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# Developments in Mobile Termination

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COMMITTEE FOR INFORMATION, COMPUTER AND COMMUNICATIONS POLICY**

**Working Party on Communication Infrastructures and Services Policy**

**DEVELOPMENTS IN MOBILE TERMINATION**

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## FOREWORD

This report was presented to the Working Party on Communication, Infrastructures and Services Policy (CISP) in June 2011. It was recommended to be made public by the Committee for Information, Computer and Communications Policy (ICCP) in October 2011. The report was prepared by Mr. Rudolf van der Berg. It is published under the responsibility of the Secretary-General of the OECD.

*The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.*

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## MAIN POINTS

This report reviews developments in wholesale interconnection rates for mobile wireless telephony service in the OECD area (Mobile Termination Rates or MTRs). These rates are the charges that telecommunication network operators pay for delivering telephone calls to mobile wireless providers. There have been considerable changes in these rates and, in some countries, the role regulatory authorities play in how these charges are set. In these countries, particularly those with the calling party network pays (CPNP) system, regulators have increased their role over time. This was because they assessed that the rates were significantly above cost, with limited possibility for competition to reduce them, due to the monopoly power operators hold over the termination of telephone calls to their customers.

Following intervention by regulators, the rates for interconnection, between and to mobile service providers have decreased. The report documents a decline, for example, of 78% from USD 0.366 per minute to USD 0.077 per minute, for the termination of a call, in one country. There are still, however, significant differences across the OECD area. Rates can be as high as USD 0.142 per minute to as low as USD 0.0007 per minute in the United States. Around the world some countries, such as India and Sri Lanka, have set rates as low as USD 0.004, which is lower than most OECD countries.

All but one country uses CPNP for interconnection to mobile networks. Only Canada uses a different model where the mobile network pays for interconnecting traffic to and from the mobile network. Some regulators are contemplating whether it is possible to set tariffs for interconnection at zero. This system entitled “Bill and Keep” is, or was, in use in some countries for some types of interconnection. It is used for specific types of traffic in the OECD. Outside the OECD area, Singapore, Hong Kong, China, and China use this model.

Termination rates have an influence on the flexibility that operators have to structure their retail offers to meet the needs of their customers. The higher the rates and the greater the asymmetry between rates, the more difficult it is for networks to vary pricing based on per minute voice charges. When termination rates are lowered, some service providers make available bundles with greater amounts of airtime included, if they are wireless providers, for calls to mobile networks if they are fixed network providers. There also appears to be a relationship between the number of minutes called on mobile networks and the termination rate. The United States has by far the lowest mobile wireless termination rates in the OECD area and much greater average use of mobile telephony.

Lower rates are also believed to be favourable in encouraging competition and innovation. Newer entrants, with lower market shares, tend to be more favourable to reducing termination rates than those operators with a greater market share. At the same time, some services have been developed in countries with the lowest termination rates that may not be economic in countries with high termination rates. Finally, it is evident from the retail pricing of some international VoIP services, from users making calls with domestic or foreign origination that the structure of termination and the level of rates lead to very large differences in the retail prices for business and consumers.

There is still scope for reductions in termination rates, especially in some countries. This would also allow network operators to develop business models which are less dependent on voice services. The Bill and Keep model or capacity based interconnection models like Peering and Transit deserve further work to better understand how these models can stimulate greater competition and innovation.

## WHOLESALE AND RETAIL ARRANGEMENTS FOR VOICE INTERCONNECTION

There are different wholesale and retail arrangements for interconnection with mobile wireless networks. In annex 1 a short explanation will be given of each of the different types of arrangements. There are four types of wholesale interconnection models and three types of retail models:

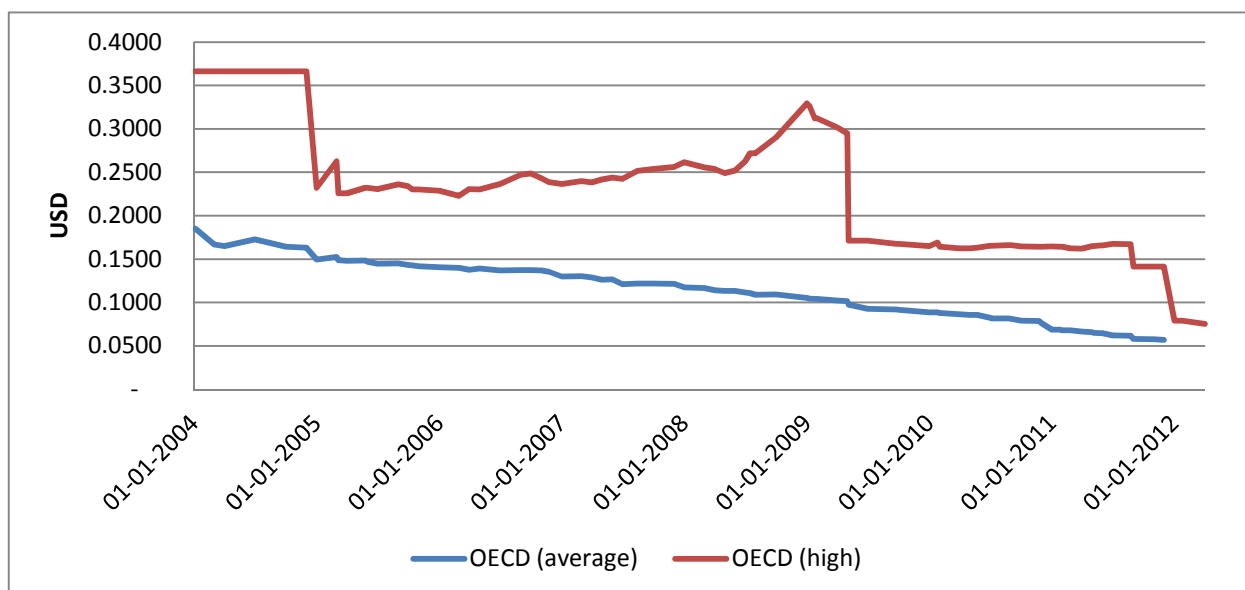
- Wholesale
  - Calling party network pays (CPNP)
  - Receiving party network pays (RPNP)
  - Bill and Keep (B&K) also known as Sender Keeps All (SKA)
  - Peering and Transit
  
- Retail
  - Calling Party Pays (CPP)
  - Receiving Party Pays (RPP)
  - Bundled

There is not always uniformity in the terms used to describe interconnection models and this can lead to confusion. Sometimes analysts mix the terms for wholesale models and retail models; Calling Party Pays and Calling Party Network Pays are used interchangeably, even though they mean something different and the same for RPNP and RPP. Furthermore, some equate RPNP with Bill and Keep and others equate Bill and Keep with Peering and Transit, which is not correct either. When a country uses a particular wholesale model, the retail model may be different; a country may use B&K for wholesale, but have CPP for retail. When reviewing interconnection models, especially in other countries, policy makers need to keep in mind that the use of the terminology may not be consistent across reports. For example the reports may state that the United States uses Bill and Keep as its wholesale arrangement, or receiving party pays as its retail arrangement, neither of which is correct.

## TERMINATION RATES IN THE OECD

A survey of the termination rates, in operation in the OECD area, on 5<sup>th</sup> May, 2011 shows that termination rates for a fixed-to-mobile call are the lowest in Canada, the United States, Israel and Korea. The situation in Canada and the United States will be elaborated in a following paragraph. Israel and Korea charge USD 0.02 and USD 0.028 respectively. The highest termination rates are in Estonia, Chile, Luxembourg and Italy, where interconnection rates vary from USD 0.142 to USD 0.094. The average wholesale rate across the OECD area is USD 0.065 per minute. The average has declined, over recent years, with regulators decreasing MTRs. In 2004 Switzerland had the highest MTR at USD 0.366 per minute (Figure 1). In 2008, the short-term rise in the index for maximum MTRs was due to changes in Chile's exchange rates rather than a trend toward higher prices.

Figure 1. Average and high termination rates



Data, for Figure 1 and 2, are available in Annex 2, with the data in the country's currency available in Annex 3. These data were collected for the regulated peak hour per minute fixed-mobile interconnection rate of the largest mobile network. The termination rates for other networks were not recorded, nor were off-peak and weekend rates. The dates at which the rates, shown in Annex 2, came into force were used. This way the rates between countries could be compared in an unbiased way. The data as it is in the table should be used with care, but can be used for comparative purposes. The caveats, set out in the following paragraphs, associated with these rates, provide greater insight into how termination rates are used in various OECD countries.

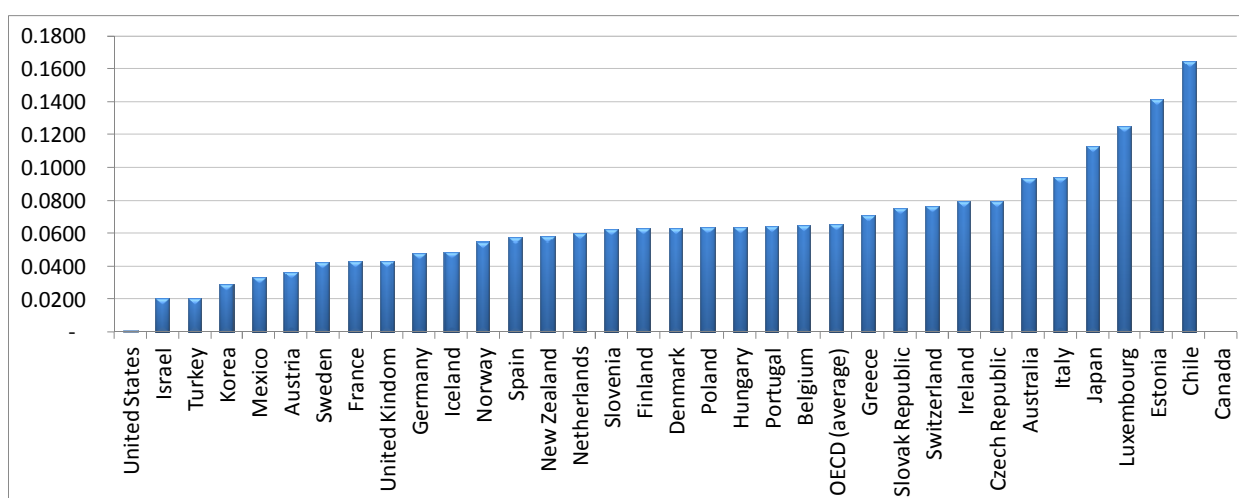
These rates are the charges that telecommunication network operators pay for delivering telephone calls to mobile wireless providers. In most OECD countries, except Canada and the United States this rate is regulated. The way in which the MTR is regulated can, however, differ greatly across different countries. Most countries set the termination rates *ex-ante* for a period of one to four years, often with a "glide path". However, not all countries use an *ex-ante* regulated MTR. Korea and Japan use a method where the regulated rate for a year is determined *ex-post* based on the traffic in the previous year and several other parameters. The networks settle with each other at the end of the year, based on this *ex-post* set rate. Mexico and Switzerland can only regulate the rate in case of disputes between networks on the MTR. Ireland uses Voluntary Deeds, where the networks commit that their rates will be in line with the European Union average as calculated by the organisation of European regulators BEREC. BEREC has on its website a twice yearly overview of average termination rates in European Union countries.<sup>1</sup> The European Union has defined the market for mobile termination as "Market 7" and has issued a Recommendation on the subject, which is expected to result in significant reductions. In principle in most countries the rate set is a maximum and not a minimum. Networks could decide on a lower rate in most countries. If they do, this is part of commercial negotiations and may therefore not be made public.

The fixed-mobile termination rate was chosen, in the collection of data for this report, as it is generally the same as the mobile-to-mobile termination rate. This is not the case, or has not always been this way, in every country. A different rate for fixed-mobile than mobile to mobile is rare however and the differences are not very substantial in many cases.

Data, in this report, were collected for peak hour rates. This is different from the data published by, for example, the European regulators through BEREC, which uses average rates. However, to ensure comparability through the years and across countries the peak hour rates were used. Some countries differentiate between peak, off-peak, night and weekend for the termination rate. In Chile, for example, the night MTR is half of the peak MTR and the weekend MTR is 75% of the peak rate. The average MTR, that operators pay per minute, is therefore dependent upon the relative volumes among the different categories. The uncertainty this creates in calculating the MTR is the reason the average MTR is not used.<sup>2</sup> In the United Kingdom the MTR was not set at a fixed rate, but was to be an average over a month, with a different average for peak, off-peak and weekend rates. This formula was “gamed” by market participants in the United Kingdom. Under the 2007–2011 charge control, the four mobile operators in the United Kingdom were able to change their MTRs as often as they wished; provided that they ensure their average charge does not exceed the limit set by regulation. They were also able to set different MTRs at different times (for example, for day, evening, weekend rates or any other charging period - termed ‘time of day flexibility’). Although this flexibility was originally conceived as a tool to manage network traffic, some providers used this flexibility to ‘flip-flop’ their rates. ‘Flip-flopping’ refers to the practice whereby some mobile networks in the United Kingdom have made frequent and significant changes to their MTRs.

