Table 1. Compliance with Rental Directive

	Article No.								
	1	2	3	4	5	6	7	8	9
Country	rental	lending	presumption	remuneration	public lending	fixation	reproduction	broadcast	distribution
Austria until 1993	1	1	1	0	?	?	0	?	1
Belgium until 1994	0	0	0	0	?	0	0	?	0
Czech 1995 and earlier	?	?	?	?	?	?	?	?	?
1996~1999	0	0	1	0	?	1	?	?	?
2000 and after	1	1	1	1	1	1	1	1	1
Denmark until 1996	1	0	0	0	1	0	0	?	0
Finland until 1995	0	0	0	0	?	?	0	?	0
France until 1994	1	0	1	0	?	?	1	1	0
1994~1999	1	1	1	0	1	1	1	1	1
2000 and after	1	1	1	?	1	1	1	1	1
Germany until 1995	0	1	0	0	?	?	1	1	1
Greece until 1993	0	0	0	0	?	0	0	?	0
Hungary 1993 and earlier	?	?	?	?	?	?	?	?	?
1994~1999	0	0	1	0	?	?	0	?	0
2000 and after	1	1	1	1	1	1	1	1	1
Iceland until 1994	0	0^2	0	0	?	?	0	0	0
Ireland until 1994	0	0	0	0	?	?	1	1	0
1994 and after	?	?	?	?	?	?	?	?	?
Italy until 1994	0	0	0	0	?	?	0	?	0
Luxembourg until 1997	0	0	0	0	?	?	1	?	1
Netherlands until 1995	0	0	0	0	?	?	0	0	0
Norway until 1994	0	0^2	0	0	1	?	0	?	0
Poland 1993 and earlier	?	?	?	?	?	?	?	?	?
1994 and after	1	1	1	1	?	1	1	1	1
Portugal until 1997	1	1	0	0	?	?	1	1	0

Spain until 1996	1	1	0	0	?	?	1	1	1
Sweden until 1995	0	0	0	0	1	?	0	?	0
Switzerland[1] 1992 and earlier	?	?	?	?	?	?	?	?	?
1993~1994	0	0	0	0	?	?	0	?	0
1995 and after	0	0	0	0	?	?	1	?	1
U.K. until 1996	0	1	0	0	?	?	0	1	0

Sources: Reinbothe and von Lewinksi (1993), European Commission (undated), Geller (1999), national copyright laws.

Notes:
1. For all EU members, deemed to comply fully after date of legislation, unless otherwise specified, e.g., France with regard to remuneration right after 1994.
2. Switzerland did not to accede to EEA Treaty.
3. Assumed same as Sweden (Nordic system).
4. Law deemed to comply if required change is "clarified" or "make clear".
5. Reproduction right deemed not to comply if excludes indirect reproduction.

Table 2. Correlations in compliance indicators

	rental	lending	presumption	remuneration	reproduction	distribution
rental	1					
lending	0.8757	1				
presumption	0.8477	0.7866	1			
remuneration	0.8224	0.8224	0.8479	1		
reproduction	0.641	0.641	0.5484	0.6468	1	
distribution	0.7197	0.7853	0.6955	0.7536	0.7815	1

Table 3. Movie Production: Descriptive statistics (187 observations from 17 countries)

Variable	Unit	Source	Mean	Max	Min	Std dev
Movie production	—	GMID	44.16	201	6	40.70
Compliance with Rental Directive[1]	—	Table 1	0.65	1.3636	-4.47	1.63
GDP per cap	Million USD at PPP	GMID	33.20	276.15	14.28	42.96
Population	'000	GMID	23172.49	82536.7	4299.2	25178.15
PC per cap[2]	Per 100 households	GMID	40.86	84	7	19.49
Internet users per cap	%	GMID	25.10	104.08	0.12	20.54
Real long-term interest rate[3]	%	OECD	3.46	8	0.02	1.66
Piracy[4]	%	IFPI	5.68	35.46	0	6.51
Time	—	~	1999.36	2005	1993	3.70

