessible to the poor, the so called "counterfeit pharmaceuticals" sometimes contain harmful ingredients (Horan et al., 2005).[5] Stronger and more effective enforcement of anti-counterfeiting and anti-piracy laws in this sector could thus protect public health from this threat. Therefore, it is conceivable that this may have a positive impact on life satisfaction in the Latin American region.

In summary, positive and negative associations between property rights, intellectual property protection and life satisfaction can potentially come through the following channels: pursuit of personal goals and self-realization, personal freedom, financial stability, crime, conflict, and health.

2.3. Property Rights, Intellectual Property Protection and Economic Growth

A large and growing body of literature has investigated the relationship between property rights and economic growth (see e.g. Acemoglu et al., 2001; Everest-Phillips, 2008; Besley andand Ghatak, 2009; Bose, Murshid, and Wurm, 2012; Haydaroğlu, 2015) and there is a

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[5] With the trade standing an estimated value of $650 million US dollars a year, Mexico has been considered one of the major global sources of counterfeit medicines (Latin America Battles Counterfeit Drug Threat, Daily International Pharmacy Alert: Washington Business Information, 2(292), 2006).

relatively large consensus among scholars that secure property rights are an important prerequisite for economic growth and development. There is rather more mixed evidence for the role of intellectual property protection in promoting economic growth. Both are discussed below.

The importance of well-defined and enforced property rights for economic growth and development lies in their role as an incentive shaping force in transaction processes (North 1989). Besley and Ghatak (2009) developed an analytical framework in which they examined the relationship between economic activity and property rights as well as the channels through which property rights might affect economic activity. They find that secure property rights increase investment by limiting the risk of (both private and government) expropriation (like Acemoglu et al., 2005) and thus improving incentives, allowing economic agents to reap the gains from trade, and improving efficiency in resource allocation through reduced costs. The cost reduction effect is consistent with the discussion of Ronald Coase (1960) which showed that individuals will ensure that resources go to their most productive uses if property rights are transferable, well defined, and secure. Providing evidence from two regions in Ghana, Besley (1995) examined the impact of property rights on investment incentives. His study revealed that better land rights can significantly facilitate investment. This link can also be found at the firm level: In a study conducted on a sample of new firms in post-communist countries, Johnson, McMillan and Woodruff (2002) found that the perception of insecure property rights reduces incentives for the reinvestment of profits for entrepreneurs.

The link between better property rights and economic growth has also been found for Latin America. In their cross-national study, Biglaiser and Staats (2011) established a link between property rights enforcement and growth enhancing sources of foreign capital. The authors investigated this relationship in 17 Latin American countries and found that stable property rights can promote inflows of foreign direct investment and increase portfolio investment.

Regarding individual Latin American countries, Field (2005) investigated the relationship between tenure security and investment incentives in urban slums in Peru, using data from a nationwide land titling program[6]. Her examination revealed that strong property rights

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[6] The COFOPRI (Comisión de Formalización de la Propiedad Informal) assumed responsibility for formalizing informal urban property in 1996. COFORPI used a registry known as Registro Predial Urbano (Urban Real Estate

achieved through government land titling have a positive effect on residential investment, leading to a significant increase in the rate of housing renovation, with obvious benefits for economic growth. Secure property rights can also have an impact on national labour supply. In a related study, referring to the same government land titling program, Field (2007) found that secure property rights reduce time spent on protecting property and allow household members to spend it on other activities. This freed up time can be supplied in the labour market and thus increases labour market participation leading to economic growth. In contrast to Field, Kerekes and Williamson (2010) conducted their research in rural areas in Peru and compared their results with studies that analysed the impact of Peruvian land titling in urban areas (e.g. Field, 2005; Field, 2007). While they found that the importance of secure property for economic development 'cannot be overstated', they did question the method of government land titling to achieve such secure rights (Kerekes and Williamson 2010, p. 1025).

In contrast to the evidence regarding property rights, the empirical evidence on the role of IPP in economic growth has revealed more ambiguous results. Numerous studies have shown that the strength of a country's IPP can enhance its innovative capacity and contribute to economic growth (Gould and Gruben, 1996; Adams, 2011; Horii and Iwaisako, 2007). Gould and Gruben (1996) conducted one of the first cross-country studies to establish an empirical link between strong IPP, innovation and improved GDP. Holding human capital, real government consumption, and other common growth determinants constant, they found that IPP are statistically significant and positively related to economic growth. Their findings further suggest that this relationship varies among different market structures and under different trade regimes.