Flip-flopping works by exploiting the difference in the number of weekends in each month between the prior year and the current year, because the calculation used to monitor compliance with the charge control uses prior year’s volumes. In practice, this can secure some mobile networks additional tens of millions of GBP in revenue. Not only does the practice of flip-flopping allow mobile networks to gain extra revenue (up to an additional 5% revenue), frequent and significant changes in time of day rates increase the risk for originating providers and also raise their costs, in a way that is not susceptible to competitive pressure. Since April 2011 this practice has been prevented by setting MTRs as a simple cap with a single maximum charge in each year.

**Figure 2. Termination rates in USD across the OECD on 5 May, 2011**



Data used in this report are collected on a per minute basis. Most countries regulate the MTR on a per minute basis. Chile and Japan have termination rates set on a per second basis. Most countries regulating MTRs state, however, that operators should settle MTRs on a per second basis. A 30 second call will, for example, be equivalent to half the MTR, a two and half-minute call will generate two and a half times the rate. In Mexico, by way of contrast, rates were rounded up to the nearest minute, but following a decision by COFETEL (16 March 2011) interconnection rates reflect only the actual duration of the call. A call of 30 seconds would cost one minute. A 2.5 minute call would cost the same as a three minute call.



In many OECD countries the termination rate is different depending on the mobile network the call terminated in, a so-called asymmetric rate. Some reasons given to have asymmetric rates were that some networks had an earlier start, had enjoyed special benefits, were using different spectrum with a different cost structure, had a lower market share and so forth. Many countries have begun to decrease the differences between networks and, in some, they no longer exist. In general the largest network in a country will have the lowest MTRs and rates are converging towards that operator's rates. Some networks use different rates for Mobile Virtual Network Operators (MVNO) than for spectrum license holders. Other countries specify that the termination rate of an MVNO is equal to that of the retail mobile voice service provider of the spectrum license holder that the MVNO uses.

Figure 3. Termination rates in Korea (KRW)



Source: KCC

Most regulators adjust MTRs annually. Rates can, however, change from month to month, or quarter to quarter. Some regulators, such as in Chile and the United Kingdom set their rates for a fixed period, but adjust them in line with a price index. There are many reasons for adjusting MTRs. For countries in the European Union, the European Commission (EC) sets out the guidelines for adjusting MTRs as well as FTRs. A new set of guidelines is laid out in a recent EC recommendation. The recommendation establishes that fewer costs could be recovered by the MTR. Another reason for adjusting the MTRs may be that the underlying costs change, either because of technological change, or changes in volumes. It may be that the regulator has determined that the MTRs are too high. In most cases, if the regulator has determined that MTRs are excessive, it does not adjust the rates immediately to the new level – usually this is done over a period of time. A notable exception was Israel, where it was decided to decrease the rates by 70% to reach the new rate. In absolute terms Switzerland was responsible for two sizeable drops in termination rates of USD 0.147 and USD 0.066. Korea on the other hand, a country with among the lowest rates in the OECD for a number of years, has seen stable termination rates for its biggest network SK Telecom (Figure 3).

Most interconnection arrangements are for voice only. Some countries have regulated termination rates for SMS. There are also countries where SMS interconnection rates are unregulated, even though they do exist. Even though Denmark had a relatively low unregulated SMS termination rate (around USD 3.28) compared to many other European countries, actual unregulated price level was 10 times LRAIC estimated cost. New Zealand cut the termination rates for SMS from USD 0.072 to USD 0.00045 in May 2011. Turkey has an interconnection rate for video calls, which are set at twice the rate of a voice call. Interconnection rates for other services than voice, video and SMS have not been observed in other countries in the research undertaken for this report.

## CPNP AND B&K IN THE OECD AREA

The vast majority of OECD countries use CPNP for calls to mobile telephones. Only Canada does not use CPNP. In Canada a mobile service provider is a customer of a fixed network provider, instead of being considered an equivalent to a fixed network provider. In effect there is no wholesale interconnection model between the two. A mobile network, in Canada, will buy capacity to a fixed network measured in 64kbit/s channels (one telephone line) connections. The mobile network will have to calculate how much capacity it needs to handle its incoming and outgoing telephone calls. It does not buy minutes, but dimensions its interconnection based on the peak simultaneous incoming and outgoing calls it expects. In effect the Canadian model can be considered as similar to a “Mobile Network Pays” system, where the mobile network is responsible for the costs of all incoming and outgoing traffic.

The wholesale system, of the United States, is often described as RPNP or B&K, because of the retail model where incoming calls are deducted from the bundle. In practice, however, the wholesale model in the United States is a combination of CPNP and B&K for various types of telephony, fixed, long distance and mobile. The system is dependent upon commercial negotiations as well as light regulation at the federal and the state level. For local calls on the fixed network a reciprocal CPNP system is used with charges at USD 0.0007 per minute. For long distance calls an access charge is paid to the receiving network. This charge is for most fixed networks around USD 0.005 per minute, but can be as high as USD 0.359 per minute in exceptional cases for access to some rural networks. For calls to mobile networks there is no regulated charge, but they are set to the same rate as a local call at USD 0.0007 per minute and to be reciprocal. In addition, some networks have negotiated B&K arrangements. These agreements are confidential, so the extent of their use is unknown.<sup>3</sup>

Until December 2004, France had a voluntary B&K system between mobile networks. Calls from fixed networks to mobile networks were charged using CPNP at the regulated rate. France had two integrated fixed-mobile networks. Each of these networks offered calling to its mobile network for customers on its fixed network and between its mobile customers at a retail price below the regulated wholesale price. This created an opportunity for arbitrage. Competing public fixed networks would create a ‘GSM gateway’ by becoming customers in their competitor’s fixed or mobile network for calls to the customers on the competitor’s mobile network. Larger companies would do the same for their private networks. In addition mobile networks acted as transit providers to their competitors’ mobile networks, where they could deliver traffic without charge under the B&K system. Transit would then be sold to national and international public networks and corporations. The effect was that it was less expensive to reach a particular mobile network through a GSM gateway, or transit network of a competing mobile network, than directly. At the end of 2004 around 90% of all calls to mobile networks were delivered this way. This system was, in one sense, the reverse of the Canadian model, with the addition that private companies were able to benefit from it too. In 2004, the B&K arrangement was cancelled by Orange (France). The other operators followed suit and fixed networks were required to pay the regulated termination rate from 2005 onwards.<sup>4</sup>

New Zealand uses B&K for interconnection between fixed networks and CPNP for interconnection to mobile networks. There are, however, specific calls to mobile that even though they terminate on a mobile network are treated as a call to a fixed network and therefore subject to B&K. These calls are calls to customers of Vodafone Homezone. This allows customers on the mobile network of Vodafone to have a number that is normally assigned to fixed line connections. In some other OECD countries Vodafone has similar arrangements for calls to fixed networks, where the (lower) termination charge for fixed calls is applied.

## MTRS OUTSIDE THE OECD

The majority of countries outside the OECD make use of CPNP for interconnection. However, not all countries do so. Some countries have moved from B&K to CPNP. Dewenter and Kruse provide an overview of countries of the year they switched from B&K to CPNP,<sup>5</sup> which has been adapted for Table 1.

Table 1. Models used in different countries

CPNP countries	Switched from B&K to CPNP	B&K and other models
Australia	Venezuela (1991)	Albania
Austria	Brazil (1994)	Barbados
Belgium	Colombia (1994)	Cameroon
Belize	Israel (1994)	Canada (MPP)
Denmark	Dominican Republic (1995)	China
Estonia	Uruguay (1995)	Croatia
Finland	Costa Rica (1996)	Hong Kong, China
Germany	Czech Republic (1996)	Mauritius
Greece	Mongolia (1996)	Russia
Hungary	Peru (1996)	Singapore
Iceland	Cambodia (1996)	St. Kitts and Nevis
Ireland	Panama (1997)	Ukraine
Italy	Ecuador (1998)	United States (CPNP/B&K)
Japan	Romania (1998)	
Korea	Argentina (1999)	
Lithuania	Bolivia (1999)	
Luxembourg	Chile (1999)	
Madagascar	El Salvador (1999)	
Malaysia	Guatemala (1999)	
Malta	Mexico (1999)	
Moldova	Antigua and Barbados (2000)	
Netherlands	Honduras (2000)	
New Zealand	Jamaica (2000)	
Norway	Cayman Islands (2001)	
Philippines	Pakistan (2001)	
Poland	Trinidad and Tobago (2001)	
Portugal	Dominica (2002)	
Slovak Republic	Grenada (2002)	
Slovenia	Saint Lucia (2002)	
Spain	St. Vincent (Grenad.) (2002)	
Sweden	India (2003)	
Switzerland	France (2004)	
Turkey	Sri Lanka (2010)	
United Kingdom		

Source: Dewenter & Kruse, OECD

Most countries in the world have similar interconnection rates between the average to higher range of OECD countries. Developing countries in general tend to have higher termination rates than OECD countries, with often a higher rate for incoming calls from international sources. Bypassing the higher rate for international calls through the use of GSM gateways is believed to be relatively common but illegal in some countries. Some countries have not followed the international trend of decreasing termination rates. The United States Trade Representative in its yearly report for 2011 noted that Tonga and Ghana increased their termination rates to USD 0.30 and USD 0.19 respectively.<sup>6</sup> The main component of the raise seems to be a tax on the interconnection rate.

Some countries have significantly lower termination rates than the OECD average. Notably, in South-East Asia countries where there are lower termination rates for calls to mobile services. For example, India has symmetric termination rates for fixed-mobile and mobile to mobile rates, set at USD 0.004 per minute (0.20 Rupee). Sri Lanka has a wholesale rate at USD 0.004 per minute and it also has a regulated minimum retail rate for mobile calls at USD 0.018 per minute.<sup>7</sup> Pakistan and Malaysia<sup>8</sup> are at USD 0.011 and USD 0.017 per minute. Interestingly these countries are still discussing whether the rates are too high and except for Sri Lanka have reduced them in recent years.

## SETTING MTRS

In most countries interconnection is mandatory, but the laws do not specify how interconnection should be paid for by different networks.<sup>9</sup> There are also no ITU recommendations that advise that termination fees should be paid. As shown by the example of France (until 2004) and the United States networks can voluntarily agree to set the MTR at (close to) zero. Regulators have however deemed it necessary in many CPNP countries to set a maximum rate for interconnection fees. Against a backdrop of liberalisation of the overall market this is an unusual step.<sup>10</sup>

The main reason why regulators have set MTRs is that they see the market for terminating wholesale voice services under CPNP (and RPNP if it was used) as a market with a monopoly. Every market party has monopoly power for terminating traffic to its own customers. This is because according to regulators:

- Voice termination is a separate market. There is no way to substitute the network that holds number “A” for another service provider to reach the same network. If the network that holds number “A” decides to raise prices, there is no possibility to call the number via another method.
- In the absence of competition mobile networks have an incentive to set the termination rate on their network above cost. It can extract monopoly rents from those that need to call its network. It can use these rates to compete in other markets.
- Consumers may not change their mobile operator if other users calling them pay high termination rates. In fact, there are cases where the mobile operator would credit the account of the consumer based on the amount of incoming minutes. In addition, some consumers may attempt to maximise on-net calls, for business or personal use, leading to loss of welfare given that not all potential calls will be on-net.
- There is no countervailing buying power between networks. An increase in termination rates cannot be blocked by another network by either raising or lowering its rates. Terminating the

connection is the only option, but that may not be allowed under regulation and even then, a smaller network may be disadvantaged more from such an action than a larger network.<sup>11</sup>

Empirical research has supported the foregoing conclusions and, as a result, regulators in CPNP markets have decided to intervene in these markets.

