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Advance freight rate announcements (GRI) in liner shipping: European and Russian regulatory settlements compared

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Abstract Advance price announcements in the form of general rate increase (GRIs) by liner shipping companies have recently become the subject of investigations by competition authorities in different jurisdictions, including the European Union and Russia. The main goal of this paper is to answer the question whether GRIs predict price changes of competitors. Comparison of GRIs with actual price changes in particular routes, defined as antitrust markets in competition investigations in Russia, shows a limited anti-competitive effect of advance price announcements, albeit under specific market conditions. Regression analysis, undertaken in the context of the Russian investigation, rejects the hypothesis that the GRI of a particular company would be followed by price increases of its competitors. Moreover, the frequent changes in the market shares of liner companies support the hypothesis of competition vis à vis collusion. Remedies applied by competition authorities address content and timing of GRIs. The theory of tacit collusion suggests that remedies, which further specify the content of price announcements, may paradoxically enhance non-cooperative pricing, in contrast to remedies that restrict audience of GRIs by customers.

Keywords Container shipping · GRI (general rate increase) · Advance price announcement · Tacit collusion · Antitrust enforcement · Remedies

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Introduction

In 2013, the European Commission investigated the practice of pre-announcement of price increases by international liner shipping companies, including Møller–Maersk, Evergreen Marine, Hyundai Merchant Marine, CMA CGM, Orient Overseas Container Line, and nine more. One year later, the Russian competition authority, the Federal Antitrust Service (FAS RF), opened a similar investigation. In the center of this investigation were the pre-announcements of pricing on shipping services in the form of General Rate Increase (GRI). Both competition authorities considered GRI as a tool of communication between competitors that supports tacit collusion which is illegal, under the name of concerted practice, in Russia as well as in the European Union.

The European investigation resulted in commitment that included remedies in the way of communicating prices to customers [Commission Decision on Case AT.39850]. In Russia, FAS made an infringement decision [KA/75528/15 on case № 1-11-313/00-22-13]. Companies submitted claims to annul this decision [Case A40-54700/2016 in the system of commercial court in Russia]. The first instance court upheld the decision. The companies submitted claim to annul the decision of first instance to the appellate commercial court (second instance). Before the appeals court pronounced its ruling, the companies had reached settlement with FAS in early 2017. The settlement included remedies on information in future price announcements, as well as settlement with the European Commission.

Neither competition authority obliged the companies to stop announcing future prices. But the rules of publishing information on prices are different. The European Commission obliges companies to stop informing customers on price changes expressed solely as percentage increases. Information on price changes should be specified across individual components of charge, including the base rate, bunker charges, terminal handling charges, and peak season charges. Announcements will not be made more than 31 days before the day on which the new prices are implemented. It is interesting that this remedy seems to contradict the guidelines issued, for instance, by the UK competition authority (Competition and Market Authority), when suspecting tacit collusion. Following an investigation on restrictions to competition in the cement market in 2016, the UK CMA had issued remedies with two measures on price communication. One was a time lag on disclosure and publication of cement production data, and the other is sales volume data.

In contrast, settlement with FAS addresses the channel of information provision and the source of forecasts of future price changes. Thus, companies should issue price announcements to their clients, only through secure information channels, to avoid the information on future prices becoming public. In addition, Møller–Maersk commits to provide forecasts of future prices to competitors. It is easy to see that the second remedy also contradicts the intention of the UK CMA *remedies guidelines* on market information.

Suspicion of both competition authorities has relied on the economic theory of collusion. Starting from the pioneering work of Stigler (1964), economists have considered *information exchange* as the most important facilitating practice for

collusion, explicit or tacit. Advance price announcements may support incentives to collude on future prices. They also increase profits -under collusion- by providing private information on costs and demand (Boshoff et al. 2016). At the same time, the impact of advance price announcement on the *stability* of collusion in a certain market depends crucially on its structure. Under market characteristics that make collusion unsustainable, solely advance price announcements cannot support collusion. In this context, the issue of sufficient proof on concerted practice, or tacit collusion, is unresolved in competition legislation. This fact alone makes the analysis of particular investigations on concerted practices important, in the attempt to arrive at a general approach to this policy issue.

