Report on the indicators

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Abbreviation List

CCI	Cultural and Creative Industry
DGCA	Direzione Generale Cinema e Audiovisivi
SDGs	Sustainable Development Goals
EFI	European Film Industry
ICE (ITA)	Istituto Nazionale per il commercio estero (Italian Trade agency)
ANICA	Associazione Nazionale Industrie Cinematografiche Audiovisive e Digitali
DISCE	Developing Inclusive and Sustainable Creative Economies (Project Horizon 2020)
IOTs	Input-Output Tables
BvD-ORBIS	Bureau Van DIjk ORBIS Database
GPN	Global Production Network
GUO	Global Ultimate Owner
NUTS	Nomenclature of Territorial Units for Statistics
NACE	Statistical Classification of Economic Activities in the European Community
SVOD	Subscription video on demand

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1 PROJECT SUMMARY

This project aims to connect the existing strengths, identify, and overcome weaknesses and plan for future competitiveness in the fields of policy, practice, and experience. More concretely, the project's objectives are, on the one hand, to explore the long-standing strengths and pervasive gaps in European competitiveness and policies for competitiveness This includes ways of 'measuring' 'analysing' and 'evaluating' the impact of policies and strategic pathways. On the other hand, the project aspires to place attention to the active preparation for the future in the area of audiences by exploring audience preferences and their generation, as well as modes of film content production. The latter are elements which today's youth will carry and engage with in the coming decades as makers and consumers, as well as industry and policy leaders. Therefore, the consortium interrogates not only the 'what is' but also the 'what has been' and 'what will be' with fresh lenses. REBOOT's ambition is to provide a full set of knowledge of the European film industry, which maximises its existing strengths, combined with strategic and tactical dimensions of action for the optimisation of the potential held in European youth publics, understood both as emerging audiences and as citizens Specifically, the ambition of the project combines several dimensions, which reinforce each other but are listed separately for analytical purposes (and in no particular order): a) increasing support for young people's engagement with European film; b) strengthening the place of the EU in the global audio-visual economy, particularly in light of the rise of video on demand (VOD); c) supporting cultural diversity in the EU film industry; d) addressing the need for a different understanding of competitiveness and relevant indicators in this context; and e) recognising and supporting the importance for the EU of film and, more broadly, of the cultural and creative sector as a geopolitical asset.

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2 EXECUTIVE SUMMARY

The REBOOT project is driven by the overarching goal of finding how the European Film Industry (EFI)'s competitiveness can be increased. To achieve this goal, the project measures, analyses and evaluates the pan-European policies, strategies, and institutional and legal context that shape the EFI's performance in the EU and abroad while upholding and promoting the EU values, such as cultural diversity and gender equity. In this context, WP6 is characterised by a strong empirical focus aiming at not only using and developing new indicators to assess the socio-economic competitiveness of EFI but also to provide an infrastructure to facilitate these data access and their integration into other WPs results. Capturing the socio-economic value of EFI is challenging, and this report identifies several gaps and methodological caveats.

WP6 first addresses this limitation by developing new and more inclusive indicators apprising EFI's economic and societal potential. Second, these indicators will be integrated into other REBOOT data and findings to build a competitiveness dashboard to support effective policy implementation. These objectives are achieved through three tasks operating from M4 to M36.

The literature review has highlighted several gaps concerning measuring the socio-economic impact of the film and audiovisual industry. This subsection explains the ways in which this report and, more broadly, T6.1 and WP6 address them. It is essential to stress that some limitations in quantitative approaches are related to the difficulties in capturing actors and activities involved. The REBOOT project tackles this issue through WP6, which is both a developer of new data and indicators (T6.1) and an aggregator of other WPs data (T6.2). Therefore, the literature gaps highlighted here are filled with the activities of T6.1 and, more generally, by the whole WP6.

The EFI direct economic effects analysis suggests that the film and audiovisual industry is relevant to the context of cultural and creative industries (CCIs), especially in major European economies like France, Germany, Italy, Spain, and Poland. France emerges as the country with a more developed and high-performing industry. The data highlights various degrees of heterogeneity, especially regarding economic contribution, geographical agglomeration, and segment composition. A developed film and audiovisual sector often correlates with a healthier general economy, enabling greater industry diversification and

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innovative business models. Finally, EFI displays a noticeable slowdown in the period under examination (2016-2019).

EFI indirect economic effects are measured using an embeddedness indicator to capture the level of sectoral integration at the country and regional levels. The country-level results indicate a significant relation between the EFI and CCI embeddedness, which is even more pronounced at the regional level, emphasising the role of geographical concentration. Similar to the economic direct effects results, the EFI regional embeddedness is uneven, and regions displaying a high level of EFI embeddedness are urban and often host the country's capital.

This deliverable is based on the analysis carried out within T6.1, which concludes in M28. Future work will focus on two lines of work. First, we will refine the economic effects analysis, at the firm level, using the BvD ORBIS database. Second, we complement the economic analysis with the development of social indicators. We aim to move beyond a strict economistic dimension, but rather integrate EFI societal impact in the analysis and dashboard (T6.2). Measures of societal impact will be constructed employing text analysis on European movie synopsis retrieved from the IMDb Non-commercial datasets. These indicators will measure the major contents of the EU movies and trends concerning SDGs and EU values. This content-level analysis will also be integrated with data such as the European social and value surveys.

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3 INTRODUCTORY REMARKS

The REBOOT project is driven by the overarching goal of understanding, revising and finding out the ways in which the European Film Industry (EFI)'s competitiveness can be enhanced. The project aims to connect the existing strengths, identify and overcome weaknesses and plan for future competitiveness in policy, practice and experience. More concretely, the project's objectives are twofold. First, to explore the long-standing strengths and pervasive gaps in EFI and 'measure', 'analyse', and 'evaluate' the impact of policies and strategic pathways. Second, the project aspires to actively prepare for the future in the area of audiences by exploring audience preferences, their generation, and modes of film content production. These latter are elements that today's youth will carry and engage with in the coming decades as makers, consumers, and industry and policy leaders.

Following these objectives, the consortium examines the 'what is', 'what has been', and 'what will be' with fresh lenses. REBOOT's ambition is to provide a full set of knowledge of the EFI, which maximises its existing strengths, combined with strategic and tactical dimensions of action to optimise the potential held in European youth publics, understood both as emerging audiences and as citizens.

Specifically, the ambition of the project combines several dimensions, which reinforce each other but are separately listed for analytical purposes (and in no particular order):

a. increasing support for young people's engagement with European film;
b. strengthening the place of the EU in the global audiovisual economy, particularly in light of the rise of video on demand (VOD);
c. supporting cultural diversity in the EU film industry;
d. addressing the need for a different understanding of competitiveness and relevant indicators in this context; and
e. recognising and supporting the importance for the EU of film and, more broadly, of the cultural and creative sector as a geopolitical asset.

This deliverable stems from the research carried out in T6.1, which provides a comprehensive evaluation of the effect of EFI on the economic and social system. It is essential, however, to stress that the limitations related to the quantitative analysis of the film and audiovisual industry highlighted in this report are addressed by the whole WP6 with the data dashboard and not only by T6.1. T6.1 results will constitute some of the building blocks for the data dashboard in T6.2, providing a comprehensive picture of EFI by integrating the socio-economic indicators with other data collected in the REBOOT consortium.

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Section 4 reviews the literature on the socio-economic effects of cultural and creative industries (CCIs) and the film and audiovisual industry, highlighting the most relevant gaps and how WP6 addresses them. The report continues explaining the data sources and the methods used to measure the direct economic impact of the film and audiovisual industry on the economy and its embeddedness in the local system (Section 5). The latter captures the broader economic effect of the industry, quantifying its impact on other co-located sectors. The measurement of the social impact of the film and audiovisual industry will be developed in the reminder part of the task, and the results will be included in the data dashboard (T6.2). Section 6 reports preliminary results on the economic effect that will constitute the basis for the indicators incorporated in the data dashboard (T6.2).

4 Background and Aim

The aim of this section is threefold. First, we review the existing literature on the socio-economic impact of CCIs. Second, we present a similar review focusing on the film and audiovisual industry. It is important to underline the strong relationship and complementarity between the film and audiovisual industries from the technical and artistic perspectives. Therefore, by film and audiovisual industry, we broadly refer to two industries that share similarities and are strongly co-dependent. Finally, we will summarise the identified gaps and how this deliverable addresses them within the REBOOT project. While the literature on CCI impact is beyond the scope of the task (and of the REBOOT project), it is still a relevant starting point for two reasons. First, the film and audiovisual industry is a sizeable component of CCIs, and in several countries, a large share of CCIs' effects are related to the film and audiovisual industry[1]. Second, CCIs studies still provide a benchmark regarding the theory, methodology and data sources to be employed and adapted for a more granular analysis of the film and audiovisual industry.

[1] For instance, for the case of France that is one of the main European producers the film and audiovisual industry generated the above 16% of the total value-added of the CCIs sector during 2021. Significant relevance also for the occupation that interest the 10% of the CCIs. The French film and audiovisual industry generate also the 17 % of CCIs' net return.

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4.1 The socio-economic impact of CCIs

CCIs play a role in the socio-economic system as a driver of innovation (Le Blanc, 2010), development (Sacco, 2011), sustainability (Crociata et al., 2015), social inclusion (Wilson et al., 2020), and well-being (Blessi et al., 2014). From this perspective, in the last decade, the attention on CCIs has grown significantly across social sciences from both research and policy points of view. (Sacco, 2011; KEA, 2015; DISCE, 2022). Starting with the generic view provided by Throsby (1999, 2005), cultural capital has both tangible and intangible forms. Tangible cultural stock consists of buildings and locations with cultural and historical relevance, artworks, books, music, multimedia and videos; whereas, intangible cultural capital consists of ideas, practices, beliefs, traditions and values (Hotter, 1996)[2]. Intangible cultural capital can be seen as a form of identity value shared by groups and communities (Throsby, 2005; Goldman, 2001) [3]. This dual view on cultural capital paves the way for an analysis of both the economic and social impact of CCIs. Quantitatively capture both effects is rather challenging, and cultural economists have at least focused on quantifying CCIs economic impact.

Concerning the direct economic effect of CCIs, recent contributions have investigated CCIs impact on GDP growth and development (Cerisola & Panzera, 2022), human capital (Crociata et al., 2020), occupation and specialisation in the sector (Cicerone et al., 2020), and property right (Santagata, 2008). The literature has also analysed the geography of CCIs, for instance Crociata et al. (2022) examine CCIs patterns of specialisation and spatial dependency in peripheral areas in Italy. Following the seminal contribution by Richard Florida (Florida, 2003)[4], several studies focus on CCIs and local development in term of urban economic growth (Sacco et al., 2014; Cerisola & Panzera, 2022), city attractiveness and jobs creation (Montalto et al., 2019), local human capital (Crociata et al. 2020), and workforce and level of education (DISCE, 2022). However, related to the workforce, the contribution of

[2] This engagement acts as a conduit for social inclusion and active citizenship, contributing to overall well-being and significant socio-economic factors such as happiness (Hand, 2018; Gómez-Zapata et al., 2021). Consequently, cultural activities serve as sources of social capital, fostering social connections and civic engagement (Hyyppä et al., 2006; Wheatley & Bickerton, 2019; Campagna et al., 2020). For example, individuals engaging in cultural activities demonstrate heightened awareness of societal issues such as environmental concerns, displaying pro-social and proactive behaviors (Crociata et al., 2015; Quaglione et al., 2019).

[3] For a more narrowed critical literature review we also suggest O'Connor (2010)

[4] Important contribution are also the development of Florida's work (Forida, 2017)

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Comunian and England (2020) highlighted the precarious condition of the CCIs workers during the covid Crisis-19 crisis.

CCIs do not develop in a vacuum, and because of their interdependencies with other sectors, they can influence the overall economy. Gutierrez-Posada et al.'s (2023) recent contribution measures the impact of creative jobs on non-tradable jobs between 1998 and 2018 in the United Kingdom. Using Moretti's (2010), local multipliers framework they estimate that cultural jobs generated 1.9 non-tradable jobs during the period observed. In a similar fashion, Bandano & Crociata (2023) investigate the spillover effect between CCIs and the tourism economy, finding a positive and significant linkage between the two industries. On another note, Cicerone et al. (2020) investigate the ability of the local economy to create new sector specialisation in relation to the CCIs presence.