To set the rates, regulators have to answer some of the following questions:

- What does an MTR pay for? It pays for interconnection, but what does that include? Should all costs be allocated to the MTR? Or are only specific costs included? Should it be cost oriented or is the receiving service provider allowed to charge a margin on top of a cost oriented rate?
- Should policy makers develop a model for interconnection in a country or use a benchmark? Most countries have moved to Long Run Incremental Cost-models that only look at the marginal cost of a terminating minute. For instance the European Union Recommendation on Termination Rates requires countries to adopt the Long Run Incremental Cost (LRIC) approach. Some countries use benchmarks.
- How much of the costs of a service provider are related to the voice service if the service provider also offers other services like SMS, mobile data, Machine to Machine communications, e-mail and so forth. What other services should have a termination rate?
- Are the costs to be allocated on the actual costs of the networks concerned, or are they based on some hypothetical model? A model based on actual costs is known as a top-down model. A model based on a theoretically efficient network is known as a bottom-up model. How to define a theoretically efficient network; is the type of network used of influence, or is a network-less VoIP provider an example of an efficient service provider?
- What if the model shows that different service providers have different cost structures? Does the regulator allow asymmetric rates between networks, where one network receives a higher rate than another?
- When the regulator has determined that the termination rate should be lower, how does it implement this lower rate? Does it do so overnight or does it use a glide path. If it chooses to do so overnight it may disadvantage the mobile service providers. If it does not do so it may disadvantage consumers and other operators such as those for fixed networks.

The answers to these questions are debated and often litigated. Most countries have decided that an appeal will not suspend the regulation of termination rates. If the courts decide to change the decision this is applied retro-actively. Furthermore, many countries have decided that the courts may only evaluate the underlying reasoning of the regulator and not the actual application of the rules to come to the rate. One country, where this was not the case was Mexico, where the experience was that every decision would be challenged in court cases that could take time. In May 2011 Mexico's Supreme Court determined that COFETEL resolutions cannot be suspended where an interconnection rate is fixed between telecommunication network operators.<sup>12</sup>

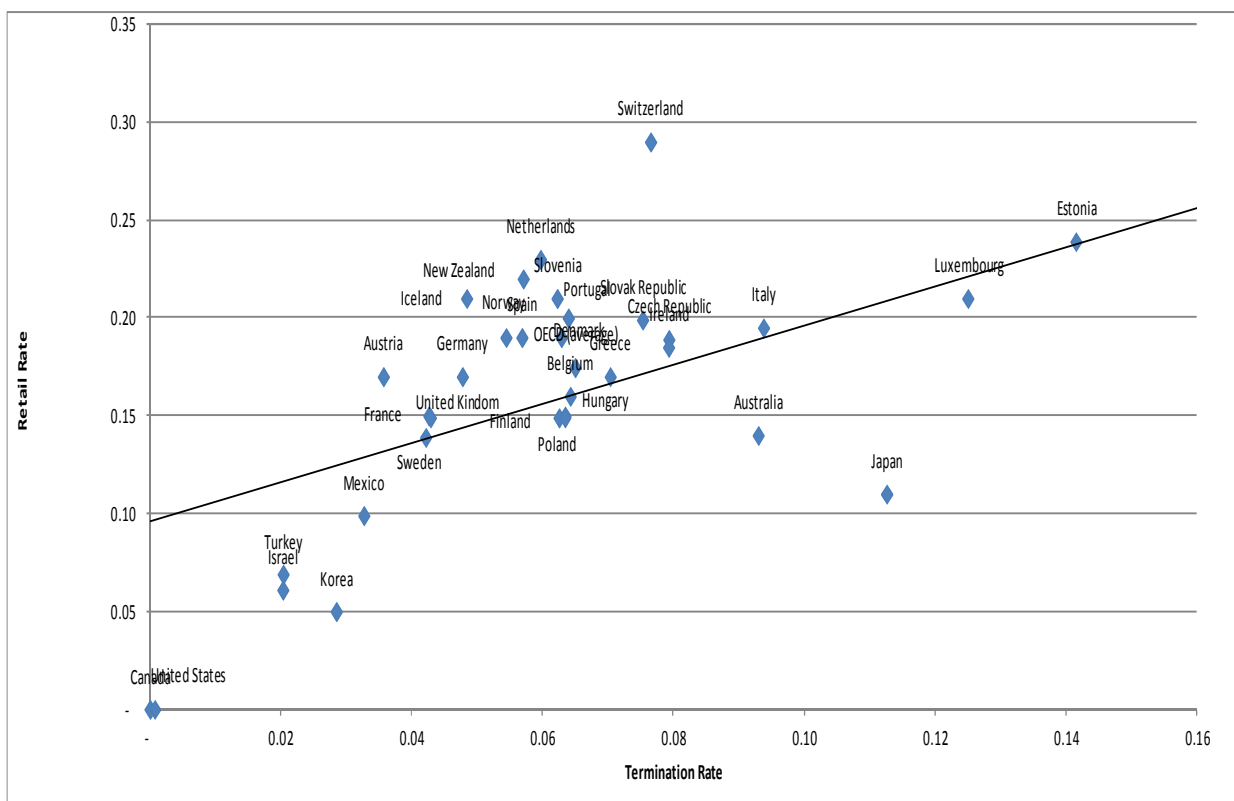
## THE IMPACT OF MOBILE TERMINATION RATES

Mobile termination rates are a source of revenue and costs for voice networks. If rates and traffic flows are symmetrical between networks, then every network receives an amount equal to what it pays. When rates and/or traffic flows are asymmetrical, then some networks will be net payers and others net receivers. The size of the asymmetry in terms of rate as well as traffic determines the impact that termination rates will have. In most countries the rates for calls to mobile networks from fixed networks and vice versa are asymmetrical, with the fixed network paying a higher termination rate than receiving it. This is the key driver behind the impact of mobile termination rates. Other effects of high termination rates are in conjunction with high on-net/off-net price differentials, which help larger operators to potentially leverage external network effects to the detriment of smaller operators.

The income received from the termination of traffic can use the income in various ways to compete in the market. For example, in some cases mobile operators would credit a consumer's account for every full minute of incoming calls. These plans were available in several countries. Such plans are now uncommon and may not exist anymore. The impact of the incoming revenue of termination rates is often not that visible. It is a source of revenue that can be spent on customer acquisition, developing networks, handset subsidies, profits and so forth.

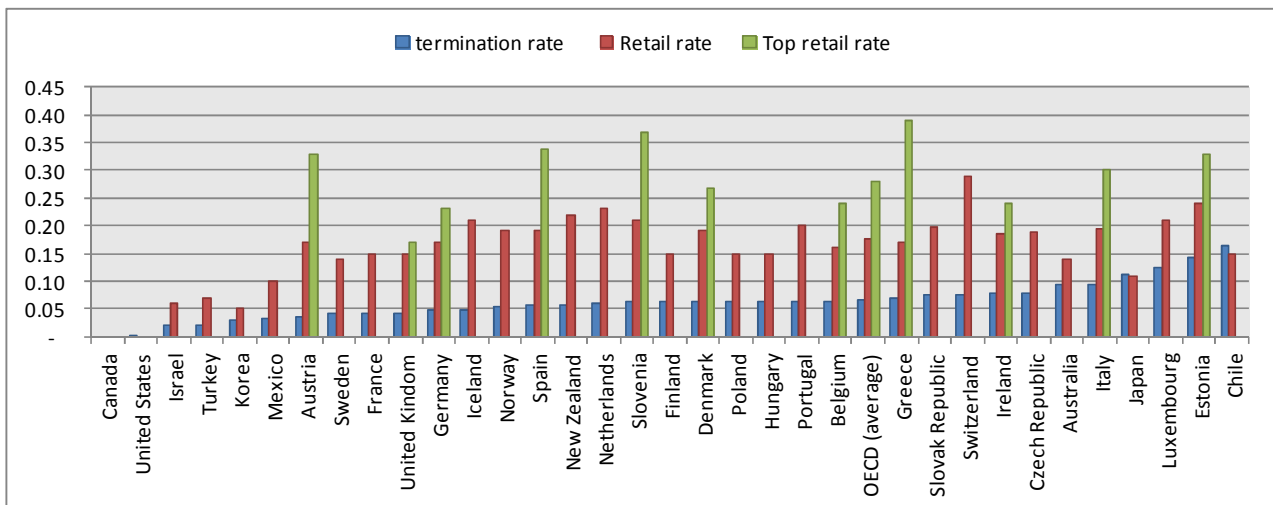
The main effect of termination rates is that they put a direct cost floor on off net voice traffic. Depending on the termination rate this may influence the possibilities for retail models. In the United States mobile operators offer buckets of minutes and even unlimited offers. The size of these buckets and the extent of unlimited plans are much less common outside the United States. In France, the decrease in mobile termination rates has been accompanied by fixed networks offering "free" calling to mobiles in their subscription bundles. The fixed network still pays a termination charge to the mobile network, but in its retail model it does not charge its customers for individual calls. A similar model is followed by Google Voice in the United States. It allows users to forward calls to any phone number they have, using a local number. This is only possible if the termination charge to a mobile is not too high<sup>13</sup>. Higher termination charges also lock in the business model of a fixed or mobile operator into one that requires charging for voice minutes. This does not mean that if termination charges are low or zero a network will not charge for voice calls by the minute, but an innovation and greater flexibility in business models is more likely if termination rates are low or zero.

Figure 4. Termination rates and retail rates for VoIP to mobile calls



One way to analyse the impact of termination rates on retail prices is to evaluate the prices for calls to mobile that are advertised by VoIP-providers. By using data from three VoIP-providers, Google Voice, Skype and Rebtel, and taking for each destination the cheapest rate of the three, it is possible to compare the impact that termination rates have on the retail price of calling to mobile numbers. A scatter diagram of the data shows that there does appear to be a relationship (Figure 4). There are some countries that are significantly below the average retail rate relative to the termination rate, for instance Turkey, Israel and Japan. The retail rate in Turkey and Israel is not below the MTR, so it could be that VoIP-providers accept a lower margin for these countries, compared to other destinations. An alternative hypothesis is that in these countries arbitrage is possible, to deliver voice traffic to mobile networks via a route that charges less than the official MTR. Figure 5 shows that the retail prices for calling to a mobile vary greatly across the OECD, from free to USD 0.39.

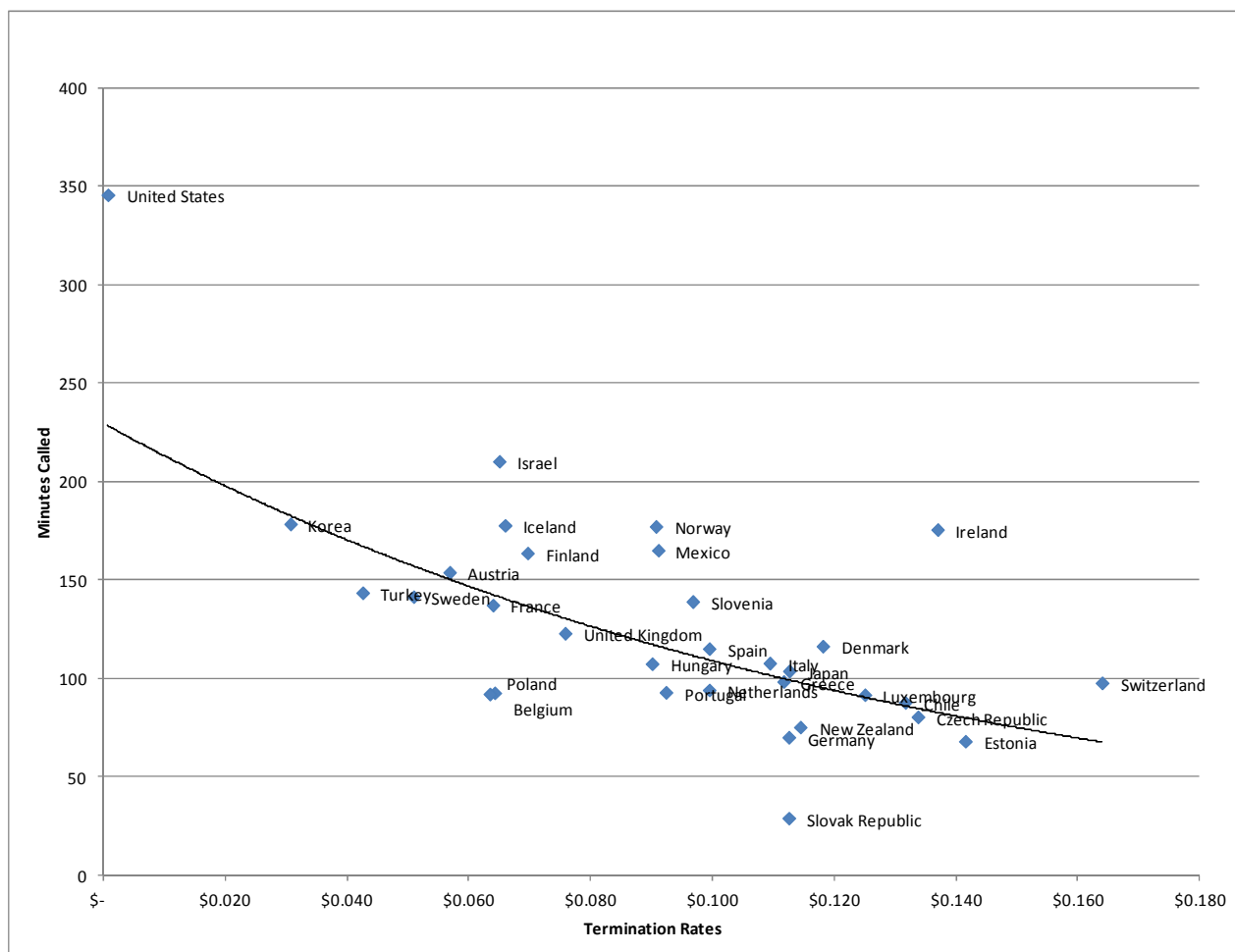
Figure 5. Member countries by retail rate for a VoIP call to mobile: USD



