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EU Roaming Regulation

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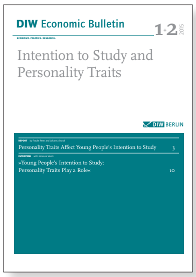

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EU Roaming Regulation: theoretical model suggests a positive assessment

By Pio Baake and Lilo Wagner

Since June 15, 2017, mobile network operators in the European Economic Area may not impose surcharges for making telephone calls, sending text messages, or using data services in other EEA countries. The regulation was designed to create a digital domestic market without adversely affecting consumers. The regulation raises the expectation of changes in mobile network operators' tariff structures. Theoretical examination shows that as long as mobile network operators do not exclude a roaming option for users who travel only occasionally, everyone will benefit from the regulations—even occasional travelers. In this case, positive effects are also anticipated for overall social welfare. However, negative effects are likely if some tariffs exclude a roaming option. The market result is highly dependent on how strongly consumers differ in their user behavior. The fact that all three mobile network operators in Germany exclusively offer tariffs with roaming options is evidence in favor of a positive assessment of the EU regulatory measures.

Effective as of June 15, 2017, roaming surcharges were abolished inside the European Economic Arrea.[1] Users who make telephone calls, send text messages, and surf inside the European Economic Area pay domestic tariffs to do so. The intention is to create a digital domestic market inside the European Economic Area with the goal of boosting the use of digital services and benefiting users.

The public received the European Commission's decision very warmly. However, people tend to ignore an associated reality: Mobile network operators will adjust their pricing structures to reflect the new conditions. The regulatory measures only affect roaming surcharges, while prices for domestic use continue to be unregulated.

Although the European Parliament believes its regulation design will prevent any disadvantage to consumers,[2] several economists have voiced arguments to the contrary. They think the regulation only benefits frequent travelers; while others will only reap the disadvantages inherent in higher domestic prices.[3]

The present study puts this result into context, contributing theoretical considerations to the discussion on the effects of the EU Roaming Regulation. The main concern is its effects on the welfare of users who travel occasionally and yet are indirectly affected by the regulation.

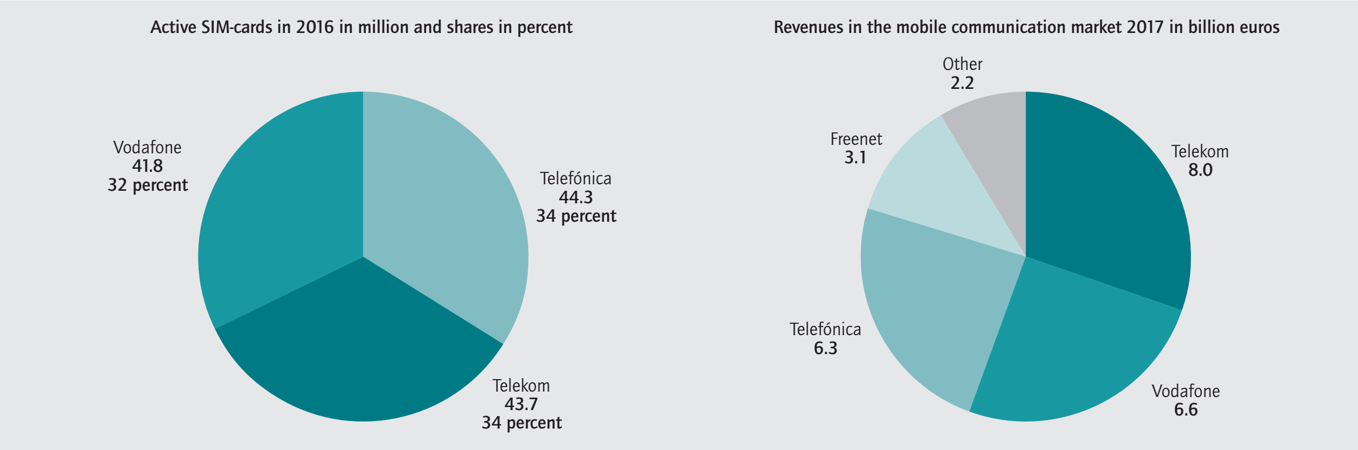
1 The European Economic Area includes all member countries of the European Union as well as Iceland, Liechtenstein, and Norway.

2 European Commission, "The EU Regulation to Reduce Mobile Roaming Charges by 70% – Final round of Committee voting in the European Parliament," press release, April 11, 2007 (available online, accessed January 19, 2017; this applies to all other online sources in this report unless stated otherwise).

