On 2 September 2003, the European Commission approved, subject to conditions, the acquisition by General Electric Medical Systems (‘GE’) of the Finnish firm Instrumentarium. The Commission was concerned that GE and Instrumentarium would hold too high a share of the patient monitoring market, which would have been detrimental to hospitals.

The Commission’s concerns were removed following GE’s offer to sell off Spacelabs, a one-year-old acquisition by Instrumentarium, together with a series of supply agreements, as well as the commitment to ensure interoperability of its anaesthesia equipment, patient monitors and clinical information systems with third parties’ devices.

This case illustrates how statistical and econometric evidence can complement the qualitative approach in assessing the impact of a proposed operation when the combined market share is high but the overlap limited and the markets at stake encompass differentiated products acquired through tenders.

In 2002 GE announced its intention to acquire, by way of a voluntary public tender, the Finnish medical firm Instrumentarium, a leading hospital equipment manufacturer. The deal was notified to the Commission for regulatory clearance in Europe on 28 February 2003. The transaction was also notified in the US and the Commission cooperated closely with the US Department of Justice in the review thereof.

General Electric is active globally in several business areas and, through GE Medical Systems, markets a wide range of medical devices including diagnostic imaging equipment (e.g. x-ray machines), electromedical systems (e.g. patient monitors) and IT solutions for hospitals. Instrumentarium is active in the areas of anaesthesia, critical care, and medical imaging technology through the brands Datex-Ohmeda, Ziehm and Spacelabs.

I. Presentation of the relevant markets

The markets concerned have undergone a significant consolidation in recent years, as the main players became bigger through the acquisition of smaller manufacturers. The merger further brings together two of the four leading players in Europe. The investigation confirmed that the following relevant product markets were horizontally affected by the operation:

(i) Patient monitors which are machines that take measurements of physiological parameters as a representation of a patient’s well-being whilst a patient is either undergoing treatment or recovering. Three product markets were distinguished depending on the type of care area in which these products are used: perioperative, critical care or general ward monitors.

(ii) C-arms which are mobile fluoroscopic x-ray machines used in hospitals and clinics to provide continuous viewing in real-time during diagnostic, surgical and interventional procedures.

(iii) Mammography which is a specific type of X-ray imaging device exclusively used for medical examination of the female breast: the X-rays produce an image of internal breast tissue with the purpose of detecting malignant growths. The image of the breast made by X-ray can be analogically recorded on a film, using an X-ray tape, or digitally recorded and displayed through a digital receptor (plate) and using a computer. The investigation confirmed that analogue mammography and digital mammography had to be considered as distinct product markets.

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Two related product markets have also been examined: (i) anaesthesia equipment, used to deliver anaesthetic gases to patients during operations, and Clinical Information Systems (CIS), used for automating patient records, patient medical readings and other clinical information. The former market had already been considered by the Commission in case No COMP/M.2861-Siemens/Drägerwerk/JV cleared on 30 April 2003.

GE submitted that the affected markets are increasingly EEA-wide. However, the market investigation disclosed evidence supporting the existence of national markets, e.g. various players’ presence differs substantially across Member States; price lists and also actual transaction prices differ from one country to the other; since after-sales, training and maintenance are key factors in taking the final purchasing decision, national presence, either directly or through distributors, is critical.

II. The market for perioperative monitors

Perioperative patient monitors are used in the perioperative area, i.e primarily in the operating rooms as well as in the induction and recovery rooms, in order for anaesthetists to monitor the patient's vital signs.

The Commission reconstructed each supplier’s share of this market in each Member State over the past years. According to the investigation, the merged entity would hold strong positions in five countries, namely France (50%-60%), Spain (80%-90%), Germany (40%-50%), the UK (80%-90%) and Sweden (80%-90%). Besides, due to the presence of only four major players (Instrumentarium, Siemens, Philips and GE), the proposed operation had the effect of reducing the number thereof from four to three. Nevertheless, the question arose whether the merger was bringing a significant change to the market. GE's position on the perioperative monitoring market is indeed not as strong as that of Instrumentarium's, and the overlap is therefore limited, ranging from 5% to 15% depending on the country.

a) Characteristics of this market

Competition in the market for perioperative monitors is driven primarily by product differentiation, whereas capacity constraints appear to play no significant role in manufacturers' decisions on price and quantity.

