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Chapter 4

Industry–Led Standardization as Private Governance?

A Critical Reassessment of the Digital Video Broadcasting Project’s Success Story

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ABSTRACT

Industry-led technical standardization is often cited as an example for private governance. And the Digital Video Broadcasting (DVB) Project is often presented as a particularly successful case of such governance without government. The successes of the industry-led DVB Project have often been cited as evidence for the superior governance capacity of private industry. While the commercial and engineering success of the DVB Project is unequivocal, this chapter raises the question whether it has been equally successful in governing a complex sector that is confronted by a range of market failures, with direct implications for important public policy objectives such as media pluralism and diversity.

INTRODUCTION

At the example of the DVB, Project, this chapter examines whether and, if so, under what circumstances governance through industry-led standardization processes, may provide a solution to the challenges posed to conventional government-led technology policy, in which governments try to select and enforce technology standards. These challenges of government-led standardization policy are well illustrated by the history of government involvement in interna-

tional and European high-definition television (HDTV) standardization. First, the case of HDTV standardization demonstrated the difficulties of global governance where governments need to collaborate and agree to common measures. When HDTV standardization was first brought onto the agenda of the CCIR (Consultative Committee for International Radio) by the government of Japan the international community failed to overcome its divergent interests and to find agreement on a common standard. As each government sought to install its domestic technology as the international

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standard, the negotiations quickly erupted into an international standards war, which could not have been any more passionate, as demonstrated by the following statement by an executive of the French company Thomson:

High-definition television was to be the [Japanese'] ultimate weapon—an instrument with which to squeeze their European competitors out of their own domestic market and blitzkrieg the wide-open American market. In short, move in for the kill [...] This was to be the new Verdun. (Interview with an unnamed Thomson executive in The Economist (The world at war, 1990)

Secondly, the story of HDTV standardization also demonstrated the information problems faced by governmental actors that seek to influence standardization processes in high tech industries. Upon the initiative of the French government and the European Commission close to €1 billion in public subsidies were sunk into the development of an HDTV standard, which was never deployed (Cawson, 1995; Peterson & Sharp, 1998). Many commentators began to refer to this failure to support their arguments that governmental actors should stay out of technical standardization processes (Cave, 1997; Cawson, 1995; Galprin, 2002; Levy, 1997).

The subsequent success of the industry-led Digital Video Broadcasting (DVB) Project was then celebrated by the critics of government interventionism as evidence for the superior governance capacity of industry-led technical standardization processes. DVB standardization was a great engineering and commercial success (de Bruin & Smits, 1999; Cave, 1997; Reimers, 2006). Its standards are today used in nearly one billion devices all over the world (DVB Project, 2013, p. 2). This led many commentators to the conclusion that industry knew best what technical standards were needed and how to develop these

and that government should stay out of industry standardization processes (de Bruin & Smits, 1999; Dai, 2008; Watson, 2005).

This article challenges this conclusion. From an engineering and from a commercial perspective the success of the DVB Project cannot be disputed. Governance, however, is concerned with the solution of all sorts of interaction problems that occur in the economy and society at large. In the case of digital television, governance is concerned with the creation and regulation of the market as a level playing field on which companies compete for the benefit of the consumer. Governance is also concerned with a range of other public policy objectives, such as media pluralism and diversity. As argued below, standardization has a critical impact on all of these governance issues. Therefore, this chapter will raise the question whether and, if so, to what extent, the DVB Project was able to address these governance issues.

The following Section provides a brief introduction to and definition of the concept of governance, which is applied in this chapter. This is followed by a detailed empirical investigation of the DVB case.

GOVERNING THROUGH STANDARDS

This chapter starts from the institutionalist premises that economic exchange cannot take place or create value without the presence of institutions, such as property rights, antitrust rules, contract law, enforcement mechanisms, payment systems etc. (see North, 1990; Fligstein, 1996). The process of creating and maintaining these institutions is described as governance. It is the institutionalized social coordination that is necessary to produce and implement collectively binding rules or to provide collective goods (Mayntz, 2004). As market competition depends on institutions to

function properly or to take place at all, markets cannot provide governance, i.e. the institutions that constitute and govern them themselves. Governance, by definition, is thus a coordinative, non-competitive process.¹

Traditionally, governance was provided by government. Faced with an accelerating pace of technical change and economic internationalization, however, governmental actors increasingly find themselves unable to provide the public goods and the coordination that they used to be able to provide. Technical change challenges the governance capacity of governmental actors. They often lack the technical expertise and market information that is necessary to keep pace with—not to mention influencing the direction of—these developments. Given their size and ability to adopt and enforce legally binding decisions, public actors are considered influential. But for their lack of information they are unable to use this influence in a purposeful way. This was also demonstrated by the above-mentioned case of European HDTV standardization, where large amounts of public subsidies were sunk in an outdated technology that was never deployed. And even where public entrepreneurs had this information and expertise, Auriol and Benaim (2000) and David (1990) suggest, they would only have a ‘narrow time window’ to intervene before markets were locked in and before their technical knowledge became obsolete.

