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Abstract

Purpose – Digital piracy is one of the most popular forms of intellectual property theft and is currently recognized as a crime in several countries. This begs the question, if persons are fully informed that digital file sharing is a crime and, if caught, can be legally prosecuted, why do individuals opt to engage in such criminal behaviour? The purpose of the paper is to determine the psychological, social and economic factors influencing digital piracy. Understanding the social and psychological features of digital pirates is necessary if effected strategies are to be developed to deter the practice of digital piracy.

Design/methodology/approach – In this paper, a representative sample drawn from the population of Barbados was surveyed. The conceptual models were estimated using ordinary least squares multiple regression, Tobit estimation and quantile regression.

Findings – The results suggest that intentions and willingness to pay (WTP) both have a significant impact on digital piracy. Intentions are in turn influenced by the pirate's attitude, perceived consequences, ethics, education level and environment. Finally, a facilitating environment and perceived importance of the piracy issue help to predict' WTP for digital products.

Originality/value – To the best of the knowledge, no other study has combined notions from attitude/values/behaviour with that of WTP. Yet, the literature would suggest that they both have significant impacts on the quantity of digital goods that are pirated. It is possible that not modelling their joint impact could have resulted in loss of vital information.

Keywords Crime, Social economy, Digital piracy, Barbados

Paper type Research paper

1. Introduction

Affordable high-speed internet connections and advancements in computing technologies have paved the way for the proliferation of intellectual property theft in the last decade. Specifically, the rapid development of peer-to-peer (P2P) file sharing software since 1999 has greatly increased the ease at which individuals can access digital products (Gunter, 2011), making the internet a refuge for stealing intellectual property. Presently, any individual with minimal experience and broadband internet access can download a music file in less than a minute (Cooper and Harrison, 2001). In fact, Envisional (2011) documents that intellectual property theft is a huge consumer of bandwidth. According to their estimates, approximately 23.8 per cent of global internet traffic in 2010 was infringing, while estimates from Ouellet (2007) suggests that up to 2.6 billion digital files are being illegally transferred every month.

Digital piracy is currently regarded as one of the most popular forms of intellectual property theft and has been characterized as a criminal act in the USA since the Copyright Act of 1976. Moreover, mass copyright violations of movies and music were

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made a felony offense in 1982 by the Piracy and Counterfeiting Amendments Act and amended to include the distribution of copyrighted materials over the internet via the No Electronic Theft Act (Higgins *et al.*, 2009; Koen and Im, 1997). Legal statutes against digital piracy are not confined to the USA; several other governments have copyright protection and anti-piracy policies. Moreover, the World Intellectual Property Organization (WIPO) has developed several treaties to assist in the protection of copyrights (for instance, the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty and the World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Rights). In other words, digital piracy is a global phenomenon.

This begs the question, if persons are fully informed that digital file sharing is a crime and, if caught, can be legally prosecuted, why do individuals opt to engage in such criminal behaviour ? Rojek (2005) points out that though piracy may be classified as a criminal act, individuals may not consider it as such, because it has become a norm through repeated practice. Individuals may recognize illegal file sharing as a theft but would not consider it a crime (Balestrino, 2008). Indeed, such a notion is conceivable, when one thinks about how digital piracy is conducted. The internet provides pirates with a sense of security as they perform their criminal acts (Higgins, 2011). Specifically, it allows the crime to take place detached from the copyright holder, giving the perception that piracy is a harmless or victimless crime (Higgins *et al.*, 2008; Wall, 2005).

As evidenced by the multi-billion dollar losses experienced in the music, motion picture and software industries, digital piracy is far from a victimless crime (Institute for Policy Innovation, 2007). In an attempt to remedy the problem, several preventives and deterrents have been put in place (Price, 2012; Wang and McClung, 2011). Among these are:

(1) The "ded kitty" approach – this entails waging lawsuits against various web sites, P2P networks and files sharers.

(2) The "play with kittens" approach – here, legitimate and better alternatives to digital piracy are made available (i.e. fee-based digital services such as iTunes and Netflix). Rather than wait for pirated releases, one can quickly and legally access digital products at home. These are also seen as a practical alternative of buying CDs and DVDs from a store or purchasing them online.

(3) The "closed cat flap" approach – this involves making the act of piracy hard to accomplish (for instance, blocking access to web sites which contain or are linked to pirated material). The idea here is that pirates would have to expend so much effort that it will wear them down and eventually, they will not want to do it.

(4) Discouraging illegal file sharing through educational marketing campaigns.

Even with the aforementioned remedies in place, losses due to digital piracy have continued to skyrocket. For example, the commercial value of pirated software climbed from US$58.8 billion in 2010 to US $63.4 billion in 2011 (Business Software Alliance, 2012). This hints that the aforementioned efforts to attenuate digital piracy have fallen short of the desired results.

Several authors posit that the reason for the lackluster performance of digital piracy deterrents is that they do not incorporate information about the social and psychological foundations underlying digital piracy. As noted by Taylor *et al.* (2009),

understanding the social and psychological features of digital pirates is critical, if efficacious marketing communication strategies are to be developed, implemented and managerially controlled to persuade individuals to reduce or even reject the practice of digital piracy. It is against this backdrop that we conceptualize a multi-stage model of digital piracy – an approach, which to the best of our knowledge, is quite novel.

