



INTELLECTUAL
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Private Copying

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This is an independent report commissioned by the Intellectual Property Office (IPO)

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Summary

This study was commissioned by the UK IPO to collect data on whether and how four copyright industries – music, film, publishing and software – have (or not) adopted private copying measures, and on whether the price of the products in the UK reflect a right to private copying.

The data

Music: The dataset consists of 18,958 observations including albums in several formats (digital files, CDs, Vinyl discs, audio cassettes, etc.). The analysis covers 17,272 albums and focused on digital albums and CDs (for which details on number of tracks were available).

Film: The dataset contains 3,515 products, which includes both digital films and films embedded in physical media (Blu-ray discs, DVDs, and VHS). The dataset also covers bundles, i.e. packages in which the same film is offered in multiple formats, and which may also include the possibility to download a digital copy of the film.

Books: 2,071 observations on books (534) and e-books (1,537) sold by five online retailers: Amazon, GooglePlay, iTunes, Kobo and Waterstones, selected according to top-100 sales and review lists.

Software: 1,008 observations across several types of software categorised by: operating systems, software for productivity, utilities, design & publishing, photography, music & audio, finance, and other software types.

The analysis

Music: Interpreting the copying conditions in the terms of sales of different suppliers and formats was, in some cases, problematic, due to internal contradictions of some of the copying conditions and terms of sale. The data collected were analysed using regression analysis. Despite the large sample size, the results of the analysis were affected by the lack of variability in the explanatory variables. Quantifying the exact number of copies permitted has been impossible as all the stores examined allow an unlimited number of copies. For these reasons the regression analysis produced undetermined results.

Film: The data were analysed according to the number of discs in a package, the kind of format a film is sold in, the type of 'bundling' and the type of additional copy included in the bundle. Digital films are on average cheaper than the other formats, even though they can be copied more times (five copies), while bundles of different formats are associated with a higher price.

Books: The data analysed were the number of copies permitted by the sampled online bookstores; regression analysis has been used to find out whether retailers charge users for allowing more copies. The lack of variability in the explanatory variables about the number of copies and kinds of devices could affect the results of the analysis for two main reasons. First, the differences between the default number of copies allowed by the stores (either five or six) are minimal. Second, it is not possible to know the real number of copies associated with an eBook without purchasing it, or obtaining additional data from publishers. For these reasons, the results of the analysis are undetermined.

Software: Data for this industry were collected based on information on the number of copies allowed by the licence, price, publisher, whether it is an update, and the delivery method (download, CD/DVD or download with a back-up disc).

Main findings

Music: We did not find any evidence in support of a widely-held view that stores are including in their price the permission to copy. All digital albums are allowed to be copied for personal use, as opposed to CD albums that cannot be copied. In spite of this, we found that digital music is associated with a lower price compared to a CD. Whether the lower price depends on the store, on the intangible nature of the product, or on the possibility to copy, cannot be determined due to the lack of variability in the explanatory variables. However as private copying for personal use is widespread and allowed in the UK, it is plausible that private copying is already largely or fully priced in the UK market. Consumers and producers of music appear to expect that music will be copied for personal non-commercial use and all downloads are sold on these terms.

Films: In parallel with traditional films, which come with only one license (e.g. Blu-Ray and DVD), the film industry has found different ways to allow users to have more than one copy of the films they purchase. Examples can be found in the sales of digital films (which could be copied onto a number devices), by bundling multiple formats in the same package (which may also include a complimentary downloadable digital copy), or through new kinds of licenses, such as Ultraviolet. We found a positive relationship between price and film copies. In particular, since different types of formats have different impacts on price, we can conclude that film stores charge users not simply to have more copies, but to have the opportunity to choose from a higher variety of available choices.

Books: All the bookstores in the sample allow users to make copies of their eBooks. In particular, the copying terms and conditions are enforced using technologies embedded in the eBooks (DRMs) which are able to limit the number of copies that users is allowed and the kinds of devices in which the eBooks may be read on (e.g. smartphones, tablets, eBook readers). The influence of the number of copies allowed and the number of allowable devices on the price could not be determined because (1) of the lack of variability in the explanatory variables, and (2) to the fact that the large majority of price dissimilarities were captured by the difference between traditional books and eBooks. However, when considering that they are allowed to be copied, eBooks are on average less expensive than physical books (which are not allowed to be copied). This premium for a physical book is of course likely to be explained by manufacturing costs and the value consumers place on physical features, rather than on the number of copies that can be made from it.

Software: This market case was used partly as a control case as it would notionally not be affected by a private copying exception. However, it is a sector, which actively tries to price for additional copies. The analysis suggests that software producers charge a price that reflects the possibility of making additional copies. In other words, a higher number of copies is associated with an increase in the price. However, this effect becomes smaller as the number of copies increases.

Music industry analysis

The music dataset includes albums in several formats, such as Audio Cassette, CD, digital music, Blu-ray, DVD, Mini-Disc, VHS Tape, Vinyl. For the purpose of this analysis, only digital music and CDs, for which we have details on the album's number of tracks, will be considered (17,272 albums).

Four online stores selling CDs and digital music are included in the analysis: 7Digital, Amazon, HMV and iTunes. 7Digital and iTunes only sell digital music, while Amazon and HMV sell both digital music and CDs.

In terms of the number of copies allowed of the music purchased from these stores, some clarification needs to be made. First, the licenses for copying are not at album level, but at store level; every store has one policy for all the music in its catalogue. Second, the stores have different policies regarding the making of legal copies of the digital music they offer¹.

- **7Digital** refers to the usage of the music purchased from their store in two different sections of their terms and conditions (2.1 and 8.4). In 2.1, they allow users to make copies for personal use; in 8.4 they do not mention the word “copy”, but only note that the use should be “*reasonably necessary for personal, non-commercial use*”. Therefore, the number of copies seems to be unlimited. However, no mention is made of the possibility to burn the music into CDs, not even in their support/help pages.
- **Amazon** allows users to copy, store, transfer and burn the music purchased only for personal, non-commercial, entertainment use. Amazon does not specify a maximum number of copies or devices, therefore the number of copies could be assumed to be unlimited.
- **HMV** allows users to burn any playlist of songs up to seven times, and to transfer the recording to a maximum of five portable devices (source: help page titled: ‘*Digital Terms and Conditions*’). However, in another webpage (*Terms and Conditions of Use*) they state: “*you are not authorised to make any copies of any downloads other than for your own personal non-commercial use*”. This can be interpreted in two ways: 1) the five allowed copies should be for personal use; 2) the number of copies allowed is unlimited. However, the limit of five copies and seven CDs is not in the terms and conditions that the users are informed about when they purchase a song. Therefore, we can conclude that HMV offers an unlimited number of copies.
- **iTunes** allows users to copy the music on “*up to five different accounts at a time on compatible devices*”. In addition, users are also allowed to burn audio playlists up to seven times. It is not clear how many times the tracks may be copied since users are allowed to create playlists combining different single-tracks or picking these tracks

1 The appendix A includes some excerpts from the terms and conditions of each online store. It also provides the sources for them.

from different albums. iTunes also sells one category of product called iTunes Plus, which can be copied to an unlimited number of devices. iTunes terms and conditions state that “*iTunes Plus products do not contain security technologies limiting their usage, and therefore users can copy, store and burn iTunes products as reasonable necessary for personal use*”. Nowadays, all the albums sold by iTunes are ‘plus’ products. For this reason we conclude that iTunes music also can be copied without limits for personal use². However, it is not clear why they still mention the limit of five computers and seven CDs.