There appears to be a relationship between the number of minutes called and the termination rate. The lower the termination rate, the higher the minutes of use. Several authors have mentioned this effect, mostly based on data from Merrill Lynch<sup>14</sup>. A scatter diagram based on OECD data, for 2009, shows similar results (Figure 6). The data is only for outgoing calls. As the United States records both incoming and outgoing minutes of use the number is nominally halved for the purpose of this comparison. More analysis would be needed, but recent studies suggest that an apparent relationship can be shown to exist between lower wholesale rates and greater usage.<sup>15</sup>



Figure 6. Minutes Called compared to Termination Rates



Decreases in MTRs can result in a lowering of retail prices for telephone calls, but this is not always the case. For a mobile network a decrease in MTRs may result in a reduction in revenue. If such an operator wishes to maintain its revenue at the same level as before it may decide to increase retail prices to its customers. This is known as the “waterbed effect”. An analysis by Genakos and Valetti (2011) argued that a 10% decrease in MTRs resulted in an increase in mobile prices of between 2% and 15% but on average 5%.<sup>16</sup> This effect could be, according to them, most pronounced for users of post-paid subscriptions, for whom the fixed part of subscriptions may rise the most. These authors say prepaid subscribers are less or not at all impacted by the waterbed effect. On the other hand, consumers may not be disadvantaged overall because they may pay less for fixed to mobile calls and benefit from other innovation which may accompany more flexibility for business models. In addition, the prices of mobile services face greater discipline, from market forces, as the pricing is transparent to customers.

In the case of a MTR decrease, fixed network operators and VoIP providers would be expected to decrease the rates for calling to mobiles, as shown by the developments in France. This, however, may not happen immediately. Fixed networks may not pass on the savings at the moment of the decrease, but may keep the increased margins for calls to mobile for some time until competition forces them to change their prices. Price changes may also not be limited to price reductions for fixed to mobile calls. In the Netherlands fixed network operators and transit providers are said to wait before introducing rate reductions until the end of court challenges to MTR decreases, in case the MTR reductions will be

cancelled retroactively. Also, in the Netherlands, the incumbent fixed-line operator and the main challenger recently decreased their fixed-mobile retail prices for the standard telephone offer, but at the same time increased their fixed to fixed retail prices. This meant that there is now a uniform price for fixed-mobile and fixed to fixed calls. In Portugal the retail rates for calls from fixed to mobile are regulated. A reduction of the MTR will thereby be reflected in retail fixed-mobile prices in that country.

To conclude it is difficult to say what the exact impact of MTR decreases may be on retail offers. What can be said is that with a decrease in asymmetry in rates it becomes easier for networks to change their business model from charging by the voice minute to another business model where the importance of voice is less pronounced. The most important change, however, is that operators' prices at the retail level are disciplined by market forces whereas MTRs are not subject to competition due to monopoly power over termination.

### **IS ZERO THE FUTURE?**

Regulators in the OECD are looking into a future where there may possibly not be a charge for interconnection anymore. The FCC in its National Broadband Plan warns that interconnection rates are keeping fixed networks in the United States from moving to Voice over IP.<sup>17</sup> The FCC says this is because VoIP is not eligible for termination rates. It aims to phase out per minute termination charges from 2017-2020. The European regulators and the European Commission are also looking into Bill and Keep as a possible model for interconnection in the future.

With networks moving to "IP high-speed fixed and wireless broadband", the question can be asked as to whether or not MTRs and other types of termination rates will decline without regulatory intervention. Peering and Transit arrangements between Internet networks are generally not subject to regulation and it may be that mobile operators will adopt this model for interconnection between networks. However, this may not occur as in some countries a network can request to be paid for telephony interconnection, through cascading payments, something which does not exist for Internet interconnection. For some services, it may seem that users may move to over-the-top services that do not have traditional interconnect arrangements or do not interconnect with other services at all. Examples include Blackberry's Ping network chat, Whatsapp, KaoKaoTalk and other SMS type services or Skype and Facetime for video calling. The difference is however that though these services work across network operators, they do not interconnect across service providers. A Whatsapp user may use a phone number to identify itself in the Whatsapp application, it cannot receive a message from a traditional SMS user.

In traditional telephony, however, it seems less likely that termination rates will be bypassed in the short term. The telephony service is uniformly standardised across service providers and service providers need to guarantee interconnection. The telephone number is still the most used identifier in the world and the only one that almost guarantees a possibility to connect on a global scale. The telephony provider still has a right to require a termination rate from another service provider. Though an e-mail address comes close in its ability for global reach, and does not carry with it a requirement to pay the receiver, it has not found a similar use in messaging and voice services.

Several studies have been undertaken on the influence that greater use of B&K may have on the market.<sup>18</sup> Some studies are positive, others warn of possible drawbacks. Some believe that having low termination rates will result in overall welfare gains for consumers. In any event it can be noted that reducing the reliance on segments subject to monopoly power, and aligning pricing with market segments subject to market forces should be positive. It would not do the discussion justice to summarize it here. Future work could look, in greater depth, into the benefits and drawbacks of moving to a different interconnection system.

NOTES

- <sup>1</sup> There is a difference in methodology between the OECD and BEREC. BEREC's methodology is explained in short on the first page of their twice yearly report. Calculating the averages would require knowledge of past market shares, distributions between peak and off-peak, which is data not all countries have available. The OECD has therefore chosen to base its methodology on the MTR for the largest mobile operator. [www.erg.eu/streaming/BoR%20\(11\)%2027%20MTR%20benchmark%20snapshot.pdf?contentId=547187&field=ATTACHED\\_FILE](http://www.erg.eu/streaming/BoR%20(11)%2027%20MTR%20benchmark%20snapshot.pdf?contentId=547187&field=ATTACHED_FILE)
- <sup>2</sup> The average is used for Ireland as other data weren't available.
- <sup>3</sup> "Study on the future of interconnection charging methods", INFISO/B Smart 2009/0014, Tera Consultants, 23 November 2010. Similar descriptions can be found in the documents of the ERG, BEREC, European Commission and national regulators. The description applies to the majority of member states, except for Canada, Japan, Korea and United States.
- <sup>4</sup> "Study on the future of interconnection charging methods", INFISO/B Smart 2009/0014, Tera Consultants, 23 November 2010 and Presentation by Benoit Loutrel, Arcep on Bill and Keep in the French Mobile industry, WIK conference, 4-5 April, 2006
- <sup>5</sup> Dewenter, R. & Kruse, J., (2011). Calling party pays or receiving party pays? The diffusion of mobile telephony with endogenous regulation. *Information Economics and Policy*, 23(1), p.107-117. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0167624510000478>.
- <sup>6</sup> 2011 Section 1377 Review on compliance with Telecommunications Trade Agreements, Ambassador Ronald Kirk. Available at: [www.ustr.gov/sites/default/files/FINAL%20REPORT%20FOR%20PUBLICATION%20\(5%20APRIL11\).pdf](http://www.ustr.gov/sites/default/files/FINAL%20REPORT%20FOR%20PUBLICATION%20(5%20APRIL11).pdf)
- <sup>7</sup> Sri Lanka price floor for mobile calls - Rohan Samarajiva, July 12, 2010, [www.lankabusinessonline.com/fullstory.php?nid=1764315906](http://www.lankabusinessonline.com/fullstory.php?nid=1764315906)
- <sup>8</sup> [www.scribd.com/doc/33804287/Telecommunication-MCMC-Announces-New-Termination-Rates-02-07-2010](http://www.scribd.com/doc/33804287/Telecommunication-MCMC-Announces-New-Termination-Rates-02-07-2010)
- <sup>9</sup> This paragraph partly written based on "Study on the future of interconnection charging methods", INFISO/B Smart 2009/0014, Tera Consultants, 23 November 2010. Similar descriptions can be found in the documents of the ERG, BEREC, European Commission and national regulators. The description applies to the majority of member states, except for Canada, Japan, Korea and United States.
- <sup>10</sup> The European Regulators Group (now BEREC) concluded that "The possibility to exploit SMP results from the interplay between the three factors: a) physical monopoly for termination; b) charging principles; and c) control of the E-164 number." (see ERG (08) 26, Ch. B.2.3; C.3.2 and C.6.5).
- <sup>11</sup> Research on countervailing buying power for mobile call termination, The Dutch Case, prepared for OPTA, Oxera, April 2007, [www.opta.nl/nl/download/bijlage/?id=537](http://www.opta.nl/nl/download/bijlage/?id=537)

- <sup>12</sup> In Mexico the Supreme Court decision (3 May 2011) means that appeals cannot suspend termination rates, as set by COFETEL (Federal Telecommunications Commission) when private operators cannot reach an agreement.”
- <sup>13</sup> Google Voice will not interconnect to certain numbers in areas with high termination rates in the United States. It accuses these numbers of traffic dumping. See <http://googlepublicpolicy.blogspot.com/2009/10/our-response-to-fcc-on-google-voice.html> and more specifically answer 4 to the FCC’s questions. [http://google.com/googleblogs/pdfs/google\\_voicecallrestrictions\\_102809.pdf](http://google.com/googleblogs/pdfs/google_voicecallrestrictions_102809.pdf).
- <sup>14</sup> Littlechild, S.C., 2006. Littlechild, Mobile termination charges: calling party pays versus receiving party pays, *Telecommun. Policy* 30 (2006), pp. 242–277 and Marcus, S. J. 2004. “Call Termination Fees: The U.S. in Global Perspective”, Paper presented at the 4<sup>th</sup> ZEW conference on the Economics of ICT, Mannheim.
- <sup>15</sup> C. Growitsch, J. S. Marcus, C. Wernick (2010), The effects of lower Mobile Termination Rates (MTRs) on Retail Price and Demand, 8 April, 2010
- <sup>16</sup> Genakos, C., Valletti, T. Seesaw (2011) in the air: Interconnection regulation and the structure of mobile tariffs. *Inf. Econ. Policy* (2011), doi:10.1016/j.infoecopol.2011.01.005
- <sup>17</sup> (2010) Chapter 8 National Broadband Plan, FCC.
- <sup>18</sup> See for instance the study by Tera Consultants, Marcus and Littlechild mentioned in earlier footnotes and the BEREK Common Statement on Next Generation Future Charging Mechanisms / Long Term Termination issues (BoR (10) 24rev1).

## ANNEX 1 INTERCONNECTION MODELS

### **Wholesale - Calling Party Network Pays (CPNP)**

This is the dominant wholesale interconnection model in the OECD and also globally for any type of telephone call, fixed, mobile and international. The service provider of the caller pays the service provider of the receiving party a fee for terminating the traffic on their service. The fee is known as a termination charge. The charge is generally per minute of voice interconnection. The fee is said to be symmetrical if it is the same for all types of networks. A fee is asymmetrical if one service provider receives more per minute of interconnected traffic, than another service provider. In many OECD countries the amount of the fee is regulated by governments. The reason is that the receiving service provider has a monopoly with regards to the users on its service and can therefore exercise market power and set the fee at any rate it sees fit. In many OECD-countries the fees are asymmetric, with mobile networks receiving more per minute as a mobile termination rate (MTR) than fixed networks receive in fixed termination rates (FTR), but there are some countries, such as in the United States, where this can be the other way round.

The wholesale termination fee is levied by the receiving service provider to the originating service provider. If use is made of a transit provider, as a service provider, it can levy a further charge on top of the termination charge. If there are multiple transit providers, then the charge will be carried over the networks to the originating network, this is known as cascading payments. The originating service provider then has the choice to have a retail model where the termination charge plus transit charges are leveraged on the end-user directly or to choose a different retail model.