The model consists of two stages. In the first stage, an individual's rate of digital piracy is determined by piracy intentions and the willingness to pay (WTP) for the product. The second stage then identifies the factors influencing piracy intentions and WTP for digital goods. To evaluate the determinants of digital piracy, a representative sample drawn from the population of Barbados will be surveyed. The latter is another distinguishing feature of our work, in that the entire country is sampled, as opposed to past research which sampled predominantly from university student bodies (Williams *et al.*, 2010; Solomon and O'Brian, 1990).

The paper proceeds as follows. Section 2 provides a description of the conceptual model. Section 3 details the data and methods, while Section 4 presents and discusses the results. Finally, some concluding remarks are provided in Section 5.

2. Conceptual model

Several researchers have sought to ascertain the determinants of digital piracy. Studies on digital piracy are usually in the form of cross-national studies or demand-type models. The cross-national studies tend to focus on the national differences in the rate of piracy. For instance, studies by Andres (2006), Shalden *et al.* (2005), Depken and Simmons (2004), Holm (2005) and Husted (2000) test whether the cross-country variation in software piracy is dependent on economic influence and institutional social mores. Other studies (for instance Janssens *et al.*, 2009) focus on the opportunities and challenges in the digital age.

On the other hand, the demand-type models are usually at the individual level, with particular emphasis on why and how consumers engage in illegal downloads. Much of these studies have drawn on traditional theoretical frameworks to explain the factors that influence an individual's intention to pirate. For instance, Glass and Wood (1996) applied equity theory to explore the intentions of legal owners of software to provide other individuals with software to make illegal copies; Taylor *et al.* (2009) modify the model of goal-directed behaviour to explore piracy; McCorkle *et al.* (2012) draw on the theory of household production, Becker's model of crime and attitudinal theories; while Malin and Fowers (2009), Higgins *et al.* (2008) and Higgins (2007) utilized the self-control perspective to model piracy. But the most popular theoretical foundation of the demand-type models is the theory of behavioural control (TRB) (Robertson *et al.*, 2012; Wang *et al.*, 2011, 2009; Van Belle *et al.*, 2007; Leonard *et al.*, 2004).

The theory of planned behaviour was developed from the theory of reasoned action (TRA) by Ajzen and Fishbein (1969). TRA maintains that actual behaviour is directly linked to one's intention to perform an action and ability. Intentions, in turn, are often shaped by an individual's attitude towards the behaviour (favourable or unfavourable) and subjective norms. The TRB extends the model of TRA by including how easy it is to perform the act, i.e. the perceived behavioural control (Ajzen, 1991).

In this paper, we build a behavioural model of digital piracy that draws extensively on attitude/values/behaviour theory and notions from WTP. To model the impact of

attitudes/values/behaviour, the authors draw on the empirical work developed by Triandis (1980).It explains individuals' behaviour in terms of intentions, by what they think they should do, and by the consequences that they associate with a specific behaviour. It contains aspects that are directly related to an individual and others that are related to an individual's environment. Indeed, Thompson *et al.* (1991) found Triandis' model to be at least as powerful as TRA in terms of prediction and to be superior to TRA in other respects. But, while the literature is filled with studies which view intent as the main precursor of digital piracy, very few have focused on the role of WTP for legal purchases when illegal versions exists. Chiang and Assane (2009) argue that reducing piracy entails reducing the net value of participating in the illegal market or increasing the net value of participating in the legal market, or both. Hence, the higher the "willingness to pay", the less likely an individual is to pirate. To the best of our knowledge, no other study has combined notions from attitude/values/behaviour with that of WTP. Yet, the literature would suggest that they jointly determine the quantity of digital goods that are pirated. It is possible that not modelling their joint impact could have resulted in loss of vital information.

Against this backdrop, a comprehensive model of digital piracy is proposed (see Figure 1). The model consists of two stages. In the first stage, the actual digital piracy conducted by individuals is assumed to be determined by piracy intentions and the WTPfor the product:

$$Digital\ piracy = f\left(\underset{+}{Intentions}, \underset{-}{WTP}\right) \tag{1}$$

According to the TRB/TRA models, intentions are a central factor in any behavioural model. Intentions are indicators of the degree to which an individual is willing to try and how much effort he/she is willing to make in order to perform a particular behaviour and are thus viewed as the best antecedent of actual behaviour (Ajzen and Fishbein, 1969, 1980; Fishbein and Ajzen, 1975). In this study, we assume that there is a positive and significant relationship between piracy intentions and actual piracy.

Conventional economic wisdom suggests that the quantity demanded for any good is largely influenced by its price. By logical progression, price should be considered a key determinant in consumers' choice of whether to buy or pirate. Indeed, several studies have shown that increases in the prices of digital products often lead to a greater rate of illegal behaviour (McCorkle *et al.,* 2012; Bhattacharjee and Gopal, 2003; Cheng *et al.*, 1997; Gopal and Sanders, 1997) while individuals who are willing to pay such prices are less likely to engage in piracy. Chiang and Assane (2009) opine that in order for the consumption of digital products in the legal market to increase (while illegal versions exist) WTP must also increase. As such, we hypothesize that WTP is negatively related to the rate of digital piracy.