Regarding the purchase of a CD, users are not allowed to make a copy of the CD or to transfer its tracks into a portable device. Table 1 summarises the number and kinds of copies per store and type of product.

Table 1. Stores, types of products, number and kinds of copies

Store	Type of product	Number of copies allowed	Possibility to burn into a CD	Possibility to copy into a portable device
Amazon	CDs	None	No	No
HMV	CDs	None	No	No
7Digital	Digital music	Unlimited	No	Yes
Amazon	Digital Music	Unlimited	Yes	Yes
HMV	Digital Music	Unlimited	Yes	Yes
iTunes	Digital Music	Unlimited	Yes	Yes

The following analysis on the effect of copies on prices is divided in two parts. The first part will present tables with average prices and with tests of differences in means (t-test and ANOVA). The second part will use regression analysis to test whether the possibility of making additional copies of the music purchased from the four stores is associated with an increase in product price.

Table 2. Average price and average price per track by store

Store	Average price	Average price per track
7Digital	7.86	0.56
Amazon	4.78	0.64
HMV	7.96	0.59
iTunes	6.04	0.60
Significantly different (ANOVA F-test)	yes	yes

2 This is confirmed by an Apple press release dated January 2009. <http://www.apple.com/pr/library/2009/01/06Changes-Coming-to-the-iTunes-Store.html> (last accessed 28 January 2013).

Table 2 shows the average price and average price per track by store, including all the kinds of albums sold (CD and digital ones). Amazon is the seller with the lowest average price, followed by iTunes. 7Digital and HMV have a similar average price. However, if we consider the average price per track the situation changes. Amazon has the highest average price per track. This might be due to the fact that Amazon is selling a large number of short albums (e.g. singles, EP, etc.). Finally the ANOVA³ test shows that the differences are statistically significant for both price and price per track.

Table 3. Average price and average price per track by store and type of product

Store	Type of product	Average price	Average price per track
7Digital	Digital music	7.86	0.56
Amazon	Audio CD	7.44	0.55
	Digital music	3.31	0.68
HMV	Audio CD	8.91	0.67
	Digital music	7.05	0.52
iTunes	Digital music	6.04	0.60
Significantly different (ANOVA F-test)		yes	yes

Table 3 reports the average prices both by store and type of product. For example, in this case, Amazon CDs and Amazon digital albums are considered separately. The results seem to confirm the results presented in the previous table. Amazon's average price for digital music is significantly smaller than any other competitor, however, the price per track is the highest.

Table 4 shows the difference in the average prices of CD albums and digital albums. CDs cost significantly more than digital albums (confirmed by a t-test⁴). However, if we consider the average price per track, the prices seem to be very similar. This is also confirmed by the results of the t-test showing that there are no significant differences between the average prices per track of CDs and digital albums. One explanation of these results is that a CD might have, on average, more tracks than digital albums or additional bonus tracks. Nonetheless, this result suggests that the number of tracks should be included as one of the control variables in the regressions carried out in the second part of the analysis.

Another explanation may be found in the number of copies. Users are not allowed to make a copy of the CD albums they purchase or to copy the music into a portable device. In the case of digital music they are explicitly or implicitly allowed to do that (see Table 1). This means that the difference between the average price of CDs and digital music may reflect these different copying allowances. However, this is not confirmed by the data since the average

3 The ANOVA test is used to test whether there is a difference between the average price (or price per track), when more than two groups are considered (in this case four stores). 'Yes' means that the differences are statistically significant at 0.01 level.

4 The t-test is used to test whether there is a difference between the average price (or price per track), when only two groups are considered. 'Yes' means that the difference is statistically significant at 0.01 level.

price of a CD is higher than the average price of a digital album, while there are no significant differences between the average price per track of CDs and digital albums. This may be due to the fact that CDs are embedded in physical and tangible artefacts, which cost is likely to be higher than the one of a pure digital copy.

Table 4. Average price and average price per track by type of product

Type of product	Average price	Average price per track
Audio CD	7.88	0.58
Digital music	6.22	0.59
Significantly different (T-test)	Yes	no

The preliminary results of the previous Tables do not provide any evidence in support of a widely-held view that online stores charge higher for additional copies. Regression analysis is one possible way to test if there is a relationship between copies allowed and price.

We performed two series of regressions using two dependent variables: album price, and average price per track (album / number of tracks), and we estimated four different models for each dependent variable.

Table 5. Results of regression analysis – Dependent variable: price

	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff	Std.Err.
Number of tracks	.118***	.002	.118***	.002	.119***	.002	.119***	.002
Short album	-4.374***	.077	-4.305***	.077	-4.126***	.083	-4.035***	.085
Top 20	-.250***	.068	-.528***	.081	-.510***	.081	-.308***	.103
Digital Copies allowed			-.773***	.123	-.488***	.132		
CD copy					-.431***	.073		
Amazon (only digital music)							-.317**	.142
iTunes							-1.264***	.141
7Digital							-.613***	.197
HMV (only digital music)							-.692***	.145
R2	.408		.409		.410		.411	
F-test sig.	.000		.000		.000		.000	

* significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level

Table 5 shows the results of the regressions using price as dependent variable. Model (1) only includes the following control variables:

- Number of tracks.
- Short album. 1/0 variable indicating whether the album is short, e.g. single album, 1-track album, Extended Play album (EP), Digital 45 (this term is used by iTunes to identify some sorts of digital single albums).
- Top 20. 1/0 variable indicating whether the album has been listed in the UK top 20 during the period 1990-2012.

All the variables are significant at 0.01 level. *Number of tracks* has a positive impact on price, *short album* a negative and quite strong effect on price (short albums cost on average and *ceteris paribus* about £4 less than normal albums), and *top 20* has a negative effect (most popular albums seem to cost less than the others).

To elaborate further Model (1) produced somewhat expected results; Model (2) attempted to add the variable *Digital / Copies allowed*. This is a dummy variable (1/0) measuring two things. First, whether the album is digital compared to the case of a CD. Second, whether the album tracks could be copied into other computers or portable devices. We did this because all the stores in the sample allow users, at least implicitly, to do copies of the digital albums if they are for personal use (see Table 1). By including this variable, the significance and sign of the other variables do not change. Moreover, its coefficient is highly significant and negative in sign. These confirm the results shown in Table 4, indicating that digital albums cost less than CDs. The results here also suggest that the possibility of making copies of the music into portable device is not reflected in a higher average price.

Model (3) adds another variable (*CD copy*) to consider whether the store is clearly informing users that they can copy the digital music into a CD (only one store – 7Digital – does not specifically mention the possibility to create CD copies). As with the case of the variable *digital*, *CD copy* is also significant and has a negative sign.

Finally, Model (4) includes four dummy variables, one for each of the stores included in the sample (for the stores that sell both CDs and digital music, such as Amazon and HMV, the dummy variable includes only digital music). All the coefficients are significant and negative, which means that digital music prices seem to be lower than CD prices regardless of the online store. The store with the highest coefficients is Amazon, which suggests that Amazon digital products are associated with a lower price compared to the other stores.