To summarise, this evidence emphasises the important complementarity role of CCIs in the local milieu, which also affects the institutional and political spheres of the economic system (Le Blanc, 2010; Plaza & Haarich, 2013). Regarding the grey literature investigating the indirect effect of the film and audiovisual industry, two recent large H2020 projects have analysed the broad effect of CCIs. The Horizon 2020 – DISCE (2022) examines the effect of CCIs on education and human capital, whereas the project Horizon 2020 - CICERONE (2023) analyses the CCIs role from the perspective of the Global Production Network (GPN). Important is also the report released by KEA European Affairs (2015) "Feasibility Study on Data Collection and Analysis in the Cultural and Creative Sectors in the EU". The report aimed to enhance statistics for these sectors at the European level, however underlining the challenges the lack of data provided by EUROSTAT.

Studies of the effect of CCIs on the social sphere beyond the strict economic domain examine a wide range of linkages between cultural good accessibility and consumption and aspects such as mental health and individual well-being (Hyyppä et al., 2006; Blessi et al., 2014), sustainable behaviours (Crociata et al., 2015; Quaglione et al., 2019), serving as sources of social capital, fostering social connections and civic engagement (Wheatley & Bickerton, 2019; Campagna et al., 2020). Blessi et al. (2014) find a positive link between cultural product consumption and activities (such as reading books, attending cinema and theatres, and visiting museums) and individual subjective well-being. Similar positive evidence is confirmed by Grossi et al. (2019), Hand (2018), Wheatley & Bickerton (2019), and Gómez-Zapata et al. (2021). Cultural consumption is also positively correlated to sustainable behaviours such as recycling waste (Crociata et al., 2015) and energy-saving behaviour

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(Quaglione et al., 2017). Also, the DISCE project (2022) provides an extensive overview of how CCIs might influence indicators such as human development, inclusiveness, and well-being (Wilson et al., 2020; Denti et al., 2022)[5].

4.2 Measuring the impact of film and audiovisual industry

Both scientific and grey literature have tried to quantitatively assess the (direct and indirect) economic and social effects of EFI. In this section, we present their main results. The scientific literature attempting to quantify the direct economic impact of the film industry is still underdeveloped. It mainly includes case studies from cross-field literature on business and management, media studies, political economy, and economics. The recent review by McKenzie (2023) distinguishes between contributions focusing on the demand or supply side of the film market. Works focusing on the demand side have examined the determinants of box office revenues and highlighting driving factors related to film characteristics and consumers preferences.[6] Furthermore, these works have also examined some distribution factors (e.g. domestic languages) that might play a role in the process that generates box office revenue (Cucco, 2010; Walls, 2009a; b; 2010; Walls & McKenzie, 2020; Ventura et al., 2019).

Film's revenues are also positively associated to different factors such as: pricing and budget allocation (Fernandez-Blanco et al., 2013; Elliott et al., 2018; Dastidar and Elliott, 2020), the presence of star talents (Hofmann et al., 2017; Nelson & Glotfelty, 2012), being a sequels or a remakes, part of a franchise (Bohnenkamp et al., 2015; Dewani et al., 2021; Hennig-Thurau et al., 2009)[7] or a book adaptation (Joshi & Mao, 2012; Knapp et al., 2014; Asai, 2016).

Studies examining consumers' preferences mostly rely on survey data (Chuu et al., 2009; Gazley et al., 2011; Wühr et al., 2017; Redondo and Holbrook, 2010; Irandoust, 2018) highlighting the role of demographic characteristics (e.g. age, social class, education, and gender of the audience) . Also based on survey data, some authors (Hong & Sun, 2012; Shon et al., 2014; Abdeltawab & Obaidalahe, 2020) focus on the role of categorisation of films and genres and the role of information sharing (Brewer et al. 2009).

[5] Project Horizon 2020 – DISCE (2022)
[6] Another approach to simultaneously examine demand and supply of movies employ a structural demand-supply framework (Clement et al., 2014).
[7] Some papers adopt a strategic perspective (e.g., resource-based view, brand equity) analysing movies franchises (Skilton, 2009; Luo et al., 2010; Mannor et al., 2016; Griffith et al., 2017).

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Studies examining the relationship between box office revenues and supply side factors have focused on the different phases related to the production chain[8]. In this stream of literature, particular attention is dedicated to the micro dimension of production processes, acknowledging the high riskiness of film making because of the high initial costs and the risk of a box-office flop[9]. This literature discusses different "coping strategies", such as adopting a portfolio approach towards production or focusing on low-risk projects (e.g. sequels of successful movies) (Wei, 2020; Sacco & Teti, 2020; Luo, 2014; Goetzmann et al., 2013; Harris et al., 2017; Paulich & Kumar, 2021). After the project financing stage, the production and post-production phases follow; related literature has focused on the challenges and strategies to optimise the production channel, highlighting the importance of aspects, such as the production team and the synergy among cinema operators. In this perspective, guiding the final budget over the whole phase becomes strategic to overcome the risk, also by surveying opportunities to place the film product in the specific segment (or niche) (Ebbers & Wijnberg, 2012; Patil & Bisoyi, 2012; Delre et al., 2017; Benner & Waldfogel, 2020; Leung et al., 2020; Arora, 2021). Finally, the distribution phase starts where decisions about the film title, the distributors choice, the audience, and the release date and play-mode affect box-office success (Bae & Kim, 2019; Zhang et al., 2019; Beckwith, 2009; Calantone et al., 2010; Belleflamme & Paolini, 2019). Furthermore, these factors not only impact on the film's success, but also on the studio's parent company's share price (Einav & Ravid, 2009) and parent company's share price (Joshi & Hanssens, 2009). Several other factors related to film production strategic aspects might determine film success. Kim and Bruce (2018) investigate the relationship between advertising and sequel (as well as parent) films. Filson and Havlicek (2018) and Opitz and Hofmann (2016) explore whether changes to the creative team between instalments affect outcomes. Ma et al. (2014) analyse the relationship between the increased bargaining power of stars in sequel films and advertising. Finally, through historical analysis, Pokorny et al. (2019) highlight sequels' significance as risk management tools for studios employing a portfolio approach to film production.

[8] The production chain comprises the following phases: development, production, post-production and distribution. See Bagnasco (2009) and Barbarito et al., (2019).

[9] For instance, for the case of Italy see also Cucco, M. (2019). (*Le istituzioni e le politiche a sostegno della distribuzione internazionale del cinema italiano. Cinema e Identità Italiana, 414–425*.) and the report of Autorità garante della concorrenza e del mercato (AGCM). (2022). (*Relazione annuale sullo stato della concorrenza nel settore della distribuzione cinematografica*.

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Given the relevance of the topic, film and audiovisual industry has also been analysed in several policy reports with different geographical scopes. Even though the scope of the REBOOT project is the film industry, we expand the scope of this review to include the audiovisual industry, given the technical and artistic complementarities between the two. These reports mainly focus on the industry's general performances by providing descriptive statistics on revenues and box office, number of films produced, import/export and general sector performances at a country level. For instance, in Italy, multiple institutional authorities (i.e., the Ministry of Culture) produce yearly reports regarding the status of the industry (ICE, 2021; ANICA, 2022; DGCA, 2023). Similarly, each European member systematically produces institutional policy reports on the performances of the film and audiovisual industry in their economy[10]. Concerning the European context, the European Audiovisual Observatory provides several reports and publications on the film and audiovisual industry, mainly analysing EFI economic performance (e.g., Kanzler, 2023[11]).

Similarly to CCIs, also the film and audiovisual industry do not develop in isolation and might have indirect economic effects. However, quantitative economic literature addressing the economic (local or not) spillover of the movie and audiovisual industry is inexistent. Moreover, given the results on the indirect economic effects of CCIs and the importance of the film and audiovisual industry within them, they are likely to produce positive spillover effects on related industries among CCIs and the rest of the economy[12].

Moving beyond a strict economic analysis of the film and audiovisual industry, contributions provide a qualitative overview of the role of the film industry in the political economy in North America and South Korea (Wasko, 1981; Baker & Faulkner, 1991; Ryoo, 2008) framing the relevance of the film industry in political and social debates. This literature

[10]For instance, France has one of the developed sector when it come to film and audiovisual industry. For further information see: https://www.bmwk.de/Redaktion/DE/Publikationen/Studien/bedeutung-filmindustrie.pdf?__blob=publicationFile&v=

[11] See also the recent publication of European Audiovisual Observatory (2024). Top players in the European AV industry - Ownership and concentration.

[12] Consequently, this encompasses diverse participants, including private and public entities and stakeholders within and across various sectors. (Bagnasco, 2009; Barbarito et al., 2019). Regarding the public sector, in the major European markets (France, Germany, Italy, Spain), the cinema and audiovisual sector stands out as one of the industries benefiting most from public support (Cucco, 2019). It is also well-known that companies in this sector often require liquidity and depend on public support, although extensive criticism regarding this aspect exists (beyond the scope of this work) (AGCM, 2022; Cucco, 2019). Remarkably, there has been a systematic lack of competitiveness and economic sustainability among the actors involved in the film and audiovisual industry (Cucco, 2019), leading to frequent enterprise defaults.

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highlights the role of the film and audiovisual industry as an important political and socio-economic driver, representing a *de facto* source of soft power that enforces national and social values (as also debated by Su, 2010; Vlassis, 2016; Guan et al., 2023[13]). In this perspective, literature on social effect analyses the linkages between the film and audiovisual industry with social learning in teenage audiences (Moretti, 2011), shared consumption values and experience (Cabral & Natividad, 2016; Gilchrist & Sands, 2016), gender gap (Wühr et al. 2017). From a different perspective, contributions dedicated attention to classification rating as a measure of film's contents: for instance, identification strategies for the type of content have made use of industry sources that capture content, such as "*kidsinmind.com*", in the case of Garciadel-Barrio & Zarco (2017), or "*screenit.com*" in the case of Palsson et al. (2013). Differently, Dahl & DellaVigna (2009) examine whether violent films have antisocial spillover effects. The grey literature on economic indicators and analysis also highlights the important role of the film industry in promoting cultural, traditional, and social values (e.g., ICE, 2021; ANICA, 2022; DGCA, 2023; Kanzler, 2023). Recent publications by the European Audiovisual Observatory (Female professionals in European TV/SVOD fiction production 2015-2022 figures[14]) have studied female audiovisual professionals, highlighting issues related to the female active population in the industry (under-represented) and wages and pay gaps across professionals.

This literature highlights several gaps that WP6 addresses. Concerning the economic effect, there is no systematic quantitative evidence on the film and audiovisual industry's economic contribution to the European economy. In particular, there is a lack of comparable data that allows to ascertain countries specificities. More substantial is the gap on the economic spillovers of the film and audiovisual industry on other geographically co-located sectors at European level. These gaps are related to several operationalisation issues such as the lack of quantitative data useful for mapping the actors involved in the film and audiovisual production chain and their connections with other sectors and entities (KEA, 2015; Crociata, 2022). Similarly to other CCIs, the film and audiovisual production involve few large corporations, and more frequently individuals working as freelancers or with short-term

[13] Miaofang Guan, Fabrício H Chagas-Bastos, Marislei Nishijima, Winning Hearts and Minds: Soft Power, Cinema, and Public Perceptions of the United States and China in Brazil, Global Studies Quarterly, Volume 3, Issue 2, April 2023, ksad029, https://doi.org/10.1093/isagsq/ksad029
Su, W. (2010). New strategies of China's film industry as soft power. Global Media and Communication, 6(3), 317-322.

[14] European Audiovisual Observatory (2024). Female professionals in European TV/SVOD fiction production 2015-2022 figures

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employment contracts. To account for these operationalisation issues, T6.1 analyses the direct economic effect relying on EUROSTAT aggregated data and using the proprietary BvD-ORBIS Database that provides information on individual firms. The use of both these two data sources allows for a more accurate picture of the whole industry at European level.

A further aspect that complicates the evaluation of the indirect economic effects of CCIs and the film and audiovisual industry is their reliance on people rather than corporations, thus emphasising the human element over the enterprise (represented mostly by small and medium-sized activities). This aspect certainly highlights the attached artistic element and creativity that characterise the CCIs, but it results in a limited identification, trackability, and measurability of the phenomena under investigation (KEA, 2015; Crociata, 2022[15]).