Recent evidence on the price effects of GRIs is limited. Several studies (see for instance Munim and Schramm, 2017) found that upward shifts in the trend of freight rates coincide with GRI of carriers. However, evidence that observed price increases are preceded by GRIs is insufficient to support the hypothesis of tacit collusion. It is instead necessary to analyze whether, on average, GRIs are followed by upward price movements. Chen et al. (2017) reported that the success of GRI, defined as the ratio of real price changes to announced price changes, was only 28.6%. Moreover, market demand and supply factors can explain price movements much better than price announcements (GRIs). However, such evidence is not sufficient to reject the hypothesis of coordination (concerted practices). The level of coordinated prices also depends on demand, costs, and excess capacity (Chen et al. 2017). At the same time, the limited effectiveness of GRI may show the inability of colluding parties to sustain agreed price levels. Moreover, the necessity to reconcile price levels again and again undermines the stability of an alleged cartel (McCutcheon 1997).

In this article, using the evidence presented under judicial review of infringement decisions in Russia, we test the hypothesis of coordination using an alternative approach. We try to confirm whether there is a dependence of the prices of a particular container shipping company on the price change announcements of another one. The main goal of this paper is to answer the question whether GRIs predict price changes of competitors. This could be considered as an argument in favor of conclusion on concerted practices. Apparently, if the GRI of one company does not influence the price changes of another, there is little support to the hypothesis of coordinated pricing, i.e., tacit collusion.

The impact that advanced price announcements may have on actual future prices depends on market structure that could facilitate collusion, or make collusion unprofitable instead. Information on future price increases may undermine collusion if the seller addresses price information to customers and the latter can easily switch to another seller. Data on changes in market shares of liner companies, cited in the Russian competition investigation, show that this is the case in particular routes, defined as markets. Regression analysis, undertaken in the context of the Russian investigation, rejected the hypothesis that the GRI of a particular company would be followed up by increases in the prices of its competitors.

In addition to market structure, the *contents* of price announcements, with respect to the structure of freight rates, also point to the absence of convincing evidence of coordinated effects of GRI. In this context, at least part of the remedies in

settlements with competition authorities seems to be ineffective in preventing future coordination and, moreover, they can help to sustain collusion.

The paper is organized as follows. First, we summarize the evidence on market structure and pricing in liner shipping, based on economic theory, and evidence on the stability of collusion. The next section is devoted to the impact of GRI announcements on container shipping base rates. Concluding remarks summarize the results of the analysis and discuss the potential impact of conditions of settlements on the ability to sustain tacit collusion.

Structure of the liner shipping market and content of GRI announcements

Market structure is important in order to correctly assess the influence of pricing on competition and freight rates (Motta 2004; Athey et al. 2004; Levenstein and Suslow 2006; Harrington and Skrzypacz 2011). Economic theory and antitrust rulings around the world demonstrate that, in different circumstances, similar pricing policies may either encourage or restrain competition (Bennett and Collins 2010). This is absolutely relevant to the practice of disseminating information on upcoming price increases. The influence of market structure on the impact (success) of GRIs is important: to regard such practice as illegal coordination, one should not just demonstrate that in certain circumstances price announcements could have led to restraint of competition, but one should instead prove that GRIs restrain competition in markets with a particular structure.

A guess on collusion in liner shipping, explicit or tacit, logically follows from the experience of *liner conferences* that historically have set coordinated prices under antitrust immunity (Clyde and Reitzes 1995). However, experiences from explicit collusion do not necessarily mean that companies are also able to sustain tacit collusion: on the contrary, explicit agreements on prices follow from the inability of coordinating parties to sustain tacit collusion (Frass and Greer 1977). Evidence on decision-making of strategic alliances in the sector does not support the guess they coordinate freight rates (Panayides and Wiedmer 2011). Therefore, the question is whether the market structure in container shipping supports collusion or not, especially tacit collusion. Let us try to summarize the arguments against tacit collusion, in a certain market, which parties discuss in investigations, and, in Russia, under judicial review.