Economic internationalization, in turn, tends to undermine the governance capacity of governmental actors for it requires governance across and beyond jurisdictional barriers. Since there is no world government which could provide governance on a global level, international governance requires national governments to cooperate. Such intergovernmental cooperation, however, is often difficult. Given heterogeneous national interests, it tends to be quite slow and prone to run into bargaining gridlocks. These cooperation problems are exacerbated by the fact that intergovernmental decision-making is usually based on the principle

of consensus, which opens the door for hold outs and other bargaining strategies that further complicate and prolong the consensus-building process.

In this context governance without government, that is governance by and through private, i.e. non-state actors, is gaining more and more attention (Hall & Biersteker, 2002; Peters & Pierre, 1998; Porter, 2005). As governments are still commonly expected to provide the same functions of governance that they used to be able to provide, they often actively encourage the inclusion of non-governmental actors (Braithwaite, 2002, 2005; Eberlein & Grande, 2005, p. 151; Knill & Lehmkuhl, 2002, p. 42).

The advantage of governance through non-governmental actors, such as private industry, appears to be that non-governmental actors’ operations tend to be less constrained by jurisdictional boundaries and tend to possess superior market information and technical expertise. Technical standardization through the various international standards setting organization represents a good example for such governance without government. Both formal standards-organizations (such as the ISO, IEC etc.) as well as informal standardization consortia fulfill a wide range of governance functions. At one end of the spectrum, they develop reference and quality standards signal consumers that a specific product or service is “fit for purpose” (ISO, 2005, p. 10), complying with a set of health, safety, or environmental quality levels etc. By resolving information asymmetries regarding the quality of products between buyers and sellers (Akerlof, 1970), technical standards can significantly increase the efficiency of economic transactions. Compatibility and interface standards, in turn, govern the technological and transactional interconnectivity between different goods and services (David & Greenstein, 1990; David & Steinmueller, 1994, p. 218). This paper shall focus on the latter. Whereas private standardization consortia may be less active in the case of quality standards, they play an increasingly central role in the provision of compatibility standards. As both

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formal organizations and private consortia can, in principle, fulfill similar governance functions, this paper does not distinguish between the two and refers to both as industry-led organizations as opposed to government-led regulatory processes, in which industry is not officially involved.

Governance through industry-led standardization appears to have two advantages over governance through governmental regulation. It is considered to be based on superior information and it is expected to allow for more flexible and timely governance than could be provided by public rule-makers (Abbott & Snidal, 2001, p. 345). The private participants of the standardization organizations always have a market incentive to update their information and to monitor market trends and technological developments continuously (Abbott & Snidal, 2001, p. 365; David, 1985, 1990).

An increasing number of policy-makers around the world—especially, though not exclusively, the European Commission—are building on governance through industry-led standardization (European Commission, 2004a, p. 2; 2004b, 2008). Günter Verheugen, the previous vice-president of the European Union (EU) Commission, for instance, suggested that:

This [industry standardization] is an excellent example of better regulation [...] We thus avoid that legislation becomes overloaded with excessive technical details, we guarantee flexibility because European Standards can be easily adapted and reviewed [...]. Günter Verheugen (CEN, 2005)

In the EU, quasi-regulatory tasks are therefore often delegated to industry standard-setters, namely CEN, CENELC and ETSI. The removal of technical barriers to trade by legislative processes, as set out in the 1969 General Programme on the Removal of Technical Obstacles to Trade, had turned out to be too cumbersome and time-consuming (Egan, 2001, pp. 78-81). The legislative process was often held up by the politicization

of minor technical issues of legislation. For this reason the *New Approach* to technical harmonization and standardization was introduced in 1985 (European Council, 1985). It was meant to circumvent the decision-making problems of the European policy-making process, which Scharpf (1988) named the ‘joint-decision trap,’ by privatizing market regulation. Under the *New Approach* the task of removing the remaining ‘technical’ barriers to market integration was delegated to the European standard setting organizations.² At the same time new standard setting organizations, such as the DVB Project, have started to emerge, which provide governance through standardization in a wide variety of fields. Given their wide prevalence and the central role that technical standards play in the governance of advanced market economies, governance through standardization could be interpreted as evidence for the superior governance capacity of private compared to public governance.