Concerning the indirect effects of the film and audiovisual industry, T6.1 develops an indicator of economic embeddedness to quantify how much this industry contributes to the local economy. This analysis also contributes to filling the gap related to identifying the geographical scope of the film and audiovisual industry impact, which is important in the case of agglomeration economies and local specialisation. This approach helps to account for some specificities of the industry under evaluation, such as the human element, the knowledge tacitness and diffusion (Iammarino & McCann, 2007; McCann, 2011), cognitive proximity (Boschma et al., 2009), and labour mobility (Duranton & Puga, 2004). Finally, this approach could capture how specific forms of embeddedness that involve different layers of society (institutional, political, economic) might also coexist in the case of the film and audiovisual industry, and CCIs in general (Plaza & Haarish, 2015; Gutierrez-Posada et al., 2023).

Finally, T6.1 couples the analysis of the economic effect to the social effects. The literature review on the film and audiovisual role in disseminating cultural and social values, is recent and still underdeveloped. Similarly to the economic effect, there is a gap in quantitatively analysing the phenomenon at the European level and future work of this task will address it. Using text analysis, we plan to analyse the European movie contents in relation to the Sustainable Development Goals (SDGs) and European social values. We will start with a pilot study to test our operationalisation of SDGs and social values, aiming to enlarge the focus on a representative sample of European movies. In addition to this large-scale exercise,

[15] KEA European Affairs (2015), Feasibility study on data collection and analysis in the cultural and creative sectors in the EU, Bruxelles, Belgium: KEA for the European Commission.
Crociata (2022). Policy recommendations for statistical analyses and mapping of CCIs. DISCE Deliverable D2.3.

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we will complement the analysis using public survey data (European social survey and/or European value survey).

5 DATA SOURCES AND METHOD

The current work gathers data from different sources to capture the socio-economic effect of EFI. Concerning the direct and indirect economic effects, we use publicly available EUROSTAT data at the country and regional levels (NUTS1 and NUTS2, where available). In contrast, we use the BvD-ORBIS Database for the analysis at the firm level[16]. Table 1 reports detailed information on the variables used to investigate the EFI direct effect, such as the source, the official name and the reference, the level of the analysis, and the used years. While these variables are in a strict sense economic variables, they capture different features. Value added, net revenues and number of businesses capture the economic health from a business perspective, whereas employment and wages encompass also some social aspects. While these variables are strictly economic, they capture different features of the economic systems, leading to different interpretations. Value added, net revenues, and the number of businesses capture the economic health from a business perspective, whereas employment and wages also encompass some social aspects. Concerning the latter, employment provides quantitative information on the economic status of the sector, where a high geographical concentration of employment suggests the local relevance of a sector. From a social perspective, high employment (in the economy or a region) highlights the sector's social importance in terms of occupation and how many persons' income depends on the sector. Also, the level of wages can shed some light on the social impact of one employment sector. The level of wages provides one dimension to evaluate job quality using aggregated statistical data, where a high level of wages is associated with high job quality and perhaps better work conditions. Comparing these data across regions further expands on this social interpretation, highlighting patterns of regional job inequality. While the interpretation should be careful given the aggregated nature, these two variables help better understand the complexity and the interplay between economic and social dimensions.

[16] For more information about this dataset see: https://www.moodys.com/web/en/us/capabilities/company-reference-data/orbis.html?cid=ppc-gglds-16891&gad_source=1&gclid=Cj0KCQjwgJyyBhCGARIsAK8LVLMu1jCIGdOux4au7CDzR0g5aNbYuaXizySNd7HMJcNm0MDa9IIvJzYaAn4SEALw_wcB&gclsrc=aw.ds

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A challenging aspect of the empirical analysis of EFI using these data sources is identifying the film and audiovisual industry through standard classifications of economic activities. EUROSTAT provides industry-level data classified using the Statistical Classification of Economic Activities in the European Community (NACE) Rev 2 (see Table 1 - Data used for the analysis of the direct economic effects). Most available data are classified at two digits of the NACE (rev 2). Also, following the DISCE (2022), we identify the film and audiovisual industry within the NACE Rev 2 classification using the following codes[17]:

- Motion picture, video and television program production activities (NACE Rev 2, J5911)
- Motion picture, video and television program post-production activities (NACE Rev 2, J5912)
- Motion picture, video and television program distribution activities (NACE Rev, 2, J5913)
- Motion picture projection activities (NACE Rev, 2, J5914)
- Television programming and broadcasting activities (NACE Rev, 2, J6020)

The analysis of the economic direct effect presented in the next section will aim, where meaningful, to keep these five segments separated to highlight their economic differences and impact. EUROSTAT data at such a level of sectoral granularity (4-digits) are available only for 2021 and 2022. However, for 2022, many values are missing in several economic sectors, including the film and audiovisual industry. Therefore, we employ these data to provide a preliminary introduction to the relevance of the EFI at the country level, continuing the report with data related to the years 2016 and 2019. We decided to focus on these two years as they are not influenced by global economic crises (such as the 2008 financial crisis and the 2020 global pandemic).

For the firm-level analysis, we use data from the BvD-ORBIS dataset. This dataset includes information on firm's NACE Rev, 2 classification up to 4-digit level; we therefore retrieve EFI firms' data using the same codes as the one used for the EUROSTAT data.

As highlighted in Subsection 4.2, some critical aspects are related to data availability and the used data sources. First, there is a systematic lack of data related to the cultural sectors,

[17] See **Fehler! Verweisquelle konnte nicht gefunden werden.** for the list of NACE Rev.2 codes and the corresponding CCIs.

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including the film and audiovisual industries. Second, data from EUROSTAT might not capture specificity, approximating the results and cutting the bottom (or upper) tail of the distribution, whereas the BvD-ORBIS Database might underestimate the number of people employed in the sector because of its data coverage (i.e. not including freelancers and self-employed people). These caveats concerning data availability reflect a general perceived disinterest on this industry (Sacco, 2011; KEA, 2015; Crociata, 2022).

Table 1 - Data used for the analysis of the direct economic effects

Source	Name	Description and reference	Unit of analysis	Year
Eurostat	SBS data by NUTS 2 regions and NACE Rev, 2 (from 2008 onwards)	Employment; Local Units, Total Wage etc. by NACE rev,2 (2 digit) https://doi.org/10.2908/SBS_R_NUTS06_R2,	Country; Region (NUTS1; NUTS2)	2016; 2019; 2020
Eurostat	Enterprises by detailed NACE Rev,2 activity and special aggregates	Employment; Enterprise; Value-Added; Net-Return by NACE rev,2 (2 digit) https://doi.org/10.2908/SBS_OVW_ACT	Country	2021; 2022*
Eurostat	Labour cost, wages and salaries, direct remuneration by NACE Rev, 2 activity and NUTS 1 regions	Wage by NACE rev,2 (2 digit) https://doi.org/10.2908/LC_RCOST_R2	Country; Region (NUTS1)	2016; 2019; 2020
Eurostat	Real GDP per capita	Real GDP per capita https://doi.org/10.2908/SDG_08_10	Country;	2016; 2019
Eurostat	GDP current market price	Gross domestic product (GDP) at current market prices by NUTS 2 regions https://doi.org/10.2908/NAMA_10R_2GDP	Region (NUTS2)	2016;2019
Eurostat	Population structure indicators by NUTS 2 region	Population structure indicators by NUTS 2 region https://doi.org/10.2908/DEMO_R_PJANIND2	Country; Region (NUTS2)	2016; 2019
Eurostat	Unemployment rate	Total unemployment rate https://doi.org/10.2908/TPS00203	Country	2016; 2019
Eurostat	Unemployment rate	Unemployment rate by NUTS 2 regions https://doi.org/10.2908/TGS00010	Region (NUTS2)	2016;2019
BvD-ORBIS Database	GUO name and GUO country	Name of the global ultimate owner and its country	Firm	2024
BvD-ORBIS Database	Firm's NUTS3	Location of the firm	Firm	2024
BvD-ORBIS Database	Firm's NACE Rev. 2	Industry classification of the firm	Firm	2024

Concerning country coverage, we restrict our analysis of the economic direct effect to a subset of relevant EU countries. We select the 16 EU countries under examination, looking at their relevance in terms of value added and employment. **Fehler! Verweisquelle konnte nicht gefunden werden.**reports the list of the countries included in the analysis (see Table 2). As a comparative benchmark, where data allow it, we also include in the analysis five major world competitors (i.e., the US, UK, India, Japan, and South Korea) and other sectors (such

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as CCIs, tourism, and manufacturing). Given this restriction on the geographical scope, in this report, the acronym EFI will refer to the 16 selected European countries.[18]

Table 2 - Ranking of EU countries by relevance of film industry.

Ranking	Country	Value Added (ml €)	Employment
1	France (FR)	12540,78	112009
2	Germany (DE)	6317,2	82544
3	Italy (IT)	3986,07	41038
4	Spain (ES)	3159,46	47683
5	Netherlands (NL)	1576,17	20484
6	Poland (PL)	1419,12	26651
7	Belgium (BE)	1004,16	11295
8	Sweden (SE)	975,22	15712
9	Denmark (DK)	848,53	12152
10	Norway (NO)	652,02	7680
11	Portugal (PT)	555,29	9705
12	Austria (AT)	524,06	10083
13	Romania (RO)	498,55	12835
14	Czech Republic (CZ)	402,22	4917
15	Finland (FI)	380,98	5724
16	Greece (EL)	327.85	16024

Source: Our elaboration on EUROSTAT data

Indirect economic effects of EFI are captured using data from the FIGARO tables available from EUROSTAT. FIGARO tables include information at the country level on the intermediated input-output flow of goods and services between sectors. The FIGARO tables identify the sectors in these data using the NACE (rev 2) at 1 digit. Therefore, we identify the film and audiovisual industry using the letter J (Information and communication), which includes the J59 (Motion and audiovisual production chain) and the J60 (broadcasters)[19].
As we are interested in examining the indirect effect of the film industry at the local level, we will "regionalise" (at NUTS2 level) these data using a weight system based on sectoral employment (see the details in Subsection 5.1).**Fehler! Verweisquelle konnte nicht gefunden werden.Fehler! Verweisquelle konnte nicht gefunden werden.** Table 3

[18] Note that the selected countries also correspond to REBOOT's partner countries. Unfortunately, we excluded Turkey because of the EUROSTAT Database's coverage.
[19] The sector J (Information and communication) include also the sector J58 (Publishing activities).

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Table 3 summarises the relevant information and references for the data used to evaluate the economic, indirect effects of EFI.

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Table 3 - Data used for the analysis of the indirect economic effects

Source	Name	Description and reference	Unit of analysis	Year
Eurostat	Full international and global accounts for research in input-output analysis (FIGARO)	Input-output tables by NACE rev,2 (one digit) https://ec,europa,eu/eurostat/web/esa-supply-use-input-tables/database	Country	2016; 2019
Eurostat	SBS data by NUTS 2 regions and NACE Rev, 2 (from 2008 onwards)	Employment by NACE rev,2 (2 digit) https://doi,org/10,2908/SBS_R_NUTS06_R2,	Region (NUTS2)	2016; 2019

The measurement of the social impact of the film and audiovisual industry will be developed in the reminder part of the task, and the results will be included in the data dashboard (T6.2).

5.1 Measuring indirect economic impact through economic embeddedness

Concerning the operationalisation of the indirect economic impact of the EFI on the local economy, this report relies on the Input-Output Tables (IOTs) approach. IOTs methods represent well-established tools within both the academic discourse and the policymaking sphere to evaluate economic structures assessing sectoral independencies. The prevalent utilisation of these analytical instruments stems from their robust provision of information crucial for disentangling the intricate economic interdependencies among different actors and economic sectors within the production chain[20]. Depending on data availability IOTs allow to capture economic interconnectedness within a sector (Timmer et al., 2015), within a country (Frenken et al., 2007), and across regions (Flegg & Tohmo, 2013).

In this report, we adopt the approach proposed by Kitsos et al. (2019) to measure the indirect effect of the film and audiovisual industry on the local economy, building a measure of its sectoral embeddedness. This analysis will allow us to quantify the contribution of the film and audiovisual industry to other sectors in the NUTS2 regions of the examined counties.

