Are all mergers equally delay-averse? An empirical analysis of procedural delay in European Commission merger cases (1999-2008)

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Abstract: This article looks at the distribution of two EC merger procedural events and examines the effect of the indefinite-length suspension of merger investigations. Although the ECMR refers to the suspension of investigations as an exceptional instrument, it is used in a high proportion of cases. As the ECMR does not set a time limit for suspension, it can lead to significant delay in the assessment of mergers. To understand the causes of delay, this article relies on the fact that the suspension of the investigation is a consequence of merging parties' failure to provide the necessary information to the Commission. Two main causes of this behaviour are identified. Firstly, merging parties may decide to intentionally withhold information in order to cause the suspension of the investigation, which allows them more time to do whatever is necessary to avoid a lengthy second phase investigation. Secondly, failure to provide the required information to the Commission may be a result of merging parties' negligence towards the regulatory assessment of their merger. Whereas the first case may be socially beneficial, identifying the second type of behaviour may help in filtering out inefficient mergers. *October 2009*

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1. Introduction

The length of merger review has been in the centre of criticism in Europe. The main reason for this is that very long merger approval procedures often lead to forgone mergers as a result of the delayed approval. The judicial review of European Commission merger decisions has been particularly referred to as making the approval practically meaningless from a commercial point of view.[1] Delayed approval of mergers however is not always caused by judicial review.

The purpose of this paper is to show the diversity in the delay-averseness of merging parties, which largely affects the litigation strategy they will choose. The analysis will be based on the uncertainty that the possibility of the indefinite-length suspension of proceedings introduces into the timeframe of merger investigations. As suspension is typically a result of merging parties' negligence and failure to provide sufficient and adequate information to the Commission, higher degree of uncertainty would mean a more diverse group of companies in terms of their delay-averseness.

I will show that given the current EC merger regulatory framework, there are two main sources of reasons why investigations are suspended. Firstly, merging parties may act 'intentionally' in a way to cause suspension, thereby winning some time to make the necessary steps in order to avoid an in-depth investigation. Secondly, it may also be the negligent behaviour parties and their lack of delay averseness that lead to the 'unintentional' suspension of the investigation. Although the analysed sample is a pool of European Commission cases, due to the similarity of merger procedures across Europe the main results could potentially be valid for other jurisdictions as well.

Ekelund and Thornton (1999) warns about the social costs of a delayed merger procedure for restructuring industries claiming that the length of a merger review should be reduced to 30 days. They distinguish between direct and indirect costs of regulatory approval, the former in the form of compliance costs, lobbying, public relations, etc. being expenditures that are a pure deadweight loss to society, and the latter in the form of lost products,

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[1]   See for example Heim (2003)

innovations, and (potentially forgone) efficiencies signifying the more relevant social costs.

In a more boiled down version of the above paper Ekelund, Ford and Thornton (2001) demonstrated empirically that mergers in regulated industries take longer to complete than mergers in other industries. The authors assumed that the length is influenced by the degree of industry concentration, the size of the merging companies, and on whether the merger is subject to multiple regulatory approvals (which is very typically the case in regulated industries). Their results showed that all these three factors increase the length of the completion of the merger.[2]

The two papers cited above focus on the delay caused by the regulator. To carry on with the same thought but from a different perspective, I will place more emphasis on the delay caused by the merging parties, which can also result in mergers falling through, especially in cases where the suspension was the result of merging parties' negligence attitude towards the merger investigation.

The paper is structured as follows: firstly an introduction of the timeframe of EC merger procedures is given. This is followed by a short comparative outlook of European Member State provisions regarding the suspension of merger investigations. Secondly the empirical results are presented through an analysis of the distribution of two procedural events, the offer of merger remedies and the Commission's final decision. Finally a simulated case, where indefinite suspension is not allowed, is analysed.

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[2]   However, the authors assumed normality for the length variable, something that might not be the case in every jurisdiction – as is later shown by this paper

2. Regulatory background

2.1 The timeframe for EC merger procedures

Both the old[3] and the new ECMR[4] set very strict timeframes for the assessment of notified mergers. Mergers of a Community dimension should be formally notified before their implementation. This means that the implementation of mergers is suspended until the merger receives clearance from the Commission.[5] The old ECMR set a one week time limit for notification following the conclusion of the agreement, or the announcement of the public bid, or the acquisition of a controlling interest. The new ECMR renounced the one week deadline and requires mergers to be notified prior to their implementation but following the conclusion of the agreement, the announcement of the public bid or the acquisition of a controlling interest.[6] Therefore for mergers after May 2004, the timing of the notification will depend on the time-path of the parties' integration plan as a delayed notification automatically delays the implementation of the merger.

Following the reception of the notification, the Commission has a period of 25 working days[7] before a decision has to be made. This deadline can be further extended to 35 days[8] if the parties offer commitments to remedy to anticompetitive effects of the merger, or if a Member State informs the Commission about reasons that could justify the referral of the case to a Member State.[9] This investigational period of 25 or 35 days is known as phase I investigation, which is concluded with one of the following events: (1) withdrawal of the notification by the merging parties; (2) referral of the case to

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[3]   Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings (hereinafter referred to as: the old ECMR) (OJ L 395, 30.12.1989)

[4]   Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (hereinafter referred to as: the new ECMR) (OJ L 24, 29.01.2004, p. 1-22)

[5]   Article 7 of the ECMR (hereinafter, where reference is only given to the ECMR, the numbering of the relevant Article is the same in both the old and the new ECMR)

[6]   Preamble (34) and Article 4 of the new ECMR, and Article 4 of the old ECMR

[7]   One month, according to the old ECMR

[8]   Six weeks, under the old ECMR

[9]   Article 10.1 of the ECMR

a Member State competition authority;[10] (3) a no jurisdiction decision if the merger does not fall in the scope of the ECMR;[11] (4) unconditional approval of the merger;[12] (5) conditional approval of the merger;[13] (6) referral of the case to a Member State;[14] or (7) initiate a second phase investigation.[15]

The first six types of decisions have one thing in common: they all lead to the end of the Commission's involvement in the procedure. As far as (7) is concerned, it leads to the start of a more thorough investigation (phase II investigation), where the Commission has a longer period of time to examine the merger at case together with the remedies offered in order to decide on the merits of the merger. In this investigational phase, which starts on the day of decision (5), the Commission has 90 working days[16] to reach a decision (if remedies are offered before day 55 of the second phase investigation). The time limit for final decision is extended to 105 working days if remedies are offered after day 55.[17] This period can be extended by a further 20 days at the request of the merging parties or as an initiative from the Commission subject to the approval of the merging parties.[18] The Commission can also clear a merger earlier than the 90 (105) day deadline. The conclusion of phase II procedures can be fourfold: (1) withdrawal of the notification by the merging parties; (2) unconditional approval of the merger,[19] (3) conditional approval of the merger,[20] (4) prohibition of the merger.[21]

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[10]   Article 9 of the ECMR

[11]   Article 6.1 (a) of the ECMR

[12]   Article 6.1 (b) of the ECMR

[13]   Article 6.2 under the new ECMR and Article 6.1(b) under the new one

[14]   According to Article 9 of the ECMR

[15]   Article 6.1 (c) of both the new and the old ECMR

[16]   Four months according to the old ECMR

[17]   Article 10.3 of the ECMR and paragraph 89 of the new remedies Notice

[18]   The notifying parties have a one-off opportunity to request an extension of no more than 20 working days of Phase two, provided this request is made not later than 15 working days after the decision to initiate an in-depth inquiry. http://www.vwew.be/news/vlu_2004_01.asp

[19]   Article 8.1 of the new ECMR, Article 8.2 under the old ECMR

[20]   Article 8.2 of the ECMR

[21]   The Commission can also order the restoration of effective competition if the merging parties had implemented their merger even though the Commission later prohibited it

In order to ensure that the Commission has sufficient time to investigate the remedies offered by the parties, these offers also have to be embedded into a strict timeframe.[22] Merging parties can submit commitments to the Commission even before the notification of the merger.[23] Once the formal procedure starts, parties have 20 days[24] to submit their proposals to modify the merger.[25] Provided that they do so, it will result in a 10-day extension of the time limit for the Commission's decision, as explained above. If the merging parties miss this deadline, and the merger would result in anticompetitive effects, the parties will have to face a second phase investigation. This is a rather strong incentive for companies to be ready to offer remedies at the outset.