But, if WTP and intentions determine the rate of piracy, a central question then becomes, what determines intensions and WTP? In the second stage, a model of intentions and WTP is presented. Specifically, piracy intentions assumed to be influenced by a person's attitudes towards piracy, ethics (relativism), perceived consequences, facilitating conditions, education and gender. Meanwhile, WTP is

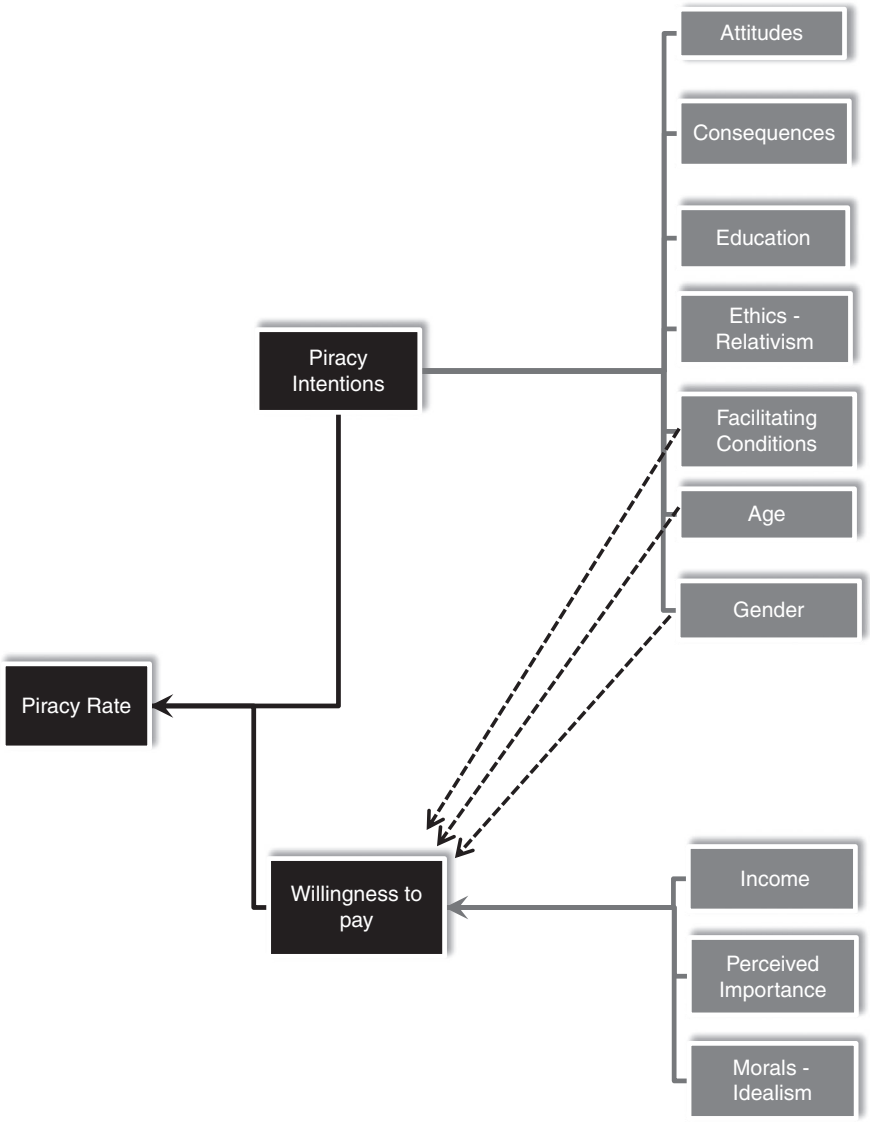

Figure 1.
Behavioural model of digital piracy

determined by income, perceived importance, facilitating conditions, moral judgment (idealism) and personal characteristics (such as gender and age):

$$Intentions = f\left(\underset{-}{\text{attitudes}},\ \underset{-}{\text{perceived consequences}},\ \underset{+}{\text{relativism}},\ \underset{-}{\text{education}},\ \underset{-}{\text{facilitating conditions}},\ \underset{-}{\text{age}},\ \underset{+/-}{\text{gender}}\right) \tag{2}$$

$$WTP = f\left(\underset{+}{\text{Income}},\ \underset{+}{\text{perceived importance}},\ \underset{-}{\text{idealism}},\ \underset{+}{\text{facilitating conditions}},\ \underset{+}{\text{age}},\ \underset{+/-}{\text{gender}}\right) \tag{3}$$

The expected impact of the independent variables in Equations (2) and (3) are detailed below.

Attitudes

Attitudes – i.e. an individual's feelings of joy, elation, pleasure, distaste or discontentment with respect to a particular behaviour – has long been acknowledged as the most important construct in social psychology (Allport, 1935; Triandis, 1980). Ajzen (1991, 2012) note that attitudes are key antecedents of intentions for individuals based on theory of planned behaviour, and much empirical research has provided support for this assumption. For instance, Trafimow and Finlay (1996) found that attitude was the best predictor of intention in 29 out of 30 studies. As it relates to piracy, several studies have shown that individuals who strongly view piracy as unethical will have a lower intent to pirate and vice versa (Taylor *et al.*, 2009; Wang *et al.*, 2009; Van Belle *et al.*, 2007; Leonard *et al.*, 2004; Peace *et al.*, 2003; Loch and Conger, 1996). Thus, this study postulates that there is a negative relationship between attitudes and digital piracy intentions.