The definition of embeddedness is rooted in the sociological literature, attempting to conceptualise an actor's capacity to integrate into the local context and establish interdependencies with other actors within the system (Granovetter,1973; 1985). Following

[20] EUROSTAT (2019) - European Union inter-country supply, use and input-output tables — Full international and global accounts for research in input-output analysis (FIGARO); KS-TC-19-002; ISBN 978-92-76-00805-7; ISSN 2315-0807; doi:10.2785/008780.

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this framework, the embeddedness captures the extent to which relevant actors establish relationships and partnerships with local actors, integrating and sharing common goals and collaboration (McCann, 2007; De Martino et al., 2007; Iammarino & McCann, 2013; Marano & Kostova, 2016). Therefore, the embeddedness approach has been applied in social science across numerous domains for qualitative analysis (e.g., Plaza & Haarish, 2015, in the case of the Guggenheim Museum Bilbao) to explain better the dynamics occurring between actors in a local system, not only from an economic perspective but also from a political, institutional, and social one[21]. The concept of embeddedness encompasses an economic dimension that quantifies the degree to which a sector is integrated into the local economy. (i.e. another local sector). Along this line, recent contributions have operationalised the concept of sectoral embeddedness using added value to study regional resilience (Kitsos et al., 2019), MNCs employment to examine the relation between MNCs embeddedness and regional well-being (Pilo, 2023), and innovation (Breschi & Lissoni, 2007).

While IOTs have not been used yet to study the embeddedness of the film and audiovisual industry, recent contribution from the project Horizon 2020 - CICERONE (Creative Industries Cultural Economy Production Network) (2023) has used input-output structure to analyse the CCIs in the context of Global Production Network[22].

To measure EFI embeddedness, we employ data from the FIGARO database[23] described in Section 5 for the years 2026 and 2019. Figure 1 shows a snapshot of the FIGARO database, highlighting its structure and the included data. For each country, on the row dimension, the table reports the exchanges of inputs (thus, the import) from one sector to another, whereas on the column dimension, the table reports exchanges of output (thus, the export) from one sector to another.

[21] In summarising the literature, definitions of embeddedness can be categorised as follows: (i) economic embeddedness (Turok, 1993; de Martino et al., 2006): this encompasses interactions such as cooperation and competition with local firms, as well as the proximity of activities to the local economic structure; (ii) scientific embeddedness (Oerlemans et al., 2001; Schiller & R. Diez, 2010): This pertains to the relationship with scientific institutes and universities; (iii) Institutional and political embeddedness: This includes relationships with local institutions such as municipalities, as well as interactions with trade and labour associations (Phelps et al., 2003; Mattes, 2013).

[22] Permanent link: https://cordis.europa.eu/project/id/822778/reporting

[23] For more official information on data construction and potential use see: https://ec.europa.eu/eurostat/documents/51957/12767369/Description_FIGARO_Tables.xlsx/6efab159-7812-7ce4-bc07-0d94e460e68b?t=1701443984308.

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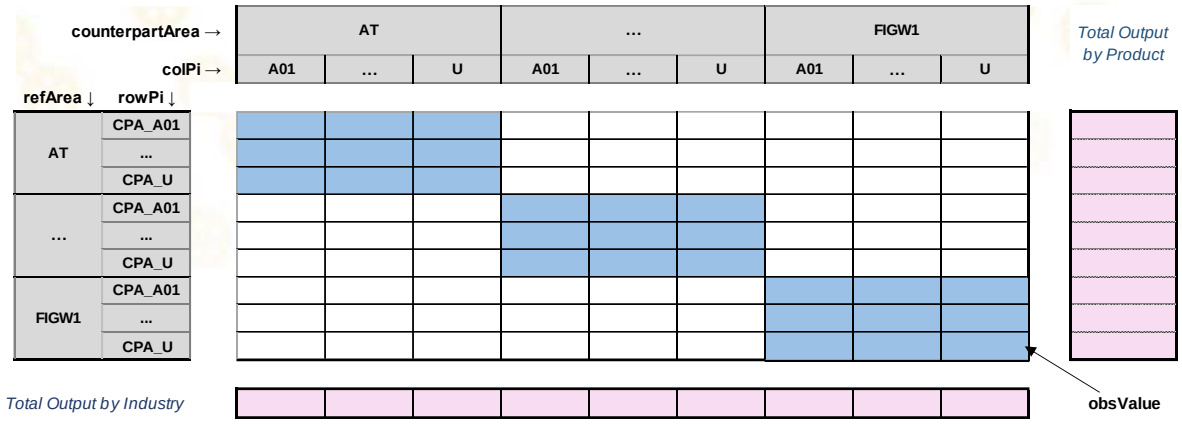

Legend:

refArea (flat format):	46 geographical areas / **countries of origin** (please refer to sheet 'Geographic areas' for full detail)
rowPi (flat format):	64 **products**, as per CPA2.1 (please refer to sheet "Products & Industries" for full detail)
icuseRow (flat and matrix formats):	Concatenation of **refArea** and **rowPi** codes
counterpartArea (flat format):	46 geographical areas / **countries of destination** (please refer to sheet 'Geographic areas' for full detail)
colPi (flat format):	64 **industries**, as per NACE rev.2 (please refer to sheet "Products & Industries" for full detail)
icuseCol (flat and matrix formats):	Concatenation of **counterpartArea** and **colPi** codes
obsValue (flat and matrix formats):	Value of goods and services flows
obsValue colour meaning:	**Domestic** flows of goods and services
	Non applicable
	Aggregates/totals (by row or column) not included

Figure 1 - Representation of FIGARO INPUT-OUTPUT tables – Supply side
Source: EUROSTAT (2023), FIGARO - EU Inter-Country Supply, Use and Input-Output Tables (EU IC-SUIOTs), available at: https://ec,europa,eu/eurostat/web/esa-supply-use-input-tables/database

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(a) $$Emb_j = \frac{\sum_{i=1}^{n} Z_{ij}^{d}}{\sum_{i=1}^{n} Z_{ij}^{d} + Z_{ij}^{m}}$$

(b) $$Emb_j^r = \frac{\sum_{i=1}^{n} Z_{ij}^{d}}{\sum_{i=1}^{n} Z_{ij}^{d} + Z_{ij}^{m}} \times \frac{X_j^r}{\sum_{j=1}^{n} X_j^r}$$

Equation (a) and (b) present the definition of embeddedness with and without regional disaggregation, adapted from Kitsos et al. (2019). Equation (a) indicates that the embeddedness of sector *j* (Emb_j) is calculated as the ratio between the sum of all the intermediate domestic flows (Z^d) between sectors *i* and *j* (*n* being the total number of sectors) and the sum of all domestic (Z^d) and foreign (Z^m) flows between sectors *i* and *j*. This measure shows how independent sector *j* is in terms of intermediate inputs employed in domestic production, providing a proxy of the generic economic structure of the country. It ranges from 0 to 1, where a value close to 0 means that domestic sector j depends on foreign sectors that supply input, while a value equal to 1 means that domestic sectors' productivity does not depend on foreign sector suppliers; thus, most supply (input) is from sectors of the same country. Another embeddedness interpretation is its link to industry's susceptibility to external shocks. High embeddedness indicates high reliance on local inputs, potentially shielding against external shocks.

Equation (b) displays how embeddedness can be "regionalised" using some weights ($X_j^r / \sum_{j=1}^{n} X_j^r$), which quantifies the sector's contribution to the whole economy in the region *r*. In this case, the embeddedness of region *r* is calculated as the embeddedness calculated in Equation (a) multiplied by the share of the variable X of region *r* over the total. Depending on data availability, the literature has used different variables a X. For instance, Kitsos et al. (2019) regionalise embeddedness using gross added value, whereas Pilo (2023) has used employment. This approach, independently of the used X, relies on the assumption that the economic composition of a region mirrors the national economic structure (Kitsos et al., 2019). In this report, we compute sectoral embeddedness using Equation (b) and employment. In our analysis, the weighting factor X_j^r is the employment in region r in sector *j*. Employment data are from EUROSTAT (see Table 3 for more details) using the sector J59 (Motion and

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audiovisual production chain) and the J60 (broadcasters). Finally, we identify the film and audiovisual industry in FIGARO using sector J (Information and communication), and our measure of the EFI local embeddedness is then calculated as the average of the two sectoral embeddedness.

6 THE ECONOMIC STATUS OF THE EFI: QUANTITATIVE MAPPING AND RELATED INDICATORS

6.1 Economic Analysis of the EFI: Direct effect

In this section we present the economic direct impact of EFIs at country, regional and micro level.

6.1.1 Economic impact of *EFI at country-level*

We assess the direct economic impact of EFI, looking at its relevance in a country's economy in terms of employment, wages, value added, number of firms, and net return. This allows us to give a snapshot of its importance in terms of both macro and micro level national economy.

Table 4 - EFI absolute size

	Mean	SD	Min	Max
Employment	24547.4	47894.96	461	241746
Wages	22455.59	12040.14	6906.982	45722.8
Added Value	2341.82	6375.923	26.88	33334.18
Number of firms	9552.267	25470.08	196	140943
Net returns	6724.873	18376.25	50.28	96392.9

Source: our elaboration on EUROSTAT data

Table 4 reports the absolute size of the film and audiovisual industry in terms of the five variables under examination. The table shows large variability among the countries under investigation. In absolute terms, France, Germany, Italy, Spain, Netherlands, and Poland are the countries with the largest film and audiovisual industry.

However, to better assess EFI relevance, we contrast it with CCIs. Figure 2 shows the contribution of the film and audiovisual industry as a percentage of CCIs in terms of macro-level variables such as employment and added value in the 16 countries under examination. The film and the audiovisual industry represent between the 1% (in the Czech Republic) and the 4.3% (in France) of CCIs employment, indicating a relatively marginal role vis-à-vis other

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industries. Looking at the added value contribution of the film and the audiovisual industry to CCIs, we can see that it is more significant than employment, ranging between 1.5 % (in Finland) and 16.1% (in France). Interestingly, besides France, the country with the largest contribution of the film and audiovisual industry to CCIs regarding employment and added value, the remainder of the rankings differ. Indeed, the Spearman correlation coefficient is positive (0.347), indicating that the two rankings are independent.

Figure 2 - EFI impact on employment and value added as % of CCIs
Source: Our elaboration on EUROSTAT data

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Fehler! Verweisquelle konnte nicht gefunden werden. Figure 3 shows the contribution of EFI to CCIs about the number of businesses, net value, and wage.

Figure 3 - EFI impact on number of businesses, net revenues and wages as % of CCIs
Source: Our elaboration on EUROSTAT data

Denmark has the largest number of businesses and is second for wage contribution; however, the Danish net return is below the EU27 average. Regarding the total wages produced in the country, the French film and audiovisual industry generates 6% of the CCIs and more than 6% of the CCIs businesses. Continuing, the number of firms (or units), value added, and net return are above 6%, 16%, and 17% respectively. Concerning the largest EFI countries (i.e. Germany, Italy, Spain, and Poland), their pattern in terms of performance is more heterogeneous. For example, the Italian film and audiovisual industry is above the European average for employment, value added, and net return. However, it is below them in terms of wages and number of firms (in this case, it is the last among the top 16 with 2% of CCIs).
This observed heterogeneity suggests divergences in sectoral structure and institutional frameworks within the European countries. Even if these data are aggregated at the country

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level, they reflect EFI industry composition and possibly different types of business models. Furthermore, these different industry configurations also highlight different institutional frameworks (e.g. differences in public support and general governance) as emerged in other REBOOT research activities (see WP3).

Figure 4 shows the relative importance of EFI with respect to the manufacturing sector at the country level for employment and added values. Figure 5 displays EFI contribution in term of number of firms, net returns and wages.