DIGITAL VIDEO BROADCASTING STANDARDIZATION

This Section examines the success of the DVB Project as a form of private governance. The DVB Project, was and still is the main driver behind digital television standardization. Its creation and institutional design was a direct response to the debacle of European HDTV standardization mentioned above. This is also reflected in the four principles upon which it was built. First, it was decided that the development and standardization of digital television should--from operators, content producers down to TV-set manufacturers--include the entire value chain (DVB Project, 1993, Article 2(1)).³ In its first year, the DVB grew from 83 to 147 firms (de Bruin & Smits, 1999, p. 14). Today, it includes 200 firms (DVB Project, 2013).

Secondly, the DVB Project broke with the tradition of consensual decision-making and introduced the possibility of majority voting to

prevent the body's broad membership from delaying joint decision-making and to reduce the risk that individual members would be able to pursue hold out strategies.⁴

Thirdly, the DVB Project was meant to seek independence from governmental influence. "We decided at an early stage that we had to keep it [the DVB] away from any regulatory influence," Peter Kahl, the first president of the DVB project, was argued (Homer, 1994).⁵

Finally, the standardization process was meant to be 'market driven.' For that purpose, the DVB Project was divided into separate Technical and Commercial Modules. While latter were meant to formulate commercial requirements, such as functionality, cost targets and deadlines, the role of the former were deliberately limited to the transposition of these commercial requirements into technical specifications. This 'market driven' approach was meant to ensure that standards were specified in accordance with companies' business demands and that they would only be developed if and when they can be translated to products with "direct commercial value" (DVB Project, 2010). According to an early participant in the DVB Project this approach was the result of the:

[...] the burned fingers (or perhaps burnt-out cheque books) in the age of MAC and HD-MAC. [...] The engineers now realized that, before designing a new broadcast system, it was necessary to decide what the system should do for the public and how much it should cost to be successful on the European domestic market. (Wood, 1995)

This approach is considered to have contributed greatly to the success of DVB standards (Reimers, 1997, p. 28; Dai, 2008, p. 1; DVB Project, 2010). It allowed the DVB Project to respond to the commercial opportunities in a more timely fashion than other standard setting organizations.

Given these four principles, the institutional design of the DVB Project can be considered as rather progressive. A priori it can be expected to be more likely to develop common standards and thus to provide governance without government than less progressive organizations. To assess whether and to what extent this was the case, the following two Sections provide an in-depth analysis of the development of two of the technological cornerstones of digital television: Digital transmission and conditional access.

Digital Transmission Standardization

As a result of its innovative organizational structure, the DVB Project could celebrate its first success soon after its foundation in 1993. By 1994, the DVB Group quickly agreed to a common set of standards for satellite (DVB-S), cable (DVB-C) and, shortly thereafter, terrestrial (DVB-T) transmission via a common compression technology (MPEG-2).⁶ Due to cooperation agreements with ETSI and CENELEC, the DVB Group could feed these technical specifications into the latter's standardization processes. ETSI and CENELEC simply rubber-stamped the DVB Project's specifications and transformed them into formal European standards (Grimme, 2001).

As a result of this first success the literature, without exception, has been quite positive about the European digital television standardization project (de Bruin & Smits, 1999; Cave, 1997). Dai (2008) even goes as far as to present the case of digital television standardization—in comparison to European HDTV standardization—as evidence for the superior governance capacity of private industry and as an argument for non-intervention:

The spectacular failure and the unexpected success of DVB have certainly dealt EU policy-makers, including the European Commission, the Coun-

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cil of Ministers, and the French Government, a powerful blow. The EU finally accepted in 1995 that the outcome of technological standardization should be determined by market forces, rather than policy makers. (Dai, 2008, p. 61)

Not without *schadenfreude*, Dai (2008, p. 60) argued that, “[i]t is rather ironic that television viewers in France,” a country which the author associates with interventionist industrial policies, “today are beginning to experience digital TV from the non-official DVB project, rather than the officially favored HD-MAC technology!” According to Dai this stands in stark contrast to the United Kingdom (UK), which he considers to be a rather non-interventionist country, where digital television is striving.

From an engineering perspective, the development of this technology clearly was a great success. The DVB overcame tremendous technological challenges and pushed the technological frontier into the digital age.⁷ This stood in sharp contrast to the above-mentioned European HDTV technology, which, despite large government subsidies, was already outdated before its development was completed. This appears to confirm the expected informational advantage of industry compared to government.