Perceived consequences

Each act or behaviour is perceived as having a potential outcome that can be either positive or negative (Triandis, 1980). According to deterrence theory, individuals will defer from illegal activities or unethical behaviour if the perceived consequences are swift, certain and severe (Banerjee *et al.*, 1998; Williams and Hawkins, 1986). Moreover, embedded in the TPB is the assumption that the individual's choice of behaviour is based on the probability that an action will provoke a specific consequence (Ajzen, 1991). As such, a person's intention to pirate should be influenced by the potential outcomes (Robertson *et al.*, 2012). Hence, we expect that to find an inverse relationship between perceived consequences and digital piracy intentions.

Education

Education has been widely used as a variable to predict piracy rate (Eyun-Jung *et al.*, 2006; Shalden *et al.*, 2005; Marron and Steel, 2000). Generally, persons with higher levels of education are viewed to be more developed, both ethically and morally, and therefore are more likely to view piracy as unethical behaviour. Also, people with higher education are more informed of intellectual property rights, tend to have higher incomes and thus, more legitimate consumption of digital material. Hence, our hypothesis is that the level of education is inversely related to digital piracy intentions.

Relativism

A person's ethics is a primary determinant of their behaviour in response to any ethical issue. In this study, we utilize relativism to measure ethics. Relativism measures a person's attitude towards universal moral principles and rules: relativists reject universal moral principles and feel that the morality of a given action depends on the situation and individuals involved (Forsyth, 1980). Persons with low relativism contend that morality requires acting in ways that are consistent with moral principles (Ziegenfuss, 1999). This paper assumes that high relativists will have stronger intentions to commit digital piracy than low relativists.

Income

Income is commonly used in the piracy literature to provide insights about the ability or wiliness to pay for copyright goods (Chiang and Assane, 2009). Thus, we assume that a higher level of income is associated with a higher WTP.

Perceived importance

This variable measures the perception of the degree of importance of the ethical issue. Robin *et al.* (1996) find that individuals who rate an issue high in importance were less likely to behave unethically. Indeed, Van Belle *et al.* (2007) and Leonard *et al.* (2004) find evidence to suggest that perceived importance has a moderating effect on piracy. Hence, we expect positive relationship between perceived importance and WTP.

Idealism

Idealism measures a person's attitude towards causing harm to others. Idealists feel that harming another individual is always avoidable and avoid choosing the lesser of two evils if it may result in harm to other people. Persons with low idealism, or pragmatists, feel that some harm is often necessary to achieve some overall benefit (Forsyth, 1980). We hypothesize that persons with high idealism are more likely to participate in the legal market, and thus have a higher WTP for digital products than individuals with low idealism.

Facilitating conditions

From a theoretical perspective, facilitating conditions are in keeping with perceptions of behavioural control. Triandis (1980) suggests that facilitating conditions are objective factors in the environment that make it easier to commit an act. In this paper, facilitating conditions are those factors in an individual's environment that facilitate the act of piracy. Indeed, various studies (Wang and McClung, 2012; Wang *et al.*, 2009, 2011; Van Belle *et al.*, 2007; Leonard *et al.*, 2004; Cheng *et al.*, 1997) found the ease to commit piracy among the main factors that facilitate piracy. Against this backdrop, we expect that this variable will have a positive influence on digital piracy intentions, but reduce the amount individuals are willing to pay for digital goods.

Age

The literature suggests that older individuals have higher ethical standards than younger individuals (Prendergast *et al.*, 2002; Coombe and Newman, 1997; Ford and Richardson, 1994). A pirate profile by the MPAA reports that the 16-24 age group commits piracy at the highest rate (MPAA, 2005). As a result, it is expected that there will be weaker intent to pirate by older persons (Cockrill and Goode, 2012). This study assumes that age has a negative impact on digital piracy intentions and a positive impact on WTP for digital products.

Gender

Previous research hints that males tend to pirate more than women (Cockrill and Goode, 2012; Chiang and Assane, 2008; Sims *et al.*, 1996). Moreover, a pirate profile conducted by the MPAA reports that the typical worldwide pirate is male (MPAA, 2005). Overall, therefore, it is expected that the intent to commit digital piracy will be stronger in males than females. Since the gender variable is constructed to take on a value of 1 for males and 2 for females, the sign on this variable should be negative in the intentions model and positive in the WTP specification.

3. Data and methods

It has been argued that intellectual property theft tends to be more prevalent in developing countries, as it is less vigorously enforced (see Richardson and Gaisford,

1996). Moreover, the BSA reports that emerging economies have been the driving force behind the rapid increase software piracy in recent years, decisively outpacing the developed world (BSA, 2011). Hence, studying digital piracy in developing countries is important.

This study focuses on Barbados, a small island developing state located in the Caribbean. The country has a population of < 300,000 and a nominal GDP of about US$four billion and an internet penetration rate over 70 per cent as at June, 2012. Geographically, the country is divided into 11 sub-regions, known as parishes. The data used in the empirical section was obtained from survey methods. The authors opt to use a representative sample of Barbados. Hence, quota sampling based on census data was employed. The sample was stratified by gender, parishes and age based on the portions in reported in the population census. The study targeted the adult population of Barbados, hence all participants in the survey were 15 years and older. Trained graduates and research assistants were employed to conduct the administration of the survey to the Barbadian population. These assistants were instructed to obtain the desired number of persons in each identified demographic category, such as gender and age, for each parish. The actual selection of these people in the specific categories was done conveniently. The study targeted 400 Barbadian residents. The final sample comprised of 390 participants, indicating a 97.5 per cent response rate.