Figure 4 - EFI impact on employment and value added as % of manufacturing.
Source: Our elaboration on EUROSTAT data

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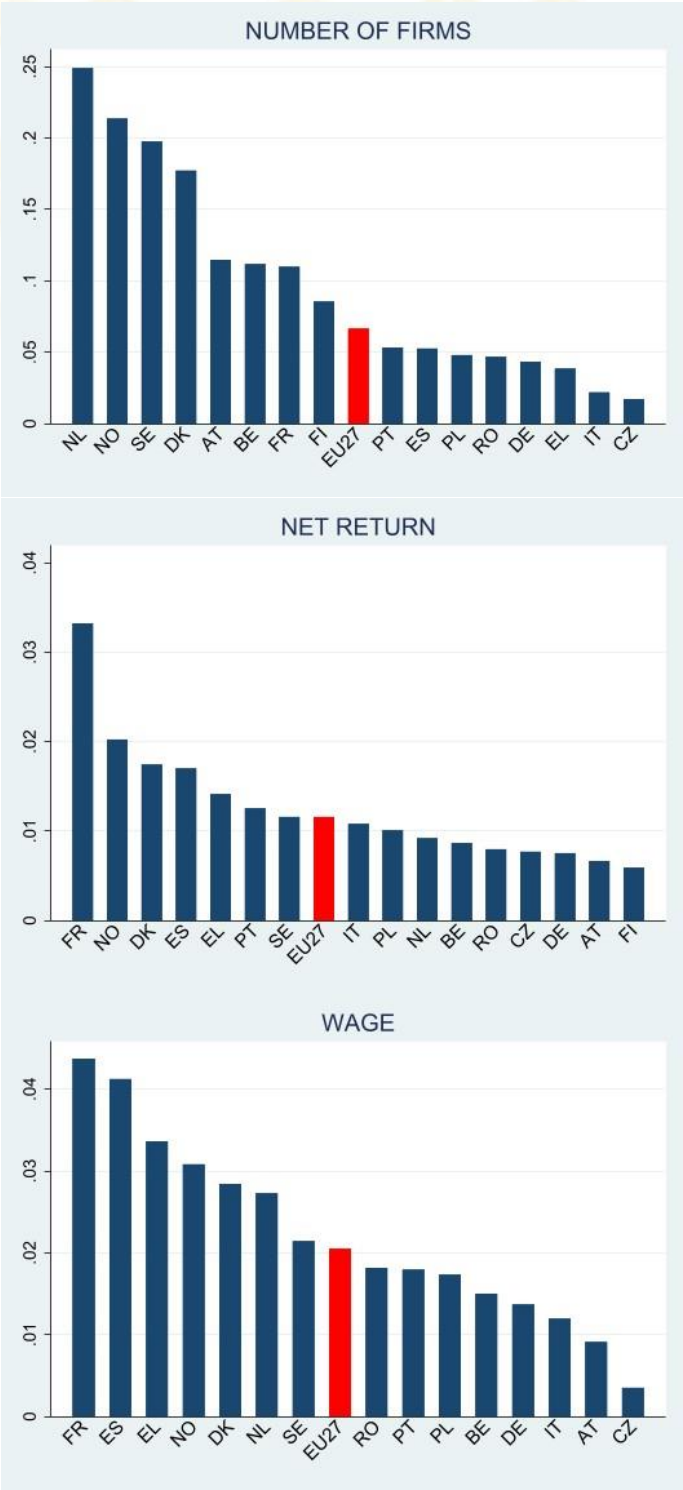

Figure 5 - EFI impact on businesses, net returns and wages as % of manufacturing.
Source: Our elaboration on EUROSTAT data

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Overall, France is the country with the largest EFI in terms of manufacturing as it leads in terms of relative total wages (4.3%), value added (5%), and net return (3.1%). Greece has the largest contribution to employment (4.5), followed by Denmark (3.9%) and France (3.5%). The Netherlands has the lead (25%) in the number of firms. Furthermore, the Netherlands also performs significantly well in employment and total wages produced (around 2.9%). Once more, the Czech Republic ranked last in terms of employment (below 0.5%), total wages (below 0.5%), and number of units (around 2%). Regarding value added and net returns, the last ranked countries are Austria (0.9%) and Finland (0.5%), respectively. The countries with the largest EFI as percentage of CCIs, (i.e. Germany, Italy, and Poland) are often below the European average when their film and audiovisual industry is compared to manufacturing. For example, the German film and audiovisual industry is above the European average for employment (1%), while it is below for total wages, number of firms, value added, and net return. On the contrary, Spain performs significantly better than the other major producers (excluding France) in all the domains except the number of firms (only 5%, below the European average)

Figure 6 shows the correlation between the wages per capita of EFI and CCIs among the EU27 plus other extra EU countries included in the EUROSTAT database[24]. The figure shows a (strong) positive and significant correlation (at 5%) between the film and audiovisual industry wages and the CCIs' wages, with Pearson's correlation at 88%. This result indicates that high work remuneration in the film and audiovisual industry corresponds to high remuneration in CCIs. Similar unreported results indicate a positive and significant correlation between EFIs' wages and wages in the manufacturing and tourism sectors.

[24] These countries are Norway, Serbia, and Nord Macedonia.

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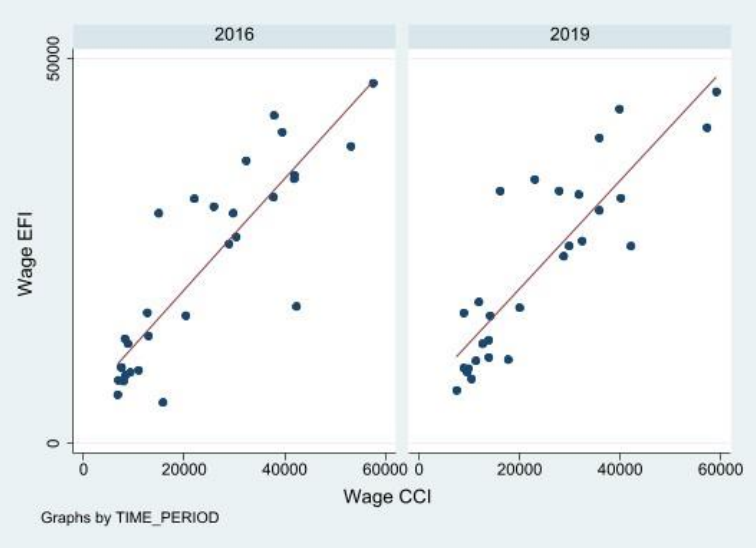

Figure 6 – Correlation between EFI wages (per worker) and CCIs wages
Source: Our elaboration on EUROSTAT data

6.1.2 Economic impact of EFI at regional level

In this section we examine the geographical distribution of EFI's activities at NUTS2 level. Providing an analysis at the regional level is important, to disentangle local heterogeneity related to aspects, such as labour market dynamics, industrial agglomeration, degree of urbanisation, degree of globalisation, institutional differences, infrastructures, and socio-cultural factors. Similarly to other sectors, the film and audiovisual industry might tend to be localised in specific areas with the presence of specific business environments, institutional frameworks, and economic structures. Not least, socio-cultural environments might be important drivers of creativity and artistic aspects that belong to the film and audiovisual industry. Perhaps a more culturally open environment might facilitate the transfer of knowledge (also tacit) among individuals, particularly in a sector that mainly bases the production chain structure more on people rather than companies.

Figure 7 shows the regional dispersion through a box-plot graph of employment, total wages, and number of firms in the film and audiovisual industry. The boxplot is a method for graphically display the locality, spread and skewness groups of numerical data through their quartiles. In addition to the box that includes the 25th and 75th percentiles, there can be lines (which are called whiskers) extending from the box indicating variability outside the upper and lower quartiles. Outliers that differ significantly from the rest of the dataset are plotted as individual points beyond the whiskers on the box-plot.

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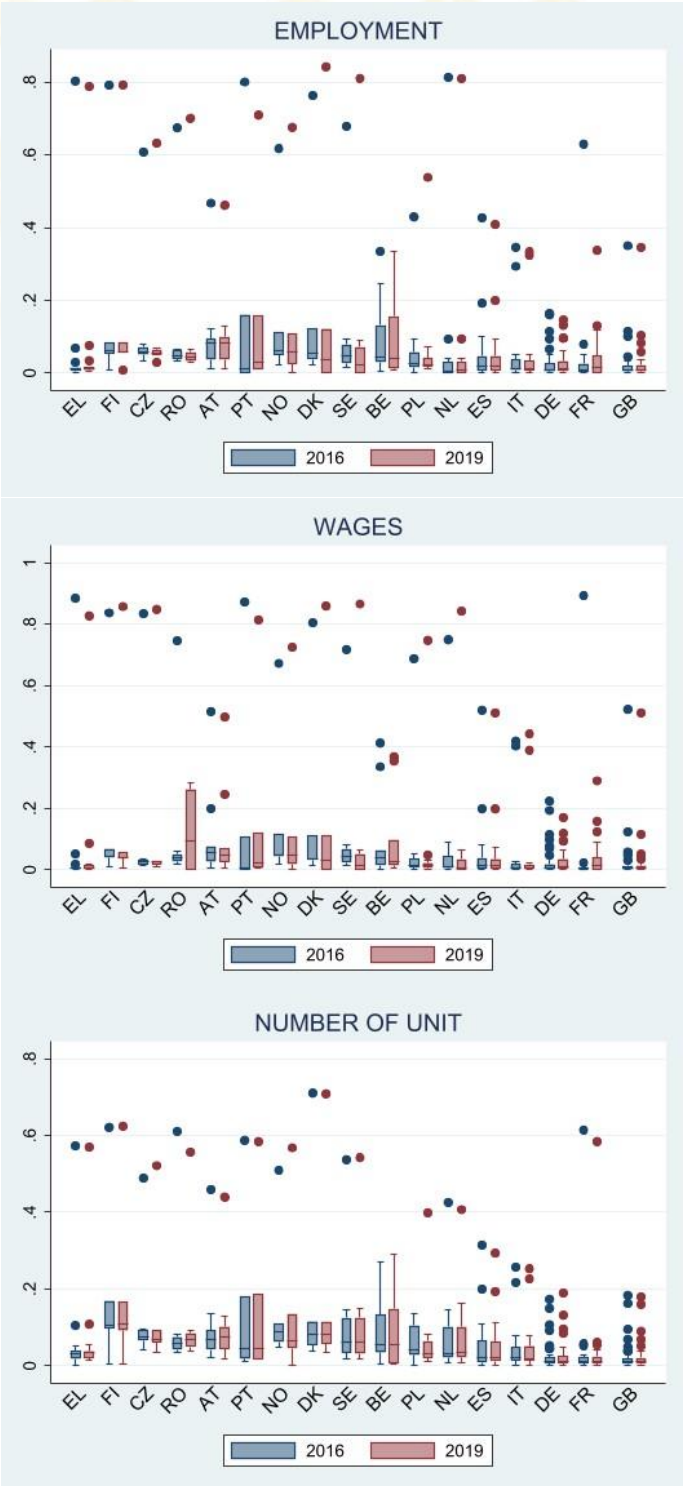

Figure 7 - Regional dispersion of the EFI: employment (a), wages (b), and local units (c)
Source: Our elaboration on EUROSTAT data

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The graphs highlight the presence in almost all countries of “outliers” regions, indicating a common pattern: in all countries, EFI is centralised in one or few regions, often including large cities or the country capital. However, differences emerge in the magnitude of the most central region contributions. Looking at employment, countries such as the Netherlands and Denmark have regions (i.e. North Holland and Hovedstaden, which includes Amsterdam and Copenhagen, respectively) that concentrate above 75% of the EFI employment, whereas, in Italy, the largest region in terms of EFI employment, (i.e. Lazio) has a share of about 35%. Germany displays a more even geographical distribution of EFI employment as the three top regions (i.e. Oberbayern, Köln, Berlin) contribute to about 42% of the EFI employment. A high concentration of employment in the film and audiovisual industry indicates a well-developed sector, providing a quantitative assessment of the sectoral status. The uneven regional distribution of employment corresponds to a specific region specialising in the film and audiovisual industry and polarising the whole production chain in specific geographical areas.

Figure 8 shows the correlation between the wages per capita of EFI and the other sectors (CCIs, manufacturing, and tourism) among 273 EU regions (NUTS2) under analysis. Starting with the CCIs (a), the picture shows no correlation between the film and audiovisual industry wages and the CCIs wages. One of the reasons behind this result might be that at the regional level, in terms of remuneration, the presence of well-developed film and audiovisual industry does not relate to the development of the CCIs compartment, suggesting a more independent system of the labour market in respect to the one of CCIs. Concerning manufacturing (b) and tourism (b), there is a positive correlation with a 5% significance level. Pearson’s correlations are at 67 % and 43%. In this case, the remuneration system at the local level follows the rest of the economy, supporting high wages in those regions that are more developed and diversified in economic terms. From this perspective, wage gaps across regions highlight the potential uneven development of the film and audiovisual industry job market, showing the presence of wage inequality across regions. This result on wage inequality bears some social implications, as it can summarise some features of job quality and possibly job well-being. Indeed, the level of wages is one fundamental dimension in evaluating job quality, where a high level of wages is associated with high quality of job and perhaps better work conditions in the film and audiovisual workers.