In another cross-country study, Park and Ginarte (1997) constructed an index for intellectual property rights (Ginarte-Park Index), which attempts to give a quantitative score to a country's level of intellectual property protection. Using this index, they provided an examination of the relationship between patent protection and long-run economic growth for 60 countries for the period over 1960-1990 (now extended to 2005 (Park, 2008)). The results of their study show that strong intellectual property rights do not contribute to

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Registry), or RPU. For 2001, COFOPRI's main objective was to establish legal land titles for over one million informal urban properties in eight main urban centers (Cantuarias & Delgado, 2004).

economic growth by "being codified into laws", but rather by increasing investment possibilities; such investments then being associated with the stimulation of long-term growth (Park and Ginarte, 1997, p. 60). Similarly, Gould and Gruben (1996) also identify an indirect effect of intellectual property rights on GDP: strong patent protection leads to improvements in factor accumulation (of factor inputs like R&D capital and physical capital) which in turn has an influence on economic growth. Their findings further suggest that it is important to distinguish between developed and developing countries (see also Thompson and Rushing, 1996). Using cross-country panel data Kanwar and Evenson (2003) analyzed the relationship between technological progress as a growth determinant and IPP. They identified a strong positive effect of intellectual property protection on technological change (as measured by R&D investment expenditures), which in turn positively affects economic growth.

However, some authors consider the relationship between IPP and economic growth to be a bit more complex and not necessarily positive. For instance, Falvey et al. (2006) argue that providing strong IPP gives foreign firms patent advantage, which turns them for at least an initial period of time into a monopoly and thus reduces competition. This might result in an output below the socially desirable level of output and lead to consumer welfare loss. Adams (2011) and Horii and Iwaisako (2007) concluded that the ultimate effect of strong IPP protection on economic growth and development depends on the country's level of economic development and other country-specific characteristics and give a similar explanation as Favley et al. (2006). According to Sattar and Mahmood (2011), the strength of the relationship depends on the country's level of income. They found that the impact of IPP on GDP is more significant in high income countries as compared to middle and low income countries. (And the effect is stronger in case of upper middle income countries as compared to lower middle income and low income countries). In relation to these findings, there is recent evidence from the literature on agricultural productivity indicating that stronger IPP could also promote yield gap convergence between developed and developing countries (Spielman and Ma, 2016).

While the discussion above is general, it is conceivable that these associations may differ dependent upon the individual's labour market status and the proportions of such groups in a country or region. In Latin America, larger informal sectors are generally associated with

more self-employment (Tokman, 2011): self-employment accounts for more than half (56%) of the total informal work (Biles, 2009), where regulations and bureaucracy are sometimes seen as barriers to business. But self-employment is very diverse in the Latin American region, which makes it important to consider the other categories of self-employment too. Cortés Aguilar et al. (2013), made use of the available data in the Latinobarometer from 2017 and classified self-employment in Latin America into four different main groups, namely professionals, business owners, farmer-fishermen and those in the informal sector. These different categories of self-employment have been assessed with respect to life satisfaction generally (Cortés Aguilar et al., 2013).

According to Tokman (2011), inadequate regulations and bureaucracy lead many micro-enterprises to flee to informal sectors. Furthermore, it is similarly argued that individuals who "voluntarily" work in informal sectors reject formality, which could potentially explain why the informally self-employed might not benefit from stronger intellectual property protection. Since strong regulations and bureaucracy lead them to informality in the first place, they might be against any increase in government intervention. Moreover, individuals who are active in the informal sector may be directly affected in their jobs and therefore not benefit, but instead suffer from stronger intellectual property protection.

There also might be different preferences within other groups of the self-employed. A business owner or entrepreneur, for instance, may benefit from stronger intellectual property protection as this could protect her from piracy and imitation, better facilitating the invention of new products as well as improvements of existing products and production processes. However, it could also be that self-employed business owners do not benefit from stronger intellectual property protection, because it is likely that purchasing intangible assets such as patents becomes more expensive. As for more secure property rights, self-employed business owners may not benefit from them because they are usually related to more costly and time-consuming paperwork (Jacobs, 1999).

Our investigation is particularly interested in the relationship between these rights and protections, GDP growth and life satisfaction. The next section discusses the data and chosen method we use to empirically assess these associations.

3. Data and Methodology

To investigate the issue of property rights, intellectual property protection, economic growth and well-being we employ secondary data from three different sources: the World Economic Forum's Global Competitive Index, the Latinobarometer, and the World Bank. We make use of data for the Latin American region from 2006, when the property rights data we use was first available, until 2015, the (at the time of writing) last year of Latinobarometer data. Here we discuss each in turn.