3 For example see Centre on Regulation in Europe, "End of roaming charges: CERRE's Martin Peitz comments," June 15, 2017 (available online); Tomaso Duso, "EU-Roaminggebühren werden abgeschafft: Gute Nachricht! Aber legen wir uns damit auf ein Wasserbett?" *DIW Wochenbericht*, no. 24 (2017): 500 (in German; available online); and "Regulating the mobile phone industry: beware the 'waterbed effect'" (2007) (available online).

Figure 1

Mobile communication market in Germany



Source: Dialog-Consult / VATM (2017): 19. TK-Marktanalyse Deutschland.

In Germany, the three largest mobile network operators have approximately equal shares of the mobile communication market.

Roaming regulation affects retail and wholesale prices

The term "roaming" designates international mobile network use. It is managed by foreign mobile network operators and billed to the domestic operator in the form of a roaming wholesale price. Users pay the relevant roaming prices to their domestic operators. Before the EU Roaming Regulation was implemented, domestic operators were able to set roaming prices without restrictions.

The regulation has limited the flexibility of mobile network operators. Prices for roaming calls and text messages are not permitted to exceed domestic off-net prices that is, the price for calls and text messages in other operators' networks. If the off-net price is higher than the on-net price in one tariff, the higher price may be billed for all roaming calls and text messages. As a result, a call in one's own network can actually be more expensive if it is made from abroad.

The regulation also prohibits surcharges for calls and text messages received abroad.[4] Data use is regulated in a similar manner, although the data volume for flat rate tariffs or particularly low prices may be limited according to a specified rule.[5] Mobile network operators must provide these new roaming options as standard, but may also operate with a blanket roaming exclusion.[6] In Germany, this option is currently only offered by three small operators that do not have their own network.[7]

In order to ensure the regulation's financial feasibility, counteract competitive distortions, and limit the increase in domestic prices,[8] a co-regulation applies to the market for roaming wholesale prices. Since June 15, 2017, foreign mobile network operators have been permitted to charge a maximum of 3.2 cents per minute for outgoing calls, one cent for text messages, and 7.70 euros per gigabyte of data transferred from domestic mobile network operators. And as a rule, access may not be denied.

International communication–telephone calls and text messages originating domestically to foreign countries–are explicitly not included in the regulatory provisions. As

4 In general, mobile network operators can decide themselves whether or not to charge for incoming domestic calls, but none of them take advantage of this option.

5 European Commission, "End of roaming charges for travellers in the European Union," December 8, 2016 (available online).

6 In charge of Germany's electricity, gas, telecommunications, post, and rail networks, the *Bundesnetzagentur* agency has clearly stated that operators have the freedom to decide not to offer roaming. See "Tarife ohne Roaming: BNetzA äußert sich zur Rechtmäßigkeit," March 22, 2017 (in German; available online). Operators are also permitted to demand surcharges if they have evidence of longer stays abroad (*fair-use policy*).

7 DeutschlandSim (Drillisch), Yourfone (Drillisch), and Callmobile (freenet).

8 European Parliament Think Tank, "The review of national wholesale roaming markets and the Roaming Regulation," May 31, 2016 (available online).

a result, telephone calls placed abroad to foreign countries could be less expensive than the same calls made from domestic telephones.

Mobile communication market features high concentration of operators

There are 129.8 million active SIM cards in Germany (as of 2016), and they are by and large evenly distributed among the market's three major mobile network operators: Vodafone, Telekom, and Telefónica. In 2017, the top three generated around 80 percent of the sector's total revenue of 26.2 billion euros. With revenue of eight billion euros, Telekom had a somewhat larger market share than Vodafone and Telefónica. With a market share of 11.8 percent, freenet is the largest independent operator. The others play only a minor role (Figure 1).

Throughout the EU there are 35 active mobile network operators, many of whom operate in multiple countries. With respect to individual countries, the situation is similar to that of Germany. Typically, three or at most four mobile network operators have virtually equal shares of the market.[9]

A model for assessing the regulatory measures

In order to examine the possible effects of the EU regulations on both roaming and wholesale prices, we have analyzed a theoretical model.[10] Two mobile network operators of the same size are in a situation of imperfect competition for domestic consumers,[11] who choose one of the tariffs offered in the market.

There are two types of consumers in the model: frequent travelers and occasional travelers. The former have more international contacts, spend more of their time abroad, and use their mobile telephones accordingly. Occasional travelers primarily use their mobile telephones in their home country and have few international contacts.