The main data-collection tool used was a structured questionnaire comprising several quantitative measures or scales, piracy patterns, WTP for various forms of digital products and participant demographics. Table I provides some summary statistics for the variables used in the study. There were 207 (53.1 per cent) females and 183 males (546.9 per cent) females. The average age of the sample was approximately 41 years. A plurality of respondents indicated that their highest level of education attained was secondary (32.3 per cent); the smallest category for this demographic was primary education (3.3 per cent). The majority of the sample (70.9 per cent) was employed and the average monthly income of employed respondents was BDS $ 2142.2 or US$ 1071.25. A description of the measurement and validity/reliability of the intentions, attitudes, perceived consequences, perceived importance, relativism, idealism and facilitating conditions scales are provided in the Appendix.

The theoretical models are estimated using ordinary least squares (OLS) multiple regression, Tobit estimation and quantile regression. OLS assumes that a linear relationship between the dependent variable and the independent variables exist subject to the Gauss-Markov assumptions. However, OLS estimates have been showed to be biased in the presence of censored or zero-inflated- = dependent variables such as the piracy rate or WTP variables. Indeed, several individuals in the sample indicated that they do not pirate digital material or are unwilling to pay for digital products. Hence, the study also used Tobit estimation techniques – the censoring model applied to a linear model with normal residuals – to estimate the digital piracy (Equation (1)) and WTP (Equation (3)) models. But, Tobit and OLS regressions only provide a partial view of the relationship: they can only provide information on the average relationship between the dependent and independent variables. A more complete picture could be attained by analysing the relationship between the variables at different points in the conditional distribution of income. Hence, quantile regressions are used to test the uniformity of the results across various quantiles. Specifically, it allows us to explore whether or not the impact of an independent variable differs across the distribution of the dependent variable. A key advantage of quantile regression, relative to OLS, is that

Variables	*Descriptions*	*Mean (SD)*
Actual piracy (%)	The share of digital products owned by the participant which were pirated	66.8 (39.2)
Intentions[a]	Respondents intend to pirate digital media	3.1 (0.6)
Willingness to pay (BDS $)	The amount of money a participant is willing to pay for various digital products	49.7 (34.5)
Perceived consequences	Respondents' perceived consequences of piracy	11.6 (2.9)
Attitudes	Measures a respondent's attitude to digital piracy	3.3 (0.7)
Ethics – relativism[a]	Measures a person's attitude toward universal moral principles and rules	3.6 (0.6)
Moral judgments – idealism[a]	Measures a person's attitude toward causing harm to others	4.0 (0.5)
Facilitating conditions[a]	Environmental factors that make piracy easier to do	3.7 (1.0)
Perceived importance[a]	The perception of the degree of importance to digital piracy	2.9 (0.6)
Income (BDS $)	Participant's monthly salary	2142.5 (1895.9)
Demographic variables	*n*	*Frequency (%)*
Gender		
Male	183	46.9
Female	207	53.1
Highest level of education		
Primary	13	3.3
Secondary	126	32.3
Technical/vocational	78	20.0
A-level/associate degree	70	17.9
Degree		
Bachelors	65	16.7
Postgraduate diploma	22	5.6
Masters/PhD	16	4.1
Age group		
15-19 years	38	9.7
20-29 years	80	20.5
30-44 years	115	29.5
45-59 years	81	20.8
60 years and over	76	19.5

Note: [a]Indicates that variable was measured on a five-point scale

Table I.
Summary statistics

the quantile regression estimates are more robust against outliers in the response measurements.

4. Results and discussion

Table II presents the estimated results, disaggregated according to the two stages of the conceptual piracy model (Figure 1). The first panel presents Stage I of the model – i.e. the determinants of piracy behaviour. The OLS estimates are consistent with our expectations outlined in Section 2: intentions contribute significantly and positively to individuals' piracy behaviour, while a person's WTP reduces digital piracy. Since the "piracy" variable is censored (zero for a substantial part of the sample, but positive for