The data regarding property rights and IPP come from the World Economic Forum's Global Competitive Index which has, since 2006, collected data annually on many different aspects of many countries. The data on property rights and IPP in this index, and hence in this investigation too, come from an executive survey. 100 executives were asked the following question in each year: In your country, to what extent are property rights, including financial assets, protected? The answers are given on a Likert scale from 1, indicating not at all, to 7, meaning to a great extent. The Latin American countries with the highest averages for property rights over the years considered are Panama (4.89) and Uruguay (4.86); those with the lowest are Venezuela (1.97) and Bolivia (2.81), with Argentina (2.85) not faring much better. The question for intellectual property protection is similar – In your country, how strong is the protection of intellectual property, including anti-counterfeiting measures? – with the same scale. For this intellectual property protection measure the highest averages are again found for Panama (4.14) and Chile (3.81); those with the lowest averages are Venezuela (1.91) and Bolivia (2.30), with Paraguay having a negligibly higher score (2.34). In general, the ratings for property protection are higher than those for intellectual property protection. All of the averages for each year and each country are shown in Appendix 1 and 2.

The data for life satisfaction and the important socio-economic control variables come from the Latinobarometer. The Latinobarometer is an annual dataset (though with occasional missing years) containing socio-economic data from between 1,000 and 1,200 individuals in each of 18 Latin American countries in each year. Along with the World Values Survey it is currently one of the best datasets covering this region, although not without limitations to our analysis. For example, rather than being longitudinal, it is a repeated cross-section

dataset, which has implications for the analysis we can undertake.[7] The Latinobarometer's life satisfaction question is as follows: Generally speaking, would you say you are satisfied with your life? Would you say you are…? There are four options as possible answers: very satisfied (1); quite satisfied (2); not very satisfied (3); and not at all satisfied (4). These are positively coded for the analysis here so that higher numbers indicate higher satisfaction. Table 1 presents the number of observations, and the mean and standard deviation of life satisfaction for each country.[8]

Table 1: observations, mean and standard deviation of life satisfaction in individual countries

Country	*Life Satisfaction*		
	observations	*mean*	*standard dev.*
Argentina	11897	2.95	0.75
Bolivia	11899	2.65	0.81
Brazil	12037	2.81	0.60
Chile	11947	2.83	0.75
Colombia	11973	3.22	0.80
Costa Rica	9948	3.30	0.74
Dominican Republic	9977	3.10	0.91
Ecuador	11969	2.76	0.83
El Salvador	9971	2.90	0.89
Guatemala	9885	3.11	0.82
Honduras	9951	3.04	0.96
Mexico	11956	3.08	0.84
Nicaragua	9932	3.00	0.90
Panama	9965	3.27	0.78
Paraguay	11351	2.94	0.80
Peru	11909	2.63	0.84
Uruguay	11931	2.92	0.75
Venezuela	11953	3.25	0.83

Latinobarometer data, these averages do not consider 2008, and there was no survey in 2012 and 2014. The scale is 1 to 4, with life satisfaction being positively coded.

Where possible we employ standard socioeconomic controls, common to many models and investigations within the 'economics of life satisfaction' area. These have all been demonstrated, again and again, to be associated with average life satisfaction. Thus, we

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[7] Further limitations are discussed in section 5.

[8] Importantly, we do not consider data from 2008. In every other year, the life satisfaction question is asked at the start of the survey; in 2008 it was asked after questions about politics. Other Latin American studies make this decision too (for example Macchi and Plagnol 2017) and it is known that question order can substantially influence life satisfaction data (Deaton 2012; Nikolova and Sanfey 2016).

consider income, socioeconomic level, labour force status, marital status, age, and education. What is particularly missing is health, which is not asked about enough for analysis in the Latinobarometer. Importantly, income, again reflecting the data collected in the Latinobarometer, is a subjective measure. Rather than asking individuals about their actual income, they are instead asked whether their salary is sufficient or not.[9] The socioeconomic level data reflect the interviewer's opinion and is based on the appearance of the respondent, their house and furniture. The other socioeconomic controls are straightforward and require no elaboration, though we discuss labour force status below. Descriptive statistics for all 18 countries combined are available in table A1 in the appendix.

The GDP data come from the World Bank, our third source of data. We use GDP growth per capita as our measure of economic growth. This data enters the last stage of our analysis and enables us to see if there is a positive association between property rights and life satisfaction, and intellectual property protection and life satisfaction, which is not caused by economic growth. This last stage enables us to learn if there is an additional life satisfaction benefit when economic growth is controlled for. Before that we investigate the association between both types of rights and protections and life satisfaction, while considering socio-economic controls known to influence life satisfaction, without considering economic growth.