Once the second phase starts, there is a deadline of 65 days for submitting commitments. This deadline may be extended, if the length of the phase II investigation is also extended according to Article 10 (3) of the ECMR. Remedies can also be offered following the 65 day deadline, but only where based on the already available information the Commission can clearly determine that these commitments resolve the identified competition concerns and where there is sufficient time to allow for an adequate assessment by the Commission.[26]

The above paragraphs set out a rigorous timeframe for EC merger procedures. Although the regulatory approval process is often regarded as a delay that merging parties inevitably encounter in their integration process, this delay can be further exacerbated by other factors. Despite a well defined

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[22] Detailed rules on remedies are contained in Commission Notice on remedies acceptable under Council Regulation (EEC) No 139/2004 and under Commission Regulation (EC) No 802/2004 (new Notice) and in Commission Notice on remedies acceptable under Council Regulation (EEC) No 4064/89 and under Commission Regulation (EC) No 447/98 (old Notice)

[23] See Article 19 (1) of the Implementing Regulation (Commission Regulation (EC) No 802/2004 of 7 April 2004 implementing Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings), and also in Paragraph 76 of the new Notice, and paragraph 33 of the old Notice

[24] 3 weeks, according to the old Notice

[25] The Commission informs the parties about its doubts before the 20 day deadline

[26] See paragraph 94 of the new remedies Notice, and also Case COMP/M.3440—ENI/EDP/GDP of 9 December 2004, paragraphs 855 et seq.; confirmed by Judgment of CFI in Case T-87/05 EDP v Commission [2005] ECR II-3745, at paragraphs 162 et seq.; Case COMP/M.1628—TotalFina/Elf of 9 March 2000, at paragraph 345

procedural framework, where the merger review delay is easily predictable, it has one element which can significantly change these time limits and therefore introduce a large deal of uncertainty in the established framework. Article 10 (4) of the ECMR declares that the Commission may suspend the above periods owing to circumstances for which one of the merging parties is responsible. The Commission suspends the investigation either to request information by decision pursuant to Article 11 or to order an inspection by decision pursuant to Article 13. As the relevant legislation does not establish a time frame for these suspensions,[27] they can lead to substantially longer procedures. The suspension of merger investigations for the purposes of acquiring additional information has sometimes led to significant delays in the merger review process. The *SFR*/*Tele2*[28] merger presented in Box 1 is a good example for such delay.

Box 1: The SFR/Tele2 merger

In the *SFR*/*Tele2* merger, roughly two months following its public announcement, the Commission received notification on 28 November 2006. Shortly following notification the procedure was suspended as the notification was declared incomplete. It took nearly two months for the parties to resubmit the completed notification, which resulted in the start of the phase I investigation in late February 2007. Roughly 3 weeks later the Commission concluded that the merger raises serious doubts as to its compatibility with the common market, and initiated the start of a second phase investigation.[29] The news of the delay resulted in immediate speculations on the market, and Télé2 started receiving offers from other competitors, which it eventually turned down in favour of SFR.[30] However, failure to provide the required information in a timely manner resulted in the merger receiving regulatory clearance nearly 10 months after its announcement. Had Tele2 – for

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27   Article 9 of the Implementing regulation (Commission Regulation (EC) No 802/2004), that regulates suspension in merger cases does not contain any time limit for the length of suspension

28   Case COMP/M.4504 — SFR/Télé 2 France

29   The source of the information of the deadlines was the final report of the Hearing Officer in Case COMP/M.4504 — SFR/Télé 2 France

30   Vente de Télé2 France: la maison mère rejette l'offre de Neuf Cegetel, ITespresso.fr, 02.08.2006, downloaded from: http://www.itespresso.fr/vente-de-tele2-france-la-maison-mere-rejette-loffre-de-neuf-cegetel-16340.html

> some reason – not been so eager to only sell to SFR, this could have easily resulted in a third party snatching up Tele2 from SFR before the conclusion of the approval procedure, and SFR losing at least 300,000 potential broadband customers.[31]

Merging parties therefore have the possibility to influence the length of the investigation by not complying with the ECMR in terms of providing information for the Commission.

2.2 *Indefinite and definite suspension – a Member State level outlook*[32]

Although the two-staged nature of merger investigations can be found in all European Union Member States, the time limit for conducting merger investigations varies from country to country. The deadlines for investigation or for other procedural actions are strictly regulated all across Europe, but the actual length of procedures and particularly its variance shows a rather heterogeneous picture. The primary reason for this diversity is not the difference in the applied deadlines, but the fact that some countries (akin to the Commission) allow for an indefinite length of suspension of the procedure when asking for additional information from the merging parties, and others only allow the suspension of procedures for definite time periods.

Appendix I provides a list of how the suspension of investigations for requesting additional information varies across European jurisdictions. Countries can be subdivided into two groups depending on whether they allow for an indefinite length of suspension or whether such a suspension is constrained by a regulatory time limit. Denmark, Hungary, Iceland, Ireland, Italy,[33] Lithuania, and Portugal[34] are the jurisdictions where an indefinite suspension of the merger investigation is not provided for by the relevant pieces of legislation. Belgium, Czech Republic, Estonia, France, Germany, Italy, The Netherlands, Norway, Poland, Portugal, Romania, Slovakia,

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[31]   Tele2 privilégie toujours SFR pour ses activités françaises. Capital.fr, Available at: http://www.capital.fr/bourse/actualites/tele2-privilegie-toujours-sfr-pour-ses-activites-francaises-223170

[32]   Appendix II contains the list of Member State competition laws used for this paper

[33]   The length of suspension for requesting information is indefinite in phase I and definite in phase II investigations in Italy.

[34]   Similarly to Italy, only definite in phase II investigations

Slovenia, and the United Kingdom on the other hand – similarly to the EU – allow the investigation clock to stop for an indefinite length of time, or more precisely, until the requested information is provided by the merging parties. In some countries (for example Portugal) the introduction of a definite length suspension was motivated by the intent to (sometimes considerably) reduce the length of merger investigations. However, in Portugal the practice of the authority suggests that indefinite suspension is still possible in phase I cases in order to increase the chance of closing down the case without starting a second phase investigations.[35]

In general it can be concluded that in a handful of jurisdictions policymakers were concerned about the existence of very long procedures, and as a result, introduced a definite timeframe for the suspension of cases. In the remainder of the countries, such considerations did not exist and thus a deadline for answering requests for information is not set. It is therefore left to the merging companies to make sure they are aware of what is required from them for the authorisation of their merger.

3. The dataset and summary statistics

The focus of this paper is on analysing the length of spells for various procedural events in EC merger control. For this reason a sample of EC merger cases between 1999 and 2008 was chosen.[36] As one of the analysed variables is the timing of remedy offers, a common denominator of the sample cases was that they all necessitated intervention from the Commission's part. The data was collected from two sources: (a) the Commission's case reports, and (b) the Hearing Officer's reports. The sampling process used for this research was – in a sense – purposive sampling as it aimed at collecting all of those European Commission cases within the analysed timeframe which involved some sort of intervention from the Commission's part. The most obvious constraint on sampling was the availability of the required data in the

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[35]   Leitão, Teles and Associados (2009)

[36]   The use of earlier cases was rejected as the information available from Commission case reports becomes very fuzzy for cases before 1999

text of the decision. Another constraint affecting the collected sample was that only English and French texts were included. Therefore from the 223 cases in the examined period, 9 had not been published by the time of finalising this article, 11 were in German, 3 in Italian, and 2 in Spanish, leaving 198 cases to be analysed.

3.1 The length of procedures

The *NLENGTH* variable is treated as a continuous one,[37] with a finite interval $[0, NLENGTH_{max}]$,[38] which measures the number of working days between the notification of the merger and the Commission's final decision. This is the total length of the procedure, which includes suspension and other delays recurring during the investigation. The procedural deadlines were different under the two merger regulations. This means that if the analysis includes cases from both under the old and the new ECMR, then the results can only be meaningfully interpreted if some sort of weighting is used for the event-spell variables. In comparison with the old ECMR, phase I merger procedures can be 1.666 times,[39] whereas phase II investigations can be 1.356 times[40] longer under the new ECMR. These multipliers were used as weights accordingly.

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[37] Although *NLENGTH* cannot assume an infinite number of possible values it was assumed for simplicity

[38] Where $NLENGTH_{max}$ is the length of the longest investigation. As it will be showed later, due to the possibility of an indefinite length suspension, $NLENGTH_{max}$ is not defined. As the length of suspension is indefinite, this could theoretically converge to infinity, but in practice this would certainly not be the case as the procedure would stop for other reasons (e.g. withdrawal from the case)

[39] 35 working days is the longest phase I procedure – without suspensions – under the new ECMR and 30 working days (6 weeks) is the longest under the old ECMR

[40] 160 is the longest phase I procedure – without suspensions – under the new ECMR and 118 is the longest under the old ECMR

Table 1 : Summary statistics for NLENGTH

variable	description	N	mean	std.dev.	min	max	p5*	p50*	p95*
NLENGTH	Number of working days between notification and final decision	198	79.2	59.46	25	337	34	40.5	178
	phase I	*136*	*42.99*	*18.08*	*25*	*171*	*33*	*37*	*83*
	phase II	*62*	*158.6*	*36.84*	*98*	*337*	*117*	*157*	*225*
NLENGTHg	Number of working days between notification and final decision, **without outliers**	197	77.9	56.68	25	260	34	40	176
NLENGTHs	Number of working days between notification and final decision, **without suspension**	198	71.0	51.92	21	179	33	38	165
	phase I	*136*	*36.90*	*3.73*	*21*	*47*	*31*	*36*	*43*
	phase II	*62*	*145.9*	*19.41*	*98*	*179*	*116*	*150*	*174*

* 5th, 50th (median), and 95th percentiles

The variable *NLENGTHg* refers to a sample where the outlier observations were removed based on a Grubbs' outlier test. The *NLENGTHs* variable differs from *NLENGTH* in that it excludes the length of time for which the investigation was suspended. Table 1 reveals some interesting features about the length of procedures. For example, we can see that the suspension of investigations can affect both the length and the dispersion of the length of procedures (compare the phase I and phase II mean and standard deviation figures for *NLENGTH* and *NLENGTHs*).The timing of remedy offers

3.2   The timing of remedy offers

The *NREM* variable is also treated as a continuous one. It measures the number of working days between the notification of the merger and the day of the remedy offer. In EC merger procedures, in case of anticompetitive mergers, it is the merging parties who have to make the remedy offer and the Commission decides whether to accept or reject the offer. If the offer is not accepted, the parties can make subsequent offers until the Commission accepts them (if the offer eliminates the competitive concern) or until the

procedure finishes (the merger is prohibited if parties fail to offer a suitable remedy by this time.