From a governance perspective, however, the DVB’s compression and transmission standardization process was not as successful. The problem was that instead of developing a single common standard—or at least multiple interoperable standards—distinctly incompatible standards were adopted for satellite, cable and terrestrial broadcasting.⁸ To make things worse, different countries adopted subtly different versions of the three transmission standards. Even different generations of the same technology, such as DVB-C and DVB-C2, were made incompatible. Philip Laven, the DVB Project’s current director, later stated that:

There are now more than 1500 digital satellite TV services using DVB standards in Europe [...] Regrettably, to receive all 1500 satellite services, you would need many different digital TV set-top boxes. The reality is that there is a serious problem with inter-operability. (Laven, 2002, p. 3)

From a governance perspective, however, a single common standard or at least multiple interoperable standards would have been preferable for two reasons: First, a single intermodal standard could have significantly accelerated the market take-up of digital television by maximizing economies of scale and scope and creating the basis for a competitive market for set-top boxes, which would have brought down the retail price of digital TV equipment. The lack of a single transmission standard, however, undermined scale economies and is hence considered to have “cost real money”.⁹ It is held, at least partially, responsible for the relatively slow market penetration of digital television (Brown & Picard, 2004, p. 2; Cawley, 1997, p. 2). The high retail prices of set-top boxes were one of the main reasons why the consumer switch-over to digital television has been slower than expected.

Secondly, a single common standard or intermodal interoperability would have increased competition on the service provision side of the market. Competition across the three modes would have (1.) resolved significant antitrust problems within the individual markets—especially the have brought competition into the naturally monopolistic infrastructure side of the cable market—(2.) brought down the price of television services, and (3.) it could have accelerated the switchover from analog to digital television. Incompatible standards, by contrast, decreased intermodal competition by raising the switching costs for consumers. Modal incompatibility meant that if consumers wanted to switch from one mode to another they had no choice but to purchase new

transmission equipment, stacking up towers of set-top boxes in their living rooms (Brown & Picard, 2004, p. 2). Given high initial equipment prices, however, consumers were unlikely to do so and would thus stay with their old provider. This is not to suggest that a maximum level of variety reduction is always necessary. In the case of digital television, however, it clearly was. From the governance perspective, it can thus be argued that DVB transmission standardization was not a success.

Even if it would not have been possible to use the same technology for all three modes the Japanese example demonstrates that it would have been technically feasible to develop an interoperable system that functions across modes and minimizes switching costs for consumers. However, cable, satellite and terrestrial operators deliberately chose to develop incompatible systems for each mode. In the face of technical convergence and market liberalization, the incumbent operators saw incompatible standards as an opportunity to minimize competition between the different modes of broadcasting—i.e. satellite, cable and terrestrial.

The reason why the DVB developed incompatible standards nonetheless was that governance concerns did not play a role in the standardization process. The standard-setters deliberately chose incompatible standards to minimize competition among each other and across modes.¹⁰ The problem hence was not that standard setters were unable to adopt the necessary standards because of decision-making problems. The problem was that they were unwilling to do so. They were more concerned with their current market shares than the opportunity to maximize the size of the future market. The standard-setters cooperation thus appears to have been closer to competition-reducing collusion than market-making governance.

Although the DVB's transmission and compression standardization may have been a great commercial and engineering success, it clearly illustrates the limits of industry-led standardization as a form of governance without government. It

shows that even where companies would be able to agree to the required standard—there neither appear to have been technological nor proprietary problems—industry standard-setters are unable to provide the necessary governance. Interestingly, this view was also shared by Philip Laven, the DVB Project's current director:

[I]n the strange world of digital TV, many operators have deliberately chosen standards that are unique to their services. This suggests that self-regulation will not be successful in this area. (Laven, 2002, p. 6, emphasis added)

Although this case study does not directly lend itself to an empirical investigation of this issue, theoretically it is rather straight forward to conceive of ways in which governmental interventions might have lead to superior outcomes. To achieve the optimal level of variety reduction governmental actors might have forced the DVB by law or regulation to adopt a single common standard for all three modes of television transmission. This could have been done in a technologically neutral way, thus avoiding the infamous information problems of public actor interventions. The bigger problem would have been that national laws or regulations can only have a limited success in a market which is as international as the consumer electronics market. An EU level intervention, however, might have sufficed. If manufacturers and broadcasters were forced to apply a multi-modal standard in the European market, they may not have altered their products and services for non-European markets.