Our interest focuses on the coefficients for property rights and intellectual property protection. Both variables are in every estimate, thus the coefficient for property rights (intellectual property protection) is obtained while controlling for intellectual property protection (property rights). Any substantial differences with the obtained coefficients between the two stages will thus be explained by a moderating role for economic growth. Given that the dependent variable, life satisfaction, is ordinal and only has four different options we treat it as ordinal and present results from ordered probit analysis. This is undertaken for all countries combined (controlling for the specific countries), and full results are presented in the next section.

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[9] The actual question is as follows: "Does the salary you receive and your total family income allow you to cover your needs in a satisfactory manner? Which of the following statements describes your situation?" The possible answers are: It's sufficient and we can save; It's just sufficient and we don't have major problems; It's not sufficient and we have problems; It's not sufficient and we have major problems.

As mentioned above, one advantage of the Latinobarometer is with respect to self-employment. In the survey, self-employed individuals indicate whether they are self-employed as professionals, business owners, farmers or within the informal sector. This information is used to uncover potential heterogeneity in our general results. Given the discussion of the literature above (see the latter part of section 2.2), it is plausible that the relationship between property rights, intellectual property protection, GDP and life satisfaction might be somewhat different when these vastly different groups of the self-employed are considered. Furthermore, our analysis also considers other labour force statuses (e.g. unemployed and retired).

4. Results

Table 2 presents ordered probit regression coefficients for the variables of special interest and the controls. The columns are distinguished by the addition of a control for GDP growth in column (2).

Table 2: Life Satisfaction, Property Rights, Intellectual Property Protection and GDP growth ordered probit estimates.

	(1) Life Satisfaction	(2) Life Satisfaction
Property Rights	0.05***	0.05***
	(0.017)	(0.018)
Intellectual Property Protection	0.05***	-0.01
	(0.017)	(0.018)
GDP per capita growth	-	0.01***
		(0.001)
Income: sufficient	0.24***	0.23***
	(0.011)	(0.011)
Income: insufficient	-0.14***	-0.13***
	(0.007)	(0.007)
Income: very insufficient	-0.22***	-0.22***
	(0.008)	(0.008)
Socioeconomic level: very good	0.26***	0.26***
	(0.013)	(0.013)
Socioeconomic level: good	0.13***	0.13***
	(0.007)	(0.007)
Socioeconomic level: bad	-0.14***	-0.14***
	(0.009)	(0.009)
Socioeconomic level: very bad	-0.26***	-0.26***
	(0.022)	(0.022)
Female	0.00	0.00

	(0.007)	(0.007)
Have partner or married	0.06***	0.05***
	(0.008)	(0.008)
Separated, divorced or widowed	-0.07***	-0.07***
	(0.012)	(0.012)
Age	-0.02***	-0.02***
	(0.001)	(0.001)
Age squared	0.00***	0.00***
	(0.000)	(0.000)
Education: incomplete primary	0.03**	0.02**
	(0.012)	(0.012)
Education: complete primary	0.01	0.01
	(0.013)	(0.013)
Education: incomplete secondary	0.04***	0.05***
	(0.014)	(0.014)
Education: complete secondary	0.09***	0.09***
	(0.013)	(0.013)
Education: incomplete high school	0.12***	0.12***
	(0.016)	(0.016)
Education: complete high school	0.18***	0.19***
	(0.016)	(0.016)
Self-employed	-0.05***	-0.05***
	(0.008)	(0.008)
Unemployed	-0.19***	-0.19***
	(0.014)	(0.014)
Retired	-0.02	-0.02
	(0.015)	(0.015)
Not in labour market	-0.06***	-0.06***
	(0.010)	(0.010)
Student	0.02	0.02
	(0.015)	(0.015)
Observations	135,794	134,616
Constant cut1	-2.41***	-2.55***
	(0.040)	(0.042)
Constant cut2	-1.16***	-1.29***
	(0.039)	(0.041)
Constant cut3	0.05	-0.08**
	(0.039)	(0.041)

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, Base categories: just sufficient income; not bad socioeconomic level; single; illiterate; employed. Latinobarometer data 2006-2015. Both estimates include year and country dummy variables.

As seen in column 1 of table 2, overall in the Latin American region both property rights and intellectual property protection are positively associated with life satisfaction when GDP

growth per capita is not controlled for. When GDP growth per capita is controlled for (column 2), property rights are still positively associated with life satisfaction whereas intellectual property protection no longer has a significant relationship with life satisfaction. The benefits of intellectual property protection for life satisfaction seem (for this region as a whole) to come from its promotion of GDP growth per capita. In contrast, property rights maintain their positive association with life satisfaction. Thus, in Latin America, the promotion of property rights may well improve well-being over and above any benefits to economic growth. This is the central finding of our investigation, although we also provide some evidence for groups of individuals with different labour force statuses.