Notes:
1. Considering significance to the movie industry and availability of data, we focused on 6 out of 9 articles in the Rental Directive: rental, lending, presumption, remuneration, reproduction and distribution. We constructed their principal component as the indicator of compliance. The correlation between the principal component and the sum of the compliance indicators for these six articles was 0.87.
2. Personal computers per capita for Iceland and Luxemburg were not available for any year.
3. Real long-term interest rate was calculated as long-term interest rate less year-to-year change in the consumer price index. The real interest rates for the Czech Republic, Greece, Hungary, Iceland, and Poland were not available for some years.
4. CD piracy rates for Luxemburg were not available for any year.

Table 4. Movie Production (Natural logarithm)[1]

Specification	a OLS Country indicators only[2]	b OLS Demographic variables	c OLS Piracy[3]	d OLS Fixed effects	e Fixed effect estimator with robust cluster variance matrix[4]	f FGLS Cross-sectional time-series Panels[5]
GDP per cap	—	1.1023 (0.7491)	1.2836 (0.7656)*	1.2836 (0.7656)*	1.2836 (0.9206)	1.7147 (0.5576)***
Population	—	0.8666 (1.3981)	0.4359 (1.3951)	0.4359 (1.3951)	0.4359 (1.1751)	1.4589 (1.3636)
PC per cap	—	0.0701 (.05514)	-0.2725 (0.1784)	-0.2725 (0.1784)	-0.2725 (0.1859)	-0.1815 (0.1350)
Internet users per cap	—	-0.2408 (0.1630)	0.0927 (0.0551)*	0.0927 (0.0551)*	0.0927 (0.0597)	0.0967 (0.0440)**
Real interest rate	—	-0.0531 (0.0428)	-0.0527 (0.0422)	-0.0527 (0.0422)	-0.0527 (0.0274)*	-0.0444 (0.0297)
Piracy (music CD)	—	—	-0.0142 (0.0124)	-0.0142 (0.0124)	-0.0142 (0.0066)**	-0.0104 (0.0132)
Rental Directive	—	0.0498 (0.0205)**	0.0390 (0.0207)*	0.0390 (0.0207)*	0.0390 (0.0281)	0.02435 (0.0154)
Rental Directive * Piracy	—	—	-0.4862 (0.2725)*	-0.4862 (0.2725)*	-0.4862 (0.3511)	-0.6584 (0.1840)****
Constant	4.4590 (.0841)****	-8.0363 (16.8036)	-3.6775 (16.7607)	-3.8591 (14.0766)	-3.8591 (12.8553)	-17.0601 (16.0700)
Country indicators	Included	Included	Included	—	—	Included
Year indicators	—	Included	Included	Included	Included	Included
Adj. R^2	0.8682	0.9192	0.9216	—	—	—
R^2: within	—	—	—	0.475	0.475	—
R^2: between	—	—	—	0.624	0.624	—
R^2: overall	—	—	—	0.5881	0.5881	—
# of Obs.	187	187	187	187	187	187
Impact of Rental Dir.	—	5.10%	3.97%	3.97%	3.97%	2.46%
Impact std. dev.	—	2.07%	2.09%	2.09%	2.85%	1.55%

**** significant at 99.9%; *** significant at 99%; ** significant at 95%; * significant at 90%.

Notes:
1. Iceland, Ireland, Luxemburg, and Poland were excluded because of data being unavailable for more than half of the studied period. Some country-years were excluded because of missing data on real interest rates (Greece and Portugal), and on compliance with the Rental Directive (Czech Republic, France, Greece and Switzerland).
2. Germany was omitted from the country fixed effects.
3. In the interaction between the piracy rate and the indicator of the Rental Directive, the piracy rate was specified as its difference from the sample mean (Wooldridge (2002) page 194). Hence, the coefficient of Rental Directive indicator was the partial effect of the Rental Directive on the logarithm of movie production at the mean piracy rate.
4. As recommended by Bertrand et al. (2004), the estimator for the variance-covariance matrix under OLS is a generalized White-like formula (Huber 1967; White 1980). It allows for within-panel correlation, relaxing the usual requirement that the observations be independent.
5. This FGLS regression adjusts the variance covariance matrix estimator on the assumption of AR(1) autocorrelation within panels and heteroskedasticity across panels.