Table II.
Empirical results

	OLS estimates	Tobit estimates	25th quantile	50th quantile	75th quantile
Panel 1: determinants of actual piracy					
Intentions	15.864***(1.590)	19.917***(2.042)	23.519***(1.692)	12.943***(1.467)	3.181***(0.675)
Willingness to pay	−0.290***(0.063)	−0.442***(0.079)	−0.248***(0.055)	−0.467***(0.052)	−0.182***(0.022)
Panel 2: determinants of piracy intentions					
Attitudes	−0.763***(0.104)	n.a.	−0.988***(0.135)	−0.898***(0.121)	−0.721***(0.104)
Perceived consequences	−0.079***(0.022)	n.a.	0.181(0.158)	−0.322***(0.075)	−0.256***(0.052)
Ethics – relativism	0.408***(0.108)	n.a.	0.096***(0.029)	0.096***(0.025)	0.104***(0.019)
Education	0.071*(0.040)	n.a.	0.438***(0.136)	0.340***(0.115)	0.407***(0.094)
Facilitating conditions	0.278**(0.139)	n.a.	0.038(0.055)	0.063(0.045)	0.025(0.036)
Gender	−0.100(0.120)	n.a.	−0.099(0.158)	0.035(0.138)	−0.034(0.113)
Age	−0.006(0.004)	n.a.	−0.003(0.005)	−0.010**(0.005)	−0.012***(0.004)
Panel 3: determinants of willingness to pay					
Income	0.001(0.001)	0.001(0.001)	0.002**(0.001)	0.002***(0.001)	0.001(0.001)
Perceived importance	13.772***(3.271)	13.532***(3.340)	7.345**(3.067)	9.309***(2.558)	21.859***(3.697)
Moral judgment – idealism	3.284(3.364)	3.597(3.486)	2.322(1.647)	6.274***(1.510)	3.722**(1.540)
Facilitating conditions	−5.836***(2.207)	−5.932***(2.242)	−7.557**(3.321)	−0.712(2.648)	−0.339(3.550)
Gender	−4.025(4.455)	−4.146(4.548)	1.659(3.491)	3.471(2.845)	−5.273(4.044)
Age	0.077(0.206)	0.050(0.210)	0.125(0.117)	0.063(0.099)	−0.167(0.147)

Notes: ***,**,*Represents statistical significance at the 1, 5 and 10 per cent levels of testing, respectively. SE are in parentheses

the rest), Tobit estimates are also presented to ensure that the results were not biased by the OLS estimation. These confirm the OLS results; intentions and WTP are highly significant determinants of actual piracy. Quantile estimates show that these determinants are statistically significant over the distribution of actual piracy.

Given that intentions and WTP influence piracy behaviour, the next logical question for persons interested in reducing the incidence of digital piracy would be "what determines intentions and WTP?" The second and third panels of Table II present these results. Looking first at piracy intentions[1], attitudes, perceived consequences of committing piracy, relativism, education and facilitating conditions are found to be significant predictors. Specifically, consistent with our hypotheses outlined in Section 2, we find that persons with less favourable views of piracy (more negative attitudes) have lower intentions to pirate digital material, perceived consequences of committing piracy reduce the intention to pirate, while high relativism and a facilitating environment increase piracy intentions.

A number of studies have emphasized the role of age, education and gender in digital piracy. For instance, studies by Cockrill and Goode (2012), Chiang and Assane (2008) and Sims *et al.* (1996), all find evidence that males tend to priate more than females; Prendergast *et al.* (2002) and Coombe and Newman (1997) found that older persons are less likely to engage in piracy, while generally, the literature suggests that education decreases piracy intentions, as educated individuals are more informed of intellectual property theft (Eyun-Jung *et al.*, 2006; Shalden *et al.*, 2005; Marron and Steel, 2000). In contrast, our OLS estimations suggest that neither gender nor age has a statistically significant impact on piracy intentions and that education increases the intention to pirate.

The robustness of the OLS results is checked via quantile regressions. The evidence suggests that attitudes, relativism and education, all have a significant impact in the 25th, 50th and 75th quantiles. However, the previously significant impact of facilitating conditions disappears. Also, the impact of perceived consequences and age varies as one moves along the intention distribution. Perceived consequences are insignificant at the 25th quantile but significant at the 50th and 75th. This implies that the impact of consequences is greater for persons at the top of piracy intentions distribution than those in the lower quantiles. More than this, the age variable, which was insignificant in the OLS regression, explains intentions at the 50th and 75th quantiles. Thus, age acts as a moderator of piracy intentions in the higher quantiles.

The final panel highlights the determinants of WTP. As expected, the more important the issue of piracy is perceived to be, the more a person is willing to pay for digital goods. This finding was significant across the board i.e. OLS, Tobit and Quantile regressions. Facilitating conditions affect WTP using OLS and Tobit estimation, but was only significant at the 25th quantile of the quantile regression. Surprisingly, we did not find a relationship between income and WTP using OLS or Tobit regressions. However, the impact of income seems to be hidden in techniques focused on the average relationship between the variables. The quantile estimates suggest that there is a significant relationship at the lower quantiles – the WTP of persons in the 25th and 50th quantiles increases with income. However, persons at the top of the WTP distribution seem to be unaffected by income. Like income, idealism has no impact on WTP in the OLS or Tobit estimations. However, (unlike income), the impact of this variable is significant in the higher quantiles. Finally, we turn to the case of gender. Finally, we find no evidence to suggest that gender impacts on an individual's WTP.

4.1 Discussion

This paper extends previous research on digital piracy by examining how intentions and WTP jointly determine piracy behaviour in Barbados, a small island developing state. Internet penetration in Barbados has grown tremendously, from 2.3 per cent in 2000 to 78.1 per cent as at June 2012, therefore ranking among the top 50 internet using countries. But, as internet penetration has grown, so has the rate of digital piracy highlighted by the increasing number of papers in the press (see Table III). Incidences of digital piracy in Barbados typically come to the fore during the summer months when the annual crop over festival takes place. During this period, thousands of bootleg CDs containing music produced and recorded by local artistes for the festival are sold or downloaded online.