Table 6. Results of regression analysis – Dependent variable: price per track

	Model (1)		Model (2)		Model (3)		Model (4)	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Std.Err.	Coeff.
Short album	.277***	.006	.283***	.006	.303***	.007	.302***	.013
Top 20	.018***	.006	-.007	.008	-.005	.007	-.025***	.007
Digital Portable device			-.069***	.011	-.030**	.012		
CD copy					-.058***	.007		
Amazon (only digital music)							-.084***	.013
iTunes							-.111***	.013
7Digital							-.047***	.013
HMV (only digital music)							-.059***	.018
R2	.101		.103		.106		.107	
F-test sig.	.000		.000		.000		.000	

* significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level

Table 6 shows the same estimations using *price per track* as dependent variable. In this case, the control variable *number of tracks* is not included since it is already part of the dependent variable. The results of all the models are very similar to the ones presented in Table 5, with only some differences in the coefficients of the *top 20* variable, which is positive in Model (1) and not significant in Model (3).

Overall, the analysis on the impact of the number of copies on price for a sample of digital and CD albums has produced puzzling results. These could be explained by a number of factors. First, the analysis is probably affected by an omitted variable issue. The R2 shows the percentage of the variability in the dependent variable (price) which is captured by the model. The models estimated using price as dependent variable capture approximately 40% of price variability (and much less in the case of price per track). Second, a main problem with music recordings is that music is essentially an “experience” good whose value depends on several factors. Some of these factors are latent and intangible (such as tastes, fads, consumers’ subjective preferences, etc.) and are very difficult to measure. Third, other factors are technically measurable but very difficult to collect (such as advertising expenditures, radio plays, promotional campaigns, etc.). The fourth factor pertains to the variability of the explanatory variables. All the stores sampled allow the possibility to copy the digital music into a CD or into a portable device for personal use (with the only exception of 7Digital, which does not explicitly mention the possibility of burning a CD with the purchased music, already noted above). This creates a problem as it is not possible to control for both the copying possibilities and the store at the same time because these variables would overlap. Moreover, the exact number of copies cannot be quantified since the limit is ‘personal use’.

In summary, none of the results seems to support the claim that online stores are charging for digital copies. Therefore, according to our sample, an assumption or view that online stores embed an additional cost into their product price for copying remains ambiguous.

Film industry analysis

The dataset consists of 3,515 products divided into five categories⁵.

- Blu-ray discs
- DVDs
- VHS tapes
- Digital films. These are digital films that can be purchased and downloaded without being embedded in any physical medium (streaming services have not been considered). The only seller of this kind of products in the sample is iTunes.
- Bundles. These are bundles of products including one or more physical media (e.g. DVD, Blu-Ray), which may also include the possibility to download a digital copy of the film. In some cases, the downloadable digital copy comes with an Ultraviolet license⁶.

While digital films are sold as individual downloads, sometimes DVDs, and Blu-Ray discs are sold in packages. These packages are different from bundles. In brief, movie packages contain different movies (or bonus discs) and are sold in one package. Each disc in the package comes with only one license. In contrast, bundles include the same film in different formats, which means having an additional license for each format in the bundle. In some cases we also found bundles of packages. See Table 7 for some examples of packages and bundles.

Table 7. Examples of packages and bundles:

	Example	Number of discs	Number of copies
SINGLE FILM	The Matrix DVD	1	1
FILM PACKAGE	The Matrix Trilogy	3	1
SINGLE FILM BUNDLE	The Matrix bundle (DVD+Blu-Ray)	1	2
FILM PACKAGE BUNDLE	The Matrix Trilogy bundle (DVD+Blu-Ray)	3	2

5 Note: the dataset also contains some UMDs (Sony's Universal Media Disc for PlayStation Portable). However, due to the small number of observations they have been excluded from the analysis.

6 This kind of license is particularly interesting as it offers a very broad license with options to watch films on multiple devices, with up to five copies in some cases, and a possibility to share the license with other people (<http://www.uvvu.com>).

The product price reflects both the number of discs in the packages, and the number of copies allowed. The number of discs in the package is captured by the variable *number of discs*, while the variable *number of copies*, is measured as follows:

- For VHS, DVDs and Blu-rays, it is one per product.
- For iTunes digital copies, it is 5 copies⁷.
- For products sold in bundles, the number of copies is the sum of the items in the bundle (including the digital copy)⁸.

The second column in Table 8 shows the average price of the products. The average price of DVDs is £12.26. Compared to DVDs, VHS tapes are much cheaper, while Blu-Ray discs are on average more expensive (£14.90). Digital films (only purchasable from iTunes) are much cheaper than DVDs and Blu-Ray discs, with an average price of £7.80. The most expensive products are those sold in bundles (£16.42).

Table 8. Average price of products per kind of format

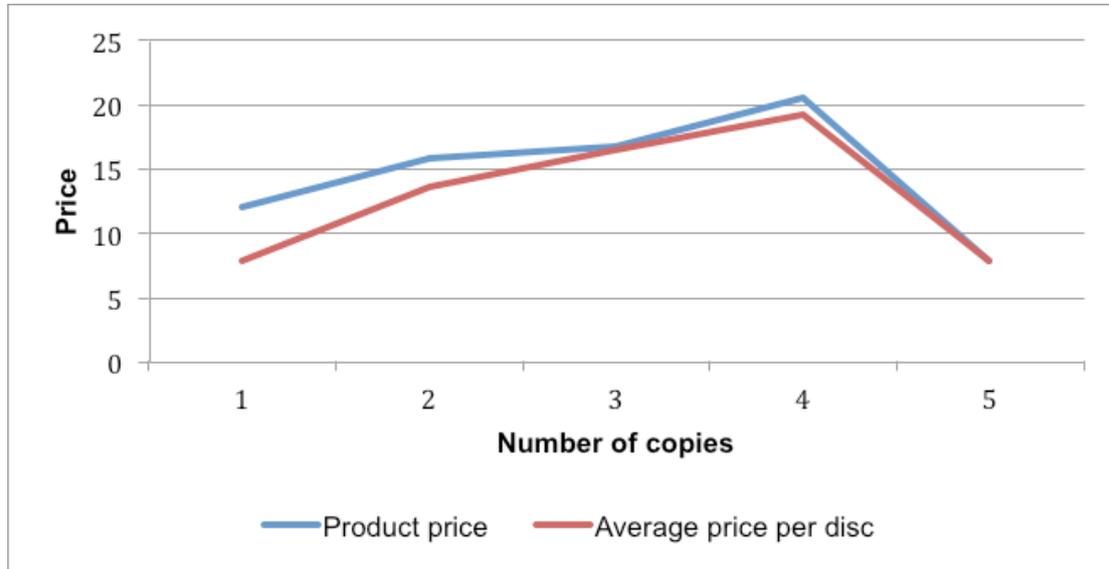
Type of format	Average price	Average price per disc	Average price per disc per copy
Blu-Ray	14.90	9.65	9.65
Bundle	16.42	15.06	6.14
Digital	7.80	7.80	1.56
DVD	12.26	7.89	7.89
VHS Tape	4.78	4.23	4.23
Average	11.84	8.33	7.12

Note: based on a total of 3515 products.