(1) *Too large a number of sellers; non-homogeneity of sellers; and uneven distribution of market shares.* The higher the number of sellers, the more difficult it is to maintain tacit collusion. According to the findings of experimental studies, non-cooperative equilibrium consistently matches the results of collusion only in the case of two identical sellers; if the number of market players is higher, price behavior in equilibrium is closer to the parameters of a Cournot equilibrium (Huck et al. 2004).

All this lets us believe that concentration in liner shipping is not as high as to lead us to the conclusion that market structure encourages collusive behavior.

For instance, the decision of the Russian competition authority cites the following levels of HHI (Herfindahl–Hirschman Index) in two geographical markets (Southeast Asia–Russian Federation; and Russian Federation–Southeast Asia) and two product markets—shipping in universal and reefer containers:

- En route Southeast Asia to Russian Federation:

  universal containers: 1336 in 2012 and 1399 in 2013;
  reefer containers: 1484 and 1318, respectively.

- En route Russian Federation to Southeast Asia:

  universal containers: 1004 in 2012 and 1,026 in 2013;
  reefer containers: 3343 and 2805, respectively

Concentration does not seem particularly high; on the contrary, according to the guidelines of competition authorities, concentration is rather low (below the 1500 threshold for 3 out of the 4 markets considered). This is not only because of the relatively large number of market sellers, but also because of uneven distribution of shares. In the route from Southeast Asia to Russia in 2012, the share of the largest carrier was only 25%, and the share of the smallest company that allegedly participated in coordinated conduct was less than 7%.

There are counter-arguments, however, on the point of relatively small concentration. Competition law and economics have well-known examples of collusion (Christie and Schultz 1994), also including tacit collusion (Albæk et al. 1997), among large numbers of participants of very different sizes.

(2) *Low entry cost and switching cost.* If we define markets in liner shipping in the way that Russian FAS does in its decision, that is a shipping service in a particular type of container, in a particular direction, then this is a market with low entry cost and low switching cost of customers. Shipping companies can switch between different routes, entering the markets with higher demand and higher margins. In turn, customers can easily switch between companies. Easy entry and exit predict low incentives to collude (Ivaldi et al. 2003). Low switching cost of customers provides the same effects. Empirically, both characteristics of market structure should result in high volatility of market shares. This is exactly the case for ocean liner shipping. Fusillo (2013) uses different measures of market share stability and shows not only the instability of share distribution, but also the instability that increases with market concentration. Below we report some evidence of the instability of market shares in routes including Russian ports. In this context, even if ocean shipping were to be highly concentrated (which is not the case), it would still not be prone to abuse of market power, including market power due to concerted practices. The closest parallel is the airlines industry, a classic example of a so-called *contestable market* (Bailey and Panzar 1981) where low entry cost, together with timeless entry, effectively prevents anti-competitive behavior. In recent studies of ocean shipping, there are also examples of testing the traditional contestability hypotheses, with strong empirical support (Hirata 2017). It is not totally clear whether limited demand and excess capacities during the last 10 years can explain easy entry–exit and

easy switching. Earlier work (Fusillo 2004) has found evidence of faster capacity adjustment after the breakdown of the conference model as a legal cartel in Europe.

Pro-competitive anti-collusion effects of switching companies between routes, and customers between different companies, should be important for understanding the impact of advance price announcements in a specific context. Price announcements will have strong pro-competitive impact if they help customers to choose between different carriers, and at the same time being ineffective as an instrument of unilateral price increase, undermining the potential stability of collusion. Little and irregular price increase in respond to 1% GRI (found by Chen et al. 2017) might not support, but instead destroy, potential collusion.