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Figure 8 - Correlation between wages (per worker) of EFI and wages of CCIs (a), Manufacturing (b), and Tourism (c)

Source: Our elaboration on EUROSTAT data

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6.1.3 Contribution of EFI at firm-level (micro level)

In this subsection, we will give an overview of the economic contribution of EFI at the firm level. As explained in Section 1, for this analysis level, we leverage the information available in the BvD-ORBIS database. This database includes information that allows appraising specific EFI characteristics such as firm ownership, location, and some financial data. Using the four NACE codes related to the film and audiovisual industry, we retrieved information about 261,492 European firms. Of these, 174,847 (66.87%) are in one of the 16 European countries considered in this report. Table 5**Fehler! Verweisquelle konnte nicht gefunden werden.** reports the country distribution of the firms in the sample, showing a significant heterogeneity. Three countries, France, The Netherlands, and Sweden (9.07%), account for 55.36% of the whole sample.

Table 5 - Country distribution of film firms

Country	Freq.	%	Cumulative %
France	57,355	32.95	32.80
Netherlands	23,665	13.6	46.34
Sweden	15,784	9.07	55.36
Spain	14,812	8.51	63.84
Germany	10,590	6.08	69.89
Poland	9,524	5.47	75.34
Italy	8,958	5.15	80.46
Belgium	8,023	4.61	85.05
Romania	6,536	3.76	88.79
Denmark	5,935	3.41	92.18
Austria	5,906	3.39	95.56
Finland	4,167	2.39	97.95
Portugal	2,439	1.4	99.34
Greece	795	0.45	99.8
Czech Republic	351	0.2	100
Norway	7	0	100
Total	174,052	100	

Source: Our calculations using the BvD ORBIS data

The NACE classification distinguishes five segments of the industry. *Production* and *Post-production* account for more than 90% of the firms in the sample, whereas *Distribution*, *Projection* and *Broadcasting* account for about 9% of the firms. Figure 99 displays the firms' percentages of these five sectors across countries. Production is the largest segment in all countries with some differences in size, ranging from 43.6% in Czech Republic to 93.5% in Austria. Post-production is the second largest segment with percentages across countries that ranges between 0.1% in Austria and 24.8% in Spain. The last three segments account for a residual percentage ranging between 3% in the Netherlands and 49% in Czech Republic,

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where Distribution accounts for the 23% of all the firms in the film industry. All in all, we can conclude that the EFI structure is rather homogeneous across the examined countries, with however some peculiar countries.

The NACE Rev2 classification distinguishes five segments of the industry. Production and Post-production account for more than 90% of the firms in the sample, whereas Distribution, Projection and Broadcasting account for about 9% of the firms. Table 6Table 1 displays the firm's percentages of these five sectors across countries. Production is the largest segment in all countries, with some differences in size, ranging from 43.6% in the Czech Republic to 93.5% in Austria. Post-production is the second largest segment, with percentages across countries that range between 0.1% in Austria and 24.8% in Spain. The last three segments account for a residual percentage ranging between 3% in the Netherlands and 49% in the Czech Republic, where distribution accounts for 23% of all the firms in the film industry. Overall, the EFI structure is relatively homogeneous across the examined countries, with some peculiar countries.

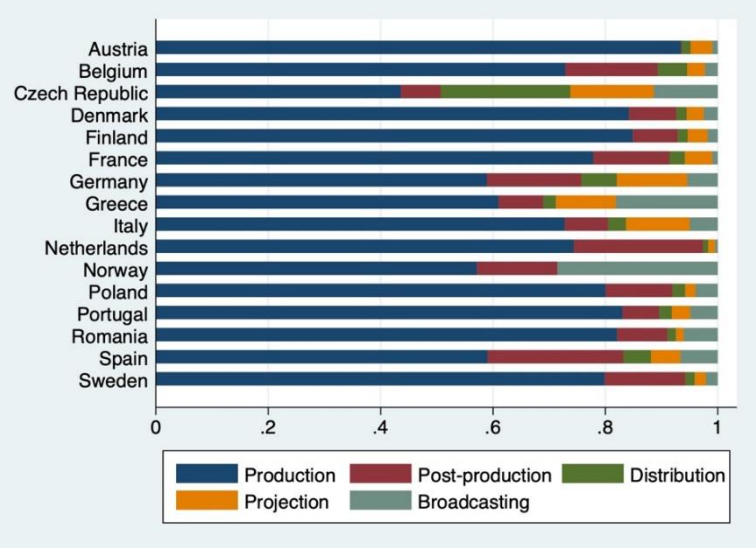

Figure 9 - Segment distribution over country.
Source: Own elaboration using ORBIS data

The BvD-ORBIS database reports a firm's ownership structure and the nationality of the owner for its foreign subsidiaries. In the EFI, foreign ownership is a rather limited phenomenon: only 13% of the firms in the sample have a foreign European owner, and only 2.27% have an extra-European owner. Concerning the number of companies in the group, the distribution is rather

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skewed, as half of the EFI companies does not belong to any group. However, there are few notable exceptions as, in the sample there are few subsidiaries of large groups such as Comcast, Disney, Vivendi, and National Amusement Inc.

Table 6 - Geographical distribution of EFI firm location.

PRODUCTION					
Rank	NUTS3	NUMBER OF FIRMS IN THE REGION	SHARE	C5	HH
1	FR101 - Paris	13408	10.82%		
2	SE110 - Stockholm	6766	5.46%		
3	NL329 - Groot-Amsterdam	4880	3.94%	24.99%	0.022
4	ES300 - Madrid	3149	2.54%		
5	PL911 - Miasto Warszawa	2770	2.24%		
POST_PODUCTION					
Rank	NUTS3	NUMBER OF FIRMS IN THE REGION	SHARE	C5	HH
1	FR101 - Paris	1605	6.54%		
2	NL329 - Groot-Amsterdam	1548	6.31%		
3	ES300 - Madrid	1389	5.66%	26.20%	0.020
4	SE110 - Stockholm	1142	4.66%		
5	ES511 - Barcelona	746	3.04%		
DISTRIBUTION					
Rank	NUTS3	NUMBER OF FIRMS IN THE REGION	SHARE	C5	HH
1	FR101 - Paris	421	9.66%		
2	ES300 - Madrid	291	6.67%		
3	ES511 - Barcelona	178	4.08%	27.87%	0.025
4	SE110 - Stockholm	174	3.99%		
5	BE100 - Brussels-Capital Region	151	3.46%		
PROJECTION					
Rank	NUTS3	NUMBER OF FIRMS IN THE REGION	SHARE	C5	HH
1	FR101 - Paris	256	3.77%		
2	ES300 - Madrid	140	2.06%		
3	ES511 - Barcelona	122	1.80%	10.67%	0.006
4	FRI32 - Charente-Maritime	106	1.56%		
5	ITI43 - Roma	100	1.47%		
BROADCASTING					
Rank	NUTS3	NUMBER OF FIRMS IN THE REGION	SHARE	C5	HH
1	ES300 - Madrid	233	5.81%		
2	SE110 - Stockholm	213	5.31%		
3	ES511 - Barcelona	141	3.51%	20.58%	0.013
4	RO321 - Bucharest	128	3.19%		
5	PL911 - Miasto Warszawa	111	2.77%		

Source: Our calculation on the BvD-ORBIS database

The BvD-ORBIS database also harmonises the geographical information of firm's location and for European firms it is possible to retrieve the NUTS3 code. Table 6 reports the top 5 European locations by industry segment and some indicators of geographical concentration.

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Except for the case of projection, the segments are moderately concentrated. Looking in details at the regions, not surprisingly, we identify urban areas mostly including capital cities.

6.2 Economic Analysis of the EFI: Indirect effect

Following the presentation of the embeddedness indicator (Subsection 5.1) as a measure of economic indirect effect, we present the results in this section. We examine economic embeddedness at the country and regional levels and the correlation between this variable and some economic development variables.

6.2.1 *Embeddedness at country level*

Figure 10 – EFI embeddedness vs. major competitors in 2016 and 2019 displays the embeddedness of the film and audiovisual industry in the EU countries in 2016 and 2019. Furthermore, it includes as a reference the level of embeddedness for the five major competitor countries also included in this report analysis.

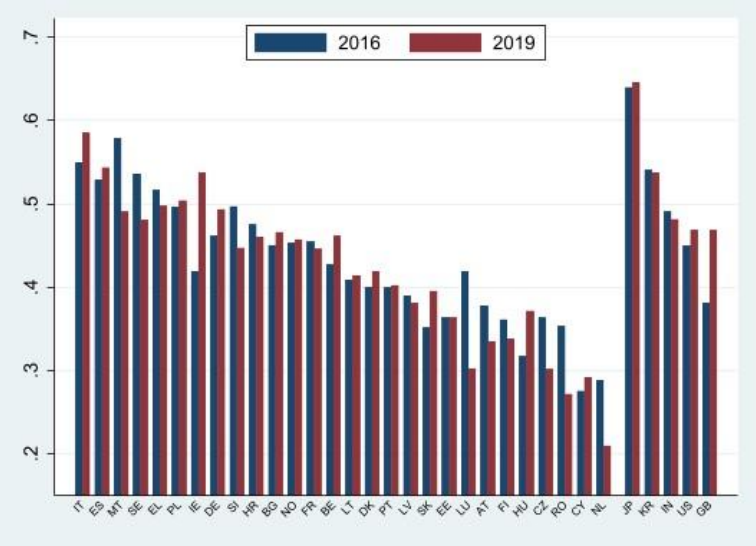

Figure 10 – EFI embeddedness vs. major competitors in 2016 and 2019
Source: Our elaboration on EUROSTAT-FIGARO data

The figure highlights a significant heterogeneity across countries that range from an embeddedness of less than 0,3 (The Netherlands and Cyprus) to countries with an embeddedness of more than 0,5 (Spain and Italy). Also, competitor countries display considerable heterogeneity, where Japan displays the highest level of embeddedness (0,65)

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of the whole sample. Concerning the variation over time, countries display increases and decreases in the embeddedness of the film and audiovisual industry. The most significant negative variation is registered in Luxemburg, where the embeddedness decreases by 0.11; whereas the largest positive variation is found in Ireland[25], where the embeddedness increases by 0,11[26].

To better assess the film and audiovisual industry embeddedness, we compare it to other industries embeddedness. Figure 11 compares the film and audiovisual industry with the CCIs sector[27] for the top 16 EU countries under examination.