Conditional Access Standardization

This Section investigates the governance capacity of industry-led standardization processes at the example of the DVB's attempts to standardize conditional access systems. Conditional access constitutes the technological basis of pay TV and its standardization succeeded the above-described development of transmission standards. While

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pay TV used to be a small niche market in most European countries, it was expected to play a central role in the governance of the newly created digital television market because of two reasons (see Ypsilanti, & Sarrocco, 2009, p. 196).

First, conditional access was crucial for the commercial viability, sustainability and size of the digital television market. Because advertising revenues were not going to rise proportionally with the larger number of channels that digitalization allowed broadcasters to submit they had to look for new revenue streams (see Lyle, 2008, p. 125). Conditional access systems allowed broadcasters to scramble their television systems and to restrict the consumption of their program to paying customers.¹¹ This was expected to open the market to a larger number of broadcasters and content providers, not only increasing competition among companies but also increasing the size of the market overall. In order to achieve this, however, it was necessary that all market participants—both incumbents and potential insurgents—gained access to the revenue streams of pay TV. An open conditional access standard was necessary.

In the absence of such a standard, access to the revenue streams of pay TV was going to remain limited to a small number of firms, impairing the overall growth of digital television markets as well as the competition upon them. The problem is rooted in a first-mover advantage resulting from two factors (Nolan, 1997, p. 601). First, companies managing to obtain a critical mass of subscribers before their competitors would be able to exploit economies of scale and reduce retail prices of the set-top boxes containing their conditional access systems thus setting off a bandwagon effect of accumulative sales. Secondly, consumers were discouraged to switch from one pay TV provider to another as long as set-top box prices were non-negligible. Once having purchased one conditional access decoder—which, in the early days, could cost up to €1,000—consumers were unlikely to acquire another one only to access services from another pay TV provider. As a result only one

firm would gain access to the revenue streams of pay TV. To prevent a monopolization of pay TV markets and to cease the technological opportunities provided by digitalization an open standard for conditional access was necessary.

The first mover advantage and the dominant position that can result from it is well illustrated by the emergence of satellite-based pay TV in the UK. Sky TV, which was owned by Rupert Murdoch's News International Corporation, began transmission two years before BSB, its main competitor. With the help of an aggressive penetration pricing strategy—leasing receivers to new subscribers at minimal cost and charging low introductory rates—Sky TV quickly build up an installed base of 1.5 million consumers before BSB entered the market. This initial lead turned out to be irrevocable. Only 7 month after going on air, BSB collapsed and had no choice but to merge with Sky TV—forming BSkyB (British Sky Broadcasting) (Hart, 2004, p. 36). Within one year, BSkyB managed to break even and has held a dominant position in the British satellite broadcasting market since (see Grindle, 2002, pp. 6-7). Many third party providers complained about the terms which BSkyB obliged them to accept to gain access to its conditional access system called Videocrypt. To prevent that this bottle neck would be carried over into the digital era, it was necessary to develop a common non-proprietary standard for digital conditional access that could provide a large number of companies with equal access to a the revenue streams of pay TV.

Secondly, a common standard was also necessary to maintain and promote media pluralism and diversity. In markets characterized by a high degree of market concentration, Hotelling (1929) demonstrated, companies tend to target the same middle ground of consumers by providing a relatively homogeneous range of products (i.e. programs) to maximize sales (i.e. viewing time and thus advertising revenues). This 'Hotelling effect' was recently confirmed by a study of the British Department for Culture, Media, and Sport

(2001, Paragraph 1.5). It suggested that companies with a significant market presence tend to 'super-serve' a median audience of young adults rather than to address the full range of cultural, ethnic and religious niche markets. Only where new companies were able to enter the market and competition intensified would companies employ product differentiation strategies and start to offer a more heterogeneous range of programs catering to niche markets and minority interest (Biggam, 2000). This, however, could only be achieved through a common open standard. In its absence, the opportunity to increase media pluralism and diversity via a diversification of the television market would be sacrificed. It was feared that television programs would "[...] be dominated by the TV culture of quiz shows featuring stripping housewives, squeezing out educational and public interest programmes," as suggested by Arlene McCarthy, Member of the European Parliament (EP, 2001).

To maximize the size and competitiveness of the digital market and to optimize its contribution to media-pluralism and diversity, it was necessary to create a common and open standard. The remainder of this section will examine whether and to what extent the DVB Project was able to develop such a standard.