The other coefficients are in line with expectations based on previous literature. A ceteris paribus summary follows: the more sufficient one considers their income (including family income) the more satisfied with life they are (cf. Clark, 2018); the higher the interviewer rated socioeconomic level, the more satisfied with life; being married or having a partner is associated with more life satisfaction than being single which, in turn, is associated with more life satisfaction than being divorced, separated or widowed (cf. Stutzer and Frey, 2006); age follows the often-found U-shape, with life satisfaction falling in early adulthood, reaching a bottom at approximately 52 years, before increasing again (Cheng et al., 2015; Piper, 2015c)[10]. Education is also broadly positively associated with life satisfaction too: the more education an individual has the more satisfied she is with life, on average (as also found for Latin Americans by Graham and Felton, 2006).

The results for labour force status, may seem more unusual (i.e. different from most of the academic literature which often investigates highly developed countries), however they are supported by previous research from Latin America. Table 2 shows that being self-employed, unemployed and not being in the labour market are all associated with less life satisfaction than the base category of being conventionally employed. Here the somewhat unusual result is self-employment, though one general reason why self-employment is associated with less life satisfaction is that self-employed individuals might focus on their work and neglect other important domains of life such as leisure, family, etc. (Binder, 2013). However, in the Latin American context, other research has found that this on average finding covers considerable heterogeneity (Aguilar et al. 2013). This was a motivating factor for our more

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[10] A result based on the full coefficients, and not just the two decimal places shown in the table.

detailed consideration of labour force status, and particularly different groups of the self-employed.

As briefly mentioned in section 2, there are a few possible explanations as to why these associations are different dependent upon the individual's labour market status. The most striking differences, however, can be found within the self-employed category. While the results indicate that self-employed business owners, for instance, seem to benefit from stronger intellectual property protection, even after controlling for GDP growth, the same association is negative and statistically significant for individuals who are self-employed in the informal sector. As briefly discussed in section 2, individuals self-employed in the informal sector can be expected to be negatively affected by stronger intellectual property protection, as it may directly affect their jobs. One reason for this could be that this sector has been argued to be predominantly imitative (Schmitz, 1989). Subsequently, it can be argued that stronger implementation of IPP instruments such as anti-counterfeiting laws, which are intended to dampen imitative activity, could be perceived as a threat to the business and livelihood of those self-employed in the broad informal sector. Another explanation is that many individuals who are active in the informal sector often resorted to informality because of strong regulative policies and too much bureaucracy (De Soto, 1989). Therefore, they are more likely to have a rather negative attitude toward stricter protection of intellectual property.

In contrast, self-employed business owners, are more likely to benefit from a more secure IPP regime, because it can lower entrepreneurial risk and build transactional trust (Estrin et al., 2013). The latter aspect could possibly explain why the relationship between IPP and life satisfaction remains positive, even after controlling for GDP growth. As mentioned in section 2, some studies have identified strong linkages between trust and well-being (see e.g. Helliwell and Wang, 2010). In a Latin American context, the aspect of trust becomes even more important, and especially in business (Levitt, 1995). In fact, many Latin American business owners will rather employ family members than paid employees, because of the issue of trust (Zarrugh, 2007). This can help to understand why the well-being of Latin American self-employed business owners can be expected to be positively affected by stronger protection of IPP and why the benefits are not only economic benefits.

Additional interesting findings are for students and the retired. For students, regardless of whether GDP growth per capita is controlled for or not, there is a negative association between IPP and life satisfaction. This relationship remains significant and negative, even after controlling for GDP growth. One explanation could be that their age makes them an important target group for illegal access to entertainment such as movies, videogames and music. This idea can be confirmed by some studies, which have suggested that young individuals are usually the ones involved in the production and consumption of pirated entertainment material (Proserpio et al., 2005).[11] Stronger IPP are likely to restrict illegal access, making it difficult for students to enjoy such entertainment and thus negatively affecting their life satisfaction. With respect to property rights, however, the relationship is significant and positive.