### **Wholesale - Receiving Party Network Pays (RPNP)**

The Receiving Party Network Pays model means that the receiving party's service provider will pay an originating charge to the service provider from which the caller originates. There are no countries where such a model exists at the moment. As there is an originating monopoly here, the fixed network is regulated by the regulator, in the fee it can charge to the mobile network, for the originating traffic from its network.

### **Wholesale - Bill and Keep (B&K)**

In Bill and Keep, or Sender Keeps All as it is also known, the service provider from which the call originates does not need to pay anything to the service provider that the traffic terminates on. It may have to pay a fee to a transit provider, but the transit provider is not charged by the receiving service provider for the traffic it delivers on the receiving provider. The originating service provider can bill its customer for the telephony service, but it does not have to share this money with the service provider that received the call. Some countries have regulated that voice interconnection is done on a Bill and Keep basis. In some other situations networks have mutually agreed not to charge each other for traffic delivered on each other's networks.

Some critics of Bill and Keep, as a model, argue that it requires a Receiving Party Pays model retail arrangement. Such a model is however not acceptable to consumers in many countries. In practice, however, there is no evidence that Bill and Keep requires RPP as a retail arrangement. Singapore for instance has a Bill and Keep wholesale model, but Calling Party Pays as the retail model and mobile operators in France used Bill and Keep in conjunction with a CPP retail model until 2004.

## Wholesale - Peering and Transit

This model is in some literature often equated with Bill and Keep, but it is quite different in practice. It is the most common model for internet interconnection. The main differences are:

1. Wholesale Internet interconnection (transit) is paid for on a peak capacity basis, measured in dollars/gbit/s, not on a per unit (minute or gigabyte) basis. This is similar to the Canadian model for interconnection between fixed and mobile.<sup>1</sup>
2. Wholesale Internet interconnection (transit) is paid for irrespective of the direction of traffic. Thus, whether a network needs 100gbit/s one way, the other way, or both ways is irrelevant for the price it pays.
3. Wholesale Internet interconnection (transit) is in principle the carriage of traffic to all other networks on the Internet. Though it is possible to block access to specific networks behind a transit provider, the assumption is that networks will accept all routes to and from their transit providers. This is unlike some interconnection disputes in telephony, where some networks may refuse to send or receive traffic to a competitor's network even when the competitor used a transit provider.<sup>2</sup>
4. Wholesale Internet interconnection (transit) is open to any organisation with an Autonomous System Number. In the OECD this means that any type of organisation, government, private companies, public telecommunications companies can, and do, enter into wholesale Internet interconnection agreements. This is not possible for telephony as private organisations are not entitled to routing codes, telephone numbers and so forth. The result is a more dynamic market place with "non telecommunication companies" (*i.e.* webhosting companies, content companies, governments) bypassing retail arrangements to access wholesale arrangements.
5. Peering is the result of bypassing a transit provider by two networks. They agree to exchange traffic directly between their networks. This only gives access to the networks and customers of the two parties. As both parties save an equal amount of capacity from their transit bill, these relationships are always symmetric from a capacity point of view. From a financial point of view it is more difficult to estimate who benefits, because this is dependent upon the locations both parties buy their transit (*e.g.* Amsterdam tends to be cheaper than Rio de Janeiro) and the volume they buy capacity in (*e.g.* Akamai is bigger than a small ISP). So it can well be that the bigger content provider benefits less than the smaller telecommunications company. At Internet exchanges multi-lateral peering agreements are sometimes used.

A result of this model is that there is no terminating monopoly with regards to Internet traffic. If an operator refuses direct interconnection or charges a rate for direct interconnection which the other party deems too high, there is always the option of using a transit provider. If the transit provider is too expensive, both peering and competition will enable a network to switch part or all of their traffic away from that provider.

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<sup>1</sup> It may be possible to calculate a marginal cost based upon various cost pricing models. In the day-to-day operation of the business of an ISP, content provider or private business, the cost of a unit of traffic is not relevant, but the peak capacity used is.

<sup>2</sup> Though uncommon in the OECD it has been reported in other countries, for instance in Cambodia between Mfon and Metfone in 2010, between Liberian Lonestar and Cellcom in 2011 and for SMS interconnection between Digicel and Telesur in Suriname 2009. Peering disputes between so-called Tier 1 networks have left some customers unable to reach the whole Internet. However, only single-homed wholesale customers and retail customers were affected, with the single-homed customers being able to bypass the loss of connection by buying transit from a second network, either the other party in the dispute or a third party.

There are a few service providers that do not need to contract any other service provider for transit. These are known as Tier 's. They receive transit fees for all other service providers connected, except for other Tier 1s and the service providers connected to those. Though at first seeming to be an enviable condition, only receiving and not paying transit fees, the customers of a Tier 1 will continuously try to set up peering to decrease their transit costs. Furthermore they face a threat from other Tier 1 providers who compete for the same customers and may choose to cancel the peering arrangements. Thus unless a Tier 1 has competitive downwards pricing the service providers it provides transit to will go elsewhere. Peering and transit is further discussed in Internet traffic exchange: Market developments and policy challenges" [DSTI/ICCP/CISP\(2011\)2/FINAL](#) (forthcoming).

### **Retail - Calling Party Pays (CPP)**

The dominant retail model for telephony is Calling Party Pays. The caller will pay for their communication, the receiver of the communication does not pay for the communication. This payment is generally time based on a second or minute basis. If it is combined with a CPNP wholesale arrangement, the caller will pay a charge based on the termination rate, a transit fee if applicable and the charge its network charges per minute, plus appropriate margins. CPP can also be combined with the other wholesale models RPP and BAK. In Singapore where B&K is used at the wholesale level, CPP is used for retail. In Sri Lanka the wholesale model for traffic from the fixed network to the mobile network was Bill and Keep, but the retail model used was first RPP with CPP, but changed to CPP under competitive pressure. In 2010 the wholesale model changed to CPNP in Sri Lanka.

### **Retail - Receiving Party Pays (RPP)**

In a RPP retail model, the consumer does not pay for the calls they make, but for the calls they receive and the caller does not pay. In a strict sense there is not any mobile or fixed network that uses this model. It was used in some form in Sri Lanka for a while as a complement to the wholesale model, however competition made mobile companies abandon this system for a CPP retail model. Companies and public organisations, however, do sometimes choose such a model for instance for their inbound callcenters. Mobile subscriptions in the United States are sometimes described as RPP as the user has a bundle of minutes from which both incoming and outgoing calls are deducted. Strictly speaking this is not an RPP-model, as the consumer pays for both incoming and outgoing calls. It might therefore be more correct to say that this model is Both Parties Pay (BPP) Some literature, perhaps as shorthand, equates the United States with Receiving Party Pays but it may be more accurate to describe this as a bundle.

### **Retail - Bundles**

Voice can also be sold in bundles of minutes, alone or together with other services. There are several ways in which a bundle can be structured. A retail model is not bundled if the consumer can buy an amount of outgoing minutes up front, that would be regarded as CPP. However if incoming and outgoing minutes are included in the way of Both Parties Pay, or when other services like SMS, MMS and other messaging is included, then it is seen as bundled. As explained in the previous paragraph in the United States incoming and outgoing minutes are paid for in a bundle, from which both incoming as well as outgoing minutes are deducted. In France, the retail model for calling to fixed national, international and, since recently, also to domestic mobile telephones is an 'unlimited' offer as part of some bundles. In the Netherlands some offers are for an amount of credits, a credit can be used on an SMS or minute of calling. The customer therefore buys a bundle of voice minutes and SMS's combined. For every minute called or SMS sent a credit is deducted. In countries where the wholesale model is based on CPNP, a telephony provider will likely need to make some statistical assessment of the wholesale costs and income and how this interacts with the price of the retail bundle. For the consumer, however, the wholesale arrangement is not visible in the conditions of the retail offer. In many countries the phone itself is also part of the bundle. In Internet subscriptions e-mail is a type of communication service that is part of the bundle, but does not' have a per unit charge associated with it.

## ANNEX 2 MOBILE TERMINATION RATES IN USD

	01-01-2004	07-01-2004	01-03-2004	01-04-2004	01-07-2004	01-10-2004	01-12-2004	01-01-2005	01-03-2005	38418	01-04-2005	25-05-2005	01-06-2005
Australia					0.2169	0.2169	0.2169	0.2169	0.2169	0.21693	0.2169	0.2169	0.2169
Austria													
Belgium													
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	0.2992	0.2956	0.2089	0.2105	0.2268	0.2375	0.2344	0.2320	0.2202	0.2256755	0.2257	0.2319	0.2319
Czech Republic													
Denmark													
Estonia													
Finland			0.1279	0.1279	0.1279	0.1279	0.1193	0.1193	0.1193	0.1193388	0.1193	0.1193	0.0966
France	0.2123	0.2123	0.2123	0.2123	0.2123	0.2123	0.2123	0.1776	0.1776	0.1775875	0.1776	0.1776	0.1776
Germany													
Greece													
Hungary												0.1453	0.1453
Iceland													
Ireland								0.1600	0.1600	0.1599708	0.1600	0.1600	0.1600
Israel									0.0945	0.0945011	0.0945	0.0945	0.0945
Italy													
Japan	0.1819	0.1819	0.1819	0.1674	0.1674	0.1674	0.1674	0.1674	0.1674	0.1674492	0.1581	0.1581	0.1581
Korea	0.0297	0.0297	0.0297	0.0297	0.0297	0.0297	0.0297	0.0291	0.0291	0.0291096	0.0291	0.0291	0.0291
Luxembourg													
Mexico								0.1429	0.1429	0.1428876	0.1429	0.1429	0.1429
Netherlands													
New Zealand													
Norway													
Poland													
Portugal									0.2628	0.198898	0.1989	0.1989	0.1989
Slovak Republic								0.2011	0.2011	0.2011314	0.2011	0.2011	0.2011
Slovenia													
Spain	0.2063	0.2063	0.2063	0.2063	0.2063	0.1823	0.1823	0.1823	0.1823	0.1822644	0.1823	0.1823	0.1823
Sweden													
Switzerland	0.3662	0.3662	0.3662	0.3662	0.3662	0.3662	0.3662	0.2186	0.2186	0.21862	0.2186	0.2186	0.2186
Turkey						0.1013	0.1013	0.0961	0.0961	0.0961112	0.0961	0.0961	0.0961
United Kindom													
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
OECD (average)	0.1852	0.1847	0.1667	0.1651	0.1727	0.1642	0.1631	0.1495	0.1526	0.148745	0.1481	0.1483	0.1469
OECD (high)	0.3662	0.3662	0.3662	0.3662	0.3662	0.3662	0.3662	0.2320	0.2628	0.2256755	0.2257	0.2319	0.2319