Because the market for perioperative monitors is not significantly different from a standard differentiated product market, the Commission took the view that, even though products are procured mostly in a bidding process, this does not invalidate market shares as a first indication for market power. Individual customer preferences are reflected in the technical specifications of the tender limiting the number of eligible bidders for a specific project to those suppliers meeting the given set of requirements. According to the Commission's market investigation, winning bids are not necessarily allocated to the lowest-price bidder, but to the supplier that best meets the individual hospital's requirements on both technical and economic grounds. Anaesthetists effectively play a key role in selecting equipment. Also, there are no significant differences in the size of the markets over the years and the number of tenders per year is fairly high, while the value of each contract won is on average relatively low.

In order to assess whether the parties' market shares overestimated or underestimated their market power, and with a view to ascertain the likely change brought about by the merger, the Commission further examined the closeness of substitution between the merging parties' products on the basis of both qualitative and quantitative criteria.

On the qualitative side, the market investigation revealed that, although GE's now discontinued alliance with Draeger had a positive influence on its sales of perioperative monitors before 2002, GE was and would still be, absent the merger, a strong competitive constraint on Instrumentarium. Indeed, GE's monitors are considered by many customers and independent surveys as close substitutes to Instrumentarium's, irrespective of the previous alliance with Draeger. GE was also able to retain a sizeable market share in 2002 despite the fact that it is in a transition period during which it has to re-establish its own distribution network in the perioperative monitoring market.

b) Quantitative approach

Given the specific features of this case (e.g. purchases through tenders and limited overlaps), the Commission sought to supplement its qualitative assessment with statistical and econometric analyses of past tenders. This exercise aimed mainly to gather additional evidence to estimate the competitive constraints that the various players, and in particular the merging parties, exercise on one another.

To this end, each major supplier of perioperative monitors (Instrumentarium, GE, Siemens and
Philips) was requested to provide electronic files containing precise information about all the tenders in which it took part in each of the fifteen member states over the past five years. For each tender, it had to specify the hospital, the date and the equipment at stake as well as the price offered (and the discount off the price list when possible), which companies were present, which one won the tender and which one was the second best (the ‘runner-up’).

In addition, the parties were requested to provide the invoices of all the bids they won, the related bidding documents and their price lists in order for the Commission to analyse in greater detail how the tenders unroll and to compute the discounts offered by each of the merging parties when they were missing. Hospitals were also solicited in case of missing information (e.g. identities of the competitors present in a given tender). This allowed the Commission to build up a database containing information relating to several thousands of tenders across the fifteen Member States.

Based on this database the Commission conducted two types of empirical analysis: first it computed summary statistics of the various tenders (statistical analysis), and secondly it sought to measure to what extent the presence of one of the merging parties in a given tender had an impact on the price offered by the other (econometric analysis).

**Statistical analysis**

The statistical analysis of the various tenders brought to the fore useful information on how the various players compete and how they perceive their positioning in the market place. For example, the Commission computed how often the merging parties actually encounter each other in the tenders. Because the players cannot take part in all tenders but have to select those whose technical specifications make them believe that they have chances to win, the frequency of encounter is a valuable indication as to how close the merging parties are to each other. As a competitive effect may occur only when the merging parties are both present, the frequency of encounters also provides information on the extent of the likely impact of the merger.

The Commission also looked at the number and the identities of the other bidders participating in the tenders where the parties were both present. Lastly, it checked to what extent the presence of one of the merging parties affects the other's chances of winning bids.