For retired individuals, the association between property rights and life satisfaction is statistically significant (at a 10% level) and positive when GDP growth is not controlled for and becomes slightly more significant (while remaining positive) when GDP growth is controlled for. The link between IPP and life satisfaction on the other hand, is not significant for retired individuals. This suggests that the life satisfaction of the retired could in fact be positively influenced by stronger property rights, and that this positive influence is not solely due to benefits of economic growth. At the same time, the results suggest that retired individuals' subjective well-being is not (significantly) affected by changes in the strength of IPP. Here, a similar explanation as the one that was used for the students' category results could be applied. Following that argument, it could be that because of their age group, the retired are less likely to consume pirated material in the first place. One reasons for this could be, again, similar to the ones mentioned above, the lack of skills that are required to access platforms which offer pirated material.

To conclude the results section, Table 4 presents the coefficients from a standard pooled OLS regression, thus treating life satisfaction as a cardinal variable. The results are consistent

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[11] Proserpio et al. (2005) name three potential reasons as to why young people usually are the ones involved in those activities. The first one involves their buying power. In order to compensate their relatively weak buying power, young individuals are usually more willing to engage in extra-legal practices that allow them to save money. Second, in most advanced economies, young people tend to represent the segment of the population that disposes of the skill sets and know how necessary to use innovative file-sharing platforms. Third, the authors suggest that in some cases, young people can even be rewarded with prestigious status when they have managed "to get around the rules of the system" (Proserpio et al., 2005, p. 40).

with those in Table 2, where life satisfaction was treated as an ordinal variable. A brief discussion about the size of the coefficients follows the table.

Table 4: Life Satisfaction, Property Rights, Intellectual Property Protection, OLS results

	(1) Life Satisfaction	(2) Life Satisfaction
Property Rights	0.04***	0.04***
	(0.013)	(0.013)
Intellectual Property Protection	0.04***	-0.01
	(0.013)	(0.013)
GDP per capita growth	-	0.01***
		(0.001)
Income: sufficient	0.15***	0.15***
	(0.007)	(0.007)
Income: insufficient	-0.10***	-0.10***
	(0.005)	(0.005)
Income: very insufficient	-0.16***	-0.16***
	(0.006)	(0.006)
Socioeconomic level: v good	0.17***	0.17***
	(0.009)	(0.009)
Socioeconomic level: good	0.09***	0.09***
	(0.005)	(0.005)
Socioeconomic level: bad	-0.10***	-0.10***
	(0.007)	(0.007)
Socioeconomic level: very bad	-0.20***	-0.19***
	(0.018)	(0.018)
Female	0.00	0.00
	(0.005)	(0.005)
Have partner or married	0.04***	0.04***
	(0.005)	(0.005)
Separated, divorced or widowed	-0.05***	-0.05***
	(0.009)	(0.009)
Age	-0.01***	-0.01***
	(0.001)	(0.001)
Age squared	0.00***	0.00***
	(0.000)	(0.000)
Education: incomplete primary	0.02*	0.02*
	(0.009)	(0.009)
Education: complete primary	0.01	0.01

	(0.010)	(0.010)
Education: incompl. secondary	0.03***	0.04***
	(0.010)	(0.010)
Education: completed secondary	0.07***	0.07***
	(0.010)	(0.010)
Education: high school incompl.	0.09***	0.09***
	(0.012)	(0.012)
Education: high school complete	0.13***	0.14***
	(0.012)	(0.012)
Self-employed	-0.04***	-0.04***
	(0.006)	(0.006)
Unemployed	-0.14***	-0.14***
	(0.010)	(0.010)
Retired	-0.01	-0.01
	(0.011)	(0.011)
Not in labour market	-0.04***	-0.04***
	(0.007)	(0.007)
Student	0.01	0.01
	(0.010)	(0.010)
Observations	135,794	134,616

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. See the note under table 2 for more details.

For Latin Americans generally, Table 4 demonstrates that, while the size of the coefficient for property rights when GDP per capita growth is controlled for (column 2) is small, a one point change in property rights is equivalent to the life satisfaction premium of having a partner or being married compared with being single. A two point change in property rights protection is associated with an equivalent increase in life satisfaction similar to that of being considered to have a good socioeconomic level rather than a not bad socioeconomic level (and nearly as much as the difference between insufficient income and just sufficient self-rated income). While these comparisons may not suggest that increasing property rights are a massive boon for life satisfaction, we must remember that this is additional to the more hoped for benefits of GDP per capita growth. When policy makers pursue GDP growth through its positive association with enhanced property rights, they may also be making citizens of that country happier too, perhaps a previously unrecognised benefit to the pursuit of enhanced property rights.

5. Concluding discussion, including limitations and suggestions for future research

This discussion section focuses on the key result from the analysis and offers potential explanations in line with the literature review above. Following this, the limitations of the study are discussed along with suggestions for future research.

