

The intricate relationship of the media business and economic development

Castulus Kolo

Macromedia University of Applied Sciences, Munich, Germany

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Abstract

Growth theories are among the cornerstones of economic theory, dating back to the field's origins. There have been many explanations for growth (or lack of thereof), yet the role of the media in economic development has only begun to receive increasing attention over the last twenty years.

Our contribution hopes to shed light on the intricate relationship between the media business (and its specific sub-segments) and general economic development (and possible intervening variables). Based on media data provided by an international consultancy, economic indicators from the World Bank, and several sources mapping national "media systems" we will outline the diversity of the world's 30 leading countries (in media terms) and expose the correlations between them. Additionally, annual data from the 2001-2010 period will allow for analyses of time series and possible causal relationships. Analyses show a strong correlation between media industries' yearly revenue and GDP. Correlations shifted by time intervals also point beyond annual effects. Media's long-term growth and their share of overall economic value creation, along with compound economic growth rates and the general state of development, are all strongly linked to each other as well as to media systems' variables, like freedom of the press. Nevertheless, despite the overall dependency of media industries' growth on the growth of GDP, less developed countries show stronger rates of media growth than might be expected based on GDP growth. Furthermore, outperformance in media markets' growth appears to stimulate general economic development, which suggests a process of co-evolution.

Key words: economic development, media business, growth, media systems.

La intrincada relación entre el negocio de los medios y el desarrollo económico

Resumen

Las teorías del crecimiento son uno de los pilares de la teoría económica y, por ende, se remontan a los inicios del campo. Aunque se han desarrollado diversos abordajes para ex-

plicar el crecimiento económico, el rol de los medios recién empezó a recibir atención académica en los últimos veinte años.

Nuestro trabajo pretenderá esclarecer las intrincadas relaciones entre el negocio de los medios (y sus subsegmentos específicos) y el desarrollo económico general (más las variables que puedan intervenir). A partir de datos proporcionados por una consultora internacional, indicadores económicos del Banco Mundial y otras fuentes que esquematizan los “sistemas de medios” nacionales, exhibiremos la diversidad de los 30 países más destacados —mediáticamente hablando— y trazaremos las correlaciones entre ellos. Además, analizaremos series temporales y posibles relaciones causales según datos anuales del período 2001-2010. Los análisis demuestran una fuerte correlación entre los ingresos anuales de las industrias mediáticas y el PBI. Las correlaciones desplazadas por intervalos de tiempo también indican efectos anuales. El crecimiento a largo plazo de los medios, su rol en la generación de valor económico, las tasas de crecimiento económico compuestas y el estado general de desarrollo están estrechamente vinculados entre sí y ligados con ciertas variables de los sistemas de medios como la libertad de prensa. De todos modos, a pesar de que las tasas de crecimiento de las industrias de medios generalmente dependen del crecimiento del PBI, los países menos desarrollados disfrutaron niveles de crecimiento mediático más altos que los que podríamos esperar a partir del PBI. Finalmente, el crecimiento del mercado de medios parece estimular el desarrollo económico general, lo que indica una coevolución.

Palabras clave: desarrollo económico, negocio de los medios, crecimiento, sistemas de medios.

O intrincado relacionamento entre o negócio da mídia e o desenvolvimento económico

Resumo

As teorias do crescimento são um dos pilares da teoria econômica e, por conseguinte, se remontam aos inícios do campo. Embora tenham se desenvolvido diversas abordagens para explicar o crescimento econômico, o rol da mídia recém começou a receber atenção acadêmica nos últimos vinte anos.

Nosso trabalho vai tentar esclarecer o intrincado relacionamento entre o negócio da mídia (e seus subsegmentos específicos) e o desenvolvimento econômico geral (mais as variáveis que possam intervir). A partir de dados proporcionados por uma consultora internacional, indicadores econômicos do Banco Mundial e outras fontes que esquematizam os “sistemas da mídia” nacional, será exibida a diversidade dos 30 países mais destacados —midiaticamente falando— e serão traçadas as correlações entre eles. Além disso, serão analisadas séries temporais e possíveis relações causais segundo dados anuais do período 2001-2010.

As análises mostram uma forte correlação entre as rendas anuais das indústrias mediáticas e o PBI. As correlações deslocadas por intervalos de tempo também indicam efeitos anuais. O crescimento no longo prazo da mídia, seu rol na geração de valor econômico, as taxas de crescimento econômico compostas e o estado geral de desenvolvimento estão estreitamente vinculados entre si e ligados com certas variáveis dos sistemas da mídia como a liberdade de prensa. De qualquer maneira, apesar das taxas de crescimento das indústrias da mídia

geralmente dependem do crescimento do PBI, os países menos desenvolvidos disfrutam níveis de crescimento mediático mais alto que os que poderíamos esperar a partir do PBI. Finalmente, o crescimento do mercado da mídia parece estimular o desenvolvimento econômico geral, o que indica uma coevolução.

Palavras chave: desenvolvimento económico, negocio de los medios, crescimento, sistemas de medios.

Introduction

Since wealthier people can spend more money, on media among other things, and since companies typically raise their advertising expenditure in a prospering economy, it is no surprise that the prosperity of a nation's media business is somehow related to the economy. Conversely, media are influential in culture and society, since they provide information for good (business) decisions. In so doing, they also influence the economy, at least indirectly. Furthermore, both national media industries and national economies simultaneously interact with variables related to the political system or to the available technical infrastructure (see World Bank 2002a, UNESCO 2008, and Coyne & Leeson 2009 for overviews).

Hence, the relationship between media industries and the overall economic context is complex. Indeed, specific aspects of this multifaceted relationship constitute strands of academic discourse and entire research fields (for instance, the influence of advertising on the development of media industries). This dynamic relationship is neither unidirectional nor entirely ruled by simple cause and effect. It is interactive and prone to various feedback loops, possibly with diverse time lags.