Article	Date published
Anti-piracy workshop	12-May-05
Progress made in piracy fight	03-Jun-05
No Bag for the crown this year	07-Jun-05
Editor's Diary: caught in the "mix" of things	21-Jun-05
Piracy, a worldwide problem	25-Jun-05
Grynner lights up Hit Parade	26-Jun-05
Pirates a Hit	20-Jul-05
Theatre boss hails video swoop	24-Jul-05
Pirates strike again	09-Aug-05
DVD Dilemma	09-Aug-05
"Protect" cricket products	16-Nov-05
Pirates' Dream	03-Jan-06
Piracy Net	03-Feb-06
Warrant for Walrond	14-Feb-06
T&T man jailed for music piracy	17-Mar-06
Time to clamp down on piracy	04-May-06
Jamaica to tackle piracy problems	08-Jun-06
Two plead guilty to net piracy	10-Jun-06
Copyright laws "being left behind"	26-Jul-06
Net cause of fall-off in CD sales	29-Jan-07
Creative sector "falling behind"	23-May-07
Producers off-beat!	20-Jul-07
Bag full of ideas	10-Aug-07
Are artistes feeling pain as pirates take profits?	01-Oct-07
Heat is On	10-Oct-07
Hunt down the pirates	24-Jul-08
Over 4,000 pirated discs destroyed	17-Oct-08
Let's get the music pirates	17-Nov-08
Move to protect digital works	14-Dec-08
Pirates killing music industry	08-Aug-10
Intellectual Property Protection	01-Oct-11
What of knock offs?	20-Oct-11
Local film producers upset over piracy	20-Mar-12
Eyes on piracy	25-Jun-12
Video piracy a headache for cinemas	18-Jan-13
Inniss taking fight to pirates	16-Mar-13
Blood: piracy putting some out of jobs	14-Apr-13

Table III.
Piracy in the print media in Barbados

Source: www.nationnews.com

This has had increasingly adverse effects on the incomes of local artistes and producers. Hence, local artistes have embarked on intense lobbying of the Government to step up its efforts in fighting piracy. According to Lorde *et al.*, 2010, eliminating or significantly reducing the rate of digital piracy in Barbados is important for several reasons. For instance, it would permit local creators and innovators of digital products to reap the financial rewards of their efforts and also allow them to be the sole determinants of the commercial and public use of their work, thereby safeguarding their economic rights; aid in the development of the country's nascent digital industries, particularly the recording industry; provide local producers a better platform from which to access the global market; enhance the preservation of local culture and heritage; protect consumers from purchasing inferior and uncertified products and, foster local economic growth and development.

Recently, the Minister of Industry, International Business, Commerce and Small Business Development has recently promised to step up efforts to tackle intellectual property breaches, adding that:

> The issue of enforcement of intellectual property rights is by no means an easy task in today's technologically advanced world (www.nationnews.com).

Thus, the findings from this paper could have aid in fighting the rate of piracy in Barbados. First, the study finds that facilitating conditions – such as weak enforcement of anti-piracy laws, high-speed internet, cheap CD and DVD burners and even cheaper blanks - significantly affect the intentions to pirate digital media in Barbados. As facilitating conditions also reduce individuals' WTP, this suggests that the local environment is conducive to committing digital piracy. One option for policy makers would be to increase the cost of resources needed for piracy, for example, placing a charge on every CD or DVD burner to compensate for the lost revenue from piracy.

We also find evidence of relativism implies that individuals higher on the relativism scale are more likely to pirate. The survey data indicated that approximately 78 per cent of Barbadians are high relativists. So many individuals do not feel much guilt about committing piracy. This suggests that they may not consider that copyright holders were losing money due to piracy. They may even believe that copyright holders are making too much money to begin with. Local anti-piracy campaigns and laws should demonstrate that digital piracy is a real crime as opposed to a petty offence, and will be penalized as such.

The positive influence of education on intent suggests found in the paper that individuals with higher levels of education have higher intentions to pirate. At the same time, intent declines with age (at least in the 25th and 50th quantiles). As discussed above, these results may seem counter-intuitive, but an in-depth look at the survey information provides some explanation. Specifically, in this sample of 390 Barbadians, individuals who have attained make lower case bachelors, technical/vocational, secondary and a-level/associate degree certification are mainly from the 15 to 19 and 20 to 29 age groups. This demographic also has the highest intent to pirate; 53 per cent from each age group have a high intent to pirate. On the other hand, only the 60-and-over group had individuals who have at most a primary level of education. Just 8 per cent of the latter have a high intent to pirate. Thus the positive sign on education is partly due to the influence of age. The implications of these findings are that anti-piracy campaigns and education must target the youth, for example, the use of advertisements in movie theatres explaining how piracy affects the motion picture

industry as well as individuals that are a part of the industry. The intertwining relationship between education and age also suggests that piracy is related to overall socioeconomic status.

An interesting finding is that for individuals with relatively low WTP (25th and 50th quantiles) more income would increase the likelihood of them doing so. This evidence also supports the argument that piracy occurs more frequently among people with lower incomes (see Chiang and Assane, 2008). The significance of income seems to suggest that the overall economic development level of a country may provide a market demand for pirated items in general. This facilitates the formation and development of black market networks that sell pirated products. The availability and ease of obtaining pirated products (facilitating conditions) may also act to eliminate the lines between the poor and the rich. High-end firewalls to prevent the illegal trading of digital media may be one solution; however, internet service providers have been reluctant to block file sharing software for fear of losing customers.