Similarly to the length variable, in order to make the two subsamples of the old and the new ECMR comparable, the difference between the deadlines had to be accounted for. The same weighting was used as explained above. Information on the timing of remedy offers was published in the Commission's case report, but it is not reported in every decision, which resulted in missing observations for 27 merger cases. The available data revealed no evidence for the missing observations not missing at random. Given that in the individual cases there can be more than one remedy offer (if the previous offers had been rejected) there are altogether 302 remedy offers in the sample.

Table 2: Summary statistics for NREM

variable	description	N	mean	std.dev.	min	max	p5*	p50*	p95*
NREM	Number of working days between notification and remedy offer	302	59.50	52.66	0	325	14	34	155
	phase I	*188*	*29.02*	*17.73*	*0*	*155*	*3*	*25.5*	*58*
	phase II	*114*	*109.8*	*52.64*	*0*	*325*	*15*	*114.5*	*203*
NREMg	Number of working days between notification and remedy offer, **without outliers**	301	58.95	51.87	0	325	14	34	152
NREMs	Number of working days between notification and remedy offer, **without suspension**	302	52.83	44.89	0	165	8	33	142
	phase I	*188*	*24.72*	*9.83*	*0*	*45*	*3*	*22*	*38*
	phase II	*112*	*99.76*	*41.17*	*0*	*165*	*20*	*106*	*155*

* 5th, 50th (median), and 95th percentiles

In Table 2 *NREMg* is the sample without outliers, and *NREMs* is the sample not including the suspension of the investigation. *REM1* refers to the number of working days between notification and the first remedy offer. The same can be said of the timing of remedy offers as of the length of the investigations. High variance suggests that there are some characteristics of a merger that makes parties offer remedies at significantly different times.

3.3 Suspension of investigations and other sources of delay

In the analysed sample there were 39 cases (20 phase I and 19 phase II) where the Commission suspended the procedure and this suspension is explicitly mentioned in the case report. Table 3 summarises the number of suspension and no suspension cases in phase I and phase II procedures, broken down into cases under the old and the new ECMR.

Table 3: European Commission merger intervention cases with suspension (1999-2008)

	old ECMR			new ECMR			Total sample		
	phase I	phase II	total	phase I	phase II	total	phase I	phase II	total
no suspension	58	33	91	58	10	68	116	43	159
%	79.45	76.74	78.45	92.06	52.63	80.49	83.82	69.35	79.29
with suspension	15	10	25	5	9	14	20	19	39
%	20.55	23.26	21.55	7.94	47.37	19.51	16.18	30.65	20.71
total	73	43	116	63	19	82	136	62	198

Although the ECMR reserves the suspension of investigation to exceptional situations, there was a suspension in around 20% of the cases and this figure seems to be constant under the old and the new ECMR.[41] The total number of suspension cases for phase I and phase II procedures (found in the 'Total sample' rows of Table 3) are very similar,[42] but we can also see that they represent a higher proportion in phase II cases.[43] Under the old ECMR the proportion of cases with suspension was roughly the same in phase I and phase II cases, whereas under the new ECMR suspension is clearly more likely in phase II cases (11% of phase I and 47% of phase II suspended).[44] However, the relative length of these suspensions is higher in phase I cases. In the sample, there were 39 cases with suspension explicitly mentioned in the Commission's report. For the remainder of the cases it was assumed that the investigation was not suspended.

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[41] This is a strikingly high figure considering the fact that Article 10(4) of the ECMR says that "The periods set by paragraphs 1 and 3 shall *exceptionally* be suspended where, owing to circumstances for which one of the undertakings involved in the concentration is responsible"

[42] However, it will be showed later that the relative length of suspension is higher in phase I cases

[43] In testing the difference, the t-score of the Student's t-test was -2.3508

[44] In testing the difference, the t-score of the Student's t-test was -3.7428

Table 4: Summary statistics for the suspended investigations

variable	description	N	mean	std.dev.	min	max	p5*	p50*	p95*
*SUSP***	Length of suspension in working days	39	46.1	36.839	3	193	5	32	98
	phase I	*20*	*55.16*	*41.566*	*3*	*193*	*7*	*57*	*146*
	phase II	*19*	*36.64*	*29.25*	*5*	*94*	*5*	*20*	*94*

* 5th, 50th (median), and 95th percentiles
** Only for the subset, where the case was suspended

Table 4 summarises the length of suspension in EC merger investigations. The continuous variable *SUSP* was broken down into phase I and phase II for those cases only, where the investigation was suspended by the Commission. The table shows that the investigation was suspended in around 20% of the total number of analysed cases, even though the ECMR refers to suspensions as an exceptional possibility.[45] Although phase II suspensions are more frequent (Table 3), Table 4 reveals that phase I suspensions last longer. This is not surprising as the suspension of the investigation is due to circumstances for which the merging parties are responsible, therefore they can deliberately 'cause the suspension of a case' in order to gain more time for making sure they can avoid a phase II investigation.

Apart from the cases where suspension was explicitly mentioned in the merger decision, there were another 73 cases, where the length of the procedure exceeded the regulatory limit but typically only by a few days.[46] No explanation was found to this in the analysed texts and therefore further will be referred to as *unaccounted delay*. Table 5 summarises the length of unaccounted delay in cases under the old and the new ECMR. The basis of this calculation is the maximum regulatory length of a procedure for phase I and phase II. The regulatory deadlines were subtracted from the actual length of the case (as collected from the Commission's case report) in cases where the Commission did not report any reason for a delay. Whenever this number was positive, we found an unaccounted delay.

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[45] Article 10(4) of both the old and the new ECRM

[46] In 16 of these cases the case was referred to the Commission from a Member State authority, which could also have caused some unaccounted delay

Table 5: Summary of the length of unaccounted delay

	old ECMR	new ECMR	total
phase I			
% of cases with unaccounted delay	0,70	0,52	0,61
mean unaccounted delay (days)	2,21	1,73	1,98
std.dev of unaccounted delay (days)	2,46	2,32	2,40
phase II			
% of cases with unaccounted delay	0,35	0	0,25
mean unaccounted delay (days)	1,79	0	1,31
std.dev of unaccounted delay (days)	3,50	0	3,08
total			
% of cases with unaccounted delay	0,56	0,40	0,49
mean unaccounted delay (days)	2,04	1,35	1,76
std.dev of unaccounted delay (days)	2,91	2,17	2,65

The length of unaccounted delay is typically around 2 or 3 days. As the % rows reveal, unaccounted delay was significantly more likely under the old-ECMR,[47] which might suggest a reporting bias as older case reports are typically shorter and therefore are more likely to avoid reporting the cause of a delay (especially if it is a rather short one). As the source of unaccounted delay is not revealed in the texts of EC merger decisions, the focus of this paper remains on suspension cases that were published in the sample decisions.

4. Effect of indefinite suspension in European Commission merger intervention cases (1999-2008)

This section looks at the effect of indefinite-length suspension in European Commission merger decisions. For this reason, the distribution (over time) of the timing of two procedural events (submission of remedy proposals, and final decision) will be analysed. I will show that even the length of procedural events should be regarded as a set of stochastic variables in both situations. As the uncertainty is largely a result of the possibility of indefinite suspension – which is a consequence of merging parties' negligence in providing the necessary information to the Commission – the non-parametric estimations below support the hypothesis that not all mergers are equally delay-averse. It

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[47]   In testing the difference, the t-score of the Student's t-test was 4.4106

will also be shown that the uncertainty about the length of the analysed event-spell is higher in phase I cases suggesting that the possibility of suspension may be used in cases to gain some time and avoid phase II procedures.

4.1 A non-parametric analysis of cases with indefinite length suspension

When trying to fit a distribution one often relies on non-parametric means to be able to draw some inference on the shape of the density function (whether it is monotonic increasing or decreasing, convex or concave, etc). The use of histograms and kernel estimations[48] of the timing of remedy offers and final decisions help to visually demonstrate the bimodality caused by the two-staged nature of merger procedures.

The grey bars on Figure 1[49] represent the probability of the examined spells (*NREM* and *NLENGTH*) taking a particular value. The black continuous line is a plot of the kernel density function for the given data, to show a rough estimation of the density of the examined variables. The bin-width for the histograms and the window-width for the Kernel curves are calculated and presented in Appendix III.

Both histograms and both kernel density curves imply bimodality for the respective variables. Although a formal test of multimodality has not been conducted, theory also helps backing up this observation for reasons of having two distinct procedural stages (phase I and II). The first 'bump' primarily consists of cases where the procedure ended with a phase I approval decision, or when remedies were offered in phase I, and the second 'bump' corresponds to final decisions and remedy offers in second phase investigations.

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[48]   An explanation of the presented histograms and kernels estimations is given in Appendix 2.3

[49]   The outlier case *Omya/Huber* merger (NLENGTH = 337, NREM = 325) was dropped from the sample
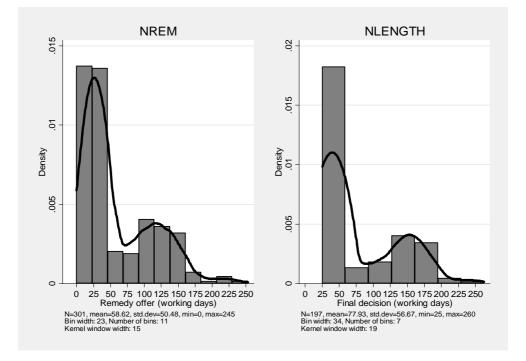
Figure 1: Bimodal histogram of NREM and NLENGTH

To show that the bimodality is given by the two-staged nature of EC merger procedures, the samples are separated into phase I and phase II investigations. Firstly, Figure 2 shows[50] the distribution of the timing of remedy offers[51] for Phase I and Phase II procedures.