Surprisingly, detailed studies of the relationship between media industries and the overall economy from a comparative international perspective across different "media systems" (see below) are relatively rare. Most studies on the media, the economy, and society tend to be national in scope. This makes sense, since media politics and regulatory frameworks are largely national, if not regional. Moreover, media products are embedded into a certain culture and depend on a certain language. However, these narrow approaches do not contemplate the general effects of the media on the economy and vice versa.

In 2011, we set up an international comparative study program to elucidate the intricate relationship between the media business (including specific media industries), general economic development, and possible intervening variables on both sides. During an initial exploratory phase, which lasted until 2012, we investigated

the relevant theoretical underpinnings and compiled earlier and related studies. Furthermore, we tested different data sources for their capacity to produce time series over reasonably long timespans. In fall 2011, during a national conference, we presented a descriptive summary of the diversity of national economies and their media industries within specific media systems, along with an initial analysis of the relationship between these three areas of investigation, which were outlined based on linear and non-linear regression models of their characteristic variables (Kolo & Müller, 2012). At that time, the data were limited to the 2005-2009 period and therefore anchored to a particular global economic phase. Furthermore, this timeframe did not allow for a time series analysis, which underlined the need for more data in order to tackle more complicated research questions on media economics and economics in general (and developmental economics in particular). Among these research questions are the following:

- To what extent is media development linked to general economic development? What are the differences between countries at various stages of economic development?
- What are the effects of underlying media systems? More specifically, what are the effects of historical trajectories of media development within these systems?
- How do these interrelations surface in different media industries and through the contributions to media revenues by consumers and advertisers?

After obtaining additional data at the end of 2013, we embarked on a second phase of quantitative analysis. This phase is not yet complete, but it already confirms major indications from phase one (Kolo & Müller, 2012) and boasts a more substantial database. Additionally, the first time series analyses, which explore causal relations across the 2001-2010 period, are available. Our results, as outlined below, also suggest the need for further investigations on specific countries and, qualitatively, of historical media development and other peculiarities of media systems. For a complete and concise interpretation of the quantitative relationships, such a third phase will likely be required

Setting up the theoretical and conceptual context

Kolo & Müller (2012) already outlined the theoretical context. We recapitulate it below, with some revisions.

Since growth theories and economic value creation are among the cornerstones of economic theory, both date back to the field's origins (Smith, 1776 [1991]).

Subsequently, there have been many explanations for the growth or failure of certain economies (for one of the earlier overviews see e.g. Lewis, 1955). Among these explanations, we find: foreign financial aid or investments (Easterly, 2001, p. 26-45), culture (Lal, 1998) or (ethnic) diversity (Alesina & La Ferrara, 2005), the level of risk adversity (Oetzel, Bettis & Zenner, 2001), institutions (Knack & Keefer 1995), and geographic location (Gallup *et al.*, 1998). More specifically, copyright protection has been linked to rates of direct foreign investment (Dunning, 1993; Seyoum, 1996), innovation, economic growth (Gould & Gruben, 1996), and the specific development of media industries (van Kranenburg & Hogenbrink, 2005). While all these factors are certainly important, the direct role of the media in facilitating economic progress has only begun to receive increased systematic attention over the last twenty years.

At first, authors emphasized the more indirect role of the media in economic development. Simmons (1948) and Stigler (1961) pointed out, long ago (*cf.* Djankov *et al.* 2003), that access to information is essential for voters to make the best possible decisions for the benefit of society and the economy. Sen (1984) was one of the first to conduct an empirical study of the importance of media in this context. Today, there is a convincing body of evidence that suggests freedom of the press is key to the development and maintenance of transparent and honest government and, in turn, durable economic growth (see, for example, Sen, 1984; Norris & Zinnbauer, 2002; or Kilman, 2006). There have also been studies on the impact of the media on government transparency; accountability (Stiglitz, 2002); the principal-agent problem, in which citizens constitute the “principal” and the government, the “agent” (Besley & Burgess, 2001; Besley *et al.* 2002); public policy (Spitzer, 1993); and corporate governance (Dyck & Zingales, 2002). Additionally, many case studies address the state of the media in specific countries (McAnany, 1980; Lent, 1980; Paletz *et al.* 1995; Gross, 1996; O’Neil, 1997; Anam, 2002; and Potts, 2009).

Nevertheless, beyond the media’s indirect role as watchdogs of political processes, they also have a more direct impact on economic growth, since information is also central to consumers, competitors, and/or investors (Mansell & When, 1998), to name only a few economic actors. The media collect and make most of this crucial information available, even in nations where their influence on politics is rather limited.

The World Bank (2002a) released a comprehensive volume dedicated to the effects of the media (both direct and indirect) on economic development. It empha-

sises the role of the media as government and corporate watchdogs (also see: Coyne & Leeson, 2004, 2009), their function as transmitters of new ideas and information, and as catalysts for growth. Moreover, it discusses what kinds of media systems are most favourable. In this volume, Djankov *et al.* (2002 and 2003) build on Sen's work and analyse, among other societal factors, the correlation between media ownership structures in 97 countries and economic well-being given by GDP (see below). They show that available data support public choice theory (government ownership undermines political and economic freedom) more than it does public interest theory (government ownership cures market failures). Consequently, the same year, the World Development Report entitled *Building institutions for markets* (World Bank, 2002b) dedicated a chapter to the importance of media in development.

Compared to the complexity of the media's role in economic development, the impact of economic growth on the media is more straightforward. For example, the correlation between advertising spending and GDP has been proven repeatedly (van der Wurff, Bakker & Picard, 2008), though with discrepancies across media industries. Newspaper advertising, for example, depends more strongly on economic development than advertising in other media. Therefore, the GDP predicts ad-spending better in countries where newspapers are an important advertising medium, at least at the time of the above-cited study.