Table 5. Robustness (Dependent variable: Logarithm of number of movies produced; Fixed effect estimator with robust cluster variance matrix)

Specification	(a) Sum of 6 compliance indicators	(b) Software piracy instead of music piracy	(c) Lagged independent variables	(d) Copyright Term Directive	(e) Government funding[1]
GDP per cap	1.5082 (0.9388)	1.3331 (1.0224)	0.2248 (0.3320)	1.1385 (1.0419)	0.9787 (0.9521)
Population	0.6378 (1.1843)	0.0121 (1.4251)	-0.4744 (1.1252)	0.2674 (1.4125)	-1.2076 (1.9919)
PC per cap	-0.2651 (0.2098)	-0.3182 (0.2340)	0.5037 (0.9855)	-0.3019 (0.2129)	0.1547 (0.2821)
Internet users per cap	0.0959 (0.0654)	0.0459 (0.0614)	0.3112 (0.1485)*	0.0951 (0.0611)	-0.0087 (0.0754)
Real interest rate	-0.0485 (0.0269)*	-0.0603 (0.0328)*	-0.1455 (0.0720)*	-0.0531 (0.0261)*	-0.0237 (0.0696)
Piracy	-0.01230 (0.0079)	0.5132 (0.3251)	0.0040 (0.0092)	-0.0151 (0.0074)*	0.0382 (0.0103)***
Rental Directive	0.0434 (0.0272)	0.0796 (0.0380)*	0.0379 (0.0280)	0.0400 (0.0248)	0.0261 (0.0456)
Rental Directive *Piracy	-0.1861 (0.1281)	-0.2207 (0.2343)	-0.3407 (0.3265)	-0.5639 (0.3126)*	-1.1137 (0.6007)*
Government funding	—	—	—	—	-0.0682 (0.0509)
Copyright Term Directive	—	—	—	0.2288 (0.1776)	—
Constant	-6.6419 (12.9421)	0.2656 (15.2789)	1.5032 (3.7919)	-1.7486 (15.4768)	12.0301 (19.7386)
Year indicators	Included	Included	Included	Included	Included
R^2: within	0.4738	0.4653	0.4481	0.492	0.4161
R^2: between	0.6996	0.2605	0.016	0.4939	0.1197
R^2: overall	0.6668	0.175	0.0153	0.4428	0.2722
# of Observations	187	187	173	187	142
Impact of Rental Directive	4.43%	8.29%	3.86%	4.08%	2.64%
Impact std.	2.76%	3.87%	2.84%	2.51%	4.67%

Note: We collected data on national funding from Database on public funding for the film and audiovisual sector in Europe (KORDA) and European Audiovisual Observatory (1999). Data for 2005 was unavailable.

**Table 6. Market share of movies produced in other EU countries
(OLS with heteroskedastic disturbances across panels)[1]**

Specification	(a) Time trend	(b) Year indicators
Czech	-11.9747 (1.4414)****	-12.1806 (1.4319)****
Denmark	-11.6980 (1.4904)****	-11.8078 (1.5125)****
Germany	-14.8747 (1.3242)	-15.1465 (1.4386)
Finland	-14.3982 (2.0400)****	-14.3560 (1.8399)****
France	-14.3580 (1.3001)****	-14.4678 (1.3550)****
Hungary	-13.6880 (1.9464)****	-13.7978 (1.8759)****
Italy	-8.5110 (1.6135)****	-8.6208 (1.3919)****
Netherlands	-12.8846 (1.6454)****	-12.8851 (1.4918)****
Spain	-9.5680 (1.6259)****	-9.6778 (1.5067)****
Switzerland	-11.4846 (1.5185)****	-11.4851 (1.5792)****
Sweden	1.9620 (2.4672)	1.8522 (2.2694)
UK	-20.4380 (1.3879)****	-20.5478 (1.3831)****
Time trend	0.0555 (0.1235)	—
Year 1995	—	-0.4466 (3.6836)
Year 1996	—	-0.2599 (3.6709)
Year 1997	—	1.5126 (3.6732)
Year 1998	—	-1.3699 (3.6549)
Year 1999	—	3.0872 (3.6549)
Year 2000	—	-0.4506 (3.6549)
Year 2001	—	3.9632 (3.6709)
Year 2002	—	2.1742 (3.7712)
Year 2003	—	-0.9914 (3.7588)