The two kernel curves in Figure 2 both suggest that the separation of the sample into phase I and phase II investigations resulted in two unimodally distributed sub-samples. What is also apparent from Figure 2 is that the tails of the two distributions – especially for phase I cases – are rather heavy (i.e. there is a relatively high likelihood of extreme values), and right-skewed, especially in the case of the phase I sub-sample.

---

[50]   The outlier phase I mergers, *GE/AGFA NDT* (*NREM* = 155), *Totalfina/ELF Aquitanie* (*NREM* = 155) and *DONG/Elsam/Energi E2* (*NREM* = 121) and the outlier phase II mergers *Omya/Huber* (*NREM* = 325) and *Lagardere/Natexis/VUP* (*NREM* = 225, 245) were dropped from the sample, based on a Grubb's test (maximum normalised residuals test)

[51]   Denoted as *g(t)* above

Figure 2: Histogram of NREM broken down into Phase I and Phase II
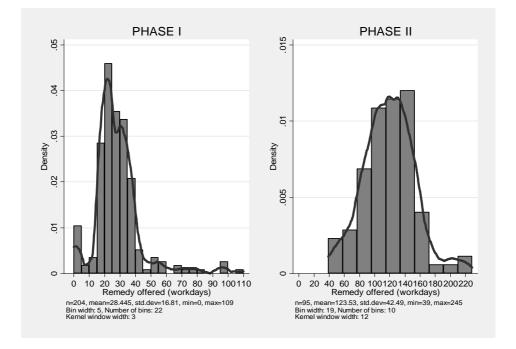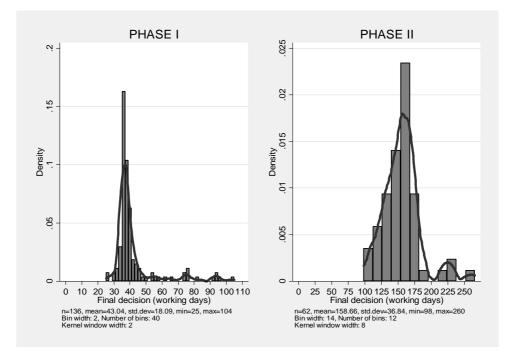

Figure 3[52] breaks down the sample of the timing of the final decisions (*NLENGTH*) into Phase I and Phase II cases:

Figure 3: Histogram of NLENGTH broken down into Phase I and Phase II

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[52] The outlier phase I cases *GE/AGFA NDT* merger (NLENGTH = 143) and the outlier phase II case *Omya/Huber* merger (NLENGTH = 337) were dropped from the sample

Similar conclusions can be drawn from Figure 3 as from Figure 2, although somewhat less ambiguously. The kernel window width was smaller in both sub-samples and even with a narrower window unimodality for both distributions can be observed – again – with rather heavy (right) tails and right-skewed features, which characteristic is more visible in the phase I sub-sample.

The presented histograms suggest that despite the strict procedural time-frame the distribution of the analysed four variables may be better explained by some kind of unbounded distribution function. Therefore, when making an assumption about the functional form of the distributions we would be looking at a distribution which is bounded from left (signifying the start of the procedure) but is unbounded to the right,[53] and is able to accommodate rather heavy right tails. However, before making such assumptions, the boundedness of the distribution of all four variables is going to be tested, and then a parametric form is chosen to describe the distribution of the analysed EC procedural event variables. The two sub-samples of phase I and phase II investigations are analysed separately.[54] Once their functional form is found, this information can be plugged into the bimodal curve of the total sample.

4.1.1 Analysing boundedness

The method for testing the boundedness of the distributions of the analysed sample of variables is taken from Slifker and Shapiro (1980), who proposed a technique for deciding on the boundedness of distribution in relation to placing a given distribution in the Johnson family of distributions. The Johnson system is a very flexible one in the sense that it is capable of approximating a number of continuous distributions with a large variety of different shapes: (1) the S_L

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[53] This does not mean that any of the event spell variables may assume a value of infinity, only that unbounded theoretical distributions might be better suited at explaining the behaviour of these variables

[54] In Phase I cases the competition problem must be identifiable at the beginning of the procedure, and a remedy must be offered in a time that still allows sufficient time for the Commission to assess whether that remedy is sufficient enough. What is more interesting for this analysis are the Phase II procedures. These procedures start off in frame of a Phase I investigation and then carry on to Phase II when the parties fail to provide sufficient commitments in due time

(lognormal) distribution, (2) S$_U$ (unbounded) distributions, and (3) S$_B$ (bounded) distributions.[55]

The method in Slifker et al. is based on the percentiles of the distribution of standardised and the analysed variables. This technique stems from the intuition that there is some relationship between distances in the tails and distances in the central portion of the distribution, which could be used in order to distinguish bounded from unbounded cases. The first step is to subdivide the domain of a standard normal variable into three intervals, in a way that the intervals are separated by an arbitrarily chosen *z*, and the corresponding values of –*z*, 3*z*, and –3*z*. Slifker et al. hypothesised that for bounded distributions the distance between each of the outer and inner points is smaller than the distance between the two inner points. If *x*, –*x*, 3*x*, and –3*x* are the values of the analysed variable corresponding to *z*, –*z*, 3*z*, and –3*z* using the transformation $z = \gamma + \eta k_i(x; \lambda; \varepsilon)$ – where *z* is a standard normal variable and $k_i(x; \lambda; \varepsilon)$ is one of the three functions suggested by Johnson (1949) – and letting $m = x_{3z} - x_z$, $n = x_{-z} - x_{-3z}$, and $p = x_z - x_{-z}$, it can be proved[56] that:

(1)
$$\frac{mn}{p^2} > 1 \text{ for any } S_U \text{ distribution;}$$

$$\frac{mn}{p^2} < 1 \text{ for any } S_B \text{ distribution;}$$

$$\frac{mn}{p^2} = 1 \text{ for any } S_L \text{ distribution;}$$

[55]   The Johnson system of distributions was proposed in Johnson (1949) to ensure the best approximation of any analysed theoretical distribution (see also and George (2007)). These distributions are approximated by using a system of three corresponding functions, which allows a transformation of the analysed random variables into a standard normal distributed random variable, and thus highly facilitate analytical work. In order to decide which function to use for the Johnson transformation, Johnson proposed plotting the standardised third and fourth moments of the examined variable ($\sqrt{\beta_1}$, and β_2) on a two dimensional plane, which maps all three functions in a manner where the plane is divided by the S$_L$ distributions (lognormal) into the region of S$_B$ functions (bounded) and the region of S$_U$ functions (unbounded). Many different ways have been proposed to find out which of the above three Johnson categories an empirical distribution falls into, this paper uses one of these methods. (For a summary of these methods see for example DeBrota, Roberts, Swain, Dittus, Wilson and Sekhar (1988))

[56]   The proof can be found in Slifker and Shapiro (1980)

From the values calculated for *m*, *n*, and *p* we can use these criteria to select the corresponding member of the Johnson family (or at least to decide whether the analysed samples are bounded or not).[57] However at this stage I was only interested in whether the analysed distributions are bounded from right as we know that from left they are necessarily bounded at zero (i.e. as there is no negative length of procedural time-spells).

For this reason the method from Slifker and Shapiro (1980) is used with a slight tweak by ignoring the left tail $n = x_{-z} - x_{-3z}$ and calculating the following:

$$
\begin{aligned}
\frac{m^2}{p^2} &> 1 \text{ for any } S_U \text{ distribution;} \\
(2) \qquad \frac{m^2}{p^2} &< 1 \text{ for any } S_B \text{ distribution;} \\
\frac{m^2}{p^2} &= 1 \text{ for any } S_L \text{ distribution;}
\end{aligned}
$$

When choosing the value of *z* one has to keep in mind that by choosing *z* = 1 would result in having to make percentile estimations around $\pm 3z$,[58] which might be problematic for smaller samples.[59] For illustration and for making sure that the arbitrary choice of *z* does not lead to biased results, 6 different values for *z* were looked at. The following table contains the calculated $\frac{m}{p^2}$ for each of the examined samples, and for all of the chosen values of *z*. For cases where the indefinite length of suspension of cases is a possibility, the results are as follows:

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[57] As we treat the *x*'s as random continuous variables, the probability that $\frac{m^2}{p^2} = 1$ is zero therefore one has to allow a confidence interval around 1 for checking if the examined sample is distributed according to Johnson S_L

[58] The percentiles corresponding to $\pm 3z$ are very much

[59] For example Slifker and Shapiro (1980) suggest a *z* near 0.5 for smaller sample size

Table 6: Testing the boundedness of cases with indefinite length suspension

z	NLENGTH		NREM	
	phase I	phase II	phase I	phase II
0.50	103.49	5.85	1.47	0.57
0.60	170.88	6.70	5.75	2.69
0.70	86.61	10.91	9.08	2.59
0.80	76.15	13.32	14.06	3.14
0.90	138.68	15.61	19.22	4.24
1.00	117.64	11.56	29.04	3.15

Table 6 reveals that apart from phase II remedy offers where $z = .5$, the calculated $\dfrac{m}{p^2}$ is rather large for all the examined cases, showing that the distance between the outer points is clearly larger than the distance between the two inner points. This implies that for cases where indefinite suspension of the investigation is allowed, the analysed four variables follow a distribution, which is best explained by a process that is unbounded to the right. These results do not tell us how well the analysed four samples fit any of the theoretical distributions, although one should assume that given the versatility of the Johnson S_U distribution, it could be used to mathematically describe the distribution of these variables. Nevertheless, for simplicity (both the Johnson S_U and the Johnson S_B have 4 parameters to estimate and work with).and for theoretical justification (i.e. that these variables should be non-negative) a different assumption will be made, as is presented below.