Only a few approaches have encompassed both the media's impact on the economy and the economy's impact on the media, as Potts (2009) does in the case of China. He argues, for example, that media and communication theory, as an analysis of cultural and creative industries (Florida, 2002), can benefit from a deeper understanding of economic growth theory. The latter, in turn, should be elaborated in the context of cultural and media studies and economic development. Economic growth should be seen as a complex evolutionary process that is tightly woven into sociocultural and political processes, like the co-evolutionary dynamics of economic and socio-political systems, including the media system. In this respect, Pott's analysis concludes that digital media capabilities are a primary source of economic development.

Data on economies, media industries, and systems

The aforementioned guiding research questions cover three different yet overlapping areas of investigation: "media industries" as part of "national economies" embedded in particular "media systems." In what follows, we will map all three ar-

as as precisely as possible in order to comprehensively distinguish their differences and study their interrelations. To allow for a time series analysis, we must cover a certain period of years. Unlike data on media systems and national economies, internationally-comparable data on media industries are compiled by commercial information services. Hence, the limiting factor, in terms of the time horizon accessible to analysis, was the data available on media industries.

“Media industries” —which is synonymous in this article with “media markets”— shall be broadly understood as the set of companies involved in developing, producing, and distributing content that informs, entertains, and/or persuades (Lavine & Wackman, 1988). Unlike other contemporary authors, who focus on traditional media, we will also consider computer-based media, like the Internet and electronic games. The data of different countries’ media systems were made available by the international accounting consultancy PwC. This information is based on primary data from proprietary sources, government agencies, trade associations, and other related entities that seek to have their data disseminated in the public domain. PwC publishes this information every year (PwC, 2013) and it provided us with a compilation of selected data for the 2001-2010 period. This decade was chosen because the methodologies employed to compute the revenues of specific media industries and of media industries at large did not change so as to possibly distort the analysis. During this decade, data on different media industries were all compiled using the same logic and scope. The figures are reported in nominal terms, reflecting actual spending transactions, and therefore include the effects of inflation. Industry-specific spending consists of advertising and end-user spending directly related to entertainment and media content. Spending on hardware or services potentially needed to access content is not included, since it does not represent spending on actual content. The data comprise revenues from television (including subscriptions, license fees, and advertising); recorded music; filmed entertainment; radio; consumer magazine spending; newspaper publishing; consumer and educational book publishing; B2B media; internet access and advertising, both mobile and wired; and video games and out-of-home advertising. Spending is counted at the consumer or end-user level, not at the wholesale level, and includes retail mark-ups when applicable. Advertising is measured by net earnings of agency commissions in all regions, except the United States, where gross advertising is measured to be consistent with the way advertising is generally reported there.

From the 48 countries whose data is regularly updated by PwC, only the largest (in terms of GDP) were taken into account, as the relative precision of the data, in their cases, was presumed to be higher than in smaller countries. To cover all world regions as extensively as possible, the selection identified a set of countries that covered at least 50 percent of the total GDP per region and had data available for the entire period under consideration. This led to 30 countries being included in the analysis:

- Canada and the United States were selected as the two North American countries.
- Latin America is represented by Mexico, Colombia, Venezuela, Brazil, and Argentina (out of six countries in the full data set).
- Australia is the only Pacific country chosen (out of two in the full data set).
- Asia is represented by China, India, Indonesia, Japan, South Korea, Malaysia, Pakistan, and Thailand (out of 13 countries in the full data set).
- For North Africa and the Arabian countries, only a summary category was available (Pan-Arabian countries), while the rest of Africa has only one representative available in PwC's data set (South Africa).
- Among Western, Northern, and Southern European countries, Germany, France, UK, Italy, Spain, Sweden, Norway, and Finland were selected (out of 16 countries in the full data set).
- For the Central and Eastern European economies, only Russia and Poland were taken into account (out of five in the full PwC set).
- Israel and Turkey are included as the most industrialized economies in the Near East and South-Eastern Europe, respectively.

In our analysis, development of media industries is characterised by overall revenue and its split into consumer contribution and advertising. Additionally, online advertising revenue is integrated into the analysis as an indicator of Internet media maturity (given by its share of overall advertising). Total newspaper revenue (and its share of all media revenue) represents "old" media. Film and music revenue shall be used to study possible specific effects related to entertainment-based media.

The second area under investigation, the "national economies" (all data from World Bank 2013), is described by:

- GDP at purchaser's prices as the sum gross value of all resident producers in the economy plus product taxes and minus subsidies not included in the value of

the products. GDP is calculated without deductions due to depreciation of fabricated assets or depletion and degradation of natural resources. Data are in US dollars, converted from domestic currencies using single-year official exchange rates.

- Annual percentage of GDP growth rate at market prices. Calculated on constant local currency, not just on the absolute values of GDP as introduced above.
- Gross national income based on purchasing power parity as the sum value of all resident producers plus product taxes (and minus subsidies) not included in the valuation of output and net receipts of primary income – compensation of employees and property income – from abroad.
- As an alternative measure, GNI is also considered in the analysis based on the Atlas method. In calculating gross national income according to this method, the World Bank uses a conversion factor to reduce the impact of exchange rate fluctuations in the cross-country comparison of national incomes.
- The total population was compiled for each country to compute per capita values.

Both measures of economic and societal well-being —GNI and GDP— share the advantage of being largely accepted, though they are based on problematic concepts. However, they were recently confirmed as still powerful single indicators for monitoring short-to-medium-term fluctuations in how the market economy is performing (though GNI remains less widely accepted) even after being challenged by different commissions. Only for longer-term economic and social progress is there a clear case for complementing these measures with other economic, social, and environmental statistics, upon which people's well-being critically depends (European Commission, 2009; Commission on the Measurement of Economic Performance and Social Progress, 2009; Hawksworth, Jones & Ussher, 2011).