(3) *Pricing (non-) transparency* Investigations and settlements of both competition authorities relied on the well-known point in game theory according to which the better sellers are informed about the prices of competitors, the higher the incentives to collude. However, the prices of ocean carriers are not transparent enough. Transparency of contract terms, as well as GRI announcements, is low for a number of reasons. The first reason is the complexity of the structure of the final, or effective, freight rate. Base rates, being the subject of GRIs, represent no more than 2/3 of the effective freight rate, which is the subject of the price competition. Normally, the effective freight rate consists of the base rate plus several surcharges and fees. Surcharges usually include payments for ancillary services, such as loading and unloading services, customs clearance, security, and environmental compliance services (for example, use of below-average sulfur content fuel). Local fees include payments for documentation and preliminary order processing. Moreover, final rate structures may differ significantly. For instance, in June 2011, a list of 107 possible fees and surcharges to the base rate was published on the website of the world's largest container shipping company Maersk Line (UNCTAD 2011, p. 78). An unnamed shipping company, mentioned by UNCTAD Review, had 541 surcharges and fees (UNCTAD 2011, p. 99). What is more, surcharges of different shipping companies may also differ significantly. For instance, in June 2011, the range of currency adjustment factors (CAF), applied by different transportation companies, amounted to six percentage points, from 10.3 to 16.7% of the freight rate (UNCTAD 2011, p. 78). Fusillo (2013) presents evidence that before breakdown of price agreements of liner conferences, carriers applied different rates, in spite of the fact they had earlier announced the same ones.

The complexity of the freight rate structure reduces significantly the ability of carriers to monitor prices charged by their competitors. Even if, hypothetically, this was possible, the amount of extra charges and fees would become the source of price competition. Since carriers apply GRIs on base rates, in contrast to an effective charge, the announcement does not make more transparent neither the price nor the price increase.

The list of factors that influence the sustainability of alleged tacit collusion is not exhaustive. Among others, an important feature of market structure during the last 10 years is the structural excess capacity of shipping companies. However, the

analysis of only two important features of market structure—low concentration (large number of carriers with unevenly distributed market shares) and high entry and exit indicators, together with intensive switching of customers—leads us to the view that tacit collusion is unlikely in this market. Price announcements in the form of GRI do not provide sufficient transparency of pricing.

Evidence on market shares volatility and impact of GRI on the pricing of competitors

In this section, we analyze two types of data, presented under investigation and judicial review of the decision of the Russian competition authority (FAS) against A.P. Møller–Maersk A/S (Denmark), Evergreen Marine Corp. Ltd (Taiwan), Hyundai Merchant Marine Co., LTD (South Korea), CMA CGM SA (France), and Orient Overseas Container Line Limited (Hong Kong): data on market shares, and data on GRI and price changes. Using the data on market shares, we calculate simple measures of market share changes $\Delta s_i = \frac{s_{i_t}}{s_{i_{t-1}}} - 1$ where s_{it} is the market share of the i th