4.1.2 Finding a functional form for the analysed event-spell variables[60]

To formally analyse the distribution of the two examined procedural events, a few assumptions have to be made. We will assume that timing of final decisions and remedy offers are distributed according to a continuous

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[60]   At first, results are presented and explained. The economic and legal interpretation of these results can be found in the subsequent section

process, which is subdivided into $g_1(t)$[61] (phase I)[62] and $g_2(t)$ (phase II) for the two sub-samples of *NREM*, and $f_1(t)$ and $f_2(t)$ for the two *NLENGTH* sub-samples. We know that *t* cannot assume negative values as it measures the time between notification and the examined events (remedy offer or final decision), and none of these can happen before notification.[63]

From the analysis of histograms I assume that neither the timing of remedy offers nor the timing of final decisions is uniformly distributed; i.e. the probability of *t* assuming any value is not uniform. Much rather an inverted U-shaped density function is expected for the timing of both events for both phase I and phase II, with possibly some level of right skewing, which is visually confirmed by the histograms in the previous section. This suggests that in all four sub-samples the corresponding distribution curves should have a sigmoid shape with an upper asymptote. The possibility of indefinite length suspension means that the sigmoid curve is likely to be asymmetric, with the decreasing rate of growth after the inflection point. This latter attribute results in a right-skewed density function. As none of the observations can take a negative value a non-negative assumption is made. The relative fatness of tails (caused by indefinite length suspensions) implies that the distribution is expected to be leptokurtic. The unbounded nature of the sub-samples is also assumed even though in practice none of the events can last until infinity, but – as tested in the previous section – unbounded theoretical distributions can better explain the behaviour of the analysed data.

Four theoretical univariate continuous distributions were tested that fit the above listed assumptions: the log-logistic, the lognormal, the gamma, and the

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61 With $t \in [0; t_{\max}]$, where *t* is the number of working days counting from the notification of the merger, and $t_{\max}$ is the length of the longest observation allowed by the ECMR (which, given that the length of suspension is not defined by the ECMR may theoretically tend to infinity)

62 In the case of remedy offers, $g_1(t)$ contains those remedies that were offered in the phase I procedure (irrespective of whether the case was decided in phase I or phase II) and consequently $g_2(t)$ contains remedies that were offered after the phase II procedure had started

63 Assuming that pre-notification discussion (according to paragraph 78 of the 'new remedies Notice') between the parties and the Commission about potential remedies do not count as remedy offers

weibull distribution. What is common in these distributions is that they are all unimodal, non-negative, unbounded and can accommodate a right-skewed shape. Another appealing feature of all four of these distributions is that they are often used for modelling duration data, similar to that being analysed here.

The summary descriptive statistics of the four chosen theoretical variables, in comparison to the empirical summary statistics are contained in Table 7. The theoretical distributions were fitted to the data by moment estimation. As far as the timing of the final decision is concerned (*NLENGTH* section of Table 7), the log-logistic distribution seemed to have performed better than the other three distributions. The lognormal, the gamma, and the weibull distributions all underestimated the level of skewness and kurtosis, whereas the log-logistic distribution overestimated the kurtosis and somewhat underestimated the skewness of the distribution (but was still the closest hit regarding the skewness of the sample). The log-logistic kurtosis for phase I procedures is very large, therefore the theoretical distribution that is most capable of accommodating such a high level of kurtosis (i.e. the log-logistic distribution) should be preferred.

Table 7: Summary statistics for the empirical and the four analysed theoretical distributions

	Phase I				Phase II			
	mean	std.dev.	skewness	excess kurtosis	mean	std.dev.	skewness	excess kurtosis
NLENGTH								
empirical	42.04	14.35	2.64	6.63	155.72	29.00	1.02	2.69
log-log	41.99	13.38	1.81	11.55	154.52	29.26	0.96	3.64
lognormal	41.77	10.97	0.81	1.18	155.69	28.08	0.55	0.54
gamma	42.04	14.35	0.68	0.70	155.72	29.00	0.37	0.21
weibull	42.14	12.63	-0.03	-0.28	153.81	26.30	-0.45	0.17
NREM								
empirical	28.45	16.81	1.85	5.98	121.39	37.21	0.63	1.36
log-log[a]	29.46	15.29	3.50	107.92	121.53	36.94	0.71	2.50
lognormal[a]	30.03	15.50	1.69	5.44	121.38	36.78	0.45	0.36
gamma[a]	28.45	18.81	1.18	2.09	121.39	36.76	0.42	0.26
weibull[a]	98.10	221.33	6.71	87.39	121.13	37.82	0.31	-0.18

a   for the phase II cases the 3-parameter version of the distribution was used to allow for a horizontal shifting of the curve.

The picture is a little more ambiguous for the timing of remedy offers (the *NREM* rows of Table 7), although the weibull distribution clearly underperforms the others. The gamma and the lognormal distributions underestimate the skewness and the kurtosis of the distribution but this is not as significant as above. The log-logistic assumption gives a small overestimation of skewness, but the kurtosis of phase I cases is very significantly overestimated. The ambiguity of the results displayed in Table 7 suggests that a goodness of fit test is needed to confirm the choice of assumed theoretical distribution.

It stands out that the phase I empirical measures of skeweness and kurtosis are greater than the same measures for the phase II subsample. Using measures of the skeweness and kurtosis standard errors from Tabachnick and Fidell (2006), we can calculate the confidence intervals for all subsamples to show that they are different.

Table 8 contains the results of this calculation.

Table 8: Comparing skewness and kurtosis for all subsamples

	skewness				kurtosis			
	stat	std.err.	95% CI		stat	std.err.	95% CI	
NLENGTH								
Phase I	2.64	0.210	2.228	3.052	6.63	0.420	5.807	7.453
Phase II	1.02	0.311	0.410	1.630	2.69	0.622	1.471	3.909
NREM								
Phase I	1.88	0.179	1.530	2.230	5.98	0.357	5.280	6.680
Phase II	0.63	0.229	0.180	1.080	1.36	0.459	0.461	2.259

The table shows that both the skeweness and the kurtosis of the two variables are significantly larger in phase I, implying a distribution with a more pointed section in the middle, and heavier tails on either one or on both sides.

The four analysed sub-samples were tested against the four examined theoretical distributions using a Kolmogorov-Smirnov (KS), an Anderson-Darling (AD) and a chi-square goodness of fit test.[64] The results are contained in Table 9. Bold numbers indicate those cases where we cannot reject at the

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[64] See Appendix 2.4 for description of these tests

given confidence level that the sample was drawn from the given theoretical distribution.

Table 9: Goodness of fit test results for four selected theoretical distributions

	Phase I			Phase II		
	KS	AD	Chi-sq	KS	AD	Chi-sq
NLENGTH						
critical value[a] (α=.05)	0.11688			0.17091		
Log-logistic	0.19784[b]	6.6973[b]	84.196[b]	**0.07874[b]**	**0.5289[b]**	**2.7029[b]**
Lognormal	0.20255[b]	15.076[b]	94.389[b]	**0.10202**	**0.84181**	**7.7815**
Gamma	0.24054[b]	12.732[b]	96.526[b]	**0.10455[b]**	**0.88658[b]**	**8.2063[b]**
Weibull	0.24562[b]	14.033[b]	128.9[b]	**0.1201[b]**	**1.2366[b]**	**10.086[b]**
NREM						
critical value[a] (α=.05)	0.09508			0.13818		
Log-logistic	0.14002	21.122	49.664	**0.05836[b]**	**0.35276[b]**	**11.673[b]**
Lognormal	0.11482	22.64	39.527	**0.07541[b]**	**0.59821[b]**	**5.7504[b]**
Gamma	0.13889	22.311	46.141	**0.07309**	**0.72246**	**3.1645**
Weibull	14.752	23.718	138.44	**0.08428**	**0.91479**	**12.294**

a   The Chi-square critical value depends on the degree of freedom for each distribution, whereas the AD test makes use of the specific distribution in calculating critical values, therefore the critical values had to be calculated for each distribution.

b   The 3-parameter version of the distribution was used to allow for a horizontal shifting of the curve.

In phase I, all of the tested distributions were rejected as a result of the goodness of fit tests. The reason for this might be that the sample size is larger (n = 136, 188) and as a result the KS critical values are smaller. Another explanation can be derived from knowing that phase I skeweness and kurtosis are higher than the phase II measures. This means a higher probability of extreme values in the phase I subsample that is difficult to capture with the tested theoretical distributions, which explains the relatively bad fitting.

As the three goodness-of-fit tests order the examined distributions differently, I had to decide which one to base my assumptions on. The Chi-square test statistics are very sensitive to the choice of the bin-width, which can be a problem for example if only a few observations are available for a wider range

of the domain (which is the case for the long right tails of both phase I variables). For this reason, for the best fit was decided based on the KS and the AD test results.