GDP defines its scope according to location, while GNI defines it according to ownership (e.g. the profits of a German-owned company operating in the US will count towards German GNI and US GDP). While, in mature economies, their ratio is fairly similar, it does differ for emerging economies and most substantially when there is a large expat community. GNI counted at purchasing power parity (PPP) rates facilitates international comparisons of income since market exchange rates, as applied to GDP, are often volatile, do not lead to immediate changes in income, and tend to understate the standard of living in poor countries. PPP rates equalize the purchasing power of currencies by eliminating differences in price levels

(European Communities & OECD, 2006). Furthermore, we also take into consideration GNI on a per capita basis, as it reflects the individual's financial means to engage in media consumption (neglecting the possible influence of differences in the distribution of wealth in recipient-driven revenues).

The concept of "media systems" in this paper is still preliminary and will have to be further refined in subsequent analyses. Hallin & Mancini (2005) were among the first to study media systems on the basis of empirical evidence and without being guided by ideological pre-conceptions, as was the case in the pioneering work of Siebert, Peterson, and Schramm (1956 [1963]). However, as their analysis is confined to Western democracies, and since the mapping algorithm for nation states and categories of media systems remains at least partly ambiguous (*cf.* Blum, 2005, p. 7), its value in an international quantitative comparison remains limited. A more refined model, after a previous attempt towards less ethnocentric alternatives by Wiio (1983), was proposed by Blum (2005). It considers more dimensions, but these are still difficult to operationalize. Furthermore, it still regards the media user as someone who passively reacts to the system. Though mass media are still important, there are now many other actors involved in media industries. A plethora of new media additionally requires user-centric factors (including access to and applications of online media) to define a media system. Moreover, the media system is probably linked to the educational system, that is, the knowledge base and media competence of the user base, as well as its linguistic and ethnic diversity (Thomaß, 2007, p. 23), a subject also largely ignored in research on media systems. A further expansion of discourse on media systems would also have to consider the dynamics of further development. In addition to the promotion of freedom of expression and media pluralism, community media and human resource development were also emphasized by UNESCO (2008) and were the basis of measures for media sustainability (Lambino II *et al.*, 2006; Whitehouse, 2006). Hence, even a preliminary characterisation of systems should encompass media usage, availability, and accessibility (including in economic terms); the general level of education and literacy; and regulatory and political conditions, like freedom of the press.

The following parameters were chosen for the description of media systems:

- The Human Development Index, or HDI (UNDP, 2001 and 2010), which covers general level of education and other preconditions of media usage.
- The World Press Freedom index, or WPF (Reporters sans Frontières, 2013), a measure of freedom of speech and press institutions.

- As an alternative to the WPF index, The Global Press Freedom rating, or GPF (Freedom House, 2013), which has been found to be particularly consistent across the timespan under scrutiny (Becker, Vlad & Nusser, 2007) yet still significantly correlated to the WPF index.
- The number of internet users per 100 people (i.e. those people with access to the worldwide network) (compiled in World Bank 2013 on the basis of primary data from other sources).
- Mobile phone subscriptions (compiled in World Bank 2013 on the basis of primary data from other sources) as subscriptions per 100 people to public mobile telephone services using cellular technology, which provide access to the public switched telephone network (PSTN). Post-paid and prepaid subscriptions are included.
- The circulation of daily newspapers, whereby “daily newspapers” refers to newspapers published at least four times a week and calculated as average circulation (or copies printed) per 1000 people (compiled in World Bank 2013 on the basis of primary data from other sources).

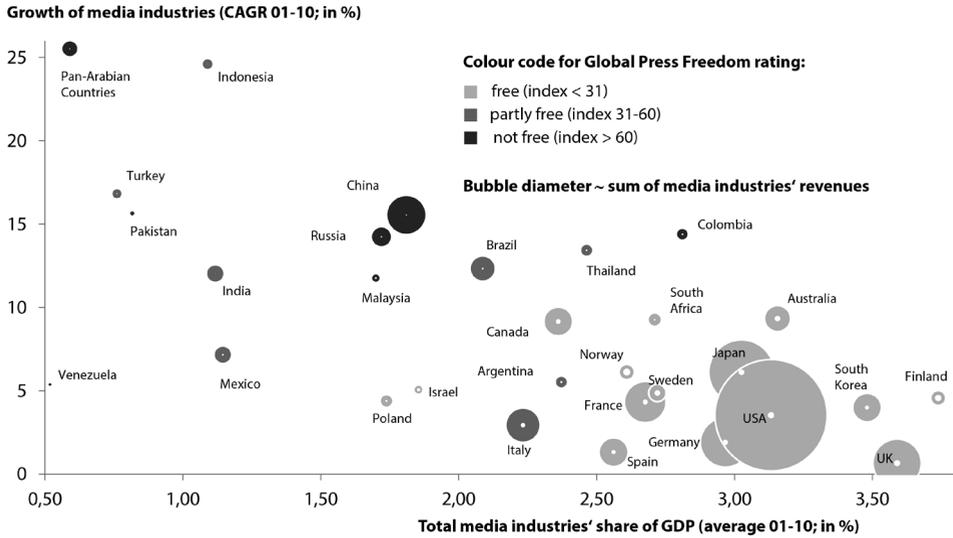
In addition to the absolute values of the aforementioned variables in all three areas of investigation, annual growth rates were calculated along with the aggregated values for the whole period, that is, the geometric averages for rates across the decade in question (compound annual growth rate, or CAGR) and the arithmetic averages for absolute values (e.g. for GNI per capita at PPP). For a selection of the central variables in the following discussion of the results, see table 1 in the appendix.

Results

Figure 1 shows the diversity of the national economies under analysis, their media systems, and their aggregated media industries. It documents a striking spread of the latter’s growth rates.

These range from over 20 percent, for Arabian nations and Indonesia, to very small single-digit rates among the most economically-developed nations, like the UK, Germany, and the USA. The diagram also illustrates the relationship between the maturity of a nation’s media sector, measured by the ratio of total revenue to GDP, and the growth of its media industries. The higher the maturity, the lower the rate. Furthermore, less-developed countries on the average grant less freedom to the press.