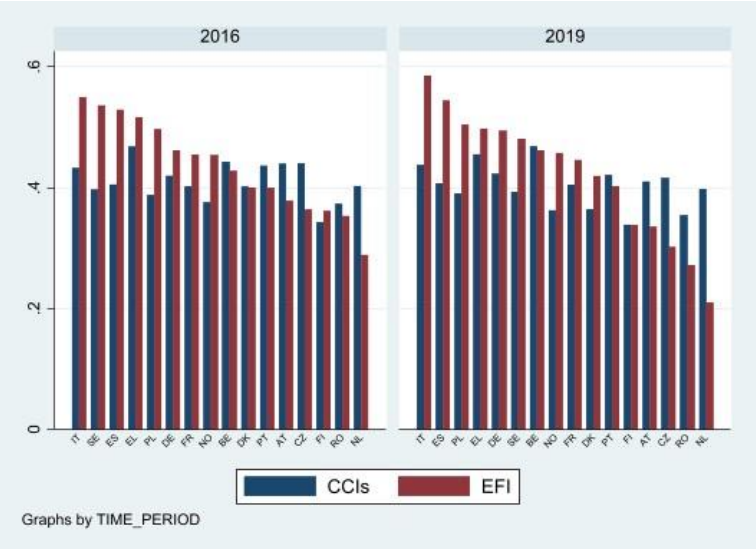

Figure 11 – Comparison between EFI and CCIs embeddedness at country level.
Source: Our elaboration on EUROSTAT-FIGARO data

The figure highlights a significant heterogeneity of CCIs across countries. Compared with the EFI, CCI embeddedness tends to be higher, showing lower divergence across countries. For instance, the Netherlands is last regarding film and audiovisual industry embeddedness, but it performs significantly better regarding CCI embeddedness (0.4). On the contrary, other countries display high levels of embeddedness in the film and audiovisual industry coupled to low CCIs level. For instance, in the case of Portugal,

[25] Due to data coverage, we cannot provide results at the regional level for Ireland.
[26] Concerning the whole EFI, there has been a sightly decrease on average embeddedness across EU, moving from 0.424 to 0.418
[27] Given the data coverage, the group of industries included in the CCIs as comparison are part of the Professional, scientific and technical activities (M71, M72, M73, M74) and the Publishing activities (J58)

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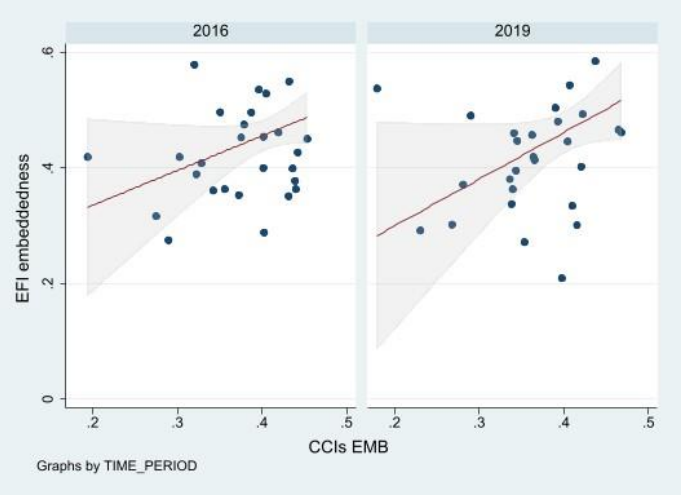
the CCIs embeddedness is right below the Netherlands (0.39). Looking at variation over time, the CCIs remain more stable than the film and audiovisual industry. Denmark, Austria, and the Czech Republic registered the smallest negative variations in the CCI embeddedness (below 0.05). [28]

Figure 11 highlights some correlation between EFI and CCI. Figure 12 displays the EFI and some other sector embeddedness in each country and their correlation. Figure 12 indicates a slightly positive but not significant correlation between the film and audiovisual industry and the CCIs embeddedness indicators (Pearson's correlation at 18%)[29]. Concerning the manufacturing sector, the figure suggests a positive and significant correlation (Person correlation at 40%) between the film and audiovisual industry and manufacturing embeddedness. Similar positive and significant results are found for the tourism sector (Pearson's correlation at 45%).

As a preliminary interpretation, we find that despite the similarity between EFI and CCIs their sectoral structure and integration into the national context significantly diverge, highlighting different pathways in terms of economic development and policy-driven interventions on the sector at the national level. Concerning the other two reference sectors, preliminary results indicate that integration is substantial part of the economy (proxied as manufacturing and tourism) can drive the integration of a "niche" sector such as EFI.



[28] Concerning the whole CCIs, there has been a sightly decrease on average embeddedness across EU, moving from 0.378 to 0.367

[29] The Pearson's correlation has been performed considering the whole sample of 28 EU countries, with Bonferroni standard error level of significance at 5%.

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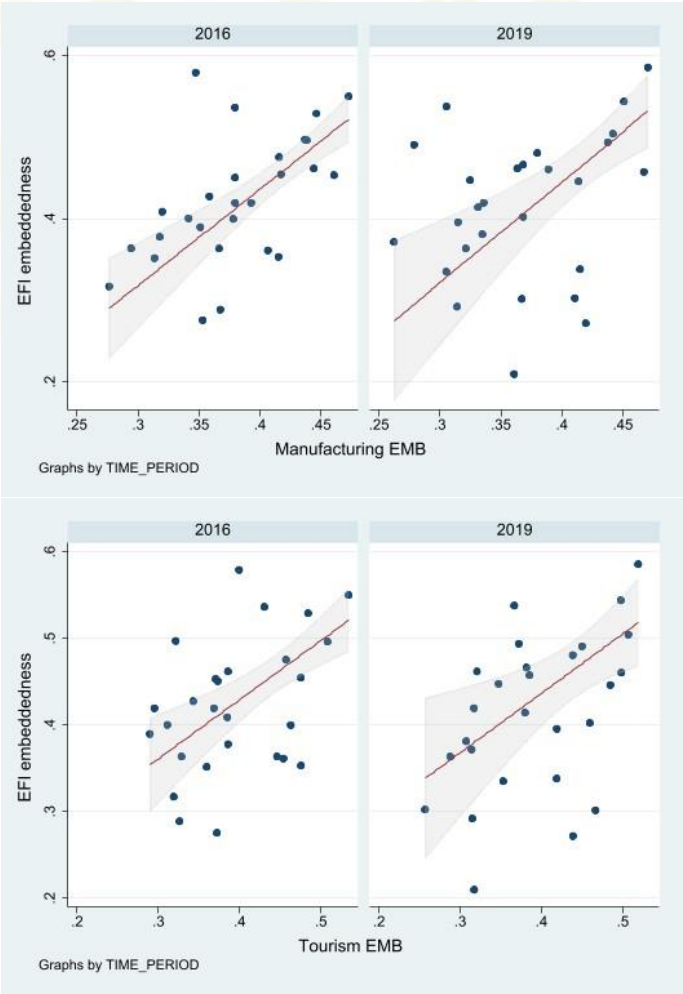

Figure 12 - Correlation between EFI and other sectors' embeddedness: CCIs (a), manufacturing (b), and tourism (c)
Source: Our elaboration on EUROSTAT-FIGARO data

The degree of embeddedness can play an essential role in enhancing the sector's economic performance. Figure 13 gives a snapshot of the relationship between economic embeddedness and performance measured as wages per worker and value-added[30].

[30] Note that the data on added value refers to 2021. As discussed in the section *Data sources and method,* the EUROSTAT data (special aggregation) does not provide information on added value at 4 digits before 2021.

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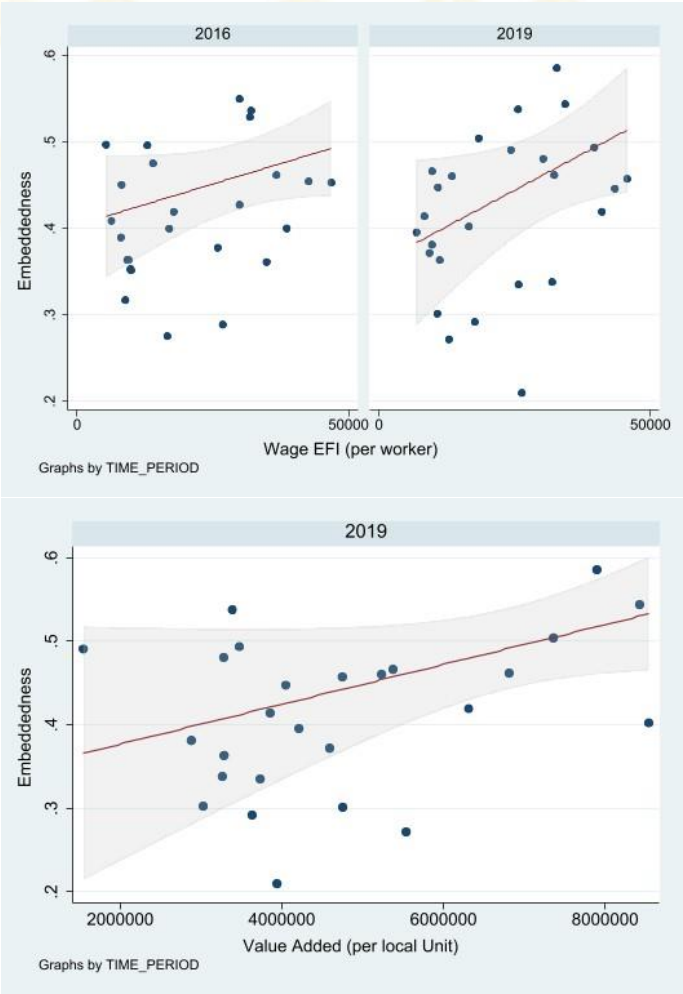

Figure 13 - Correlation between EFI embeddedness and performance: wages (per worker) and value added
Source: Our elaboration on EUROSTAT-FIGARO data

The figure shows a positive and significant correlation between the degree of embeddedness of the film and audiovisual industry and the local level of wages in the sector (Pearson's correlation at 32%). This finding suggests that more integrated and developed industries are associated with high wages and salaries, ensuring, from an economic perspective, a more sustainable work environment. Regarding the value-added per local unit existing in the sector, the figure suggests a slightly positive correlation among the variables at stake, but significant at 10% (Pearson's correlation 0.23%). France is not reported in the graph as being a significant outlier. It performs relatively better in terms of value added per local unit, regardless of the degree of embeddedness of the film and audiovisual industry, which is right above the sample average (0.418).

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6.2.2 Embeddedness at regional level

In this section, we analyse the economic embeddedness at the NUTS2 level. Table 7 shows the summary statistics of the normalised regional EFI. Malta displays the highest average EFI regional embeddedness (mean 0.24). The other major economies report lower regional embeddedness with a large standard deviation, suggesting a significant regional heterogeneity within countries (e.g., GB).

Table 7 - Regional Embeddedness of EFI, average by country. Years 2016-2019

Country	Mean	Standard Deviation	Number of regions
MT	0.24	0.10	1
NO	0.11	0.07	7
HR	0.10	0.09	3
SE	0.10	0.10	7
DK	0.09	0.08	4
GB	0.09	0.12	41
ES	0.09	0.06	19
SI	0.07	0.04	2
DE	0.06	0.06	38
NL	0.06	0.05	6
BE	0.06	0.05	11
CY	0.06	0.01	1
FR	0.06	0.05	21
EL	0.06	0.05	14
EE	0.06	0.01	1
FI	0.05	0.04	5
LV	0.05	0.00	1
LT	0.04	0.03	2
AT	0.04	0.03	9
PL	0.04	0.05	17
IT	0.04	0.04	21
HU	0.04	0.04	8
PT	0.04	0.03	6
BG	0.04	0.05	6
SK	0.04	0.03	4
RO	0.03	0.04	8
CZ	0.02	0.02	8

Source: Our elaboration on EUROSTAT-FIGARO data

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Figure *14*14 shows the dispersion of the film and audiovisual industry embeddedness across 26 European countries including Great Britain as reference[31]. Overall, the picture suggests that the film and audiovisual industry is unevenly embedded across regions within countries. Similarly to the results on EFI geographical dispersion, we find that within the major economies, one (or few) region is largely integrated. For instance, the Inner London–West region displays the highest embeddedness of the sample (0.66) and has a significantly larger embeddedness than the other regions within Great Britain. Other regions that are outliers in the sample are Oslo og Akershus in Norway (0.32), Stockholm in Sweden (0.29), and Grad Zagreb in Croatia (0.26). Other countries display lower dispersion still with an uneven pattern. For these cases, the "most embedded" regions are: for Spain, Comunidad de Madrid (0.25); for Germany, Area of Berlin (0.24) and Hamburg (0.24); for Poland, Warsaw (0.22); for the France case, Ile-de-France (0.22); for Greece, Athens (0.22); for Italy, Lazio (0.21). Not surprisingly, high embeddedness is reported in urban regions with national capital or main economic agglomeration.