We also report that attitudes and perceived consequences reduce intent while perceived importance and idealism increase WTP. The strength of these relationships indicates that the more likely an individual views piracy as unethical, the less likely the individual will commit digital piracy. Moreover, if individuals perceive that authorities will not even enforce existing laws, then simply having the laws on the books will do little to create change, if the laws are not enforced. Punishments should be clearly defined and communicated to the relevant audience. Prevention and control of digital piracy in Barbados may therefore have to consider such nuances when drafting laws and policies.

5. Concluding remarks

This paper builds behavioural model of digital piracy that draws extensively on the empirical work developed by Triandis (1980) and WTP models. The model consisted of two stages. In the first stage, an individual's rate of digital piracy is modelled as a function of piracy intentions and the WTP for the product. The second stage then identifies the factors influencing piracy intentions and WTP for digital goods. This approach is quite novel, as most studies do not combine these notions.

Our analysis shows that the proposed two-stage model is a useful tool for analysing digital piracy. Intent is the largest predictor of actual digital piracy. Factors predicting intention can be expected to vary across countries, so it is useful to determine which factors are most important in Barbados. Attitudes, perceived consequences, relativism, education and facilitating conditions had the largest impact on piracy intention in the proposed model. The antecedents of WTP were perceived importance, facilitating conditions and to a lesser extent, income and idealism. Contrary to expectations, the gender of respondents was not found to be a significant predictor of intentions nor WTP in this study. Taken together, the study imply policies for the prevention and control that only speak to consequences of digital piracy may have limited impact if they ignore nuances related to the environment, income and the personal ethics, socio-psychological traits and education of residents.

Though this study provided a first step in bridging psychological, social and economic aspects of digital piracy, it is not without its limitations. Though the study was a representative sample of the country (unlike previous studies focused on college students), the study captured approximately 400 participants and may not be adequate enough to generalise to the larger population. Future research is advised to capture much larger and representative samples (approximately 800-1,000 participants).

Note

1. Tobit estimates are not provided for this variable as it is not censored.

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Further reading

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Appendix

Measures/scales

Composite scores were computed for each measure. These measures were taken from prior research studies which have demonstrated strong evidence of their high reliability and validity. This evidence provided the basis on which the selection was made.

Attitudes were measured using seven items measuring respondents' attitudes towards piracy; this measure was derived from prior research (Woolley and Eining, 2006). Items were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores on this measure indicated more unfavourable attitudes towards the practice of piracy (Sample item: I believe there is a chance of getting caught pirating digital media). The validity and reliability were deemed adequate for this scale in prior research; for example, the reliability estimate for this scale in a past research study by Woolley and Eining was above 0.70. The Cronbach's α for this study was 0.68.

Perceived consequences were measured using five items measuring respondents' perceived consequences of piracy. Items were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores on this measure represented stronger beliefs of negative consequences regarding the practice of piracy (Sample item: I believe there is a chance of getting caught pirating digital media). This scale was derived from validated scales in prior research based on research by Limayem *et al.* (2004). In the previous study, this scale was reported to have high validity and reliability estimates above 0.80 and 0.70, respectively. The Cronbach's α for this study was 0.60.

Perceived importance was measured using four items measuring what respondents' think the penalties for selling, buying, downloading and copying digital media should be. Items were scored on a four-point scale, capturing the severity of the punishment, ranging from no penalty: (1) to a fine and imprisonment (4). Higher scores on this measure represented stronger beliefs that piracy is serious issue. The Cronbach's α for this study was 0.84.

Facilitating conditions were measured using five items which capture objective environmental factors that make piracy easier to do (Sample item: there is a weak enforcement of anti-piracy

laws). Items were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores on this measure represented higher perceived levels of facilitating conditions regarding the practice of piracy. This scale was derived from validated scales in prior research by Limayem *et al.* (2004). In the previous study, this scale was found to have high validity and reliability estimates above 0.80 and 0.70, respectively. However, the Cronbach's α for this study was 0.45, suggesting the reliability was a bit low in this sample.

Idealism and *relativism* were two measures adapted from an ethical orientations questionnaire or the EPQ (Forsyth, 1980). Idealism and relativism were each measured using five items based on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores on the idealism scale (e.g. Moral actions are those that closely match ideals of the most "perfect" action) and relativism scale (e.g. what is ethical varies from one situation and society to another) represented higher levels of idealism and relativism, respectively. Forsyth (1980) had revealed good evidence of reliability for both scales above 0.70. Cronbach's α for idealism and relativism for this research were 0.59 and 0.66, respectively.

Piracy intentions were measured using four items which highlighted the extent to which respondents intend to pirate digital media (Sample item: I intend to pirate digital media in the future). Items were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Adapted from Limayem *et al.* (2004), this piracy intentions scale (like the scales measuring beliefs, attitudes and facilitation conditions) were derived from validated scales in prior research. Limayem *et al.* (2004) tested the validity and reliability of this piracy intentions scale and revealed high validity and reliability estimates above 0.80 and 0.70, respectively. The Cronbach's α for this measure in this research was 0.96.

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