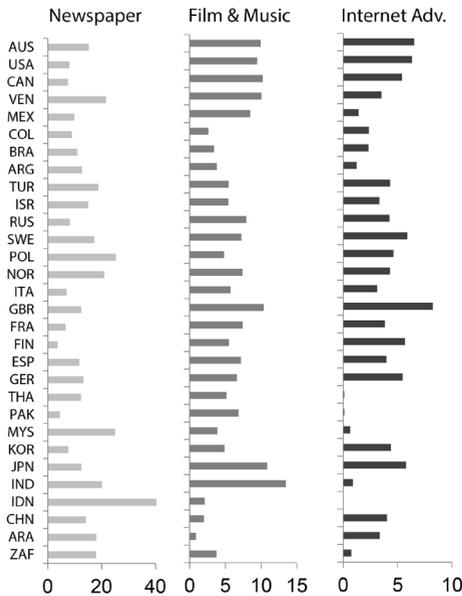
Figure 1. Diversity of media industries, media systems, and national economies.



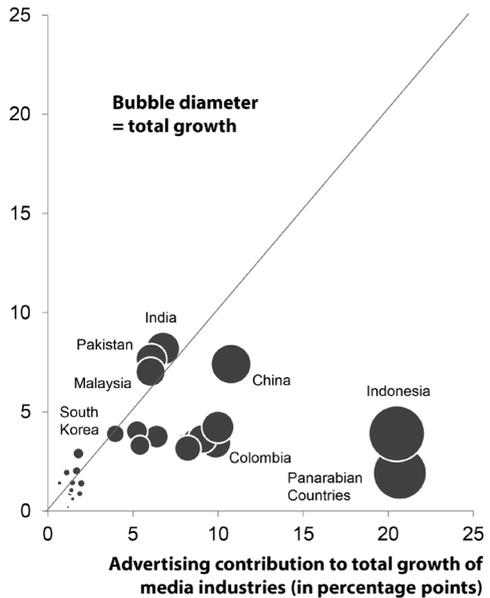
Source: Own calculation on the basis of data from PwC (2013), World Bank (2013), and Freedom House (2013).

Figure 2. Contribution of specific media industries to total media industries' revenues.

(a) Specific media industries' share of revenues (for 2010; in %)



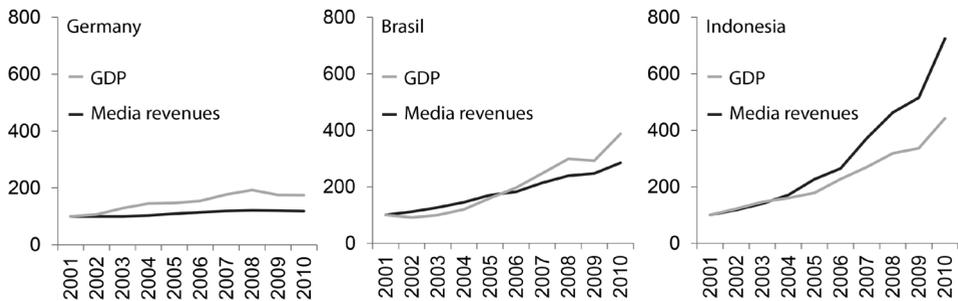
(b) Consumer contribution to total growth of media indust. in 2010 (in percentage points)



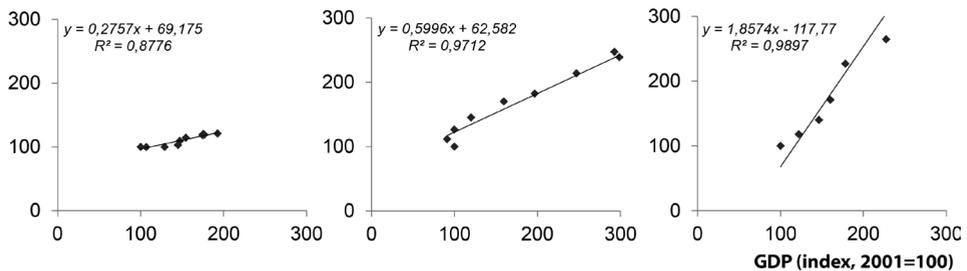
Source: Own calculation on the basis of data from PwC (2013).

Figure 3. Correlation of annual development of media industries' revenues and GDP.

(a) Media revenues and GDP (indexed, 2001=100)



(b) Media revenues (indexed, 2001=100)



Source: Own calculation on the basis of data from PwC (2013) and World Bank (2013).

Table 1. Correlations of selected aggregated values between 2001 and 2010.

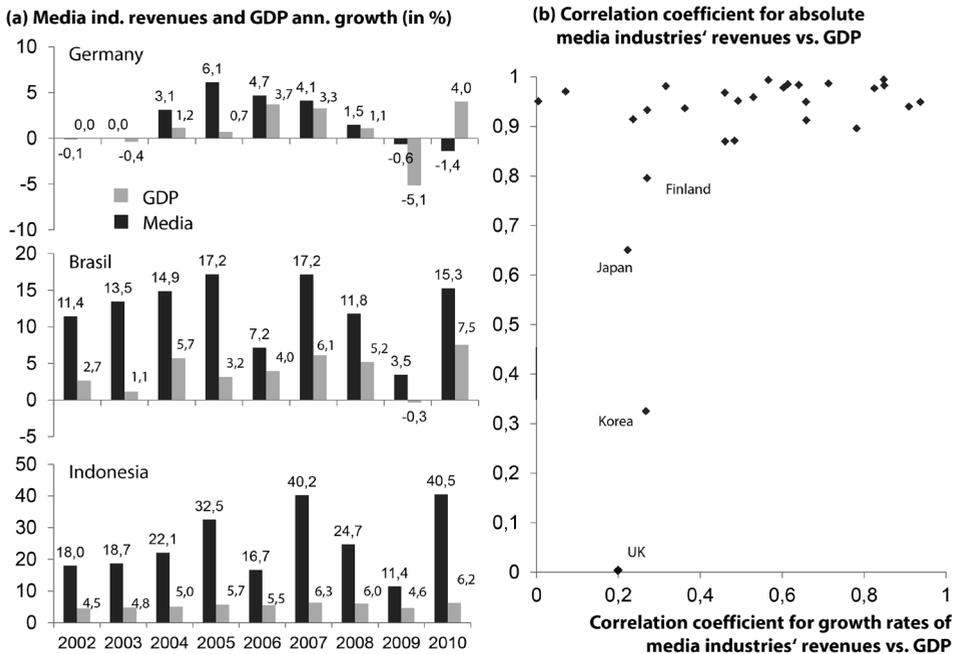
	Media ind. rev. growth (01-10)	GDP growth (01-10)	Ratio of media rev. to GDP	Average GNI per cap. at PPP	Average HDI index	Av. Press Freedom rating
Media ind. rev. growth (01-10)	1.00	0.64	-0.61	-0.67	-0.70	0.71
GDP growth (01-10)	0.64	1.00	-0.48	-0.75	-0.71	0.71
Ratio of media rev. to GDP	-0.61	-0.48	1.00	0.67	0.68	-0.70
Average GNI per cap. at PPP	-0.67	-0.75	0.67	1.00	0.91	-0.80
Average HDI index	-0.70	-0.71	0.68	0.91	1.00	-0.73
Av. Glob. Press Freedom rating	0.71	0.71	-0.70	-0.80	-0.73	1.00