Therefore we assume that both the timing of final decisions in phase I and phase II ($f_1(t)$ and $f_2(t)$) and the timing of remedy offers in phase I and phase II ($g_1(t)$ and $g_2(t)$) follow a log-logistic process, with probability density functions $f_{1,2}(t, \alpha_{f_{1,2}}, \beta_{f_{1,2}})$ and $g_{1,2}(t, \alpha_{g_{1,2}}, \beta_{g_{1,2}})$, where $\alpha_{f,g}$ are the scale and $\beta_{f,g}$ are the shape parameters. The density function for all four sub-samples is given by:

$$
(3) \qquad f(t, \alpha, \beta) = \frac{(\alpha / \beta)(t / \alpha)^{\beta - 1}}{\left[1 + (t / \alpha)^{\beta} \right]^2} \qquad \begin{aligned} &\alpha > 0 \\ &\beta > 0 \\ &t \in [0, \infty) \end{aligned}
$$

One of the advantages of choosing the log-logistic distribution is that its parameters are easily interpretable. From (3) we can see how a change in the two parameters, α and β can change the density curve. A change in α shifts the curve right or left on the horizontal axis, whereas a decrease in β reduces the dispersion of the curve.[65]

4.1.3 The legal and economic explanation of the findings

The above findings have interesting legal and economic explanations. First of all, I showed that the skeweness and kurtosis are significantly higher in the phase I sub-samples. Knowing the EC regulatory background, this means that even though suspension is more frequent in phase II investigations, it has a stronger effect on phase I cases, implying that the relative effect of suspension is larger in phase I cases.[66] One of the explanations is that merging parties, who want to avoid phase II investigations, might 'deliberately' withhold some information to cause the suspension of the investigation in the phase I stage of the investigation in order to gain more time, for example to

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[65]   As β tends to infinity, the excess kurtosis of the distribution tends to 6/5

[66]   Although it was also showed that the absolute length of suspension is also larger in phase I

finalise or improve their remedy offers. Box 2 provides an example to these cases.

Box 2: GE/AGFA ADT merger

Although difficult to prove what the real incentives of the parties had been, the *GE/AGFA* merger[67] in 2003 might be an example where parties delayed the phase I procedure by not supplying the required information in order to win some more time to be able to discuss a better remedy package and consequently to avoid an even lengthier second phase investigation. The EC investigation started on 14 May 2003, following a referral from several Member States, but was suspended 2 days later as the parties failed to provide the requested information to the Commission. After the parties submitted the requested information, the procedure restarted on 11 June 2003. The parties then submitted a proposal for remedies on 2 July. At roughly the same time the Commission requested further information. As this was not supplied in due time, the investigation was suspended again on 7 July. It took over 4 months – that is almost the length of 3 phase I procedures – before the requested documentation (together with a revised set of commitments!) was submitted to the Commission and the case was restarted on 18 November 2003. As the second set of commitments was sufficient to remedy the anticompetitive effects of the merger, the Commission approved the merger on 5 December 2003.[68]

This behaviour may actually be socially beneficial, as it helps merging parties to avoid a longer delay by causing a shorter delay. For this reason it is possible that the Commission acknowledges the use of the phase I suspension of investigations as long as it leads to a simplified assessment of mergers and consequently to a better use of resources. As Portugal explained in one of its ICLG submissions: "some of the cases suggest that the Authority might be willing to suspend the phase 1 deadline for longer periods in order to close the case without initiating phase 2".[69]

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[67] Case No COMP/M.3136 – GE / AGFA NDT (2003)

[68] The same thing happened for example in the Vodafone / Mannesmann merger (Case No COMP/M.1795 – Vodafone Airtouch / Mannesmann). See, *Mannesmann deal 'to avoid stage II Brussels inquiry'*, The Independent, 24.02.2000, downloaded from: http://www.independent.co.uk/news/business/news/mannesmann-deal-to-avoid-stage-ii-brussels-inquiry-725193.html

[69] Leitão et al. (2009)

Although delay in phase I may be explained by merging parties' slick way of making use of the possibility of the suspension of investigation, the same cannot be said of cases, where the second phase investigation was suspended. In these situations, suspension is more likely to be the consequence of merging parties' negligent behaviour in complying with what is required from them during EC merger procedures. The Omya/Huber merger[70] presented in Box 3 is a very good example to that.

Box 3: The Omya/Huber merger

A good example for a lengthy suspension of the procedure was the *Omya/Huber* merger,[71] where the Commission decided to suspend the case five times before a final decision was reached. The merger received the green light from the Commission 18 months after its announcement, and nearly a year after its notification (in comparison to the regulatory maximum of 160 days without suspension). The suspension decision of the Commission was contested by the merging parties, but the Court of First Instance confirmed the Commission's decision to suspend, under Article 11(3) of the EU Merger Regulation, its investigation of the merger case between Omya and Huber.[72]

Table 4 showed that nearly half of the phase II investigations were suspended under the new ECMR, as opposed to the 10% of phase I suspension cases in the same time period. A possible explanation could be that merging parties have become better at offering remedies to avoid phase II investigations, therefore only those mergers go into a second phase investigation where the parties are less delay-averse. As a consequence, these firms are more likely to show negligence in complying with ECMR measures.

The previous section also found some evidence that the timing of remedy offers and final decisions follow a log-logistic distribution in both the phase I and phase II sub-samples. The log-logistic assumption of the examined variables implies that whenever a competition authority can suspend the merger investigation for a longer period of time, the timing of procedural

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[70]   Case No COMP/M.3796 – Omya/Huber PCC

[71]   Case No COMP/M.3796 – Omya/Huber PCC

[72]   Judgment of the Court of First Instance of 4 February 2009 — Omya v Commission (Case T-145/06) (2009/C 69/81)

events (offering of a remedy, or reaching a final decision) has a large amount of uncertainty, i.e. it becomes more difficult to predict at the start of the investigation how long the procedure will last, or how long it will take before the parties offer remedies.

The log-logistic distribution provides an easy-to-interpret mathematical formula for the timing of procedural events in merger cases. The regulatory timeframe for merger procedures determines the α parameter (which is the median of the distribution). The β parameter depends on the level of diversity in the length of procedures. Suspension largely influences the total length of the analysed events; therefore smaller values of β indicate a larger variance of suspension (and investigation) length. As suspension is a function of delay-averseness, a smaller value for β implies more variance in delay-averseness as well. Therefore α should be around the regulatory set time limit, and β is expected to be smaller for phase I cases (where a larger variance in length has been showed).

Table 10: Log-logistic parameter estimates for NLENGTH and NREM

	NLENGTH		*NREM*	
	Phase I	Phase II	Phase I	Phase II
α	38.052	153.69018	26.55	118.94
β	3.7291	10.355	4.0209	12.753

Table 10 contains the log-logistic parameter estimates for the phase I and phase II sub-samples of *NLENGTH* and *NREM*. As projected, the scale (α) parameters are close to the regulatory time limit set for each of the event-spells, but are larger than the regulated time limit as a result of suspended investigations. The β parameters also behave as predicted, they assume a smaller value for phase I procedures, as a result of the cases where the phase I investigation was suspended to avoid a phase II procedure.

To conclude, the possibility of indefinite-length suspension, the varying delay-averseness of merging parties and their consequent behaviour that determines the length of this suspension – makes the distribution of the timing of the examined events skewed to the right, with a high kurtosis. This may be

caused by two types of behaviour. (1) In phase I cases merging parties' strategy may be to suspend the investigation to gain some time to avoid lengthy phase II investigations, and (2) when less delay-averse companies negligently cause delays by failing to comply with the relevant merger legislation (which then jeopardises the success of their merger).

As a final exercise, another situation is analysed, which does not allow for the suspension of cases. For this reason a simulated case where – contrary to the EC – the maximum length of suspension is defined in merger laws is analysed.[73] The purpose of this exercise is to examine whether the characteristics explained above can also be found in a regime that does not allow for indefinite-length suspension of investigations.

4.2 A simulated case of merger investigations without indefinite suspension

To simulate a situation where the procedural framework does not allow for indefinite suspension, the same sample of 198 EC merger cases have been analysed but the event spell variables do not contain the length of suspension. Therefore the two variables looked at are *NLENGTHs*[74] and *NREMs.*[75] Nonparametric estimations are presented first to get a feel of the newly created sub-samples of phase I and phase II event spell variables.[76]

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[73] See section 2.2 above

[74] The number of working days between notification of a case and the final decision, minus the number of days the case was suspended

[75] The number of working days between the notification of the merger and the remedy offered, minus the number of days the case was suspended

[76] Appendix 2.3 contains more information about histograms, kernel density estimators, and the choice for histogram bin-widths and Kernel window-widths

Figure 4: Histogram of NLENGTHs broken down into phase I and phase II cases

PHASE I

n=136, mean=36.96, std.dev=3.74
Bin width: 2, Number of bins: 13
Kernel window width: 1

PHASE II

n=62, mean=145.93, std.dev=19.39
Bin width: 15, Number of bins: 15
Kernel window width: 8

Two things clearly stand out even after a visual comparison of Figure 4 with the histograms of sub-samples with indefinite suspension (Figure 3). Firstly, the data points are a lot more concentrated around the mean. In practice this means that the right-skewness disappears, and the mean length of the procedure is shorter than in cases with indefinite suspension. *T*-tests for the difference between cases with and without suspension, for both phase I and phase II cases, confirm this by showing a significant difference in the means.[77] The sample without indefinite suspension visibly has a smaller variance, which is also formally confirmed by a variance ratio test.[78] The second observation is that albeit eliminating some of the uncertainty, the two variables are still stochastic, and there is still a high ratio of data points that are beyond the regulatory time limits. This means that there is a high degree of unaccounted delay in the Commission's practice, which strengthens the stochastic nature of these variables even after the elimination of indefinite length suspensions.