Year 2004	—	-0.5404 (3.7792)
Constant	21.9863 (1.3147)****	21.9 (3.3605)****
Adj. R-Square	0.7169	0.7741
# of Observations	133	133

Notes:
1. Norway and Portugal were excluded from the estimation due to too few observations. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity rejected the null hypothesis of constant variance (χ^2=28). The Wooldridge test for autocorrelation in panel data cannot reject the null hypothesis of no first-order autocorrelation (F=0.785). Using OLS with adjustment on the standard errors for cross-panel heteroscedasticity, none of the coefficients of the time trend or the year dummy variables were significantly positive at 90% confidence level.

Figure 1: National and co-produced movies[1]

1. Including only the 12 countries for which data was complete for all years.
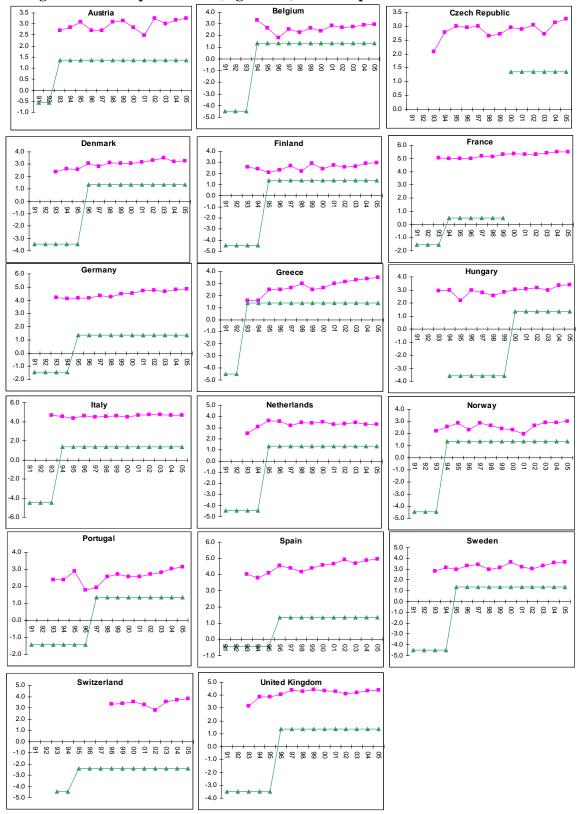
Figure 2: Movie production (logarithm) and compliance with Rental Directive

Note: Left scale: Movie production (natural logarithm) and indicator of compliance with Rental Directive (absolute).
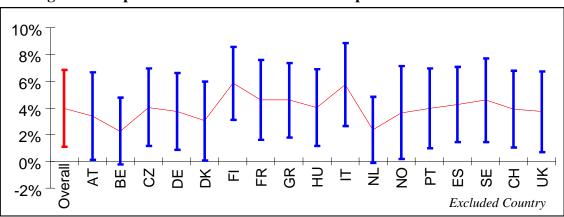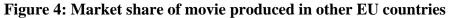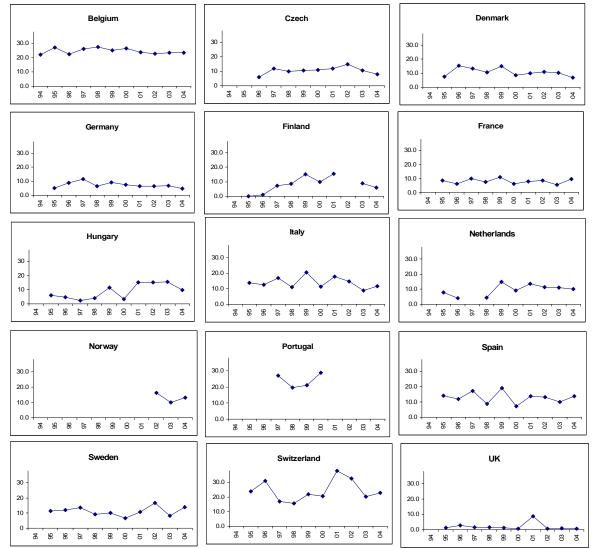
Figure 3: Impact of Rental Directive on movie production: Outlier check