If we consider film packages and bundles (second and third columns), the average price drops. The average price per disc is significantly lower for DVDs and Blu-Ray discs. Since digital films are sold individually, the average price per disc does not change. The average price of bundles does not change much as well. However, if we consider the average price per disc and copy, the average price of bundles is equal to £6.14, and it is significantly lower than the other physical media (Blu-Ray, DVD, and VHS). Also the price of digital movies is much lower if we consider the number of copies allowed. This is because iTunes allows users to copy the film up to five times.

7 In principle iTunes permits more copies since users are also allowed to copy the film into all their portable devices.

8 In some cases the possibility to watch the movie via streaming is allowed. Since in this case users do not own another copy of the film, this possibility is not considered as an additional copy.

Figure 1 Average price per number of copies

The product price and average price per disc follow a very similar pattern. The relationship between number of copies and price appears to be a positive. But this result holds only up to four copies. An increase in the number of copies seems to be associated with an increase in the product price. However, the average price dramatically drops when the copies are equal to five. One plausible explanation for this could be related to the fact that the only kind of product allowing five copies is iTunes digital films. In the case of digital films it is possible to create an exact copy of the movie with virtually no additional costs, while in all the other cases, one additional copy means one additional physical medium. Therefore, according to Figure 1 above, film sellers seem to establish a price that incorporates the possibility of having one or more additional physical copy of the films, and not for the option of making more digital copies.

We tested whether the number of copies has an impact on the product price by performing regression analysis on the film dataset. Table 9 summarises the results.

Model (1) only includes some control variables and will be taken as a reference for the other regressions.

- Dependent variable: price of the product
- Control variables:
 - Number of discs (controlling by number of discs takes into consideration the existence of products sold in packages)
 - Dummy variables per kind of format (Blu-Ray, VHS, Digital Movie, Bundle). The dummy variable 'DVD' has been omitted to avoid perfect multicollinearity, therefore, the average DVD price will be used as the reference price.

Table 9. Results of regression analysis

	Model (1)		Model (2)		Model (3)	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Number of discs	4.233***	.130	4.229***	.130	4.227***	.129
Blu-Ray	2.572***	.437	2.572***	.437	2.546***	.436
VHS	-4.758***	.589	-4.760***	.589	-4.788***	.587
Digital	-1.428**	.562	-3.316	3.863	-1.458***	.561
Bundle	3.523***	.676	2.799*	1.614		
Number of copies			.471	.954		
Bundle: DVD					-3.130***	1.146
Bundle: Blu-Ray					2.085	1.329
Bundle: Blu-Ray 3D					4.307***	1.629
Bundle: Digital copy					3.334**	1.358
Bundle: UltraViolet digital copy					5.424**	2.166
R2	0.288		0.288		0.292	
F-test sig.	.000		.000		.000	

* significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level

All coefficients are highly significant (0.01 level). An increase in the number of discs is associated to a higher price. Moreover, Blu-Ray discs cost more than DVDs, while VHS costs less. Also digital downloads have a lower average price. On the contrary bundles are the products that are most highly priced.

Model (2) adds the number of copies to the model. According to the regression results, the number of copies allowed does not have any effect on price, since the coefficient is not significant.

Since the number of copies is not significant, in Model (3) the copies are added in a different way. Instead of a quantitative measure for the number of copies, these copies are qualitatively included in terms of the kinds of formats/copies.

Five dummy variables are included in the model, each of them representing one potential kind of format which may be included in the bundle (DVD, Blu-Ray, Blu-Ray 3D, Digital Copy, UltraViolet Digital Copy).

First, the results indicate that the sign and significance of the control variables' coefficients do not change, while most of the new variables have significant coefficients. DVD and Blu-Ray discs are the most common kinds of formats. Including them in the bundle seems to have a negative effect on the price for DVDs and a non-significant effect for Blu-Rays. Other kinds of copies have all significant and quite strong impacts on price. For example, Blu-Ray 3D has a coefficient of 4.307, indicating that the price of the product increases when this kind of disc is included in the bundle. Similarly, offering the possibility to download a digital copy of the movie has a positive impact on the price (3.334). The variable with the highest coefficient is an UltraViolet digital copy (5.424). This is probably because this kind of digital

copy has a quite generous license in terms of the number and kind of devices (including portable ones) in which the digital film can be copied to and watched, with also the possibility to share the license with up to five other people.

In conclusion, although Figure 1 showed that the average price increases with an increase in the number of copies (up to four copies), the regression analysis does not confirm this result, showing that the number of copies allowed does not seem to have a significant impact on price. This may be due to the fact that the kind of product that comes with the highest number of copies (digital films) is also the product with the lowest average price. Digital films can in fact be copied up to five times. However, they are cheaper than any other product in the film dataset since they are not embedded in any physical and tangible medium.

However, if the number of copies is not entered quantitatively, but qualitatively, i.e. the kinds of formats are included in the bundles, the results change, and additional copies have an impact on price. Not all the formats have the same impact. In particular, DVDs have a negative impact on price, Blu-Rays have no effect, and Digital Copy, Blu-Ray 3D and UltraViolet Digital Copy have a positive effect. This seems to indicate that film publishers charge users not simply to have more copies, but to have a higher variety of available choices. This is also confirmed by the fact that more *sophisticated* kinds of formats, such as Blu-Ray 3D and UltraViolet Digital Copy, are also those with the highest coefficients.

The same analysis was performed with the dependent variable in natural logarithm. See Table 10 below. This means that the effect of an increment in the independent variable can be interpreted as percentage changes. The results are more or less the same as the regressions without logs. The only difference is that in model (3) *Bundle: DVD* is not significant and *Bundle: Blu-Ray* is significant.

Table 10. Results of regression analysis (in natural logs)

	Model (1)		Model (2)		Model (3)	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Number of discs	.254***	.013	.253***	.013	.253***	.013
Blu-Ray	.446***	.043	.446***	.043	.443***	.043
VHS	-1.274***	.058	-1.274***	.058	-1.277***	.058
Digital	.166***	.055	-.118	.380	.163***	.055
Bundle	.600***	.067	.490***	.159		
Number of copies			.071	.094		
Bundle: DVD					-.080	.113
Bundle: Blu-Ray					.327**	.131
Bundle: Blu-Ray 3D					.339**	.161
Bundle: Digital copy					.322**	.134
Bundle: UltraViolet digital copy					.625***	.214
R2	0.288		0.288		0.292	
F-test sig.	.000		.000		.000	

Publishing industry analysis

The dataset for books includes printed books and eBooks. Five online stores were considered: Amazon, GooglePlay, iTunes, Kobo, Waterstones. Amazon is the only retailer that sells both books and eBooks. The dataset includes a total of 2071 observations (534 books, and 1537 eBooks). Originally, the dataset also included 162 audiobooks, which have been excluded from the analysis since these kinds of products are essentially audio files, not directly comparable with books.

The eBooks are sold in three formats. All the stores adopt ePub-Adobe format, with the exception of Amazon, which uses the Kindle format, and iTunes that uses ePub-Fairplay format.

Regarding the number of allowed copies of the eBooks, in principle, every single eBook could have a different number of allowed copies but this depends on the publisher. However, this information is not available unless the book is purchased. Second, different kinds of eBook formats come with a standard or default number of copies⁹. In particular, ePub-Fairplay eBooks can be copied up to five times, while Kindle and ePub-Adobe eBooks are allowed to be copied up to six times. Unlike the case of music, all the eBooks in the sample are protected by some kind of DRM (Digital Right Management), which is a technology that limits the use of the eBooks in terms of copying, printing and sharing.