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[77]   The comparison of phase I cases showed a *t-value*: 5.0972 and for phase II cases *t* = 2.6778

[78]   The variance ratio test resulted in an *f-value* of 16.2080 for phase I and 6.50 for phase II cases
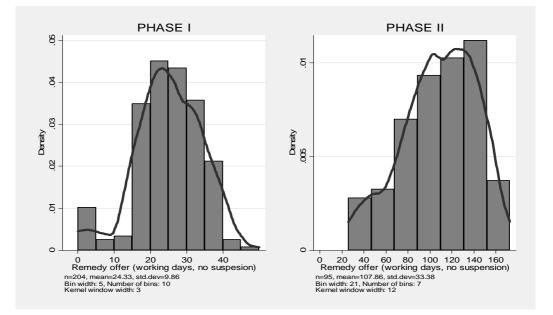
Figure 5: Histogram of NREMs broken down into phase I and phase II cases

The points made above are also true for the time spell of remedy offers (shown on Figure 5). Formal tests confirm that the means[79] and the variances[80] are significantly different from cases with indefinite length suspension.

Using the technique presented in Section 4.1.1 for measuring boundedness, the same calculations are conducted for the simulated sub-samples. The results of these calculations are presented in Table 11.

Table 11: Testing the boundedness of cases without indefinite length suspension

z	NLENGTH		NREM	
	phase I	phase II	phase I	phase II
0.50	0.99	0.11	0.25	0.44
0.60	1.03	0.33	0.17	0.24
0.70	1.69	0.29	0.19	0.19
0.80	1.07	0.22	0.45	0.15
0.90	0.56	0.17	0.38	0.13
1.00	0.56	0.10	0.39	0.08

For nearly all cases the distance between the outer points $(m = x_{3z} - x_z)$ is

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[79] $t = 2.8585$ for phase I and $t = 1.7800$ for phase II

[80] $f = 2.9669$ for phase I and $f = 1.8958$ for phase II

smaller than the distance between the inner points ($p = x_z - x_{-z}$). Based on the reasoning in Section 4.1.1, this suggests that the distribution of these variables is bounded for all the analysed sub-samples. Therefore the unbounded nature, which was found in the analysis of the EC merger sample has disappeared once the possibility of indefinite-length suspension was eliminated.

Finally, the summary statistics of the four simulated sub-samples are presented in Table 12:

Table 12: Summary statistics of the simulated sub-samples

	Phase I				Phase II			
	mean	std.dev.	skewness	excess kurtosis	mean	std.dev.	skewness	excess kurtosis
NLENGTH								
empirical	36.96	3.74	-0.50	2.81	145.93	19.39	-0.48	-0.53
NREM								
empirical	24.33	9.86	-0.43	0.11	107.86	33.38	-0.52	-0.38

The skeweness and the excess kurtosis in the simulated sub-samples are very close to zero, i.e. the heavy tails disappeared. This is a very significant difference as opposed to the results in Table 7. Another interesting finding is that the skeweness results in Table 12 show that there is no difference in the skeweness of phase I and phase II subsamples, and the difference in kurtosis is also smaller than what was found in the previous section. This confirms that the larger (both in an absolute and a relative sense) skeweness and kurtosis figures for the phase I subsample were the result of the possibility of indefinite-length suspension in the merger regime.

Assuming that the simulated samples realistically model a situation where the law does not allow the indefinite-length suspension of investigations, one can compare Table 12 and Table 7 to see the difference between the distribution of the timing of procedural events in two different merger control regimes (one that allows for indefinite suspension, and one that does not). After eliminating the possibility of indefinite suspension, the distribution of both the timing of remedy offers and the timing of final decisions become bounded, and the

skeweness and kurtosis differences between the two procedural phases also disappear. From this we can formally conclude that the elimination of the possibility of an indefinite suspension of procedures reduces the uncertainty regarding the length of procedures.

The above exercise (not allowing the indefinite suspension of investigations) showed that delay cannot be caused by merging parties in jurisdictions that does not allow the indefinite-length suspension of investigations. However if suspension is allowed in phase I to help parties improve their chances in avoiding second phase investigations, then the elimination of indefinite-length suspension would also eliminate the beneficial effect of phase I suspensions.

4   Conclusion

The current merger review system provided by the ECMR gives rise to a source of procedural delay that has not been analysed empirically. Although it is the regulator, or the lengthy judicial review that is most commonly criticised for delayed mergers, merging parties can also delay the procedure, given that the investigation can be suspended where the Commission has to request information owing to circumstances for which one of the undertakings involved in the concentration is responsible. The paper showed that this leads to a highly varying length of procedural delays.

The occurrence of this sort of delay is more frequent than what would be expected from the wording of the ECMR, which reserves suspension to exceptional cases. The variance of the duration of this delay is rather large, which is due to the fact that the ECMR does not set an upper limit for the length of the suspension (the investigation is suspended until the requested information is provided). As suspension is a consequence of the merging parties' behaviour, the dispersion in the length of delay implies a large variance in the delay-averseness of the merging parties.

Two cases of delay should be distinguished. (1) When it is caused 'intentionally in order to avoid lengthy phase II investigations', and (2) when less delay-averse companies negligently cause delays (which then jeopardises the success of their merger). Evidence supporting the first case

was found, which showed that longer suspensions characterise phase I procedures. The reason for this can be that merging parties – in an attempt to win more time before the end of phase I procedures and to avoid the start of a phase II investigation – delay the procedure until they find a commitment proposal which is likely to be accepted by the Commission in a phase I procedure. In this case the possibility of indefinite-length suspension may also represent the Commission's attempt to provide more time for merging parties to avoid second phase investigations without extending the regulatory time limits.

With regards the second possible reason of suspension (i.e. where it is a result of parties' negligence) the policymakers should ask the question: what is the social value of a merger, where a delay is treated so light-handedly by the merging parties? The negligent behaviour of companies can also be indicative to the Commission in its investigation. The lack of 'delay-aversion' could be seen as a sign of less profitable mergers. Companies are very likely aware of the fact that a delay in the completion of the merger creates costs[81] and it also risks the completion of the merger. Delay could be reduced by providing the necessary information to the Commission. Yet, in many instances this does not happen. Monitoring this behaviour therefore could provide a tool for filtering out less profitable (less efficient) mergers. Typically there are two main areas where the merger can increase profit: (1) by increasing market power, and (2) by an increased level of efficiency.[82] If the first reason can be filtered out – and a competition authority is expected to identify those cases – then the attitude towards suspension and delay could be used as a sign of how efficient the parties really think the merger will be.

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[81]   Ekelund and Thornton (1999) mention direct costs (expenditures related to the regulatory process and litigation) and indirect costs (postponement or loss of efficiency-improvements)

[82]   There are other reasons why companies decide to merge, for example (1) pre-emptive considerations: driven by their fear that competitors gain competitive advantage by acquiring other firms. (2) Increased cash flow: An acquired business can increase the cash flow of the acquiring company, which can consequently increase investments, development or growth (these naturally overlap with the goal of efficiency gains). (3) Acquiring know-how: The only way of acquiring patented technologies is to acquire the patent holder itself. (4) Other financial issues: These include tax credits for example, which might be easier to get as a larger company

Appendix I

An international comparison of the suspension of merger procedures for requesting information

Country	Reference	Comment
With indefinite length of suspension:		
Belgium	Article 44 (2) of the Belgian Competition Act	
Czech Republic	Article 16 (6) of the Czech Competition Act	
Estonia	Article 27 (10)	
European Commission	Article 10 (4) ECMR	
France	LME Act	
Germany	Article 40 (2) 1) of the Act against Restraints of Competition	Indefinite but needs the parties' agreement
Italy	Article 16(7)	Only for phase I
Netherlands	Article 38 (2)	
Norway	Section 20	
Poland	Article 96 (3)	
Portugal	Article 34 (3) and Article 36 (2)	
Romania	Article 51 (4)	
Slovakia	Article 11	
Slovenia	Article 47 (2)	
United Kingdom	Section 25 (2)-(3) of the Enterprise Act	
With definite suspension		
Denmark	Article 12d (3) of the Danish Competition Act	2 weeks*
Hungary	Article 63 (6) of the Hungarian Competition Act	60 days in phase II and by 20 days in phase I
Iceland	Article 17d	20 days to obtain further information
Ireland	Article 20 (2) and Article 21 (4)	Only in phase I, which is extended from 1 month to 45 days
Italy	Article 16 (8)	Definite for phase II (30 days) but indefinite for phase I
Lithuania	Article 13 (4)	1 month