Source: Own calculation on the basis of data from PwC (2013), World Bank (2013), UNDP (2013), Freedom House (2013); all correlations are significant at the 0.01 level (2-tailed).

These dependencies also expose the common fate of mature economies. Once a certain percentage of the GDP is provided by the value creation of media industries, the media sector is doomed to low growth rates, if not stagnation. If there is growth, then a substantial part of it is provided by online media, as shown in figure 2a by the high level of Internet advertising revenue. The 30 nations in the data sample also differ significantly when it comes to the ratio of newspaper revenue, or film and music revenue, to all media revenue. Concerning the advertising and consumer components of media revenue, fast-growing countries (predominantly developing or newly-industrialised countries) get their growth mainly from rising advertising, while in more mature economies, the contributions from both components are rather similar.

That said, how is the development of media revenue linked to general economic development on an year-by-year basis? A strong correlation has already been demonstrated in many other studies (van der Wurff, Bakker & Picard, 2008) and

Figure 4. Comparison of the correlation of growth rates to the correlation of absolute values.



Source: Own calculation on the basis of data from PwC (2013) and World Bank (2013)

is confirmed by our data. Figure 3 outlines the annual values, as well as a linear regression between the two variables, for three selected countries.

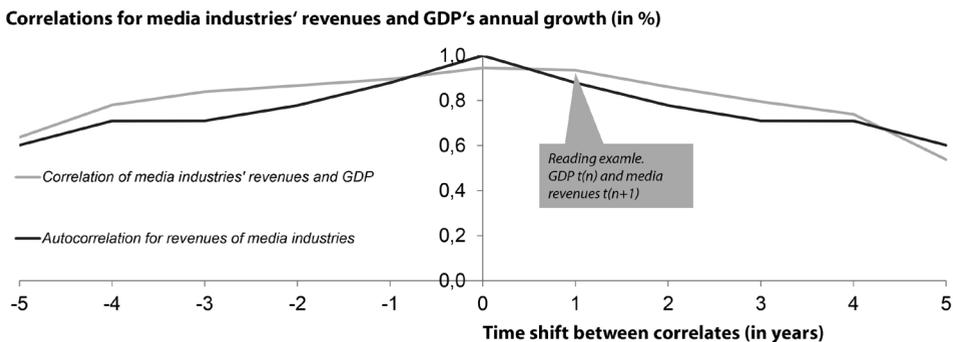
While media industries grow slower than GDP in a mature economy like Germany, the opposite is the case in a developing economy like Indonesia. In Brazil, a newly industrialised economy, the situation falls between both extremes, much as it does in other countries on a similar stage of economic development, like Argentina and Mexico.

In almost all countries (apart from three outliers), ten-year correlation of overall media revenues with GDP is above the value of 0.80 (see figure 4b) and significant at least on a one percent level. However, this strong correlation among absolute values is not reflected by the corresponding growth rates (see also figure 4b). This indicates that, behind the dependence of annual results, there are interacting longer-term trends. The examples of growth rates for three selected countries in figure 4a underline the fact that these rather complex relationships are not just linear.

Further indications of interplay between annual and longer-term dependencies are derived from figure 5, which exhibits the autocorrelation of media industries' revenues as well as the correlation of the latter with GDP, shifted by time intervals of one to five years in both directions.

The correlation with a time lag of one year is almost the same (it exhibits no significant difference) as the not-shifted correlation, and correlation only diminishes slowly with increasing time-shift. Hence, in addition to annual dependencies, there are also longer-term trends to be considered in a complete model describing

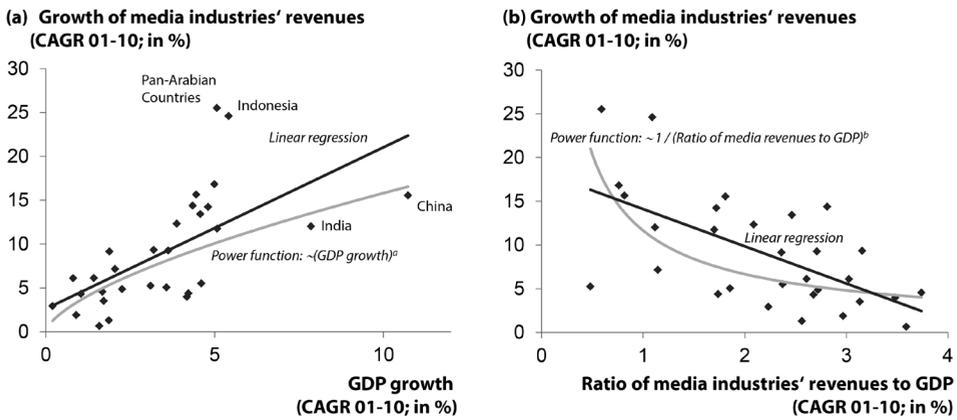
Figure 5. Correlations shifted by time intervals for media industries' revenues and GDP.