Table 11. Stores, types of products and licenses

Store	Type of product	Format	Number of copies	Number of compatible devices
Amazon	Books	-	1	1
iTunes	eBooks	ePub-FairPlay	5	2 (smartphone, tablet)
Amazon	eBooks	Kindle	6	4 (PC/Mac, eBook reader, smartphone, tablet)
Kobo	eBooks	ePub-Adobe	6	4 (PC/Mac, eBook reader, smartphone, tablet)
GooglePlay	eBooks	ePub-Adobe	6	4 (PC/Mac, eBook reader, smartphone, tablet)
Waterstones	eBooks	ePub-Adobe	6	4 (PC/Mac, eBook reader, smartphone, tablet)

⁹ More details on the terms and conditions and allowed copies of each format can be found in the appendix B.

In addition to the number of copies, another factor to be considered is the kinds of devices from which the eBooks may be copied and read. There are four devices that are most commonly mentioned in the stores' websites: PC (or Mac), eBook reader (such as, Kindle, Kobo reader, Sony reader, etc.), smartphone and the, tablet. All the stores included in the dataset, except for one, clearly specify that their eBooks are compatible with all the four devices. While iTunes iBookstore only specifically mentions two devices: smartphone and the tablet. Table 11 summarises the number and kinds of copies by store and type of product.

The first part of the analysis will present tables with average prices and tests of differences in means (t-test and ANOVA). The second part will use regression analysis to test whether the possibility to make additional copies of the eBooks purchased in the five stores is associated with an increase in price.

Table 12 shows the number of products and the average price by store and type of product. Books have an average price significantly higher than eBooks (£12.88). The store with the highest average price for eBooks is Waterstones (£7.33), the one with the lowest is Amazon (£5.43). The ANOVA¹⁰ test shows that the differences are statistically significant.

Table 12: Average price and average number of products by store and type of product

Store	Type of product	Number of products	Average price
Amazon	Book	534	12.88
	eBook	217	5.43
GooglePlay	eBook	297	6.55
iTunes	eBook	292	6.44
Kobo	eBook	386	6.40
Waterstones	eBook	345	7.33
Total		2071	8.15

Note: ANOVA test: the price differences are significant at .001 level

Table 13 shows the average price by number of copies. According to the data here, it there does not appear to be a relationship between the number of copies and the average price. Books are not allowed to be copied and therefore they come with only one copy; however, their average price is more than double that of all kinds of eBooks. The number of copies of eBooks depends on the file format. ePub-FairPlay eBooks can be copied five times, but they are on average, more expensive than Kindle eBooks, which can be copied six times.

10 The ANOVA test is used to test whether there is a difference between the average price, when more than two groups are considered.

Table 13: Average price and by number of allowed copies (both books and eBooks)

	Number of allowed copies	Average price
Books	1	12.876
eBooks – ePub-FairPlay	5	6.444
eBooks – Kindle	6	5.429
eBooks – ePub-Adobe	6	6.758

Note: Kruskal-Wallis non-parametric test¹¹: the price differences are significant at .001 level

Table 14 below shows the same statistics, but without considering books. The main purpose of this Table is to check whether the difference between the average price is still significant if we consider only eBooks. The Kruskal-Wallis non-parametric test confirms that the difference in price is significant.

Table 14: Average price and by number of allowed copies (only eBooks)

	Number of allowed copies	Average price
eBooks – ePub-FairPlay	5	6.444
eBooks – Kindle	6	5.429
eBooks – ePub-Adobe	6	6.758

Note: Kruskal-Wallis non-parametric test: the price differences are significant at .001 level

Table 15 shows the average price by number of devices that allow copying. This Table only considers eBooks. The average price does not seem to be very different between the two categories of books. Furthermore the t-test¹² confirms that there is not a statistically significant difference.

According to these preliminary results, even though books are not allowed to be copied, they cost more than eBooks, which are allowed to be copied for a specified number of times. At the same time, the average prices do not have a relationship between the number of copies allowed and the number of devices that permit copying (referred herewith to as allowed devices).

Table 15: Average price by number of allowed devices (only eBooks)

Number of allowed devices	Average of price
2 (iTunes)	6.44
4 (all the other stores)	6.53

Note: t-test: the price differences are not significant

11 This is a non-parametric test which is used as an alternative to the ANOVA since, in this case, the ANOVA test would not pass the homogeneity of variances assumption.

12 The t-test is used to test whether there is a difference between the average price when only two groups are considered.

Regression analysis was undertaken to test whether the number of copies have an impact on product price. Two models are estimated, both of them have used price as the dependent variable.

Table 16 shows the results of the regressions. Model (1) includes one dummy variable (*eBook*) indicating whether the book in the database is an eBook, and a series of dummy variables by stores (*Amazon, Kobo, GooglePlay, iTunes*); *Waterstones* is not included and will be used as the baseline. The coefficients are all significant, and the results largely confirm the results of Table 12. With respect to printed books, eBooks cost significantly less. *Waterstones* eBooks are, on average, the most expensive ones, hence all the dummies per store have a negative coefficient. The cheapest eBooks are those sold by Amazon, followed by Kobo, iTunes and GooglePlay.

Model (2) includes three variables related to the number of copies. Trying to include these kinds of variables is particularly problematic, since some of them partially or completely overlap with the dummy variables by store. As shown in Table 11, the policies of the stores in terms of the number of copies and kinds of devices do not considerably differ. All the eBooks sold in the stores in the sample allow six copies to be made, with the exception of *ePub-FairPlay* eBooks, which can be copied only five times. Regarding the compatible devices, all the eBooks in the sample are compatible with any of the four kinds of devices, with the only exception of iTunes, which can be read from only two devices.

Table 16. Results of regression analysis (dependent variable: *price*)

Model (1)			Model (2)		
	Coeff.	Std.Err.		Coeff.	Std.Err.
eBook	-7.447***	.316	Kindle (6 copies)	-7.447***	.316
Amazon	-1.904***	.340	ePub-FairPlay (5 copies)	-6.432***	.286
GooglePlay	-.780**	.310	ePub-Adobe (6 copies)	-6.118***	.210
iTunes	-.889***	.312			
Kobo	-.930***	.291			
R2	0.343			0.339	
F-test sig.	.000			.000	

* significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level

Model (2) includes three variables for the different eBook formats: *ePub-FairPlay* (five copies), *Kindle* (six copies) *ePub-Adobe* (six copies). All the variables are significant; however, their sign is negative, confirming that eBooks are always cheaper than printed books in our sample. However, the allowance of one additional copy (six instead of five) does not seem to be associated with a price increase.

Both models (1) and (2) are probably affected by an omitted variable issue. It is likely that other variables, which are not included in the model, are the ones that have the biggest influence on the price of the eBooks (e.g. the popularity of the author, the promotion campaign, etc.). However, these variables are also very difficult to measure. Moreover, the lack of variability in the explanatory variables about the number of copies and kinds of devices could affect the results of the regression. The differences between the default number of copies allowed by the DRMs (either five or six) are minimal. The main issue here is that it is not possible to know the *real* number of copies associated with an eBook without purchasing it.

For these reasons, we conclude that the analysis on the relationship between books prices and the number of copies allowed has produced indeterminate results. This is because the large majority of the price dissimilarities have been captured by the simple difference between the price of traditional books and eBooks.