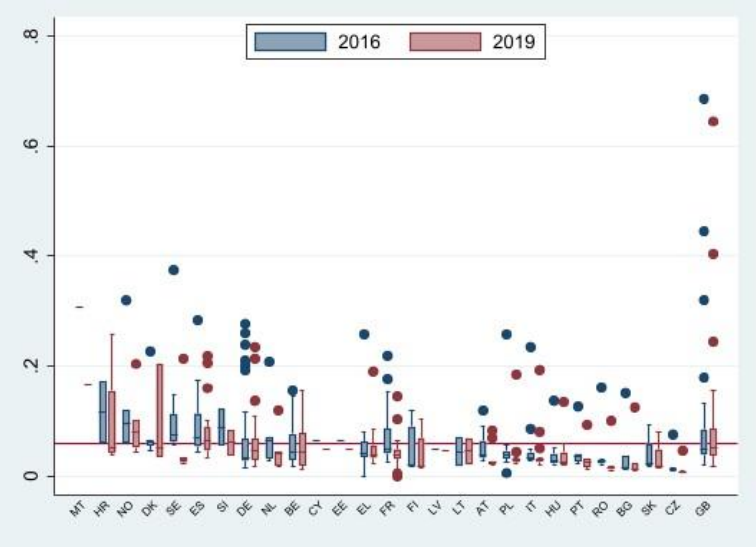

Figure 14 - Regional dispersion of EFI embeddedness by country
Source: Our elaboration on EUROSTAT-FIGARO data

Similarly to the case analysis performed at the country level, Figure 15 displays the EFI and some other sector embeddedness in each region and their correlation.

[31] The data are organised based on the highest regional value whiting the country.

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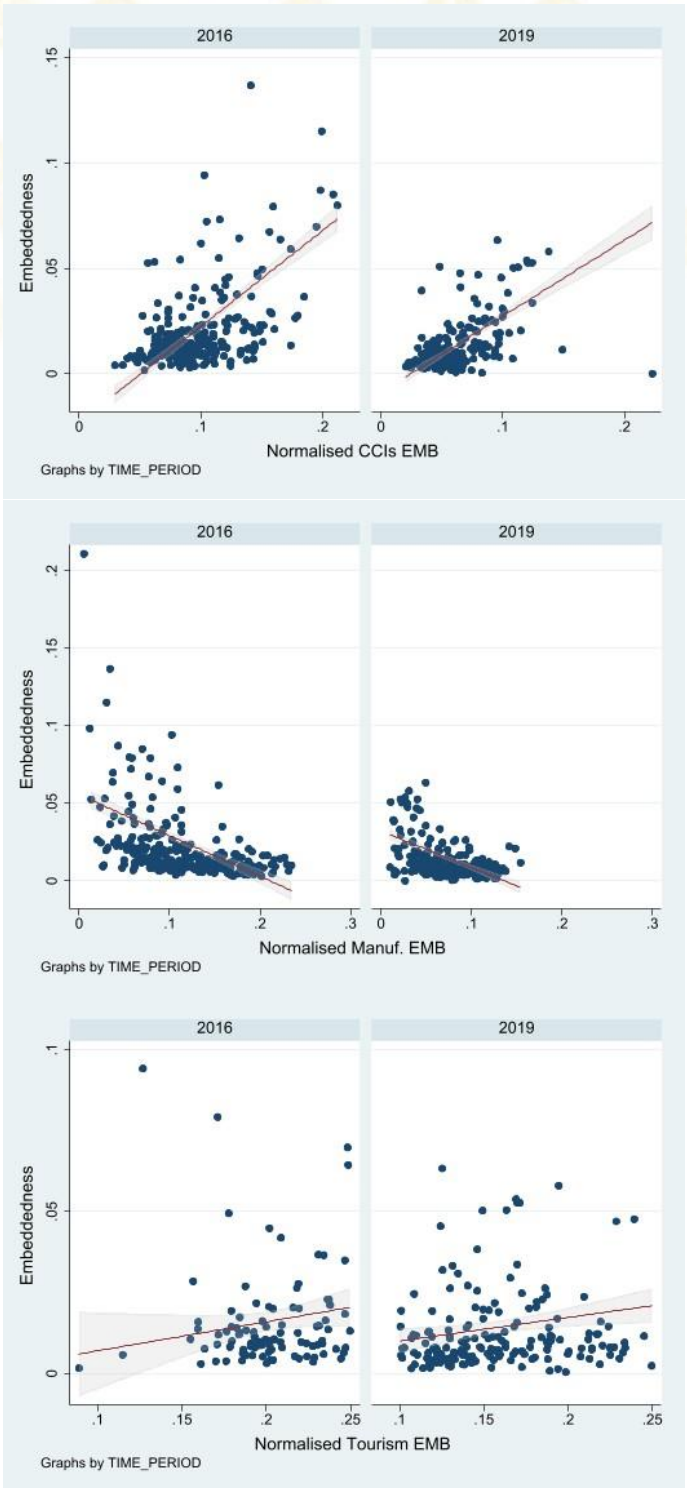

Figure 15 - Correlation between EFI and other sectors' embeddedness at regional level: CCIs (a) manufacturing (b), and tourism (c)
Source: Our elaboration on EUROSTAT-FIGARO data

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While the analysis at the country is not significant, the analysis at the regional level shows a positive and significant (5%) correlation between EFI and CCI embeddedness across EU regions (Pearson's correlation at 56%). The difference between the two results might indicate that the local context better captures the interplay between EFI sectoral integration (embeddedness) and CCIs. Perhaps the analysis at the regional level can disentangle the unobserved heterogeneity and capture common pathways between the film and audiovisual industry and CCIs at the local level.

The results for the manufacturing sector also strongly differ from the analysis at the regional level. While the correlation is positive and significant at the country level, Figure 15 suggests a negative and significant (5%) correlation between EFI and manufacturing embeddedness (Person correlation at -31%). Finally, concerning the tourism sector, there is a positive and significant (5%) correlation between the EFI and the tourism sector embeddedness (Pearson's correlation at 10%). These preliminary results indicate that the level of analysis can drive the results. They show that at the local level, regions, where manufacturing is relevant and embedded, have low incidence and integration of EFI, possibly because they are characterised by a large concentration of unskilled and labour-intensive activities. Differently, the correlation between EFI and tourism suggests that the integration of the film and audiovisual industry in the local economy is associated with economies that tend to be more diversified.

The degree of embeddedness can play an essential role in enhancing the sector's economic performance also at regional level. Figure 16 gives a snapshot of the relationship between regional economic embeddedness and performance measured as wages per worker.

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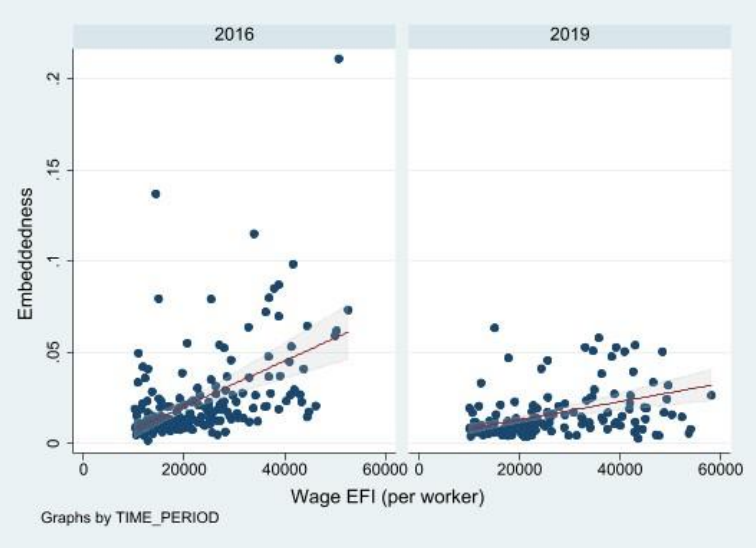

Figure 16 - Correlation between embeddedness (normalised) and wages (per worker) at regional level
Source: Our elaboration on EUROSTAT-FIGARO data

Figure 16 shows a positive and significant correlation between the degree of regional embeddedness and wages of workers in the sector (Pearson's correlation at 9%). This suggests that more integrated and developed industries are associated with high wages and salaries, ensuring, from an economic perspective, a more sustainable work environment. However, there is a significant variation in the slope of the linear fitting for 2016 and 2019, suggesting that the correlation weakens over time.

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7 PRELIMINARY CONCLUSIONS

This deliverable aims to report on the activities undertaken in T6.1 and on the analysis of the direct and indirect economic effect.

Regarding the direct effects of EFI, we find that EFI has a significant economic contribution within the context of CCIs, especially among major economies such as France, Germany, Italy, Spain, and Poland. From this perspective, France has a more developed and performing industry than other countries, as its leadership has emerged through several economic variables. The analysis indicates a large heterogeneity, especially regarding employment, wages generated, and segment distribution. For instance, Greece stands out in employment but lags in value added. The large EFI jobs concentration indicates a well-developed sector, offering a quantitative assessment of its status. The geographical analysis also confirms these results, indicating an uneven and primarily centralised large city geographical dispersion especially in larger markets, where the industry's uneven geographical distribution is more prominent. The uneven regional distribution of jobs indicates a large degree of geographical clustering concentrating the entire production. Wage gaps across regions may indicate uneven development of the job market in relation to the industry, suggesting wage inequality. The level of wage is in a strict sense economic variable; however, it relates to some aspects of job quality therefore its interpretation spans into social aspects. As high wages are associated with higher job quality and working conditions, the results indicate that the film and audiovisual workers tend to offer better jobs, at least as captured by aggregated statistics. The temporal analysis of these direct economic effects indicates an overall slowdown in terms of performance between the periods observed (2016-2019). Finally, a more significant EFI is associated with a healthier status of the general economy, perhaps more ability to diversify the industry portfolio and enhance different business models for the country and local development.

Regarding the indirect effects of EFI, we employ a measure of embeddedness to capture sectoral integration in the country and local context. EFI is significantly linked to CCIs at a country level, and this relationship is further reinforced remarkably at the regional level, highlighting the importance of geographical agglomeration. A well-developed and integrated film and audiovisual industry in the local economy is associated with a healthier sector status, measured as wages per capita and added value. The EFI integration is correlated with the integration of the rest of the economy, measured through the manufacturing and tourism

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embeddedness, perhaps highlighting how different pathways might enhance economic development and determining different policy-driven interventions, especially at the country level (less at the regional level). In addition, similarly to the results obtained for the direct effect, the EFI embeddedness at the regional level is unevenly distributed, mainly centralised in the regions with the presence of European and economic capitals. In other words, the presence of an agglomeration effect in the film and audiovisual industry is closely tied to the economy of scale and market efficiency. This is due to the interrelatedness of industries and complementary economic sectors within the production chain of the film and audiovisual industry localised in specific geographical areas. Finally, the level of embeddedness significantly impacts the quality of work, leading to increased job opportunities, more diverse job positions, and high wages overall.

Future work will develop in two directions. First, it will focus on further refining the economic effects analysis, especially at the firm level using the BvD ORBIS database. Second, we will complement the economic analysis with the development of social indicators and map the European movie contents to the Sustainable Development Goals (SDGs) and European social values. The aim is to move beyond a strict economic dimension and integrate EFI societal impact in the analysis and dashboard (T6.2). These measures of societal impact will be constructed employing text analysis on European movie synopsis retrieved from the IMDb non-commercial datasets. These indicators will measure the major contents of the EU movies and trends concerning SDGs and EU values. This content-level analysis will also be integrated with data such as the European social and value surveys.

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9 APPENDIX

Figure 17 - Classification of CCIs according to NACE Rev 2 (4-digit)

Code	Description	Code	Description
18.11	Printing of newspaper	71.11	Architectural activities
18.12	Other printing	71.12	Engineering activities and related consultancy
18.13	Pre-press and pre-media services	72.11	Research and experimental development in biotechnology
18.14	Binding and related services	72.19	Other research and exp. development on natural sciences and engineering
18.2	Reproduction of recorded media	72.2	Research and exp. development on social sciences and humanities
58.11	Book publishing	73.11	Advertising agencies
58.13	Publishing of newspapers	73.12	Media representation
58.14	Publishing of journals and periodicals	74.1	Specialised design activities
58.21	Publishing of computer games	74.2	Photographic activities
58.29	Other software publishing	90.01	Performing arts
59.11	Motion picture, video and television programme production activities	90.03	Artistic creation
59.2	Sound recording and music publishing	91.01	Library and archives activities
60.1	Radio broadcasting	91.02	Museum activities
60.2	Television programming and broadcasting	91.03	Operation of historical sites and buildings and similar visitor attractions
62.01	Computer programming activities	91.04	Botanical and zoological gardens and nature reserves activities
62.09	Other information technology and computer service activities	93.21	Activities of amusement parks and theme parks

Source: Burlina (2019), Guidelines for operationalising the data. DISCE 2022; Deliverable D2.2

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