Source: Own calculation on the basis of data from PwC (2013) and World Bank (2013)

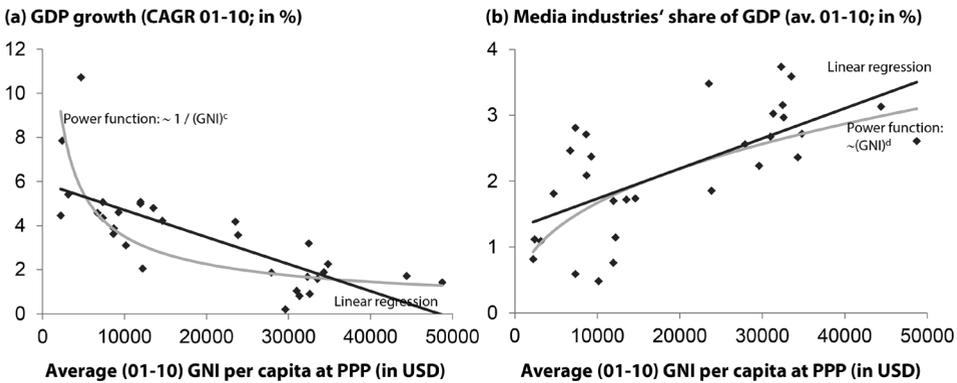
the development of media industries' revenues. Unfortunately, aggregated values with some persistent relevance, like the average growth of media industries during the whole 2001-2010 period, the average GDP growth during the same decade, the average ratio of media industries' revenues to GDP, the average GNI per capita at purchasing power parity (see section 2), the Human Development index, and the Global Press Freedom rating, all exhibit very strong cross-correlations, as shown in table 1.

Figure 6. Dependency of media industries' growth on GDP growth and the ratio of media industries' growth to GDP growth.



Source: Own calculation on the basis of data from PwC (2013) and World Bank (2013)

Figure 7. Relationship of GDP growth to media industries' maturity and GNI.



Source: Own calculation on the basis of data from PwC (2013) and World Bank (2013).

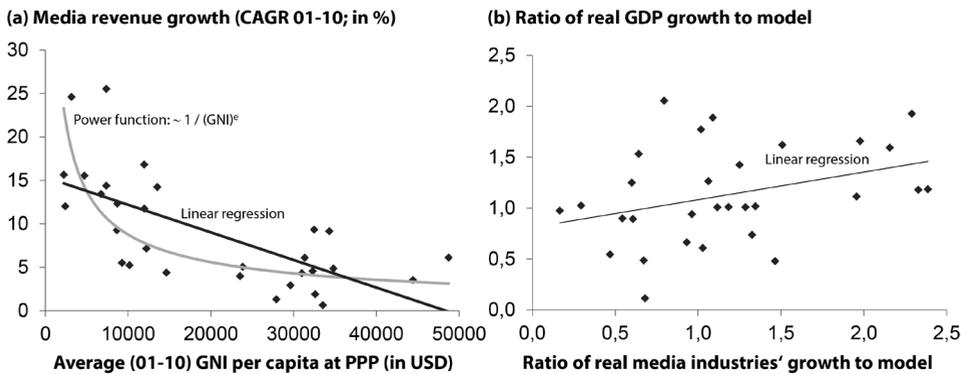
Furthermore, relationships among the above-mentioned variables may not be linear, as is discussed below.

It can be assumed that average growth during the decade is dependent on the average growth of GDP, since it has been shown that, on an annual basis, media industries are driven by general economic value creation. Additionally, it is sensible to assume that the maturity of media industries (derived from the ratio of total media revenue to GDP) also exerts an influence, as shown in figure 1. While the relationship between the growth of media industries and GDP is best described as directly proportional with a power function of positive exponent, the relationship with the media industries' maturity is indirectly proportional with a power function of negative exponent (see figures 6a and 6b). In both cases, a linear regression leads to a larger residual, although the degrees of freedom are the same (2 parameters).

However, both variables, so far considered as independent, can be assumed to be influenced by the general level of economic development or welfare. A good measure for the latter is the GNI per capita at purchasing power parity.

Wealthy countries generally grow more slowly (figure 7a) and have more mature media industries (figure 7b). Finally, one factor (GNI) dominates (figure 8a). The higher the GNI, the lower the growth in total media industries' revenue. Though the relationship can be described by a significant (one percent level) linear correlation with negative beta, the non-linear fit of a power function gives a far better value for the sum of squared differences between model and data, as is also the case for the previously-mentioned relationships.

Figure 8: Growth of media industries' revenues as a univariate function of GNI.



Source: Own calculation on the basis of data from PwC (2013) and World Bank (2013).

When we compute the ratio of real media industries' revenue growth to the same growth modelled in a reduced univariate way, as well as the ratio of real GDP growth to the same growth modelled by GNI, we find a slight dependency of excess GDP growth on the excess growth of media industries. The regression in figure 8b has a level of significance at 5.6 percent. We take this as an indication that media growth both stimulates and is driven by economic well-being. In order to determine which drives the other, the matter will have to be studied more thoroughly by directly comparing time series. These preliminary findings on how media industries may directly impact economic development suggest that further investigations in this direction should be rewarding.

The aforementioned economic indicators signal much of the influence exerted by variables related to the media system. Additional consideration of the Global Press Freedom rating or the Human Development index, in a simple extension of the above model (as an additional factor to the power function or in a linear regression model), did not further improve the fit. The apparently strong negative correlation of media growth with freedom of the press (see table 1) is misleading, as it results from a strong positive correlation with poverty and of poverty, in turn, with a generally less-free press. Only in specific industries do additional dependencies remain (e.g. newspaper revenues have lower growth rates in less-free countries, everything else being equal).