DSTI/ICCP/CISP(2011)3/FINAL

	01-07-2005	01-09-2005	01-10-2005	13-10-2005	01-11-2005	01-01-2006	01-03-2006	01-04-2006	01-05-2006	38899	01-09-2006	01-10-2006	01-11-2006
Australia	0.1859	0.1859	0.1859	0.1859	0.1859	0.1859	0.1859	0.1859	0.1859	0.15495	0.1550	0.1550	0.1550
Austria	0.1543	0.1543	0.1543	0.1543	0.1469	0.1327	0.1327	0.1327	0.1327	0.1184864	0.1185	0.1185	0.1185
Belgium	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1799	0.1576977	0.1577	0.1577	0.1577
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	0.2307	0.2360	0.2338	0.2304	0.2304	0.2286	0.2230	0.2308	0.2304	0.2366312	0.2471	0.2488	0.2432
Czech Republic						0.1800	0.1800	0.1800	0.1800	0.1730941	0.1731	0.1731	0.1731
Denmark									0.1600	0.16002	0.1600	0.1600	0.1600
Estonia										0.1747605	0.1748	0.1748	0.1748
Finland	0.0966	0.0966	0.0966	0.0966	0.0966	0.0966	0.0966	0.0966	0.0966	0.0966076	0.0966	0.0966	0.0966
France	0.1776	0.1776	0.1776	0.1776	0.1776	0.1350	0.1350	0.1350	0.1350	0.1349665	0.1350	0.1350	0.1350
Germany										0.156277	0.1563	0.1563	0.1563
Greece													
Hungary	0.1453	0.1453	0.1453	0.1453	0.1453	0.1453	0.1453	0.1453	0.1453	0.1453052	0.1453	0.1453	0.1453
Iceland						0.0785	0.0785	0.0785	0.0785	0.078496	0.0753	0.0753	0.0753
Ireland	0.1600	0.1600	0.1600	0.1600	0.1600	0.1485	0.1485	0.1485	0.1485	0.1497418	0.1497	0.1497	0.1497
Israel	0.0945	0.0945	0.0945	0.0945	0.0945	0.0945	0.0856	0.0856	0.0856	0.0856416	0.0856	0.0856	0.0856
Italy						0.1719	0.1719	0.1719	0.1719	0.1591184	0.1591	0.1591	0.1591
Japan	0.1581	0.1581	0.1581	0.1581	0.1581	0.1581	0.1581	0.1545	0.1545	0.1544575	0.1545	0.1545	0.1545
Korea	0.0291	0.0291	0.0291	0.0291	0.0291	0.0309	0.0309	0.0309	0.0309	0.0308823	0.0309	0.0309	0.0309
Luxembourg						0.2131	0.2131	0.2131	0.2131	0.1960566	0.1961	0.1961	0.1961
Mexico	0.1429	0.1429	0.1429	0.1429	0.1429	0.1287	0.1287	0.1287	0.1287	0.1286824	0.1287	0.1287	0.1287
Netherlands													
New Zealand													
Norway					0.1234	0.1234	0.1234	0.1234	0.1234	0.11791	0.1179	0.1179	0.1179
Poland									0.1513	0.1512632	0.1513	0.1513	0.1513
Portugal	0.1918	0.1918	0.1847	0.1847	0.1847	0.1776	0.1776	0.1705	0.1705	0.1633805	0.1634	0.1634	0.1563
Slovak Republic	0.2011	0.2011	0.2011	0.2011	0.2011	0.1891	0.1891	0.1891	0.1891	0.189106	0.1891	0.1891	0.1891
Slovenia													
Spain	0.1823	0.1823	0.1632	0.1632	0.1632	0.1632	0.1632	0.1632	0.1632	0.1631603	0.1632	0.1583	0.1583
Sweden	0.1034	0.1034	0.1034	0.1034	0.1034	0.1034	0.1034	0.1034	0.1034	0.10335	0.1034	0.1034	0.1034
Switzerland	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.2186	0.21862	0.2186	0.2186	0.2186
Turkey	0.0961	0.0961	0.0909	0.0909	0.0909	0.0909	0.0909	0.0909	0.0909	0.090916	0.0909	0.0909	0.0909
United Kindom								0.0869	0.0869	0.0868968	0.0869	0.0869	0.0869
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
OECD (average)	0.1447	0.1450	0.1432	0.1430	0.1417	0.1406	0.1400	0.1378	0.1391	0.137144	0.1374	0.1373	0.1368
OECD (high)	0.2307	0.2360	0.2338	0.2304	0.2304	0.2286	0.2230	0.2308	0.2304	0.2366312	0.2471	0.2488	0.2432

## DSTI/ICCP/CISP(2011)3/FINAL

	23-11-2006	01-01-2007	01-03-2007	01-04-2007	01-05-2007	01-06-2007	01-07-2007	15-08-2007	01-10-2007	39417	01-01-2008	01-03-2008	01-04-2008
Australia	0.1550	0.1240	0.1240	0.1240	0.1240	0.1240	0.0930	0.0930	0.0930	0.09297	0.0930	0.0930	0.0930
Austria	0.1185	0.1013	0.1013	0.1013	0.1013	0.1013	0.0840	0.0840	0.0840	0.0839634	0.0813	0.0813	0.0813
Belgium	0.1577	0.1382	0.1382	0.1382	0.1382	0.1382	0.1212	0.1212	0.1212	0.1211857	0.1063	0.1063	0.1063
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	0.2388	0.2364	0.2399	0.2385	0.2417	0.2437	0.2425	0.2515	0.2537	0.2560602	0.2615	0.2559	0.2538
Czech Republic	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1730941	0.1731	0.1731	0.1731
Denmark	0.1600	0.1600	0.1600	0.1600	0.1372	0.1372	0.1372	0.1372	0.1372	0.13716	0.1372	0.1372	0.1372
Estonia	0.1748	0.1748	0.1748	0.1748	0.1748	0.1748	0.1415	0.1415	0.1415	0.1415133	0.1415	0.1415	0.1415
Finland	0.0966	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0937662	0.0725	0.0725	0.0725
France	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1066	0.1066	0.1066	0.1065525	0.0923	0.0923	0.0923
Germany	0.1247	0.1247	0.1247	0.1247	0.1247	0.1247	0.1247	0.1247	0.1247	0.1125194	0.1125	0.1125	0.1125
Greece							0.1516	0.1516	0.1516	0.1515887	0.1516	0.1516	0.1516
Hungary	0.1453	0.1239	0.1239	0.1239	0.1239	0.1239	0.1239	0.1239	0.1239	0.1239132	0.1056	0.1056	0.1056
Iceland	0.0753	0.0753	0.0753	0.0753	0.0753	0.0722	0.0722	0.0722	0.0722	0.06908	0.0691	0.0691	0.0691
Ireland	0.1497	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429224	0.1411	0.1411	0.1411
Israel	0.0856	0.0856	0.0768	0.0768	0.0768	0.0768	0.0768	0.0768	0.0768	0.0767822	0.0768	0.0650	0.0650
Italy	0.1591	0.1591	0.1591	0.1591	0.1591	0.1591	0.1384	0.1384	0.1384	0.138433	0.1384	0.1384	0.1384
Japan	0.1545	0.1545	0.1545	0.1472	0.1472	0.1472	0.1472	0.1472	0.1472	0.1472399	0.1472	0.1472	0.1299
Korea	0.0309	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306	0.0306024	0.0312	0.0312	0.0312
Luxembourg	0.1961	0.1776	0.1776	0.1776	0.1776	0.1605	0.1605	0.1605	0.1605	0.1605391	0.1421	0.1421	0.1421
Mexico	0.1287	0.1120	0.1120	0.1120	0.1120	0.1120	0.1120	0.1120	0.1120	0.1119704	0.1011	0.1011	0.1011
Netherlands								0.1421	0.1421	0.14207	0.1421	0.1421	0.1421
New Zealand			0.1525	0.1297	0.1297	0.1297	0.1297	0.1297	0.1297	0.129659	0.1297	0.1297	0.1220
Norway	0.1179	0.1179	0.1179	0.1179	0.1179	0.1179	0.1088	0.1088	0.1088	0.10884	0.1088	0.1088	0.1088
Poland	0.1513	0.1513	0.1513	0.1513	0.1281	0.1281	0.1281	0.1281	0.1281	0.1280821	0.1281	0.1281	0.1281
Portugal	0.1563	0.1563	0.1563	0.1563	0.1563	0.1563	0.1563	0.1563	0.1563	0.156277	0.1563	0.1563	0.1563
Slovak Republic	0.1891	0.1754	0.1754	0.1754	0.1754	0.1754	0.1754	0.1754	0.1754	0.17543	0.1603	0.1603	0.1603
Slovenia					0.0967	0.0967	0.0967	0.0967	0.0967	0.0967497	0.0967	0.0967	0.0967
Spain	0.1583	0.1583	0.1583	0.1465	0.1465	0.1465	0.1465	0.1465	0.1347	0.1346824	0.1347	0.1347	0.1112
Sweden	0.1034	0.1034	0.1034	0.1034	0.1034	0.1034	0.0875	0.0875	0.0875	0.08745	0.0875	0.0875	0.0875
Switzerland	0.2186	0.2022	0.2022	0.2022	0.2022	0.2022	0.2022	0.2022	0.2022	0.2022235	0.1804	0.1804	0.1804
Turkey	0.0909	0.0909	0.0883	0.0883	0.0883	0.0883	0.0883	0.0883	0.0883	0.0883184	0.0883	0.0883	0.0591
United Kindom	0.0869	0.0869	0.0869	0.0819	0.0819	0.0819	0.0819	0.0819	0.0819	0.0819083	0.0819	0.0819	0.0758
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
OECD (average)	0.1356	0.1299	0.1304	0.1287	0.1263	0.1266	0.1211	0.1220	0.1217	0.1213408	0.1173	0.1168	0.1142
OECD (high)	0.2388	0.2364	0.2399	0.2385	0.2417	0.2437	0.2425	0.2515	0.2537	0.2560602	0.2615	0.2559	0.2538

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	01-05-2008	01-06-2008	01-07-2008	15-07-2008	01-08-2008	01-10-2008	01-01-2009	08-01-2009	24-01-2009	39845	01-04-2009	01-05-2009	05-05-2009
Australia	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.09297	0.0930	0.0930	0.0930
Austria	0.0813	0.0813	0.0813	0.0813	0.0813	0.0813	0.0813	0.0813	0.0813	0.081264	0.0813	0.0813	0.0813
Belgium	0.1063	0.1063	0.1063	0.1063	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642156	0.0642	0.0642	0.0642
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A
Chile	0.2489	0.2521	0.2625	0.2720	0.2720	0.2901	0.3295	0.3268	0.3122	0.3121509	0.3016	0.2949	0.1712
Czech Republic	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1731	0.1534	0.1534	0.1534112	0.1534	0.1534	0.1534
Denmark	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.1181	0.11811	0.1181	0.1029	0.1029
Estonia	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415133	0.1415	0.1415	0.1415
Finland	0.0725	0.0725	0.0725	0.0725	0.0725	0.0725	0.0696	0.0696	0.0696	0.0696143	0.0696	0.0696	0.0696
France	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923455	0.0923	0.0923	0.0923
Germany	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125194	0.1125	0.1125	0.1125
Greece	0.1516	0.1516	0.1516	0.1516	0.1421	0.1421	0.1117	0.1117	0.1117	0.111667	0.1117	0.1117	0.1117
Hungary	0.1056	0.1056	0.1056	0.1056	0.1056	0.1056	0.0901	0.0901	0.0901	0.0900603	0.0901	0.0901	0.0901
Iceland	0.0691	0.0659	0.0659	0.0659	0.0659	0.0659	0.0659	0.0659	0.0659	0.065912	0.0659	0.0659	0.0659
Ireland	0.1411	0.1411	0.1411	0.1411	0.1411	0.1411	0.1361	0.1361	0.1361	0.1361031	0.1361	0.1361	0.1361
Israel	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0649695	0.0650	0.0650	0.0650
Italy	0.1384	0.1384	0.1204	0.1204	0.1204	0.1204	0.1204	0.1204	0.1204	0.1204367	0.1204	0.1204	0.1048
Japan	0.1299	0.1299	0.1299	0.1299	0.1299	0.1299	0.1299	0.1299	0.1299	0.1299175	0.1126	0.1126	0.1126
Korea	0.0312	0.0312	0.0312	0.0312	0.0312	0.0312	0.0307	0.0307	0.0307	0.0306957	0.0307	0.0307	0.0307
Luxembourg	0.1421	0.1421	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250216	0.1250	0.1250	0.1250
Mexico	0.1011	0.1011	0.1011	0.1011	0.1011	0.1011	0.0911	0.0911	0.0911	0.0910804	0.0911	0.0911	0.0911
Netherlands	0.1421	0.1421	0.1279	0.1279	0.1279	0.1279	0.1279	0.1279	0.1279	0.127863	0.1279	0.1279	0.1279
New Zealand	0.1220	0.1220	0.1220	0.1220	0.1220	0.1220	0.1220	0.1220	0.1220	0.122032	0.1144	0.1144	0.1144
Norway	0.1088	0.1088	0.1088	0.1088	0.1088	0.1088	0.1088	0.1088	0.1088	0.10884	0.1088	0.1088	0.1088
Poland	0.1281	0.1281	0.1281	0.1281	0.1281	0.1281	0.0818	0.0818	0.0818	0.0817578	0.0818	0.0818	0.0818
Portugal	0.1563	0.1563	0.1563	0.1137	0.1137	0.1066	0.0994	0.0994	0.0994	0.099449	0.0923	0.0923	0.0923
Slovak Republic	0.1603	0.1603	0.1603	0.1603	0.1603	0.1603	0.1125	0.1125	0.1125	0.1125194	0.1125	0.1125	0.1125
Slovenia	0.0967	0.0967	0.0967	0.0967	0.0967	0.0967	0.0967	0.0967	0.0967	0.0967497	0.0967	0.0967	0.0967
Spain	0.1112	0.1112	0.1112	0.1112	0.1112	0.1112	0.1112	0.1112	0.1112	0.1112408	0.0994	0.0994	0.0994
Sweden	0.0875	0.0875	0.0684	0.0684	0.0684	0.0684	0.0684	0.0684	0.0684	0.06837	0.0684	0.0684	0.0684
Switzerland	0.1804	0.1804	0.1804	0.1804	0.1804	0.1804	0.1640	0.1640	0.1640	0.163965	0.1640	0.1640	0.1640
Turkey	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0591	0.0590954	0.0591	0.0425	0.0425
United Kindom	0.0758	0.0758	0.0758	0.0758	0.0758	0.0758	0.0758	0.0758	0.0758	0.0757933	0.0758	0.0758	0.0758
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
OECD (average)	0.1134	0.1134	0.1117	0.1107	0.1091	0.1095	0.1051	0.1045	0.1040	0.1040107	0.1024	0.1012	0.0970
OECD (high)	0.2489	0.2521	0.2625	0.2720	0.2720	0.2901	0.3295	0.3268	0.3122	0.3121509	0.3016	0.2949	0.1712