Software industry analysis

The software database includes 1008 observations¹³. Table 1 summarises some of the main characteristics of the data collected:

- Type of software (Operating System, Productivity, Utilities, Design & Publishing, Photography, Finance, Music & Audio, Other).
- Delivery method (Download, Download + Backup Disc, CD/DVD).
- Number of copies (how many different copies of the software are included in the package).

Table 17. Average price and average number of copies per kind of product

Type of software	Delivery method	Number of products	Average price	Average number of copies	Average price per copy
Operating System	Download	12	178.12	1.00	178.12
	Download + Backup Disk	12	187.11	1.00	187.11
	CD/DVD	26	142.96	1.38	137.01
Productivity	Download	32	214.72	1.59	173.49
	Download + Backup Disk	32	224.08	1.59	180.56
	CD/DVD	64	197.03	1.70	155.39
Utilities	Download	363	275.54	27.15	26.20
	CD/DVD	82	45.71	1.80	37.85
Design & Publishing	Download	123	541.36	1.00	541.36
	CD/DVD	179	532.63	1.00	532.63
Photography	Download	18	290.54	1.00	290.54
	CD/DVD	41	254.77	1.22	233.49
Finance	CD/DVD	11	275.70	1.73	216.44
Music & Audio	CD/DVD	11	281.53	1.82	174.49
Other	CD/DVD	2	127.80	3.00	76.36
All products	Download	548	330.01	18.36	162.44
	Download + Backup Disk	44	214.00	1.43	182.34
	CD/DVD	416	317.90	1.36	302.83
Total		1008	319.95	10.61	221.25

¹³ There are 1011 observations in the database but for three of them the variable “number of copies” is not available, so they are not used in the analysis.

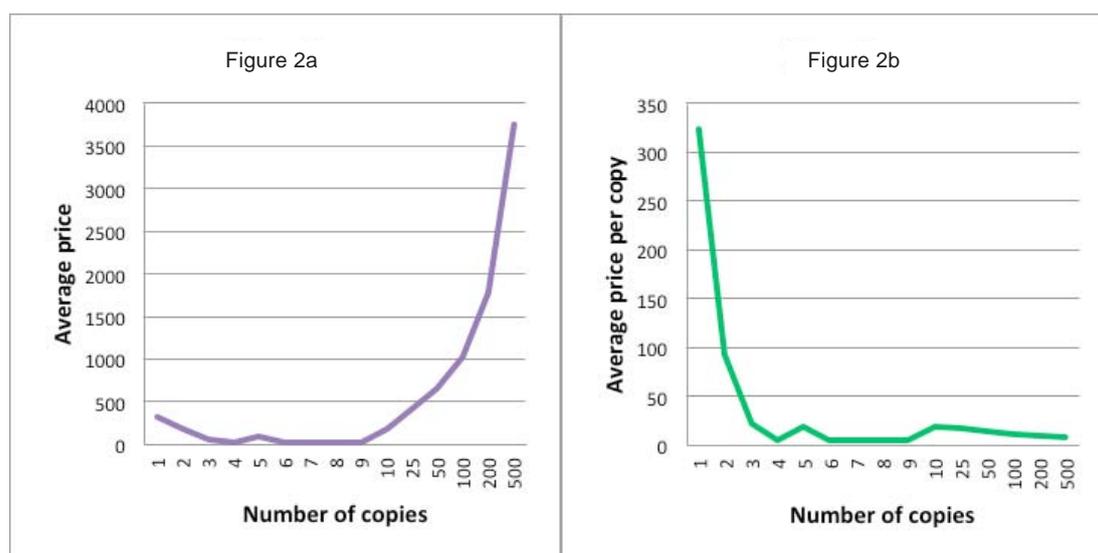
We observe that in general the products sold through direct download allow a larger number of copies than those sold on a physical medium as reflected by the 18.36 average downloads for All Products. Although in general downloadable software costs less than CD/DVD software, a downloadable version of the software does not necessarily mean a cheaper price in all the software categories; for example, for Operating Systems, Productivity, Design & Publishing and Photography the downloaded version is more expensive than the physical one.

Finance, Music & Audio and Other software are available in our dataset only in a physical medium. As these categories yielded few observations, they will be collapsed to form a new 'Other' category in Figure 2.

In most of the cases, the software included in the sample is sold directly through the software producers' websites. However, as some software can be bought from Amazon and the Apple Store¹⁴ we have included them in the dataset.

Figure 2 shows the relationship between copies and price. In Figure 2a it is clearly observable that the price increases with the number of copies allowed. This seems reasonable; however, it is interesting to note that the price is higher for one single copy, which remains stable until it reaches 10 copies. This is confirmed by Figure 2b that shows the average price per copy plotted against the number of copies. Here the average price per copy does not decrease much after the fourth license purchased.

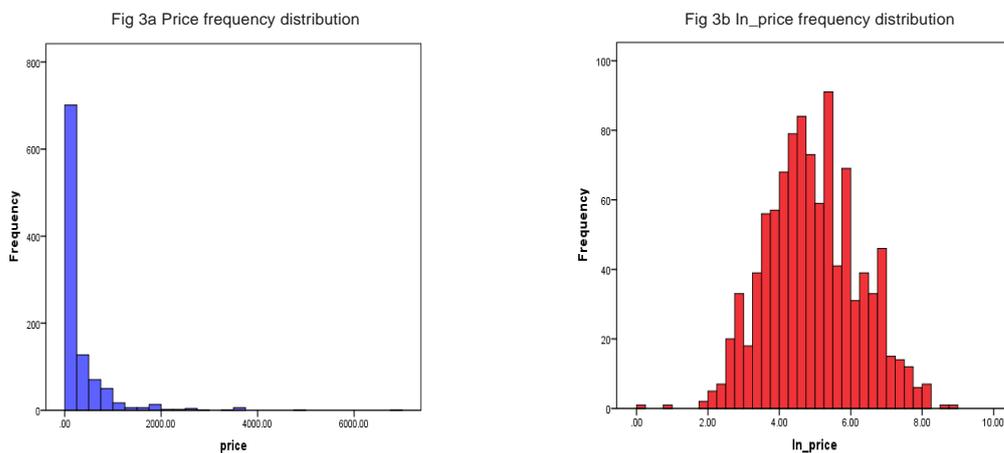
Figure 2. Average price and average price per copy by number of copies



14 Apple is also a producer of software and sells both his own software and other producer's software.

To further test the above results, we undertook a regression exercise. The regression analysis uses as the dependent variable the natural logarithm of price (\ln_price). The main reason for using the natural log of price and not the price itself is because of the distribution of this variable. Figure 3 shows the frequency distribution of price and \ln_price . Figure 3a shows that the distribution of price is very skewed, this means that the distribution is not symmetrical, but rather concentrated on one side (the left side). The majority of the software has a relatively low price, and only a few software packages have a higher price (right tail). Calculating the natural logarithm of $price$ is a potential solution for this kind of issue. Figure 3b shows that after performing the transformation, the variable \ln_price is much more normally distributed, with a better defined bell shaped distribution, thereby solving the *skewness*.