The key result from this investigation is that, in Latin America, property rights are positively associated with the well-being of individuals even after their impact on economic growth is considered. In contrast, for the whole population, the benefits of enhanced intellectual property protection for life satisfaction can be explained by their association with economic growth (thus offering no additional well-being benefits). Why might the overall population's well-being association be different with respect to these two types of rights? One possible reason for this could be that strong and secure intellectual property protection, for instance in the form of anti-counterfeiting laws, can make entertainment more expensive. In Latin America, many entertainment goods and services (cinema, pay-tv, etc.) are consumed illicitly. Strengthening intellectual property protection would thus make it more difficult to access entertainment goods illicitly (i.e. without cost or with cost but lower than the market price). Since leisure activities often include use of different entertainment goods, they could be negatively affected. The last section discussed this in more detail, making reference to the results obtained for specific labour market groups.

Some of this investigation's limitations stem from the main dataset used, the Latinobarometer. While valuable, the Latinobarometer is a repeated cross-section dataset, with different individuals asked in each wave. This limits the methods available for analysis and does not enable (for example) individual unobservable characteristics to be controlled for. Additionally, there are some important variables either not included in the dataset or asked subjectively when a more objective measure would be preferable. The biggest omission is with respect to health, which was not considered sufficient to enable inclusion in our analysis. Health has been consistently shown to be positively associated with life satisfaction, with one recent study showing that even past health status has a direct effect on current well-being even when current health is controlled for (Piper, 2018a). As section 3 explains, the income variable is subjective and an objective measure would be preferable; individuals are free to answer regarding how sufficient they find their income and may

misrepresent their situation. The inclusion or exclusion of the subjective interviewer rating of socioeconomic level does not affect the found relationship between property rights, IPP, economic growth and life satisfaction; in other words, this investigation is robust to this variable.

The results above present a general picture, one that would benefit from further research. Property rights and IPP are very diverse, both in how the law is written and in how they are enforced. Future research could look at specific changes and assess these. Are their particular reforms that are more (or less) conducive to individual well-being? And what about intellectual property protection? Is the speculation about the increased cost of entertainment (due to enhanced IPP) relevant for life satisfaction? Specific changes in law could be investigated to tease out nuance that is missed in the analysis above. This would likely require a qualitative focus as well as a quantitative one, particularly given that it might be hard to quantify; the executive survey data we use in our analysis is unlikely to be good enough to find this nuance. Case studies and field interviews are likely to contribute to increased understanding; it might also be useful to track the impact of announcements regarding law changes and then the actual subsequent change. Our general analysis can be extended in many different ways. Future research could also link these issues to the quality of institutions in local and national regions. An advantage of our executive survey data is that, presumably, this is built in to the responses about property rights; the executives are likely to be making an overall judgement incorporating factors such as corruption and quality of policing regarding their influence on property rights and IPP. Despite this possibility there is much that can be done to extend the general analysis we present above.

From the findings of this investigation, some policy implications can be derived. One first important implication involves economic stability. To improve the institutional environment, decrease informality, and foster better overall market conditions, economic stability rather than just economic growth is required (Amarante, et al., 2016). Relatedly, a recent study investigating the gender gap in Nicaragua has also found that the economic situation is important for how satisfied females are with their lives (Piper 2018b). Economic growth is important, and can be promoted by improved property rights, which themselves appear to