As a potential solution, Public and free TV operators proposed a system called Multicrypt, which could be described as a form of maximum standardization. Multicrypt was based on the Common Interface, a standardized socket integrated in the set-top boxes that would allow consumers to access any pay TV operator's programs by inserting the given operator's credit-card-sized decoder card into an open and non-proprietary set-top box. Proponents of Multicrypt argued that it would mean lower risk and lower cost for consumers, which would no longer be forced to buy a whole new decoder to watch another pay TV operators' programs. Consumers merely need to acquire the given provider's decoder card. This also reduced their risk of being stranded with a set top box that

has lost the 'standards war' to another set-top box. In the medium to long run, its proponents argued, Multicrypt would lead to deeper levels of market penetration of digital television and increase competition between conditional access services and create a common European market for conditional access decoders and content. Both could be produced at a larger scale and thus be sold at a lower price. Multicrypt had the advantage that no rules or regulations were required to guarantee third party access to digital television markets.

The incumbent pay TV operators, however, opposed the Multicrypt solution. They each sought to use the installed base of consumers acquired in analogue pay TV markets to launch proprietary systems, which would give them a dominant position in the market (Verse, 2008, p. 226). Therefore, they sponsored the Simulcrypt system, which, in turn, could be described as a form of minimum standardization. It was intended to allow third parties to transmit streams of encrypted information simultaneously through the incumbents' proprietary broadcasting system—hence the name 'Simulcrypt' (Levy, 1997, p. 668)—without standardizing conditional access as a whole. While this opened their conditional access systems to third parties, it also meant that the incumbent pay TV broadcasters would have been able to control and dictate the conditions of third party access themselves. Public and free TV broadcasters and manufacturers therefore vehemently opposed the Simulcrypt option, claiming that it gave pay TV operators too much market power.

Given this divergence of interests between the incumbent pay TV broadcasters—BSkyB, Canal+ and Nethold—on the one side; and public service and free TV broadcasters, on the other, the DVB Project soon found itself in a stalemate. "Those who drive the market at the beginning want to protect their market and they want Simulcrypt. Those who don't want to be debarred, favour Multicrypt," the gridlock was summarized by Robin Crossley, of SES Astra (in M. Brown, 1995). At a closer look, this stalemate could be described

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with the classic hold-out problem. While public service and private broadcasters as well as potential market insurgents depended on the standardization of conditional access to create—and gain access to—the digital pay TV market, incumbent pay TV operators did not depend on such a standard. This allowed them to hold out agreement and force their negotiation partners to make costly concessions.

These concessions were eventually spelled out in the DVB Project's conditional access compromise, which comprised both Simulcrypt and Multicrypt.¹² And in order to appease regulators and competition authorities, the legal departments of BSkyB and Filmnet drafted a voluntary and nonbinding code of conduct on fair reasonable and non-discriminatory conditions (FRAND) for third party access to digital decoders (Levy, 1997, p. 668). The incumbent pay TV operators celebrated the compromise as a good example of successful self-regulation: "This underscored the recognition [...] that commercial actors were well placed to find a solution for a perceived market distortion," it was argued (Eltzroth, 2007).

At a closer look, however, this compromise rather demonstrates the problems of industry-led standardization as a form of private governance. While the conditional access technologies—particularly the common scrambling mechanism—developed by the DVB Project may also have been a great engineering success and while the compromise may have been a great commercial success to some companies, the DVB Project failed to adopt a standard that would have maximize the size and competitiveness of digital television markets and wasted an opportunity to increase media pluralism and diversity.

The first problem of the compromise was that although it formally included Multicrypt, it meant that Simulcrypt—and thus minimum-standardization—would prevail. It allowed the incumbent pay TV operators to use their installed base of consumers to promote their proprietary Simulcrypt and to consolidate their dominant

position. While market insurgents were free to use Multicrypt, they had no means of compensating their second-mover disadvantage.¹³ The incumbents' proprietary control over Simulcrypt allowed them to fend off market insurgents. Second movers never stood a chance. This was demonstrated, for instance, by the bankruptcies of the British ITV Digital in April 2002 and the Spanish Quiero TV soon after (Iosifidis, Steemers, & Wheeler, 2005, pp. 112-114; Iosifidis, 2007). The companies that were not immediately driven into bankruptcy, such as TPS in France or OnDigital in the UK, could never develop into serious competitors of the incumbent pay TV operators (see Levy, 1999, pp. 65-67; Rediske, 1996). Given their second-mover disadvantage market insurgents were often forced to employ costly penetration pricing strategies and invest in premium content such as football or blockbuster movies to obtain enough consumers to break even. In the UK, for instance, this resulted in ITV Digital's overbidding on Premier League football rights had pushed the consortium into insolvency (Iosifidis et al., 2005, pp. 112-114). In Spain, Quiero TV failed because it could not afford to give their set-top-boxes away for free as its competitors Canal Satellite Digital and Via Digital were able to do. Instead Quiero TV had to sell its decoders for around €400 to €500 (Iosifidis et al., 2005, pp. 112-114; Iosifidis, 2007). The European pay TV markets continue to be dominated by the incumbent operators. This was a direct consequence of the failure to adopt a common and open conditional access standard.