Figure 3. Price and \ln_price frequency distributions



The results of the regression analysis are reported in Table 18. Three different models have been estimated. The first one includes a series of control variables and will be taken as the baseline for the other regressions. These variables are:

- CD/DVD and Download + Backup: dummy variables for delivery method, compared to the case of direct download;
- Amazon and Apple: whether the software is sold by Amazon, or by the Apple Store, compared to software bought directly from the software producers' websites;
- Upgrade: whether the software is an upgrade of a previous purchase, compared to the case of a full version of the software;
- Dummies per types of software: Productivity, Utilities, Design & Publishing, Photography, Others¹⁵, compared to the case of Operating System software, used as the baseline.

15 Note again that this category also includes Finance + Music & Audio.

Table 18 presents the results of the estimations. Model (1) shows that the delivery methods (CD/DVD and Download + Backup) do not seem to have an effect on the log of price. The coefficient of one of the two software web stores is significant; this is the case of Amazon. This means that, holding constant all the other variables, software bought from Amazon are cheaper than software bought from the producers' online store. Given that Amazon only sells software embedded in physical media (e.g. CDs or DVDs), this is an explanation of the difference in prices observed in Table 17 above between downloaded software and software delivered on a physical disk.

Furthermore, the *Upgrade* variable is significant and with negative sign, indicating that an upgrade version costs less than the full version. Regarding the dummies by kinds of software, only two of them have significant coefficients: *Utilities and Design & Publishing*. The former has a negative sign, while *Design & Publishing* has a positive sign (this result was expected since some very expensive professional or semi-professional software is included in this category).

Model (2) adds one variable to measure the *Number of copies* allowed (number of licences). Adding this variable does not change the significance and the sign of Model (1) coefficients. The coefficient of *Number of copies* is highly significant and positive, and equal to 0.010. Since the dependent variable is transformed into natural logarithms, the interpretation of this coefficient is as follows: a unit increase in the number of copies is associated with an increase in price of approximately 1%.

Table 18. Results of regression analysis (dependent variable: *In_price*)

	Model (1)		Model (2)		Model (3)	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
CD/DVD	-.141	.095	-.077	.080	-.040	.074
Download + Backup	-.125	.185	-.059	.156	-.021	.145
Amazon	-.686***	.116	-.620***	.098	-.587***	.091
Apple	-.237	.142	-.198	.120	-.178	.111
Upgrade	-.550***	.096	-.527***	.081	-.512***	.075
Productivity	-.138	.175	-.131	.147	-.134	.137
Utilities	-1.146***	.168	-1.312***	.142	-1.413***	.132
Design & Publishing	.880***	.164	.897***	.138	.908***	.128
Photography	.109	.203	.114	.171	.118	.159
Others	.350	.266	.302	.225	.267	.209
Number of copies			.010***	.001	.032***	.002
Number of copies squared					-.00005***	.000
R2	.358		.549		.661	
F-test sig.	.000		.000		.000	

* significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level

The last Model (3) adds a quadratic term to the regression (*Number of copies squared*). This is to capture a decreasing or increasing marginal effect. Figure 2 shows that the average price per copy seems to decrease with an increase in the number of copies. By adding a squared term, it is possible to test if this effect is influencing the price of software.

By adding this variable, the coefficients of *Number of copies* remains significant but increases, becoming equal to 0.032. More interestingly, the coefficient of *Number of copies squared* is significant and negative, suggesting that the variable *Number of copies* has a positive but diminishing effect on price. This means that software producers charge users to make one additional copy of the software however, this additional price gradually reduces with an increase in the number of copies allowed.

In conclusion, the analysis suggests that software producers charge a price that reflects the possibility of making additional copies. In other words, a higher number of copies is associated with an increase in the price. However, this effect becomes smaller as the number of copies increases.

Appendix A – Terms and Conditions of Music sellers

7Digital

According to the Terms and Conditions webpage¹⁶, 7Digital states:

Section 2.1 Services.

“The Services provide digital media download, upload, streaming and storage services designed to enable you to purchase, upload, store and play legally acquired digital media. The services are for your own personal and non-commercial use and you are not authorised to make copies of any downloads or streams other than for personal use, or to otherwise distribute copyright protected digital media. 7 may at any time limit the number of devices that you may access the Services from simultaneously. You assume all risk arising from your use of the Services. 7 may discontinue any aspect of the Services in its sole discretion without notice to you.”

Section 8.4 Content Usage Rules

“(i) You are authorised to use the Content only for personal, non-commercial use, and not for redistribution, transfer, assignment or sublicense, to the extent permitted by law.

(iii) You may not use Content as a musical “ringer” in connection with mobile phone calls.

(iv) You agree that you will not attempt to, or encourage or assist any other person to, circumvent or modify any security technology or software that is part of the Service or used to administer the Usage Rules, or interfere with, remove or alter any rights management information on the Content.

(v) The delivery of Content does not transfer to you any commercial or promotional use rights in same.

(vi) Content in the MP3 or AAC format does not contain security technology that limits your usage of such Content and you may use them as reasonably necessary for personal, non-commercial use.

You agree that your purchase of Content constitutes your acceptance of and agreement to use such Content solely in accordance with the Usage Rules, and that any other use of the Content may constitute a copyright infringement. Any security technology, if applicable, is an inseparable part of the Content. The Usage Rules shall govern your rights with respect to the Content. 7 reserves the right to modify the Usage Rules at any time.”

¹⁶ <http://www.7digital.com/termsandconditions> (accessed 2 May 2012).

Amazon.co.uk

According to the Terms of Use webpage¹⁷, Amazon states:

Section 2.1 Rights Granted

“Upon your payment of our fees for Digital Content, we grant you a non-exclusive, non-transferable right to use the Digital Content for your personal, non-commercial, entertainment use, subject to and in accordance with the Terms of Use. You may copy, store, transfer and burn the Digital Content only for your personal, non-commercial, entertainment use, subject to and in accordance with the Terms of Use.”

Section 2.2 Restrictions

“You represent, warrant and agree that you will use the Service only for your personal, non-commercial, entertainment use and not for any redistribution of the Digital Content or other use restricted in this Section 2.2. You agree not to infringe the rights of the Digital Content’s copyright owners and to comply with all applicable laws in your use of the Digital Content. Except as set forth in Section 2.1 above, you agree that you will not redistribute, transmit, assign, sell, broadcast, rent, share, lend, modify, adapt, edit, sub-license or otherwise transfer or use the Digital Content. You are not granted any synchronization, public performance, promotional use, commercial sale, resale, reproduction or distribution rights for the Digital Content. You acknowledge that the Digital Content embodies the intellectual property of a third party and is protected by law.”

HMV

HMV terms and conditions are partially contradicting. One page states that no copies are allowed, another one gives a maximum number of copies.

According to the Terms and Conditions of Use webpage¹⁸, HMV states:

Section 5.1 Description of the services

“This website provides digital media download and streaming services (the “Services”) designed to enable you to purchase/listen to legal digital media. The Services are for your own personal and non-commercial use and you are not authorised to make any copies of any downloads other than for your own personal non-commercial use.”

According to the help page titled: ‘Digital Terms and Conditions’¹⁹, HMV states:

17 http://www.amazon.co.uk/gp/help/customer/display.html/ref=hp_200285010_menu_terms?nodeId=200285010 (accessed 2 May 2012).

18 <http://www.hmvdigital.com/terms> (accessed 30 April 2012).

19 <http://hmv.com/hmvweb/navigate.do?pPageID=3350> (accessed 9 May 2012).