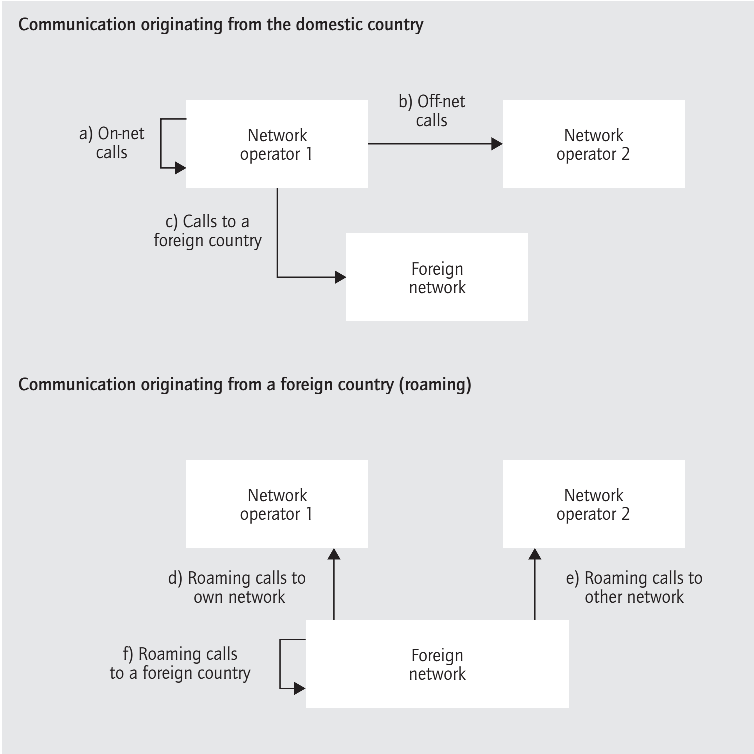
Both mobile network operators can offer a variety of multi-part tariffs. Each tariff offered consists of a monthly fixed fee and variable prices that change depending on the user's location (domestic or other euro area country) and the call's target network. This means that each tariff specifies prices (per minute) for domestic calls[12] to: a) the caller's own network (on-net), b) a different network (off-net), c) a foreign country (international calls) and calls conducted abroad to d) the caller's own network, e) a different network, and f) a foreign network (Figure 2). The latter three prices are for roaming calls. In the case of the regulation, operators' price-setting flexibility is limited.

Termination rates–payment between mobile network operators for interconnection services–are regulated on the national level. However, the European Commission has instructed the national regulatory authorities to develop cost-oriented regulations. Consequently, within the framework of the model we assumed that termination rates are equal to the costs of interconnection and for this reason, are not responsible for the differences in on-net and off-net prices.

Figure 2

Possible mobile connections in the model framework

Communication of a consumer of network operator 1



Source: Authors' own illustration.

A multi-part tariff consists of a variable price for each possible mobile communication connection.

9 European Commission, "Competition in telecom markets," speech, October 2, 2015 (available online).

10 Pio Baake and Lilo Wagner, "A theoretical assessment of the EU Roaming Regulation," mimeo.

11 The model is based on Jean-Jacques Laffont, Patrick Rey, and Jean Tirole, "Network Competition: II. Price Discrimination," *The RAND Journal of Economics* 29, no. 1 (1998): 38–56. One of the model's key assumptions is that domestic contacts are equally distributed (*equal calling pattern*).

12 In principle, the model can be applied to text messages. However, we only mention telephone calls in the following.

Roaming wholesale prices may exceed the actual costs of providing the service. They are always incurred when the customers of a domestic operator use services abroad. On the other hand, domestic operators benefit from roaming users who travel abroad. For simplicity, we considered an identical foreign market.

Benchmark: price structure without regulation

In an unregulated market, each of the two mobile network operators offers two different tariffs. Due to symmetry, both operators make identical offers. Non-linear tariffs with a monthly fixed fee and variable prices are a component of typical pricing strategies in the mobile communication market. The offer of different multipart tariffs represents an instrument of price discrimination in the mobile communication market, although users choose their tariffs themselves according to their preferences.[13] Frequent users select contracts with high monthly fixed fees and low variable prices, flat rate tariffs, for example. Occasional users tend to choose contracts with high variable prices but low monthly fixed fees: for example, pre-paid or post-paid tariffs without monthly fixed fees or a minimum usage charge. The tariffs are designed to encourage users to select the tariff intended for them.

The same logic can be applied to the use of mobile telephones abroad. Users who travel frequently tend to select a tariff with a high monthly fixed fee and low (domestic and roaming) prices. Users who travel less frequently are likely to select a tariff with a low fixed fee and high prices for domestic telephone calls abroad and high roaming prices.