company in year (t). The FAS decision presented data on market shares for the years 2012 and 2013, i.e., for the period of the alleged infringements. Our intention here is to check whether the effect of switching customers in the margin of particular markets (routes/type of container) has the same magnitude and sign as the results on instability of market shares, established for global ocean shipping without however distinguishing for 'type of container' (Fusillo, 2013).
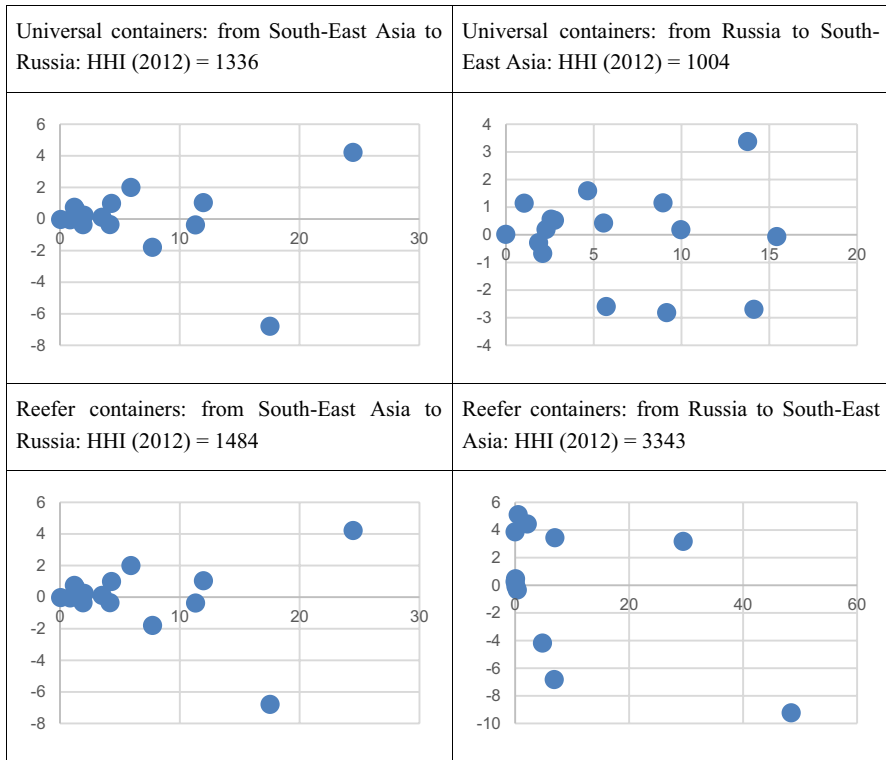
Data on price changes for three of the five largest market participants, found to infringe prohibition of concerted practices in Russia, are used to test the hypothesis on the impact of GRI announcements on price increases of competitors.[1] For the sake of data confidentiality, we name the companies *A, B, and C*. The three companies' global turnover ranges from 3 to 7%, with an aggregate market share ranging from 27 to 50% in the routes to and from Russia in 2013.

Stability of market shares

In Fig. 1 the horizontal axis presents the market share in 2012, and the vertical axis is the change in market share from 2012 to 2013 $\left(\Delta s_i\right)$. The data indicate the following important characteristics of the market. In a certain 'narrow' market definition such as this one (SE Asia–Russia), market shares of liner companies are subject to large changes. Moreover, the higher a market share was in 2012, the higher its probability to decline in 2013. And finally, changes in market shares are large both in the markets with small- and large-concentration indexes.

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[1] Only three companies provided the court with the data on GRIs and price dynamics with the required data frequency. The data are confidential.

Universal containers: from South-East Asia to Russia: HHI (2012) = 1336	Universal containers: from Russia to South-East Asia: HHI (2012) = 1004
Reefer containers: from South-East Asia to Russia: HHI (2012) = 1484	Reefer containers: from Russia to South-East Asia: HHI (2012) = 3343

Fig. 1 Instability of market shares in markets represented by particular routes (2012–2013)

The data do not support the claim that, in liner shipping, tacit collusion is easy to sustain. Unstable market shares mean that the switching costs of the customer are low and thus a (potentially) anti-competitive agreement would not be stable. According to the predictions of economic theory, this factor contradicts collusive behavior (Ivaldi et al. 2003). Under such circumstances price coordination by the largest market participants, assumed in the decision of FAS, should not be profitable at least for two reasons. First, the largest market participants cannot coordinate freight rates because of the fast expansion of carriers with negligible or low shares in the previous year. Figure 1 illustrates that 4 companies with low market share in 2012 (the dot is close to point 0 on the horizontal axis) demonstrate increases in shares by 3–5% points during 2012–-2013. Second, the high probability of such an expansion makes a strategy of keeping agreed rates unprofitable.