## DSTI/ICCP/CISP(2011)3/FINAL

	01-07-2009	24-09-2009	01-10-2009	01-01-2010	24-01-2010	01-02-2010	01-04-2010	01-05-2010	24-05-2010	40360	07-07-2010	24-08-2010	01-09-2010
Australia	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.09297	0.0930	0.0930	0.0930
Austria	0.0568	0.0568	0.0568	0.0497	0.0497	0.0497	0.0497	0.0497	0.0497	0.0427631	0.0428	0.0428	0.0428
Belgium	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642156	0.0642	0.0642	0.0642
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	0.1712	0.1674	0.1674	0.1651	0.1689	0.1642	0.1624	0.1623	0.1631	0.1652052	0.1652	0.1661	0.1661
Czech Republic	0.1337	0.1337	0.1337	0.1135	0.1135	0.1135	0.1135	0.1135	0.1135	0.0960991	0.0961	0.0961	0.0961
Denmark	0.1029	0.1029	0.1029	0.1029	0.1029	0.1029	0.1029	0.0838	0.0838	0.08382	0.0838	0.0838	0.0838
Estonia	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415133	0.1415	0.1415	0.1415
Finland	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696	0.0696143	0.0696	0.0696	0.0696
France	0.0639	0.0639	0.0639	0.0639	0.0639	0.0639	0.0639	0.0639	0.0639	0.042621	0.0426	0.0426	0.0426
Germany	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125	0.1125194	0.1125	0.1125	0.1125
Greece	0.1117	0.1117	0.1117	0.0887	0.0887	0.0887	0.0887	0.0887	0.0887	0.0886517	0.0887	0.0887	0.0887
Hungary	0.0901	0.0901	0.0901	0.0756	0.0756	0.0756	0.0756	0.0756	0.0756	0.0755672	0.0756	0.0756	0.0756
Iceland	0.0659	0.0659	0.0659	0.0659	0.0659	0.0659	0.0659	0.0659	0.0659	0.065912	0.0659	0.0659	0.0572
Ireland	0.1370	0.1370	0.1370	0.1375	0.1375	0.1375	0.1375	0.1375	0.1375	0.1140822	0.1141	0.1141	0.1141
Israel	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0649695	0.0650	0.0650	0.0650
Italy	0.1094	0.1094	0.1094	0.1094	0.1094	0.1094	0.1094	0.1094	0.1094	0.0937662	0.0938	0.0938	0.0938
Japan	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1125952	0.1126	0.1126	0.1126
Korea	0.0307	0.0307	0.0307	0.0293	0.0293	0.0293	0.0293	0.0293	0.0293	0.0292962	0.0293	0.0293	0.0293
Luxembourg	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250216	0.1250	0.1250	0.1250
Mexico	0.0911	0.0911	0.0911	0.0836	0.0836	0.0836	0.0836	0.0836	0.0836	0.08356	0.0836	0.0836	0.0836
Netherlands	0.0994	0.0994	0.0994	0.0994	0.0994	0.0994	0.0994	0.0994	0.0994	0.099449	0.0796	0.0796	0.0796
New Zealand	0.1144	0.1144	0.1144	0.1144	0.1144	0.1144	0.1068	0.1068	0.1068	0.106778	0.1068	0.1068	0.1068
Norway	0.0907	0.0907	0.0907	0.0907	0.0907	0.0907	0.0907	0.0907	0.0907	0.08163	0.0816	0.0816	0.0816
Poland	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634171	0.0634	0.0634	0.0634
Portugal	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0852	0.085242	0.0852	0.0781	0.0781
Slovak Republic	0.1125	0.1125	0.1125	0.1125	0.1125	0.0902	0.0902	0.0902	0.0902	0.0902145	0.0902	0.0902	0.0902
Slovenia	0.0967	0.0743	0.0743	0.0703	0.0703	0.0703	0.0703	0.0703	0.0703	0.0662046	0.0662	0.0662	0.0662
Spain	0.0994	0.0994	0.0870	0.0870	0.0870	0.0870	0.0782	0.0782	0.0782	0.0782436	0.0782	0.0782	0.0782
Sweden	0.0509	0.0509	0.0509	0.0509	0.0509	0.0509	0.0509	0.0509	0.0509	0.042135	0.0421	0.0421	0.0421
Switzerland	0.1640	0.1640	0.1640	0.1530	0.1530	0.1530	0.1530	0.1530	0.1530	0.153034	0.1530	0.1530	0.1530
Turkey	0.0425	0.0425	0.0425	0.0425	0.0425	0.0425	0.0203	0.0203	0.0203	0.0203262	0.0203	0.0203	0.0203
United Kindom	0.0758	0.0758	0.0758	0.0758	0.0758	0.0758	0.0673	0.0673	0.0673	0.0672646	0.0673	0.0673	0.0673
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
OECD (average)	0.0924	0.0916	0.0913	0.0885	0.0886	0.0878	0.0863	0.0858	0.0856	0.0824061	0.0818	0.0816	0.0814
OECD (high)	0.1712	0.1674	0.1674	0.1651	0.1689	0.1642	0.1624	0.1623	0.1631	0.1652052	0.1652	0.1661	0.1661

DSTI/ICCP/CISP(2011)3/FINAL

	01-10-2010	24-11-2010	01-12-2010	01-01-2011	24-01-2011	01-02-2011	24-02-2011	01-04-2011	01-05-2011	05-05-2011	24-05-2011	01-06-2011	01-07-2011
Australia	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930	0.0930
Austria	0.0428	0.0428	0.0428	0.0357	0.0357	0.0357	0.0357	0.0357	0.0357	0.0357	0.0357	0.0286	0.0286
Belgium	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642	0.0642
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	0.1648	0.1642	0.1642	0.1648	0.1642	0.1642	0.1625	0.1619	0.1650	0.1650	0.1656	0.1656	0.1674
Czech Republic	0.0961	0.0961	0.0961	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793	0.0625
Denmark	0.0838	0.0838	0.0838	0.0838	0.0838	0.0838	0.0838	0.0838	0.0629	0.0629	0.0629	0.0629	0.0629
Estonia	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415	0.1415
Finland	0.0696	0.0696	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
France	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0426	0.0284
Germany	0.1125	0.1125	0.0477	0.0477	0.0477	0.0477	0.0477	0.0477	0.0477	0.0477	0.0477	0.0477	0.0477
Greece	0.0887	0.0887	0.0887	0.0703	0.0703	0.0703	0.0703	0.0703	0.0703	0.0703	0.0703	0.0703	0.0703
Hungary	0.0756	0.0756	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634
Iceland	0.0572	0.0572	0.0572	0.0484	0.0484	0.0484	0.0484	0.0484	0.0484	0.0484	0.0484	0.0484	0.0484
Ireland	0.1141	0.1141	0.1108	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793	0.0793
Israel	0.0650	0.0650	0.0650	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203
Italy	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0938	0.0753
Japan	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126	0.1126
Korea	0.0293	0.0293	0.0293	0.0285	0.0285	0.0285	0.0285	0.0285	0.0285	0.0285	0.0285	0.0285	0.0285
Luxembourg	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
Mexico	0.0836	0.0836	0.0836	0.0327	0.0327	0.0327	0.0327	0.0327	0.0327	0.0327	0.0327	0.0327	0.0327
Netherlands	0.0796	0.0796	0.0796	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597
New Zealand	0.1068	0.1068	0.1068	0.1068	0.1068	0.1068	0.1068	0.0915	0.0915	0.0570	0.0570	0.0570	0.0570
Norway	0.0816	0.0816	0.0816	0.0544	0.0544	0.0544	0.0544	0.0544	0.0544	0.0544	0.0544	0.0544	0.0544
Poland	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0634	0.0365
Portugal	0.0781	0.0710	0.0710	0.0710	0.0710	0.0710	0.0639	0.0639	0.0639	0.0639	0.0568	0.0568	0.0568
Slovak Republic	0.0902	0.0902	0.0902	0.0902	0.0902	0.0753	0.0753	0.0753	0.0753	0.0753	0.0753	0.0753	0.0753
Slovenia	0.0662	0.0662	0.0662	0.0622	0.0622	0.0622	0.0622	0.0622	0.0622	0.0622	0.0622	0.0622	0.0581
Spain	0.0703	0.0703	0.0703	0.0632	0.0632	0.0632	0.0632	0.0568	0.0568	0.0568	0.0568	0.0568	0.0568
Sweden	0.0421	0.0421	0.0421	0.0421	0.0421	0.0421	0.0421	0.0421	0.0421	0.0421	0.0421	0.0421	0.0421
Switzerland	0.0874	0.0874	0.0874	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765	0.0765
Turkey	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203	0.0203
United Kindom	0.0673	0.0673	0.0673	0.0673	0.0673	0.0673	0.0673	0.0429	0.0429	0.0429	0.0429	0.0429	0.0429
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
OECD (average)	0.0791	0.0789	0.0762	0.0687	0.0687	0.0682	0.0680	0.0666	0.0660	0.0650	0.0648	0.0646	0.0622
OECD (high)	0.1648	0.1642	0.1642	0.1648	0.1642	0.1642	0.1625	0.1619	0.1650	0.1650	0.1656	0.1656	0.1674

	24-08-2011	01-09-2011	01-11-2011	01-12-2011
Australia	0.0930	0.0930	0.0930	0.0930
Austria	0.0286	0.0286	0.0286	0.0286
Belgium	0.0642	0.0642	0.0642	0.0544
Canada	N/A	N/A	N/A	N/A
Chile	0.1671			
Czech Republic	0.0625	0.0625	0.0625	0.0625
Denmark	0.0629	0.0629	0.0629	0.0629
Estonia	0.1415	0.1415	0.1415	0.1415
Finland	0.0625	0.0625	0.0625	
France	0.0284	0.0284	0.0284	0.0284
Germany	0.0477	0.0477	0.0477	0.0477
Greece	0.0703	0.0703	0.0703	0.0703
Hungary	0.0634	0.0634	0.0634	0.0634
Iceland	0.0484	0.0484	0.0484	0.0484
Ireland	0.0793	0.0793	0.0793	0.0793
Israel	0.0203	0.0203	0.0203	0.0203
Italy	0.0753	0.0753	0.0753	0.0753
Japan	0.1126	0.1126	0.1126	0.1126
Korea	0.0285	0.0285	0.0285	0.0285
Luxembourg	0.1250	0.1250	0.1250	0.1250
Mexico	0.0327	0.0327	0.0327	0.0327
Netherlands	0.0597	0.0384	0.0384	0.0384
New Zealand	0.0570	0.0570	0.0448	0.0448
Norway	0.0544	0.0544	0.0544	0.0544
Poland	0.0365	0.0365	0.0365	0.0365
Portugal	0.0497	0.0497	0.0497	0.0497
Slovak Republic	0.0753	0.0753	0.0753	0.0753
Slovenia	0.0581	0.0581	0.0581	0.0581
Spain	0.0568	0.0568	0.0568	0.0568
Sweden	0.0421	0.0421	0.0421	0.0421
Switzerland	0.0765	0.0765	0.0765	0.0765
Turkey	0.0203	0.0203	0.0203	0.0203
United Kindom	0.0429	0.0429	0.0429	0.0429
United States	0.0007	0.0007	0.0007	0.0007
OECD (average)	0.0620	0.0580	0.0576	0.0571
OECD (high)	0.1671	0.1415	0.1415	0.1415

### Notes

Canada does not have a termination rate for mobile

Chile adjusts its rates monthly at the 5<sup>th</sup>-9<sup>th</sup> of the month, for readability not every individual change was noted at the exact date. This data is available.

For Korea and Japan the 2010 rate was used as the 2011 rate is calculated in 2012

For Ireland the average rate as recorded by BEREC was used as the peak rates for the largest operator weren't available

For the United Kingdom the rate is the average as mandated by the government in real terms. No inflation correction was applied

Rates in the Netherlands for 2007-2009 were based on an agreement between the regulator and the industry

For Mexico, the rates requested by Telcel in a dispute between Axtel and Telcel were used.