Section 4. Permanent Download of HMV content. - Description

“The Permanent Download Service is the Service which provides Content which is capable of being downloaded to and stored on the hard drive of your computer and then exported, burned or copied, solely for personal, non-commercial use. You must register at least one Registered Player (as defined in clause 3) above to access Permanent Downloads. You are responsible for ensuring that the Registered Player functions correctly with the Service.”

Section 4. Permanent Download of HMV content. - Usage Rules for Permanent Downloads

“The Content is owned by HMV, MusicNet or their licensors and is protected by intellectual property rights. You may burn each Permanent Download to a CD up to 7 (seven) times as part of any particular play list of songs. A ‘play list’ is a discrete group of Permanent Downloads that are arranged together in a particular order. Once you have burned a Permanent Download to a CD, you agree not to copy, distribute, or transfer the track from that CD to any other media or device. You may transfer a Permanent Download to up to 5 (five) portable devices that are compatible with the Service’s usage rules and security requirements. Once you have transferred a Permanent Download to a compatible portable device, you agree not to copy, distribute, or transfer it from that device to any other media or device. You accept that you may only use such Content in accordance with the usage rules for the Permanent Downloads and that any other use of the Content! may constitute a copyright infringement. The security technology (as detailed at clause 10) is an inseparable part of the Content. You agree that you will not attempt to circumvent these usage rules. HMV reserves the right to modify the usage rules at any time on thirty days’ notice to you and by changing these Terms.”

iTunes

According to the Terms and Conditions webpage²⁰, iTunes states:

Usage rules section

(...)

(ii) You shall be authorised to use iTunes Products on five computers with the iTunes application installed at any time, except for Film Rentals (see below).

(iii) You shall be able to store iTunes Products from up to five different Accounts at a time on compatible devices, such as an iPad, iPod, iPhone and Apple TV, provided that each iPhone may sync tone iTunes Products with only a single iTunes-authorised device at a time, and syncing an iPhone with a different iTunes-authorised device will cause tone iTunes Products stored on that iPhone to be erased.

20 <http://www.apple.com/legal/itunes/uk/terms.html> (accessed 2 May 2012).

(iv) You shall be authorised to burn an audio playlist up to seven times. You may use the audio CD to which you have burned your iTunes Products in the same ways in which you may use an audio CD purchased from a retail store, subject to United Kingdom copyright laws.

(...)

(vi) iTunes Plus Products do not contain security technology that limits your usage of such iTunes Products, and Usage Rules (ii) – (v) do not apply to iTunes Plus Products. You may copy, store, and burn iTunes Plus Products as reasonably necessary for personal, noncommercial use.

On the support page on *iTunes Plus*²¹, iTunes states:

“What is iTunes Plus? iTunes Plus is the new standard on iTunes. iTunes Plus downloads are songs and music videos available in our highest quality 256 kbps AAC audio encoding (twice the audio quality of protected music purchases), and without digital rights management (DRM). iTunes Plus music can be burned to CD as many times as you need, synced to any AAC-enabled device (such as iPod, iPhone, or Apple TV), and played on any Mac or Windows computers you own.”

21 <http://support.apple.com/kb/HT1711>

Appendix B – Terms and Conditions of Books sellers

Kindle (implemented by Amazon)

According to the Amazon.co.uk Kindle License Agreement and Terms of Use²², Amazon states:

Use of Digital Content section

“Upon your download of Digital Content and payment of any applicable fees (including applicable taxes), the Content Provider grants you a non-exclusive right to view, use, and display such Digital Content an unlimited number of times, solely on the Kindle or a Reading Application or as otherwise permitted as part of the Service, solely on the number of Kindles or Other Devices specified in the Kindle Store, and solely for your personal, non-commercial use. Unless otherwise specified, Digital Content is licensed, not sold, to you by the Content Provider. (...)”

Downloading to Multiple Device section

“(...) There is no limit on the number of times a title can be downloaded to a registered device, but there may be limits on the number of devices (usually 6) that can simultaneously use a single book.(...)”

ePub-Fairplay (implemented by iTunes)

According to the Terms and Conditions webpage²³, iTunes states:

iBookstore product usage rules section

i) You shall be authorised to use the iBookstore Products only for personal, noncommercial use.

(ii) You shall be able to store iBookstore Products from up to five different Accounts at a time on certain iOS-based devices, such as an iPad, iPod touch, or iPhone.

(iii) You shall be able to store iBookstore Products on five iTunes-authorized devices (such as a computer) at any time.”

22 <http://www.amazon.com/gp/help/customer/display.html?nodeId=200506200> (accessed 10 August 2012).

23 <http://www.apple.com/legal/itunes/uk/terms.html#APPS> (accessed 2 May 2012).

ePub-Adobe (implemented by Kobo, GooglePlay, and Waterstones)

According to the Adobe Digital Editions FAQ²⁴, Adobe states:

How do I enable content portability?

The first time you run Digital Editions, you are prompted to authorize the application by entering an Adobe ID. If you don't have an Adobe ID, you are provided with a link to get one. Then, when you purchase an item online or borrow one from a library with Digital Editions, the item is automatically "tied" to your Adobe ID, rather than your computer. This way, you are free to move your items to up to six computers and six devices that have been authorized with Digital Editions.

What is the maximum number of computers and devices that I can authorize?

"You can activate up to six computers or devices . If you reach the limit, contact Customer Service (www.adobe.com/support/digitaleditions/) to reset your activations."

24 <http://www.adobe.com/uk/products/digital-editions/faq.html> (accessed 6 June 2012).

Appendix C – A Note on the construction of the software database

Given the great variety of software available to the public, we decided to concentrate our research on selected categories. The choice was made with the objective to cover the kinds of software that are commonly installed on consumers' PCs or laptops, excluding freeware or open source software. For this reason, we decided to focus on the following categories:

- Operating systems
- Office suites
- Antivirus/security
- Compressors
- CD/DVD burning software

We covered also software that could be used for professional or semi-professional use, such as design and publishing software.

The main data gathering strategy had been to collect data on prices and the number of allowed copies directly from the producers' online store, and not from retail stores or retail websites, for two reasons. First, retail stores generally sell only physical copies of the software (CD or DVD), while the software producer's online store often allows users to choose between a physical copy and an online download (or both). Second, in many cases, collecting data on the number of copies allowed requires downloading the End-User License Agreement (EULA), which is often downloadable from the producers' websites and not from the retail stores.

We downloaded data on the products sold in the following online stores:

- Adobe Store UK
 - Apple Store UK (the Apple store sells both Apple software and other producer's software)
 - AVG online Shop UK
 - Avira.com
-

- Bitdefender.co.uk
- BullGuard Online Shop
- FileMaker Store UK
- Kaspersky.co.uk
- McAfee Store
- Microsoft Store United Kingdom
- Nero Online Shop
- Panda Store
- RARLAB shop
- Roxio UK Online Store
- SmithMicro Software Online Store
- Uk.norton.com
- WinZip Online Store

We gathered around 850 observations of different products available on these web stores. Then we completed the database by looking for the same products in the Amazon UK store, arriving at 1011 observations in the final dataset. These observations include different versions of the same product in terms of: allowed number of copies; kind of compatible device (PC or Mac); software edition (full or upgrade); or type of media (direct download, physical copy, direct download plus backup disk).

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