Impact of GRI announcements on liner shipping base rates

The concept of tacit collusion, legally defined by FAS as 'concerted practice,' implies that advance price announcements by any participant to the agreement have

significant effects on the pricing of all market participants. Thus, supporting the concept of group coordination of prices would be proof of the impact of the price of a particular market player on the prices of all others. Rate changes should react to GRIs and to the actual prices of other market participants. Under contacts in different markets, with common cost factors and demand changes, the model of coordinated pricing, including GRI as a universal instrument of coordination, implies the reaction of rates to GRI regardless of the type of containers, in all interrelated routes, defined by the FAS decision as *narrow geographical and product markets*. Below we try to reveal the effects, using data on pricing of companies A, B, and C, during 2011–2013. As *price* we take the base freight rate that was the subject of GRI announcement. Our analysis tests the following hypotheses:

Hypothesis 1   Announcement of intention to increase freight rates by one company leads to an increase of freight rates by other market players in *narrowly defined* markets. In dealing with concerted behavior, that effect should be multilateral (price policy of Company 1 affects price policy of Company 2, and vice versa).

Hypothesis 2   An increase of freight rates by one carrier is accompanied by an increase of freight rates by other market players; In dealing with concerted behavior, that effect should also be multilateral.

Hypothesis 3   Price policies of one company affect price policies of other companies regardless of the route direction.

In addition, we test the influence of a company's GRIs on its own prices. The concept of price announcement, as an instrument of price coordination, implies that the actual rates of a company should follow its own GRI, or at least, that rates of all companies should follow their own GRIs similarly. This type of analysis complements that of (Fung 2014 and especially Chen et al. 2017). For example, sellers may consider price announcements 'credible at a rate of 30%,' meaning that actual price increases are not lower than, say, 30% of announced increases. We expect the rate of price increase to be similar among the competitors, as it is extremely difficult to imagine that price coordination assumes different rules for different carriers.

The usual reservations are applied to the results of the statistical analysis presented below which brings out only statistical patterns in the movement of variables (in our case, prices). The findings do not say anything regarding the existence of a cause–effect relationship. Moreover, it neither excludes the existence of a common factor that influences the pricing of all market participants. If a positive relation between freight rates is detected, one cannot say with certainty if that relation is caused by their mutual influence, or by common external factors (such as fuel prices). However, if we reject the hypothesis of a positive relation between freight rates quoted by competitors, the assumption of GRI being an instrument of price

Table 1 Monthly average statistics on GRI, freight rates, and cargo transportation volumes of three large carriers (Jan. 2011–Sept. 2015)

	RF–SE Asia (%)	SE Asia–RF (%)
Actual monthly average increase in base rate		
A's base rate increase	2.10	0.45
B's base rate increase	3.63	2.67
C's base rate increase	3.41	2.76
Monthly average base rate increase announced by GRIs		
GRI announced by *A*	14.56	23.19
GRI announced by *B*	17.80	29.72
GRI announced by *C*	28.43	69.47
Share of months in which a carrier imposed GRI in the relevant route		
GRI actually imposed by *A*	66.67	50.00
GRI actually imposed by *B*	66.67	71.43
GRI actually imposed by *C*	58.33	71.43
Monthly average cargo transportation volume increase rate		
A's cargo transportation volume increase	5.78	4.12
B's cargo transportation volume increase	0.88	0.37
C's cargo transportation volume increase	0.09	0.06

coordination and concerted practice, in the sense of competition law, should also be rejected.

The main sources of information on base freight rates quoted by the companies under review are the materials of FAS investigations, presented under judicial review of case A40-54700/16 153-97.

Data on sales of market participants, necessary for our analysis (data on shipments to and from the main Russian ports during the period), are limited. For this reason we use as a proxy data on marine cargo transportation from and to major EU ports, provided by Euromonitor.[2]

Table 1 presents average monthly statistics which underlie the econometric analysis. Average values for the binary variable, *GRI actually imposed by a particular company*, show the share of observations in which *it* imposed GRIs for the relevant route. For example, during the period under review, the number of months when *A* imposed GRIs in the RF–SE Asia route (expressed as a percentage) was 66.67%. The data indicate that the rate increase implied by GRI is several times higher than the actual base rate increase. For example, for *A* and the RF–SE Asia route, the GRI implied a base rate increase of 14.56%, while the actual increase was only 2.1% per month.