This analysis was carried out for each Member State and provided additional evidence that the merging parties were close competitors in five countries: Germany, France, Spain, the UK and Sweden.

In Germany, for example, the combined market share of the merging parties pre-merger was in the range of 40%-50% and, despite a limited overlap, Instrumentarium encountered GE in 70%-80% of the tenders while its encounters with Siemens and Philips were scarce. Besides, when the two merging parties met, they faced no other bidder in 40%-50% of the cases and only one in a further 30%-40% of the cases. Furthermore, in a vast majority of the latter tenders, the extra bidder belonged to the group of fringe players. This gave a further indication that GE, despite its lower market share, had presented a significant competitive constraint on Instrumentarium. In these cases, the effect of the proposed transaction would have been similar to a reduction of the number of competitors from two to one in a majority of the tenders.

Similarly the Commission computed Instrumentarium’s likelihood of winning a bid depending on whether GE was present. It turned out that, in Spain, for example, Instrumentarium was more likely by 15 percentage points to win bids when GE was not present compared with situations where GE is present. Again this was additional evidence of the significant constraint exercised by GE on Instrumentarium.

Based on Instrumentarium’s and GE’s bidding data, GE also carried out a statistical analysis of the tenders in which both GE and Instrumentarium took part. The study focussed on the identities of the runners-up in the bids won by Instrumentarium. The runner-up is the second-best choice of the customer, and thus it should provide the main competitive constraint to the winner of the tender under scrutiny.

Thereby the study showed that GE was not the main rival of Instrumentarium in several countries (and/or in other product markets). It also revealed that GE was indeed by far the most frequent runner-up to Instrumentarium in some Member States, such as Germany, France or Spain. In France, for instance, while GE’s market share is below 10% and Instrumentarium’s in the range of 40%-50%, GE was the runner-up to Instrumentarium in more than half of the tenders, and in a much higher proportion than Philips and Siemens. This again points toward GE being more of a constraint to Instrumentarium than its limited market share may have initially suggested.
Econometric analysis

The Commission conducted an econometric analysis to determine the likely price impact of the merger. To this end, the Commission sought to estimate to what extent the prices offered by one of the merging parties depended on the presence of the other bidders and particularly the other party to the concentration.

Because of data limitation, it was not possible to directly measure that price effect. Most tenders concerned various pieces of equipment and without additional data on product characteristics it was not possible to control for the price difference that is solely the result of difference in product characteristics. As an alternative the Commission used discount off list price. Discounts are pervasive in this market, and allow comparison across bids. However, even the construction of a discount variable proved difficult due to the lack of reliable information. The Commission managed to build a meaningful data set for discounts offered by GE and Draeger in tenders they won in France.

Multivariable regression analysis helped identify the effect of Instrumentarium on GE’s discount while controlling for other factors that also impact that discount, such as the value of the bid or the presence of other players. The Commission estimated a simple, yet robust econometric model. The dependent variable of this reduced form model was the discount offered for GE monitors. The Commission estimated one regression for the discount offered by GE and a separate regression for the discount offered by Draeger when selling GE monitors. In both cases, the regression results showed that the presence of Instrumentarium had an impact on the discount offered on GE monitors. The discount was 2% and 7% higher when Instrumentarium also participated in the bidding. These results were statistically significant, and provided additional evidence that Instrumentarium was exerting a significant competitive constraint on GE. Philips, a competitor to the merging parties, also submitted its own econometric study using a similar reduced form model that was based on Philips's own bidding data for several Member States. The regression results indicated that when both GE and Instrumentarium participated in a tender, Philips offered a higher discount as compared with tenders where only one of the merging parties was present. Although these results were statistically significant, they applied to tenders won or lost by Philips and thus did not fully reflect the actual price paid by the hospital. When focusing only on tenders won by Philips, however, the results were not as robust. The Commission concluded that the simultaneous presence of the merging parties had at least an impact on the competitive behaviour of Philips, if not on the actual prices charged to customers.

c) Access to File

Given the complexity and the extent of the empirical analysis, the Commission gave the parties access to the database and the computer programs used to generate its empirical results. This allowed GE to check the validity of the empirical methods used by the Commission and the robustness of the results.