Figure 4: Market share of movie produced in other EU countries

Source: European Audiovisual Observatory, *2005 Yearbook: Film and Home Video*, Vol. 3.

Table 7. Videos: Descriptive statistics (165 observations from 17 countries, 1993-2005[1])

Variable	Unit	Source	Mean	Max	Min	Std dev
Video rental rate	ECU (Euro)[2]	GMID	2.8829	5.8711	0.4897	1.0744
Video rental volume	Million units per year	GMID	29.1036	204.4000	0.2000	39.3263
Video sale price	ECU (Euro)[2]	GMID	11.9246	25.0460	3.9167	3.4515
Video sales volume	Million units per year	GMID	11.8606	99.8000	0.2000	19.7562

Notes:

1. Data for 1995 are mostly missing.
2. Exchange rates from Eurostat.

Table 8. Video pricing[1]

	Rental rate[2]			Rental volume[5]		
	Fixed effect estimator[3]	Fixed effect estimator[3]	FGLS[4]	Fixed effect estimator[3]	Fixed effect estimator[3]	FGLS[4]
GDP per cap	0.4316 (0.6478)	0.8107 (0.5110)	1.1603 (0.2858)****	6.9060 (3.1271)**	5.7480 (3.1768)*	5.7687 (0.9693)****
Population	-0.7720 (1.1492)	-0.4626 (1.1947)	-0.2700 (0.6472)	3.9324 (2.9062)	2.9963 (2.8770)	6.1366 (1.3372)****
PC per cap	0.1086 (0.0829)	-0.0119 (0.1076)	0.0736 (0.0709)	-0.1689 (0.6005)	0.1982 (0.5828)	0.1139 (0.1919)
Internet users per cap	0.0290 (0.0768)	0.0358 (0.0798)	-0.0139 (0.0284)	0.2682 (0.1524)*	0.2468 (0.1068)**	0.2888 (0.0637)****
Piracy	—	-0.0244 (0.0108)**	-0.0138 (0.0044)***	—	0.0745 (0.0317)**	0.0377 (0.0209)*
Rental Directive	0.0579 (0.0243)**	0.0521 (0.0231)**	0.0379 (0.0095)****	-0.0697 (0.0603)	-0.0524 (0.0525)	-0.0295 (0.0186)
Rental Directive * Piracy	—	0.2353 (0.1017)**	0.1767 (0.1025)*	—	-0.7050 (0.3752)*	-0.4057 (0.2088)*
Constant	6.8332 (11.1933)	3.0351 (11.3100)	-2.9846 (6.0047)	-53.3466 (31.4817)	-41.8304 (31.4148)	-79.2690 (13.8570)****
Country indicators	—	—	Included	—	—	Included
Year indicators	Included	Included	Included	Included	Included	Included
R[2]: within	0.4791	0.5167	—	0.8797	0.8927	—
R[2]: between	0.0516	0.1072	—	0.5667	0.5476	—
R[2]: overall	0.0758	0.1407	—	0.4609	0.4751	—
# of Obs.	165	165	165	165	165	165
Impact of Rental Dir.	5.96%	5.35%	3.86%	-6.73%	-5.10%	-2.91%
Impact std. dev.	2.46%	2.34%	0.95%	6.22%	5.39%	1.87%