In what follows, we focus on mutual relations between freight rate changes by competing companies (to test Hypotheses 1, 2, and 3). We use base freight rates as a dependent variable; cargo turnover increase for the route during the previous month as demand shifter; increase in the carriers' base rates in the previous month to track interrelation in pricing; and carrier GRIs to assess the effects of announcements.

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[2] Euromonitor, http://ec.europa.eu/eurostat/web/transport/data/database.

Table 2 Factors Affecting base freight rate increase (based on Euromonitor cargo turnover data)

	RF–SE Asia			SE Asia–RF		
	A	B	C	A	B	C
Dependent variable: base rate increase						
GRI actually imposed by A during the current month	−0.046**	0.04	0.042	0.188***	0.018	0.001
GRI actually imposed by B during the current month	0.005	0.048	−0.104	−0.03	0.072**	0.011
GRI actually imposed by C during the current month	0.018	−0.084*	0.127	−0.054	0.012	0.063
A's base rate increase during the previous month	−0.023	0.282	0.593	0.236	0.656***	−0.392*
B's base rate increase during the previous month	−0.163	0.115	0.082	−0.501*	−0.056	0.297
C's base rate increase during the previous month	0.045	−0.023	−0.268	−0.019	−0.054	−0.117
Cargo turnover increase for the route—Total (Euromonitor) during the previous month	−0.723	1.841*	3.388	−3.122	−0.24	2.94
Trend (linear)	−0.003***	−0.003	−0.015*	−0.003	−0.003	0.004
2012	0.081**	0.068	0.179*	0.019	0.022	0.013
2013	0.079**	0.072	0.314*	0	0.05	−0.047
Number of observations	495	32	32	447	32	32
R^2	0.462	0.524	0.285	0.350	0.758	0.286

*, **, *** refer to level of significance of 10, 5, and 1%, respectively. To test coefficient significance, we used estimated covariance matrix, adjusted for possible correlation of observations in the same period

Table 3 Factors affecting base freight rate increase (based on corporate cargo turnover data)

	RF–SE Asia			SE Asia–RF		
	A	B	C	A	B	C
Dependent variable: base rate increase						
GRI actually imposed by A during the current month	−0.056***	0.024	0.042	0.195***	0.029	0.001
GRI actually imposed by B during the current month	0.015	−0.062	−0.104	0.095	0.050*	0.011
GRI actually imposed by C during the current month	0.002	0.011	0.127	−0.284***	0.002	0.063
A's base rate increase during the previous month	−0.218	0.423	0.593	0.624***	0.452**	−0.392*
B's base rate increase during the previous month	0.005	−0.152	0.082	−1.010***	0.16	0.297
C's base rate increase during the previous month	−0.011	0.178	−0.268	−0.075	−0.047	−0.117
Cargo turnover increase during the previous month	−0.012	−0.022	3.388	0.257***	−0.025	2.94
Trend (linear)	−0.012***	−0.004	−0.015*	−0.020**	−0.005	0.004
2012	−0.183***	0.119**	0.179*	−0.309	0.062	0.013
2013	−0.096**	0.103	0.314*	−0.128	0.106	−0.047
Number of observations	315	26	32	321	26	32
R^2	0.718	0.488	0.285	0.647	0.679	0.286

*, **, *** refer to significance levels of 10, 5, and 1%, respectively. To test coefficient significance, we used estimated covariance matrix adjusted for possible correlation of observations in the same period

Monthly data for the period from January 2011 to September 2015 were available. Observation is a freight rate at a particular route. We are looking for cross effects, when price behavior of some companies affects price policies of others. The results of the econometric analysis are presented in Tables 2 and 3.