Because the data were confidential it was simply not possible to forward directly the data to the parties. The Commission invited the parties to come and work on its premises. The economists working on behalf of the parties signed confidentiality agreements and were subsequently given access to the database as well as the computer programs used by the Commission. They were allowed to work in a data room, furnished with computers that did not allow them to contact the outside world. The output generated by the parties' economists was thoroughly checked so that no confidential information would leave the Commission premises.

d) Conclusion on horizontal effects

Based on the qualitative and quantitative evidence collected during the investigation, the Commission came to the conclusion that in the above mentioned Member States the merger would not only lead to the creation of a new entity holding high market shares but also would remove the significant competitive constraint that the two merging firms exerted on each other prior to the operation. Because fringe players play a minor role on the market and customers do not appear to be in a position to exercise a significant countervailing buyer power, in those five countries the merged entity would thus have had the ability to act to an appreciable extent, independently from competitors and ultimately consumers, and therefore to significantly raise prices charged to customers.

III. Other affected markets

a) Other horizontal effects

The Commission also analysed the impact of the merger in the X-ray machine markets for mobile C-arms and mammography devices, on the basis
of both qualitative and the quantitative criteria. However, the in-depth investigation did not reveal any competition concerns, in particular in view of the significant position of competitors and other specific features of these markets.

b) Vertical effects

Although the transaction does not present any overlap with regard to anaesthesia-delivery systems and ventilators, since only Instrumentarium (not GE) manufactures these types of equipment, the investigation also raised concerns that GE/Instrumentarium would give preference to its critical care and perioperative patient monitors, as well as to its Clinical Information System (CIS: IT solutions used for automating patient records and medical readings), by withholding the interface information necessary for competitors to be able to interface with the anaesthesia delivery systems and other relevant equipment sold by the merged company. This would not be in the interest of hospitals as it would reduce their choice of suppliers and lead to potentially higher prices.

IV. Proposed remedies

In response to the competition concerns raised by the Commission, GE undertook to divest Spacelabs — a firm recently acquired by Instrumentarium — including the company's worldwide patient monitoring business, in conjunction with a series of supply agreements including Instrumentarium's renowned gas module. This package of remedies removes the horizontal overlap between the activities of GE and Instrumentarium in the perioperative monitoring market and is aimed at ensuring the emergence of an effective competitor to the merged entity.

Furthermore, GE/Instrumentarium will provide the necessary electrical and mechanical interface for third parties’ patient monitors and CIS to be able to interconnect with its own equipment used in operating theatres and intensive care units, including anaesthesia delivery devices and ventilators.

As a result, the Commission cleared the proposed operation subject to this set of conditions and obligations.

It is noteworthy that the Commission also recently reviewed a separate deal in the same sector concerning the setting-up of a joint venture between Siemens and Draeger for the manufacture and sale of medical ventilators, anaesthesia-delivery systems and patient monitors. This operation was cleared by the Commission on 30 April 2003 subject to similar conditions: the divestiture of Siemens's world-wide anaesthesia delivery and ventilation business, and the commitment to provide the necessary interface information in order to ensure interoperability with competitors' devices.

V. Conclusion

To the extent it was possible to perform the heavy and time-consuming task of gathering all the relevant data, this case shows that a quantitative approach, be it statistical and/or econometric, can constitute a useful complement to the more ‘traditional’ qualitative approach when assessing the likely effects of a merger on competition.

Such quantitative analyses, which may have to be very extensive when the relevant geographic markets are national, may or may not, provide conclusive information. It is also crucial to simultaneously resort to other types of analyses, to check that the empirical model specifications is consistent with the facts of a case and, above all, to consider that these quantitative studies, when relevant, may partly shed light on the competitive assessment of a proposed transaction.