Wholesale market regulation improves social welfare

Lower costs following a cap on wholesale roaming prices will be passed onto users in the form of lower prices. For this reason, lowering the wholesale roaming price toward the marginal cost level would benefit all consumer groups[14] and improve social welfare in every case. This would apply regardless of whether or not the end consumer price is also handled as the EU regulation stipulates.

13 For example, see Hal R. Varian, "Price Discrimination," eds. Richard Schmalensee and Robert Willig, *Handbook of Industrial Organization, Volume 1,* (Amsterdam: Elsevier Science & Technology, 1989), 598 et seq.

14 This applies when a tariff contains at least a roaming option. In the case of retail regulation, consumers who travel occasionally are sometimes offered tariffs without a roaming option (also see the following discussion). If a tariff does not contain a roaming option, the level of the roaming wholesale price does not have an influence on the tariff.

Domestic prices also change as a result of retail regulation

The EU Roaming Regulation ties roaming prices to the domestic off-net price. This change in conditions causes operators to offer higher off-net prices but lower roaming prices in all tariffs with a roaming option. The prices of calls in one's own network and international communication remain the same. As apparent from the theoretical literature, differences between on-net and off-net prices fuel competition.[15] Because consumers prefer larger networks in this case, positive network effects arise. In turn, these effects induce operators to lower their fixed fees.

Distortions in tariffs as a result of price discrimination can also lead to lower fixed fees for users who travel occasionally or never. However, if this causes operator profits to fall sharply, deviation incentives begin to play a role. And the EU Roaming Regulation does not include the mandatory provision of a roaming option in all tariffs. Instead, operators are permitted to offer tariffs that exclude the use of services abroad. These tariffs are designed for consumers who only travel occasionally. The off-net and on-net prices remain the same. Competition for these users will not intensify and therefore, their monthly fixed fees are not lowered. According to the model, these tariff options are offered when user behavior with respect to international use is markedly differentiated. On the contrary, tariffs with roaming options are offered to all users if there is only slight differentiation (Figure 3).

Welfare effects of retail regulation depend on market circumstances

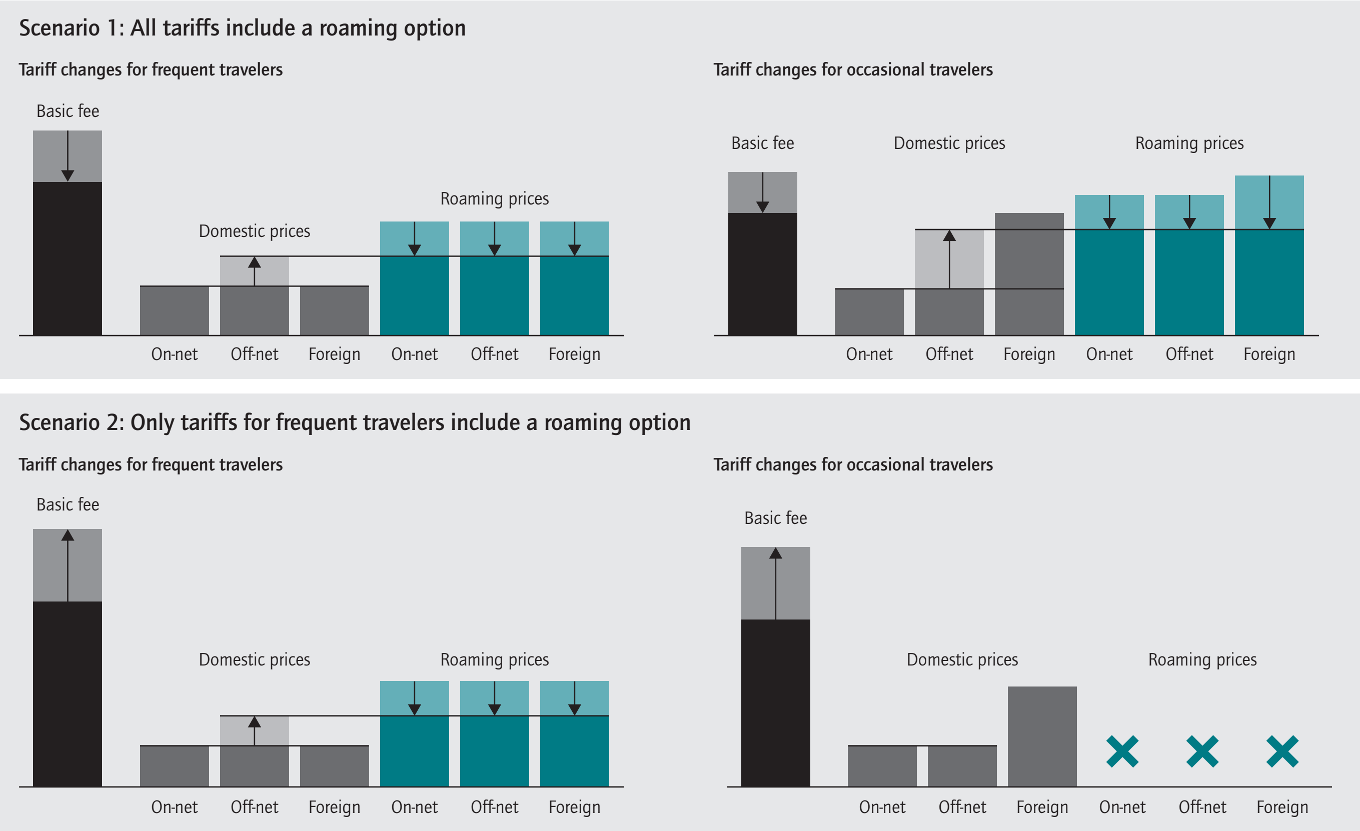
The effect that the retail regulation has on social welfare depends primarily on which tariff option users who travel occasionally are offered. If all tariffs contain roaming options, the retail regulation will increase both the welfare of all consumers and overall welfare (consumer surplus plus operator profit).[16] The regulation then does indeed raise the domestic off-net price, but at the same time it fuels competition and leads to lower fixed fees. Users who only travel occasionally also benefit. The level of the fixed fees is unimportant for social welfare because they represent pure redistribution. However, the regulation demonstrates positive effects since it leads to increased use of international services.