The findings presented in Tables 2 and 3 lead us to the following conclusions:

- GRIs do not lead to increases in competitor base rates. If this is the case, and if it is the base rate the subject of the GRI announcement, there is little evidence to support the concept of GRI as an effective instrument of price coordination. The only statistically significant effect is that of the imposition of GRI by *C* on the increase of *A's* base rate along the Russian Federation–Southeast Asia route. However, that effect is negative. This evidence is inconsistent with the FAS decision according to which it is exactly at that route that the companies were engaged in concerted action. To conclude, the companies did not increase their base rates in response to GRI imposition by their competitors.
- The effect a base rate increase during the previous month has on competitor rate increases is not homogenous. For example, as regards the Southeast Asia–Russian Federation route, and other things being equal, a base rate increase by *A* during the previous month leads to a rate increase by *B* and a rate decrease by *C*; a rate increase by *B* during the previous month leads to a rate decrease by *A*. Heterogeneity of the results—both across companies and transportation routes— shows that *A, B, and C* are unlikely to share common policy of price setting depending on prices of competitors.
- The effect that GRI announcements have on base rate increases of the announcing company is also not homogenous. For the Southeast Asia–Russian Federation route, GRI imposition by *A* and *B* leads to an increase in those companies' base rates. Conversely, in the opposite direction, a GRI imposition by *A* is accompanied by a base rate decrease. This testifies to the fact that even at a company level, the intention to increase freight rates does not always lead to an actual increase.

The above findings prompt us to reject Hypotheses 1, 2, and 3 regarding the universality of the effect that GRI announcement has on base rates quoted by other market participants. This is also the case for actual prices. Our results do not provide explanations of pricing policies but sharply contradict the contention of GRI being an instrument of effective price coordination.

Conclusions

Empirical evidence on pricing, and changes in market shares of liner shipping companies, presented under investigation and judiciary in Russia, provide little or no support to the hypothesis of coordinated prices and tacit collusion. GRIs do not result in price changes by other market participants. Shares of market participants are highly volatile, indicating shippers' ability to switch to another carrier in

response to GRI. Different market studies (Chen et al. 2017; Fusillo 2013; Hirata 2017; Lee and Song 2017) as well as evidence presented under case investigations support this conclusion. In spite of the little evidence in support of tacit collusion, or coordinated pricing, under investigation in Russia (with no relevant empirical evidence offered by the European Commission), both competition authorities made their decisions asserting the importance of information exchange, or advance price announcements, as anti-competitive devices.

Remedies of competition authorities may have controversial effects on pricing decisions. Consider first the *announcement period* restriction of the European Commission. The shorter this period, the less time shippers have to switch to another carrier and therefore to undermine the possible attempts to increase prices under tacit collusion. Russian data show that, in the period 2012–2013, the switching decisions of shippers and the redistribution of carrier market shares limited the increases in freight rates in comparison to GRI announced.

Another remedy in the decision of the European Commission is to announce not the overall increase of freight rates, but the increases in specific components. Proposals to provide information on prices across all freight rate components were extensively discussed (Cariou and Wolff 2006), but just in order to make sure that rates are cost-driven. However, the ability of more detailed price information in promoting competition is doubtful. The non-uniformity of tariff structures may undermine the ability of advance price announcements to serve as a facilitating practice. The introduction of a standard form of price announcements might support collusive behavior.

Remedies developed by the Russian competition authority also entail weaknesses through the lens of the theory of tacit collusion. The idea of limiting price announcements to customers only, without public announcement, is logical. The effectiveness of this remedy might be low however, because of the limited ability of any authority to control information flows. It is not logical, though, to expect the largest shipping company, Maersk Line, to be the source of market forecasts of shipping rates. Forecasts of the largest market participants, who have the highest motivation to collude (Ivaldi et al. 2003), may definitely support coordinated behavior.

To sum up, the case of GRIs leads to three important conclusions. First, economists still have no convincing research to show that information exchange is a practice that facilitates tacit collusion. Transparency of prices may have both pro-competitive and anti-competitive result and this depends on market structure. If, in particular period, demand and supply together with market structure favor competition, there is no way price announcements could support coordinated pricing. Second, the skills and knowledge of competition authorities on the ways information exchange could facilitate collusion in certain markets, also needs to be developed. We need to know more about detailed versus general information on prices, short versus long period between price announcement and price changes, etc. Third, competition authorities still have no robust guidance to develop remedies aimed at preventing coordinating behavior, caused by public pricing announcements.

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