Given the vagueness and lack of a commonly accepted definition of FRAND, the pay TV operators obligation to grant access under such conditions also turned out to be insufficient to guarantee third party access and thus to create a more competitive market. In other industries this often led to lengthy and costly litigations, acting as an additional deterrent to market entry. The fact that these litigations almost always eventually lead to an agreement does not mean that FRAND

has made much of a contribution to the resolution of the underlying hold-out problems mentioned above. In a hold-out situation the party holding out will always settle, albeit not without negotiation significant concessions from their negotiation partners. That is the objective of any hold out strategy. Furthermore, the fact that there have not been such litigations in the case of conditional access should not be interpreted as evidence that FRAND was working either. This rather demonstrates the significance of the lack of a common standard as an entry deterrent. Pay TV markets continue to be dominated by a limited number of incumbent operators.

Some commentators, such as EU Commissioner Liikanen, however, argued that the conditional access compromise “[...] led to the creation of strong vertical pay TV markets” (Liikanen, 2001). In contrast to horizontal markets, which would be based on open and universal standards, vertical markets are based on competing, proprietary standards, in which service providers control every aspect of the value chain, such as set-top boxes, conditional access systems, and interactivity (A. W. Brown, 2005). In many industries vertical markets might suffice. In the specific case of television and broadcasting, however, vertical markets were clearly suboptimal. In order to exploit the Hotelling effect and thus to increase media pluralism and diversity, horizontal markets are necessary. That is because vertical markets, by definition, can only sustain a much smaller number of firms than would be necessary to make use of the ‘Hotelling effect.’ Given the high sunk costs involved in entering the market and building up an installed base of consumers, the market size only allows a limited number of firms to break even.

As a result, Europe remained stuck with a limited number of broadcasters that ‘super-served’ a median audience with a lowest common denominator of content. This is not to say the structure and concentration of digital television markets is more

worrying than the structure of the old analogue television markets. However, a good opportunity was sacrificed to create a more competitive and dynamic digital television market that might have increase media pluralism.¹⁴

Just as the DVB Project’s failure to agree to a single multi-modal transmission standard the episode of conditional access standardization thus, too, illustrates the limits of governance without government in the form of private industry standardization. It shows that where companies have heterogeneous technological or proprietary preferences or where their strategic interests are at stake, they are unlikely to agree to a single common standard. Industry may reach a compromise involving multiple and incompatible standards, as in the case of the DVB Project’s conditional access compromise. But where variety reduction is necessary to achieve optimal outcomes—as in the case of transmission and conditional access standardization—such a compromise is insufficient.

Different to the case of transmission standardization, however, the problem was not that standard-setters were unwilling to adopt a common standard. In the case of conditional access standardization they were unable to find a consensus. Despite the fact that the DVB Project had adopted the principle of majority voting, the Pay TV providers were able to hold-out agreement. This suggests that industry standard-setters are faced with the same decision-making problems as governmental actors meeting in intergovernmental organizations such as the EU or the United Nations. To the public policy literature, which often conflate industry into a unitary actor which has one interest only and that is to thwart governmental interferences with their business, this is a relatively new finding. This chapter, however, demonstrates that non-governmental actors’ preferences may be just as heterogeneous as governmental actors’ preferences. For this reason, the delegation of governance functions to

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non-governmental actors should not be expected to solve the decision-making problems common to intergovernmental bargaining arrangements. Intergovernmental decision-making problems merely seem to be replaced by private decision-making problems.

CONCLUSION

Although the DVB Project has been a great engineering and commercial success, this chapter showed that the industry-led DVB project could not address many of the governance issues involved in the standardization of television systems. Governance through industry-led standardization, as in the case of DVB, may be based on better market information and technological expertise than governance through governmental regulation. This case study demonstrated, however, that industry may not necessarily be willing to engage in a level of standardization that is necessary to address a range of governance issues involved in television standardization, such as the creation of fair competition or media pluralism and diversity. The short term interests of the standard-setters involved in the DVB Project prevented them from adopting a multi-modal standard which could have maximized the size of the market in the long run. Instead, they focused on weakening their competitors and strengthening their own market position.