* Only in the preparatory documents

Appendix II

List of European Union Member State competition legislation used in this paper

Country	Competition Law
Belgium	Belgian Act on the Protection of Economic Competition (APEC) consolidated on the 15th of September 2006 (Belgian Official Gazette 29/9/2006) http://mineco.fgov.be/organization_market/competition/pdf/law_competition_001_en.pdf
Czech Republic	Act No. 143/2001 Coll. of 4 April 2001 on the Protection of Competition and on Amendment to Certain Acts (Act on the Protection of Competition), as amended http://www.compet.cz/fileadmin/user_upload/Legislativa/legislativa_EN/Act_143_2004.doc
Denmark	Danish Competition Act, Act No. 384 of 10 June 1997 as amended http://www.ks.dk/en/competition/legislation/love/the-competition-act-consolidation-act-consolidation-act-no-1027-of-21-august-2007/
Estonia	Estonian Competition Act, Passed 5 June 2001 (RT1 I 2001, 56, 332), entered into force 1 October 2001, as amended http://www.konkurentsiamet.ee/public/competition_act_july_2006.pdf
France	LOI no 2008-776 du 4 août 2008 de modernisation de l'économie http://www.autoritedelaconcurrence.fr/doc/jo_lme.pdf
Germany	Act against Restraints on Competition (Gesetz gegen Wettbewerbsbeschränkungen, GWB). Version promulgated on 26 August 1998 (Federal Gazette I p. 2546) http://www.iuscomp.org/gla/statutes/GWB.htm
Hungary	Act LVII OF 1996 On The Prohibition Of Unfair And Restrictive Market Practices, as amended http://www.gvh.hu/domain2/files/modules/module25/7874E8E091B53E38.pdf
Iceland	Competition Law No 44/2005, as amended http://www.samkeppni.is/samkeppni/upload/files/log_og_reglur/english/act_amending_the_copmpetition_act_no._44_20005.pdf
Ireland	Act Number 14 of 2002, Competition Act, as amended http://www.tca.ie/EnforcingCompetitionLaw/CompetitionLaw/CompetitionLaw.aspx
Italy	Law no. 287 of October 10th, 1990, Competition And Fair Trading Act http://www.agcm.it/eng/index.htm
Lithuania	Law on Competition of the Republic of Lithuania (Official Gazette, 1999, No. 30-856; 2004, No. 63-2244) as amended http://www.konkuren.lt/en/index.php?show=merger&merger_doc=comp
Netherlands	Act of 22 May 1997, Providing New Rules for Economic Competition (Competition Act) http://www.nmanet.nl/Images/Mededingingswet%20-%20geredigeerd_tcm16-125901.pdf

Norway	Act of 5 March 2004 No. 12 on competition between undertakings and control of concentrations (including amendments in Act of 20 June 2008 No. 43) Downloaded from: http://www.konkurransetilsynet.no/en/legislation/The-Competition-Act-of-2004/
Poland	Act of 16 February 2007 on competition and consumer protection http://www.uokik.gov.pl/en/legal_regulations/national_legal_acts/general_legal_regulations/
Portugal	Law No. 18/2003 of 11 June Approving The Legal Framework For Competition http://www.concorrencia.pt/Download/descre18ix.pdf
Romania	Consolidated Text From The Official Gazette No. 875 of December 10, 2003, and Competition Law 21/19961 http://www.competition.ro/documente/en/l21_1996_mod.pdf
Slovakia	136/2001 Coll. Act of 27 February 2001 on Protection of Competition and on Amendments and Supplements to Act of the Slovak National Council No. 347/1990 Coll. on Organization of Ministries and Other Central Bodies of State Administration of the Slovak Republic as amended http://www.antimon.gov.sk/files/32/2008/Zakon_c._136-2001-_rekon._znenie_-_po_anglicky%5B1%5D.rtf
Slovenia	Slovenian Act on the Prevention of the Restriction of Competition (hereinafter referred to as the Competition Act) adopted on 1 April 2008 (published in the Official Gazette of the Republic of Slovenia, No. 36/2008), entered into force on 26 April 2008 http://www.uvk.gov.si/fileadmin/uvk.gov.si/pageuploads/ZPOmK__neuradno_prescisceno_besedilo__-_ang.pdf
United Kingdom	UK Enterprise Act 2002, entered into force on 20 June 2003 http://www.opsi.gov.uk/Acts/acts2002/ukpga_20020040_en_1

Appendix III

The histograms and kernel estimations used in Section 4

The techniques used in this paper are based on Silverman (1986), who provides a comprehensive explanation of histograms and kernel estimations. When creating histograms a key question is a choice of bin-width, or bin intensity. There are various ways to find the ideal bin-width for a given dataset. Izenman (1991) suggests that the most robust one of these is Freedman-Diaconis' choice, presented in Freedman and Diaconis (1981). This rule, which is based on the interquartile range, says that the ideal bin-width should be $W = 2*(IQR)*n^{-1/3}$, where W is the bin-width, IQR is the interquartile range (the 75th percentile minus the 25th percentile) of the analysed variable, and n is the sample size. The calculated bin-widths are given in Table 13.

Another tool to help providing a visual clue about the shape of the density curve, is kernel estimation. The kernel curve is given by: $\frac{1}{nh}\sum_{i=1}^{n} K\left\{\frac{1}{h}(t - X_i)\right\}$, where n is the number of observations, h is the Kernel window-width, and K is the kernel function, which is assumed in this case to be standard normal.

Table 13: Calculated window widths for the histograms and for the Kernel density estimator

	n	mean	sd	IQR	W	h
NREM p1	204	30.11336	21.72841	14.98	5.0646763	3.46302363
NLENGTH p2	95	123.5334	42.49884	42.972	18.835379	11.6085655
NLENGTH p1	136	43.04319	18.08927	5.81000	2.259574	1.56085172
NLENGTH p2	62	158.6623	36.84085	27.11	13.699213	7.97606879
NREM	302	59.50045	52.67973	77.012	22.957226	15.1315933
NLENGTH	198	79.24717	59.4495	98.0485	33.64464	18.580512

Based on Section 3.3.2 in Silverman (1986), the Kernel window-width is calculated as: $h = 0.09*\min(sd, IQR/1.34)*n^{-1/5}$, where h is the Kernel window-width, sd is the standard deviation of the sample, IQR is the interquartile range, and n is the sample size. The table above contains the

calculated bin- and Kernel window-widths that were used in the non-parametric estimations in Section 4.1.

Finally, using the same technique, the histograms and kernel estimates are presented for cases where suspension was excluded from the sample. The table below contains the calculated parameters of the histograms and the kernel density estimates for these cases.

Table 14: Calculated window widths for the histograms and for the Kernel density estimator for cases without suspension

	n	mean	*sd*	*IQR*	W	*h*
NREMs p1	207	24.33062	9.864393	14	4.7333423	3.05575694
NREMs p2	95	107.8553	33.37555	50.1535	21.983156	12.0816491
NLENGTHs p1	136	36.95659	3.74365	4	1.5556445	1.26133361
NLENGTHs p2	62	145.9289	19.39199	29.3045	14.808137	7.64515949

5   References

Anderson, T. W. and D. A. Darling (1952). "Asymptotic Theory of Certain "Goodness of Fit" Criteria Based on Stochastic Processes." Annals of Mathematical Statistics **23**(2): 193-212

DeBrota, D. J., S. D. Roberts, J. J. Swain, R. S. Dittus, J. R. Wilson and V. Sekhar (1988). Input modeling with the Johnson system of distributions. Proceedings of the 20th conference on Winter simulation. San Diego, California, United States, ACM

Ekelund, R. B. J., G. S. Ford and M. Thornton (2001). "The measurement of merger delay in regulated and restructuring industries." Applied Economics Letters **8**: 535-537

Ekelund, R. B. J. and M. Thornton (1999). "The Cost of Merger Delay in Restructuring Industries." Heartland Policy Study **No. 90**

Freedman, D. and P. Diaconis (1981). "On the histogram as a density estimator: L2 theory." Zeitschrift für Wahrscheinlichkeitstheorie und verwandte Gebiete **57**(4): 453-476

George, F. (2007). "Johnson's System of Distributions and Microarray Data Analysis."

Heim, M. (2003). "Problems and process: European merger control and how to use it." Journal of Public Affairs **4**(1): 73-85

Izenman, A. J. (1991). "Recent Developments in Nonparametric Density EstimationRecent Developments in Nonparametric Density Estimation." Journal of the American Statistical Association **86**(413): 205-224

Johnson, N. L. (1949). "Systems of frequency curves generated by methods of translation." Biometrika **36**: 149-176

Johnson, N. L., E. Nixon and D. E. Amos (1963). "Tables of percentage points of Pearson curves for given $\sqrt{\beta_1}$, β_2, expressed in standard measure." Biometrika **50**: 459

Leitão, M., G. Teles and S. d. S. Associados (2009). "The International Comparative Legal Guide to: Merger Control 2009 - Portugal." (A Global Legal Group publication. Available at: http://www.iclg.co.uk/khadmin/Publications/pdf/2411.pdf)

Ramberg, J. S., E. J. Dudewicz, P. R. Tadikamalla and E. F. Mykytka (1979). "A Probability Distribution and Its Uses in Fitting Data." Technnometrics **21**: 201-214.

Silverman, B. W. (1986). Density Estimation for Statistics and Data Analysis (Monographs on Statistics and Applied Probability) Chapman & Hall

Slifker, J. S. and S. S. Shapiro (1980). "The Johnson System: Selection and Parameter Estimation." Technnometrics **22**(2): 239-246

Tabachnick, B. G. and L. S. Fidell (2006). Using Multivariate Statistics, Pearson Education

Weisstein, E. W. (_-a). "Chi-Squared Test." From MathWorld--A Wolfram Web Resource. http://mathworld.wolfram.com/Chi-SquaredTest.html

Weisstein, E. W. (_-b). "Kolmogorov-Smirnov Test." From MathWorld--A Wolfram Web Resource. http://mathworld.wolfram.com/Kolmogorov-SmirnovTest.html