Notes:

1. All variables except indicators in natural logarithms
2. The Wooldridge test for autocorrelation in panel data rejected the null hypothesis of no first-order autocorrelation ($F = 53.85$, $Pr(F > 53.85) = 0.0000$). There was also strong evidence of heteroskedasticity in the residuals ($\chi 2 = 1337.96$, $Pr(\chi 2 > 1337.96) = 0.0000$).
3. Robust cluster variance matrix.
4. Cross-sectional time-series panels.
5. The Wooldridge test for autocorrelation in panel data rejected the null hypothesis of no first-order autocorrelation ($F = 48.97$, $Pr(F > 48.97) = 0.0000$). There was also strong evidence of heteroskedasticity in the residuals ($\chi 2 = 1542.51$, $Pr(\chi 2 > 1542.51) = 0.0000$).

Table 9. Video sales[1]

	Sales price[2]			Sales volume[5]		
	Fixed effect estimator[3]	Fixed effect estimator[3]	FGLS[4]	Fixed effect estimator[3]	Fixed effect estimator[3]	FGLS[4]
GDP per cap	1.3658 (0.8086)	0.8104 (0.7073)	0.5289 (0.3487)	2.5693 (1.7269)	3.0375 (1.8621)	4.0320 (0.6388)****
Population	-0.0164 (1.8368)	-0.0196 (1.8129)	-1.5059 (0.8532)*	-8.1025 (5.5704)	-8.0239 (5.5613)	-6.4114 (2.2920)***
PC per cap	0.0236 (0.1778)	0.1450 (0.1269)	0.1380 (0.0907)	0.6227 (0.3249)*	0.5111 (0.3518)	0.1123 (0.1440)
Internet users per cap	0.0747 (0.0524)	0.0393 (0.0399)	0.0217 (0.0299)	-0.2906 (0.1138)**	-0.2650 (0.1195)**	-0.1516 (0.0568)***
Piracy	—	0.0255 (0.0055)****	0.0220 (0.0086)**	—	-0.0232 (0.0181)	-0.0089 (0.0139)
Rental Directive	-0.0086 (0.0160)	-0.0178 (0.0213)	-0.0123 (0.0121)	0.0151 (0.0290)	0.0198 (0.0263)	0.0300 (0.0186)
Rental Directive * Piracy	—	0.3318 (0.1382)**	0.2532 (0.1138)**	—	-0.1658 (0.2522)	-0.0755 (0.1557)
Constant	-0.9460 (17.7645)	0.3568 (17.6026)	12.8829 (7.8743)	67.2391 (53.8856)	65.4235 (53.4729)	35.7959 (21.0683)*
Country indicators	—	—	Included	—	—	Included
Year indicators	Included	Included	Included	Included	Included	Included
R^2: within	0.7973	0.8168	—	0.733	0.7369	—
R^2: between	0.4765	0.4761	—	0.1381	0.1182	—
R^2: overall	0.2784	0.3761	—	0.1968	0.1808	—
# of Obs.	165	165	165	165	165	165
Impact of Rental Dir.	-0.86%	-1.76%	-1.23%	1.52%	2.00%	3.04%
Impact std. dev.	1.61%	2.15%	1.21%	2.94%	2.66%	1.88%

Notes:
1. All variables except indicators in natural logarithms
2. The Wooldridge test for autocorrelation in panel data rejected the null hypothesis of no first-order autocorrelation (F = 46.73, Pr(F > 46.73) = 0.0000). There was also strong evidence of heteroskedasticity in the residuals ($\chi2$ = 145.99, Pr($\chi2$ > 145.99) = 0.0000).
3. Robust cluster variance matrix.
4. Cross-sectional time-series panels.
5. The Wooldridge test for autocorrelation in panel data rejected the null hypothesis of no first-order autocorrelation (F = 126.20, Pr(F > 126.20) = 0.0000). There was also strong evidence of heteroskedasticity in the residuals ($\chi2$ = 1459.98, Pr($\chi2$ > 1459.98) = 0.0000).