Secondly, the governance capacity of industry standard-setters is limited, for they face the same decision-making problems that often tend to constrain intergovernmental decision-making. In the case of conditional access standardization the participants of the DVB Project failed to agree to a single common standard. Instead the status quo prevailed and multiple technologies were introduced. This turned out to have had devastating consequences for the market introduction of digital television as well as media pluralism and diversity.

Because most standardization organizations merely seek to solve specific engineering or business problems and do not see themselves as providers of governance, it may be unreasonable to measure their success by their contribution to governance. However, the agreements that standards setters adopt, or fail to adopt, as so many economic transactions, can create significant externalities. And if standards setters fail to internalize these externalities themselves, different ways need to be found to do so. Ways may need to be found for governmental actors to protect the public interest and to intervene where industry standardization fails, however difficult this may be. This case study demonstrated that important public interests, such as media pluralism and diversity, cannot and should not be left to industry standard-setters alone.

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KEY TERMS AND DEFINITIONS

Conditional Access: Technological basis of pay TV that limits access to programs to fees paying users.

Digital Television: Digital technology succeeding analogue television.

Governance: Social coordination that is necessary to overcome coordination problems, to implement collectively binding rules or to provide collective goods. Not limited to government. Also non-governmental actors can provide governance functions.

Hotelling Effect: An effect of monopolistic competition where companies tend to target the same middle ground of consumers by providing a relatively homogeneous range of products to maximize sales.

Interoperability: Ability to operate different systems or technologies together.

Public Policy: Government policy in the pursuit of the public good.

Regulation: Hierarchical intervention in market competition. Not limited to government. Also non-governmental actors can regulate markets.

Standardization: The process whereby technical standards are developed.

ENDNOTES

- ¹ Therefore, this chapter is not concerned with competitive standardization processes leading to the installation of *de facto* standards.
- ² These included CEN (European Committee for Standardization), CENELEC (European Committee for Electrotechnical Standardization) and ETSI (European Telecommunications Standards Institute).
- ³ It was also decided that participation should not be limited to European firms and actively sought the participation of Japanese and Korean players (Interview 3 with a member of the DVB Group, 2010).
- ⁴ According to the DVB's memorandum of understanding (MoU), "[a]ll reasonable efforts shall be taken to ensure decisions of the Board are taken on the basis of consensus. However, when a consensus on an issue cannot be achieved ...a call for an indicative vote may be made...If the indicative vote indicates a favorable outcome but a consensus is nonetheless not achieved, a call for a deciding vote may be made [...]" (DVB Project, 1993, Article 6(4)).
- ⁵ The Commission recognized this arguing that "the group is an independent body and

draws its strength from this. It will not be appropriate therefore that the Commission [...] becomes a member of the group" (European Commission (EC), 1993, p. 24).

- ⁶ MPEG-2 was just undergoing standardization in the International Standardization Organization (ISO) and International Electrotechnical Commission (IEC) (Ely, 1995, p. 12).

- ⁷ By reducing bandwidth requirements, for instance, digital compression technology allowed satellite broadcasters to deliver between 6–12 digital channels at the cost of one analogue channel (Wood, 1995).

- ⁸ Each is based on different technologies, namely QPSK modulation, QAM and Coded OFDM respectively (Reimers, 2006, pp. 175-176).

- ⁹ Interview 11 with a representative of the broadcasting industry (2010).

- ¹⁰ The incumbent telecoms operators, for instance, that controlled cable television in most European countries were keen to minimize competition from satellite television, which was rapidly gaining more and more market shares during the early 1990s. Similarly, terrestrial television providers—public and private—sought to shield themselves from the growing competition from both cable and satellite pay TV operators.

- ¹¹ The first conditional access system, Videocrypt, was developed by Rupert Murdoch's Sky TV in 1990. Conditional access allowed Murdoch to make his investments in alleged 'premium content'—such as Premier League football and Hollywood blockbusters—profitable (Levy, 1997, p. 668).

- ¹² The compromise also included the DVB Project's Common Scrambling Mechanism and the recognition of (DVB Project, 1994a, 1994b).

- ¹³ The incumbent Pay TV providers had no incentive to include Common Interfaces in their set-top boxes. And although they

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were not allowed to prevent manufacturers from including them they had no incentive to do so because they would not be paid for it. This meant the failure of Multicrypt. If third parties wanted to enter the pay TV market, they had to negotiate access to the proprietary and unstandardized Simulcrypt systems of the incumbent providers.

¹⁴ Moreover, it is interesting to note that in many European countries, such as Germany, pay

TV never seems to have gained a permanent foothold. The lack of common standards seems to have undermined the growth of the pay TV market overall. More content diversity and the availability of larger variety of niche programming might have attracted more consumers.