15 Jean-Jacques Laffont, Patrick Rey, and Jean Tirole, "Network Competition."

16 This result is partially based on numerical simulations. A general representation is possible for the case in which consumer behavior is extremely similar with respect to international use.

Figure 3

Schematic presentation of price adjustment as a result of retail regulation



Source: Authors' own illustration.

There is a range of options for price adjustment as a result of retail regulation.

The EU regulation could be detrimental for all users if the changed conditions lead to tariffs without roaming options for people who travel infrequently. Tariffs for consumers who travel only occasionally will only change to the extent that roaming is no longer presented as an option. This clearly changes their situation for the worse. As a result of network effects, frequently traveling consumers will still benefit from the competition that has been kindled, but a tariff without the roaming option is not an appealing fallback option. It could cause monthly fixed fees to increase as a result, in which case these consumer groups would suffer. The effects on overall social welfare are not fully clear in this case, as the retail regulation is likely to increase operator profits. Operators would prefer to offer tariffs with a roaming option to their customers who travel infrequently, but they also benefit from foreign users who travel frequently. This is especially the case when a consumer group almost never travels.

Conclusion: model points to a positive assessment

According to the model presented, roaming wholesale price regulation has a positive effect on both the consumer surplus and overall social welfare. Whether or not the retail regulation represents a useful addition to it primarily depends on which tariff options operators offer in response to the changed conditions. Positive effects for both consumers, and from the point of view of overall social welfare, are to be expected if none of the tariffs offered excludes a roaming option. If, on the contrary, users who travel occasionally receive offers without this option, the additional regulation of retail prices as included in the EU regulation will have negative effects on all consumer groups.

According to the model, which tariff options are offered in the market depends on how widely users vary with respect to their use of international services. This is difficult to assess empirically, but the fact that in Germany none of the three mobile network operators offers tariffs without a roaming option speaks in favor of the positive effect of the regulatory measures. In this respect, the results contradict the hypothesis that the regulation puts groups of consumers that travel less frequently at a disadvantage. At least in the case of the cost-based regulation of wholesale prices, the EU regulation fulfills the claim mentioned at the beginning: to avoid disadvantages to consumers.

According to the model, the regulation is at the root of the differences between domestic on-net and off-net roaming prices. The extent to which the gap has widened and whether or not fixed fees have fallen in the wake of the regulatory measures must still be verified empirically. It should be noted that the regulatory measures were first adopted in 2007. However, it is still too early to carry out an empirical assessment of its effects, which is why the actual effect of the EU Roaming Regulation cannot be conclusively stated. At the end of 2019, the European Commission will verify the effects and as part of its effort, will decide whether or not the wholesale prices for roaming require further adjustment.

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