Summary, conclusions and outlook

This first summary of results, from a research programme conducted over several years, is only a starting point. We hope that it paves the way for a more thorough understanding of the mutual dependency of media industries' development and general economic development. The latter encompasses the direct effects of media's stimulation of markets and competitiveness as well as indirect effects, like media's contribution to an educated, knowledgeable society. Additionally, since media development is related to democratisation (Islam, 2002, p. 2), and since democratisation is related to economic growth and prosperity, there is also an expected relationship between such variables indirectly linking media to economic development. Less complex, and also established by research, is the impact of economic prosperity on the media business.

The results presented here underline strong correlations of media industries' annual revenues and GDP. Nevertheless, autocorrelations and correlations

shifted by time intervals also point beyond year-to-year effects. That said, the longer-term growth of media, their share in overall economic value creation, compound economic growth rates, and the general state of development are strongly linked to each other as well as to media systems' variables, like freedom of the press or the Human Development index. Despite the overall dependency of media industries' growth rates on GDP's growth, what has also become apparent is that some less-developed countries have higher rates of media industry growth than their GDP growth alone would suggest. Furthermore, outperformance in media markets' growth appears to stimulate general economic growth, an indication for the co-evolution of national media industries and economic development.

Despite a lack of earlier substantial scientific evidence, several national governments have counted on the media's role in stimulating future economic growth for some time already (Melody, 1999). Central to these considerations are new or online media. However, in order to fully establish the direct role of media industries' revenues in stimulating general economic development, a complex time series analysis will be required.

Such an analysis will have to distinguish between the possibly different contributions of various media industries, among them newspapers, entertainment media, the internet, and online business. The current results already suggest that correlations with GDP growth are different for specific media. Likewise, we might expect causal relationships to be of different strength.

We expect similar results when regarding the role of those characteristics of media systems (in the simple model with GNI as the only independent variable) that did not have an effect on the growth of media industries as well as the latter's dependence on economic development alone. We expect that variables like those for freedom of the press or general societal development, such as the Human Development index, will still show up in a time series perspective comparing interrelations of growth in specific media industries and overall economic development. Indeed, striking differences can already be seen, through simple correlation analyses, between information-oriented media and entertainment-based media.

Overall, the quality of the data seems sufficient to move beyond the analysis presented here. No specific bias is apparent and, with minor exceptions, outliers and the question of which countries to consider do not appear to have severely interfered with the results.

Finally, the outlined econometric approach will have to be backed-up with an in-depth analysis of specific countries in order to fully grasp the media's effect on general economic growth and vice versa. This will also be necessary to understand specific industry structures in the media embedded in peculiar, historically-grown media systems.

Appendix

Table 2. Summary of data on specific countries.

Country	Av. GDP 2001 to 2010 (current USD bn)	Av. GNI per cap. at PPP 2001 to 2010 (USD)	Av. GDP growth 2001 to 2010 (%)	Av. ratio media rev. to GDP 2001 to 2010 (%)	Average growth of media rev. 2001 to 2010 (%)	Av. Global Press Free- dom 2001 to 2010 (rating)	Av. Human Develop- ment 2001 to 2010 (index)
Germany	2,824	32,586	0.9	3.0	1.9	16.0	0.882
UK	2,204	33,522	1.6	3.6	0.7	18.5	0.836
France	2,161	30,982	1.0	2.7	4.3	20.0	0.853
Italy	1,785	29,615	0.2	2.2	2.9	30.0	0.840
Spain	1,146	27,900	1.9	2.6	1.3	20.5	0.846
Sweden	374	34,798	2.3	2.7	4.9	9.0	0.887
Poland	336	14,607	4.2	1.7	4.4	21.0	0.774
Norway	314	48,726	1.4	2.6	6.1	9.5	0.922
Finland	201	32,291	1.7	3.7	4.6	10.0	0.848
Turkey	486	11,939	5.0	0.8	16.8	54.5	0.654
Israel	156	23,840	3.6	1.9	5.1	29.5	0.857
Russ. Fed.	914	13,511	4.8	1.7	14.2	70.5	0.691
S. Africa	233	8,633	3.6	2.7	9.3	27.5	0.592
Pan-Arab	1,334	7,342	5.1	0.6	25.5	70.4	0.663
Japan	4,576	31,325	0.8	3.0	6.1	19.0	0.870
China	3,026	4,699	10.7	1.8	15.6	82.0	0.600
India	968	2,391	7.8	1.1	12.0	37.5	0.480
Korea, R.	807	23,520	4.2	3.5	4.0	30.0	0.846
Indonesia	369	3,140	5.4	1.1	24.6	52.5	0.550
Thailand	203	6,702	4.6	2.5	13.4	44.0	0.627
Malaysia	161	11,944	5.1	1.7	11.8	68.0	0.718
Pakistan	124	2,214	4.5	0.8	15.7	59.0	0.453

Brazil	1,103	8,683	3.9	2.1	12.3	37.5	0.674
Mexico	890	12,203	2.0	1.1	7.2	50.0	0.724
Argentina	231	9,257	4.6	2.4	5.5	43.0	0.755
Venezuela	201	10,159	3.1	0.5	5.3	59.5	0.667
Colombia	169	7,342	4.3	2.8	14.4	60.0	0.663
USA	13,092	44,399	1.7	3.1	3.5	17.0	0.898
Canada	1,156	34,304	1.9	2.4	9.2	17.5	0.878
Australia	727	32,461	3.2	3.2	9.3	16.0	0.926

Source: Own calculation on the basis of data from PwC (2013), World Bank (2013), UNDP (2013) and Freedom House (2013); for countries in the Pan-Arabian region, the sum and averages were compiled respectively.

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Contacto

Castulus Kolo

c.kolo@macromedia.de