have an additional life satisfaction benefit in Latin America. In this region at least, Thomas Sowell seems to be right about people benefiting from property rights generally. Future investigations can assess this on a case by case basis and extend this initial understanding. Overall, our general investigation suggests that policy makers in Latin America should consider improving property rights, not only for the hoped for benefits of economic growth, but also for additional benefits in terms of citizen well-being.
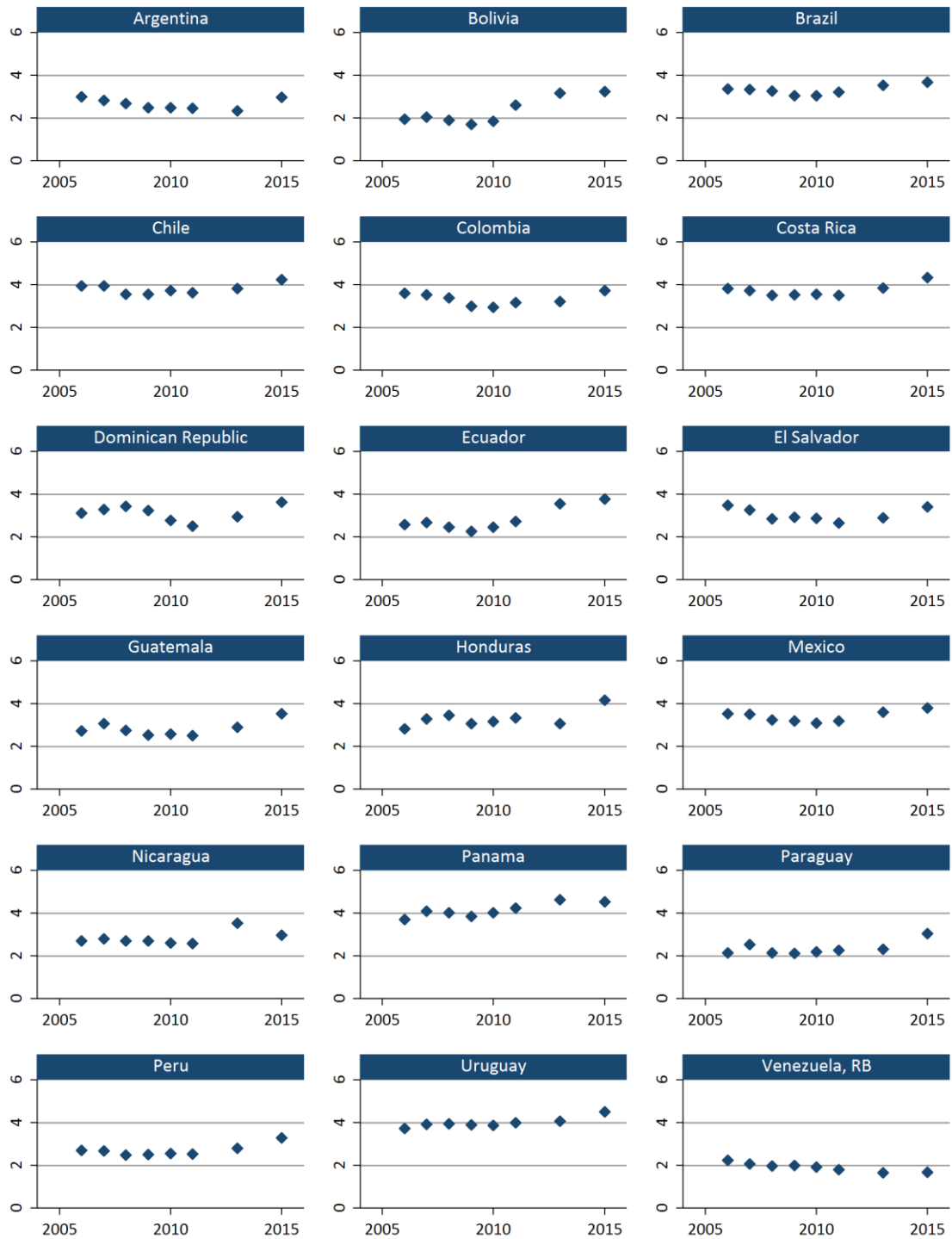
Appendices

Appendix 1: Property right scores by country and survey year

The graphs represent data of the Executive Opinion Survey by the World Economic Forum. Numbers represent averages of business leaders' assessment of protection of property rights in their country on a 1-7 scale.

Appendix 2: Intellectual property protection scores by country and survey year

The graphs represent data of the Executive Opinion Survey by the World Economic Forum. Numbers represent averages of business leaders' assessment of protection of intellectual property in their country on a 1-7 scale.

Table A1: Descriptive statistics

Table A1: Data description: socioeconomic variables		
	mean	standard deviation
Income		
Sufficient	0.10	0.30
Just sufficient	0.43	0.49
Insufficient	0.35	0.48
Very insufficient	0.12	0.33
Socioeconomic level		
Very good	0.07	0.26
Good	0.34	0.47
Not bad	0.43	0.49
Bad	0.13	0.34
Very bad	0.02	0.15
Female	0.52	0.50
Marital status		
Partnered or married	0.58	0.49
Single	0.31	0.46
Separated, divorced or widowed	0.12	0.32
Education		
Illiterate	0.09	0.29
Incomplete primary	0.19	0.39
Complete primary	0.17	0.37
Incomplete secondary	0.15	0.36
Complete secondary	0.22	0.41
Incomplete higher	0.08	0.28
Complete higher	0.10	0.30
Labour force status		
Employed	0.26	0.44
Self-employed	0.31	0.46
Unemployed	0.06	0.24
Retired	0.08	0.25
Not in labour market	0.23	0.42
Student	0.06	0.24
Age	40.58	16.66

Note: Latinobarometer data (2006-2015), from 18 countries in Latin America. All variables are dummy variables apart from age.

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