For Slovakia SKK was used where appropriate

### Exchange rates

EUR to USD	1.4207
AUD to USD	1.033
CLP to USD	0.002166
CZK to USD	0.057891
DKK to USD	0.1905
EEK to USD	0.085249
HUF to USD	0.005348
ISK to USD	0.0088
ILS to USD	0.295316
YEN to USD	0.012029
KRW to USD	0.000933
NZD to USD	0.7627
NOK to USD	0.1814
PLN to USD	0.378158
SKK to USD	0.047159 (30.1260 korunas=1 Euro)
SEK to USD	0.159
CHF to USD	1.0931
TRY to USD	0.6494
GBP	1.6092
MXN to USD	0.08356

## ANNEX 3 TERMINATION RATES IN NATIONAL CURRENCY

	01-01-2004	07-01-2004	01-03-2004	01-04-2004	01-07-2004	01-10-2004	01-12-2004	01-01-2005	01-03-2005	07-03-2005	01-04-2005	25-05-2005	01-06-2005
Australia					0.2100	0.2100	0.2100	0.2100	0.2100	0.2100	0.2100	0.2100	0.2100
Austria													
Belgium													
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	138.1260	136.4700	96.4620	97.1796	104.6880	109.6620	108.2400	107.1300	101.6460	104.1900	104.1900	107.0760	107.0760
Czech Republic													
Denmark													
Estonia													
Finland			0.0900	0.0900	0.0900	0.0900	0.0840	0.0840	0.0840	0.0840	0.0840	0.0840	0.0680
France	0.1494	0.1494	0.1494	0.1494	0.1494	0.1494	0.1494	0.1250	0.1250	0.1250	0.1250	0.1250	0.1250
Germany													
Greece													
Hungary												27.1700	27.1700
Iceland													
Ireland								0.1126	0.1126	0.1126	0.1126	0.1126	0.1126
Israel									0.3200	0.3200	0.3200	0.3200	0.3200
Italy													
Japan	15.1200	15.1200	15.1200	13.9200	13.9200	13.9200	13.9200	13.9200	13.9200	13.9200	13.1400	13.1400	13.1400
Korea	31.8000	31.8000	31.8000	31.8000	31.8000	31.8000	31.8000	31.2000	31.2000	31.2000	31.2000	31.2000	31.2000
Luxembourg													
Mexico								1.7100	1.7100	1.7100	1.7100	1.7100	1.7100
Netherlands													
New Zealand													
Norway													
Poland													
Portugal									0.1850	0.1400	0.1400	0.1400	0.1400
Slovak Republic								4.2650	4.2650	4.2650	4.2650	4.2650	4.2650
Slovenia													
Spain	0.1452	0.1452	0.1452	0.1452	0.1452	0.1283	0.1283	0.1283	0.1283	0.1283	0.1283	0.1283	0.1283
Sweden													
Switzerland	0.3350	0.3350	0.3350	0.3350	0.3350	0.3350	0.3350	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000
Turkey						0.1560	0.1560	0.1480	0.1480	0.1480	0.1480	0.1480	0.1480
United Kindom													
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007

## DSTI/ICCP/CISP(2011)3/FINAL

	01-07-2005	01-09-2005	01-10-2005	13-10-2005	01-11-2005	01-01-2006	01-03-2006	01-04-2006	01-05-2006	01-07-2006	01-09-2006	01-10-2006	01-11-2006
Australia	0.1800	0.1800	0.1800	0.1800	0.1800	0.1800	0.1800	0.1800	0.1800	0.1500	0.1500	0.1500	0.1500
Austria	0.1086	0.1086	0.1086	0.1086	0.1034	0.0934	0.0934	0.0934	0.0934	0.0834	0.0834	0.0834	0.0834
Belgium	0.1266	0.1266	0.1266	0.1266	0.1266	0.1266	0.1266	0.1266	0.1266	0.1110	0.1110	0.1110	0.1110
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	106.5060	108.9540	107.9280	106.3800	106.3800	105.5460	102.9540	106.5360	106.3500	109.2480	114.0780	114.8460	112.3020
Czech Republic						3.1100	3.1100	3.1100	3.1100	2.9900	2.9900	2.9900	2.9900
Denmark									0.8400	0.8400	0.8400	0.8400	0.8400
Estonia										2.0500	2.0500	2.0500	2.0500
Finland	0.0680	0.0680	0.0680	0.0680	0.0680	0.0680	0.0680	0.0680	0.0680	0.0680	0.0680	0.0680	0.0680
France	0.1250	0.1250	0.1250	0.1250	0.1250	0.0950	0.0950	0.0950	0.0950	0.0950	0.0950	0.0950	0.0950
Germany										0.1100	0.1100	0.1100	0.1100
Greece													
Hungary	27.1700	27.1700	27.1700	27.1700	27.1700	27.1700	27.1700	27.1700	27.1700	27.1700	27.1700	27.1700	27.1700
Iceland						8.9200	8.9200	8.9200	8.9200	8.9200	8.5600	8.5600	8.5600
Ireland	0.1126	0.1126	0.1126	0.1126	0.1126	0.1045	0.1045	0.1045	0.1045	0.1054	0.1054	0.1054	0.1054
Israel	0.3200	0.3200	0.3200	0.3200	0.3200	0.3200	0.2900	0.2900	0.2900	0.2900	0.2900	0.2900	0.2900
Italy						0.1210	0.1210	0.1210	0.1210	0.1120	0.1120	0.1120	0.1120
Japan	13.1400	13.1400	13.1400	13.1400	13.1400	13.1400	13.1400	12.8400	12.8400	12.8400	12.8400	12.8400	12.8400
Korea	31.2000	31.2000	31.2000	31.2000	31.2000	33.1000	33.1000	33.1000	33.1000	33.1000	33.1000	33.1000	33.1000
Luxembourg						0.1500	0.1500	0.1500	0.1500	0.1380	0.1380	0.1380	0.1380
Mexico	1.7100	1.7100	1.7100	1.7100	1.7100	1.5400	1.5400	1.5400	1.5400	1.5400	1.5400	1.5400	1.5400
Netherlands													
New Zealand													
Norway					0.6800	0.6800	0.6800	0.6800	0.6800	0.6500	0.6500	0.6500	0.6500
Poland									0.4000	0.4000	0.4000	0.4000	0.4000
Portugal	0.1350	0.1350	0.1300	0.1300	0.1300	0.1250	0.1250	0.1200	0.1200	0.1150	0.1150	0.1150	0.1100
Slovak Republic	4.2650	4.2650	4.2650	4.2650	4.2650	4.0100	4.0100	4.0100	4.0100	4.0100	4.0100	4.0100	4.0100
Slovenia													
Spain	0.1283	0.1283	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1148	0.1114	0.1114
Sweden	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500
Switzerland	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000
Turkey	0.1480	0.1480	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
United Kindom								0.0540	0.0540	0.0540	0.0540	0.0540	0.0540
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007



DSTI/ICCP/CISP(2011)3/FINAL

	23-11-2006	01-01-2007	01-03-2007	01-04-2007	01-05-2007	01-06-2007	01-07-2007	15-08-2007	01-10-2007	01-12-2007	01-01-2008	01-03-2008	01-04-2008
Australia	0.1500	0.1200	0.1200	0.1200	0.1200	0.1200	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Austria	0.0834	0.0713	0.0713	0.0713	0.0713	0.0713	0.0591	0.0591	0.0591	0.0591	0.0572	0.0572	0.0572
Belgium	0.1110	0.0973	0.0973	0.0973	0.0973	0.0973	0.0853	0.0853	0.0853	0.0853	0.0748	0.0748	0.0748
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	110.2560	109.1280	110.7480	110.1000	111.5940	112.5180	111.9360	116.1060	117.1200	118.2180	120.7380	118.1220	117.1560
Czech Republic	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900
Denmark	0.8400	0.8400	0.8400	0.8400	0.7200	0.7200	0.7200	0.7200	0.7200	0.7200	0.7200	0.7200	0.7200
Estonia	2.0500	2.0500	2.0500	2.0500	2.0500	2.0500	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600
Finland	0.0680	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0510	0.0510	0.0510
France	0.0950	0.0950	0.0950	0.0950	0.0950	0.0950	0.0750	0.0750	0.0750	0.0750	0.0650	0.0650	0.0650
Germany	0.0878	0.0878	0.0878	0.0878	0.0878	0.0878	0.0878	0.0878	0.0878	0.0792	0.0792	0.0792	0.0792
Greece						0.1067	0.1067	0.1067	0.1067	0.1067	0.1067	0.1067	0.1067
Hungary	27.1700	23.1700	23.1700	23.1700	23.1700	23.1700	23.1700	23.1700	23.1700	23.1700	19.7500	19.7500	19.7500
Iceland	8.5600	8.5600	8.5600	8.5600	8.5600	8.2100	8.2100	8.2100	8.2100	7.8500	7.8500	7.8500	7.8500
Ireland	0.1054	0.1006	0.1006	0.1006	0.1006	0.1006	0.1006	0.1006	0.1006	0.1006	0.0993	0.0993	0.0993
Israel	0.2900	0.2900	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600	0.2600	0.2200	0.2200
Italy	0.1120	0.1120	0.1120	0.1120	0.1120	0.1120	0.0974	0.0974	0.0974	0.0974	0.0974	0.0974	0.0974
Japan	12.8400	12.8400	12.8400	12.2400	12.2400	12.2400	12.2400	12.2400	12.2400	12.2400	12.2400	12.2400	10.8000
Korea	33.1000	32.8000	32.8000	32.8000	32.8000	32.8000	32.8000	32.8000	32.8000	32.8000	33.4000	33.4000	33.4000
Luxembourg	0.1380	0.1250	0.1250	0.1250	0.1250	0.1130	0.1130	0.1130	0.1130	0.1130	0.1000	0.1000	0.1000
Mexico	1.5400	1.3400	1.3400	1.3400	1.3400	1.3400	1.3400	1.3400	1.3400	1.3400	1.2100	1.2100	1.2100
Netherlands								0.1000	0.1000	0.1000	0.1000	0.1000	0.1000
New Zealand			0.2000	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1600
Norway	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Poland	0.4000	0.4000	0.4000	0.4000	0.3387	0.3387	0.3387	0.3387	0.3387	0.3387	0.3387	0.3387	0.3387
Portugal	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100	0.1100
Slovak Republic	4.0100	3.7200	3.7200	3.7200	3.7200	3.7200	3.7200	3.7200	3.7200	3.7200	3.4000	3.4000	3.4000
Slovenia					0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681
Spain	0.1114	0.1114	0.1114	0.1031	0.1031	0.1031	0.1031	0.1031	0.0948	0.0948	0.0948	0.0948	0.0783
Sweden	0.6500	0.6500	0.6500	0.6500	0.6500	0.6500	0.5500	0.5500	0.5500	0.5500	0.5500	0.5500	0.5500
Switzerland	0.2000	0.1850	0.1850	0.1850	0.1850	0.1850	0.1850	0.1850	0.1850	0.1850	0.1650	0.1650	0.1650
Turkey	0.1400	0.1400	0.1360	0.1360	0.1360	0.1360	0.1360	0.1360	0.1360	0.1360	0.1360	0.1360	0.0910
United Kindom	0.0540	0.0540	0.0540	0.0509	0.0509	0.0509	0.0509	0.0509	0.0509	0.0509	0.0509	0.0509	0.0471
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007

## DSTI/ICCP/CISP(2011)3/FINAL

	01-05-2008	01-06-2008	01-07-2008	15-07-2008	01-08-2008	01-10-2008	01-01-2009	08-01-2009	24-01-2009	01-02-2009	01-04-2009	01-05-2009	05-05-2009
Australia	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Austria	0.0572	0.0572	0.0572	0.0572	0.0572	0.0572	0.0572	0.0572	0.0572	0.0572	0.0572	0.0572	0.0572
Belgium	0.0748	0.0748	0.0748	0.0748	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A
Chile	114.9300	116.4000	121.2000	125.5740	125.5740	133.9260	152.1060	150.8880	144.1140	144.1140	139.2420	136.1460	79.0260
Czech Republic	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.9900	2.6500	2.6500	2.6500	2.6500	2.6500	2.6500
Denmark	0.6200	0.6200	0.6200	0.6200	0.6200	0.6200	0.6200	0.6200	0.6200	0.6200	0.6200	0.5400	0.5400
Estonia	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600
Finland	0.0510	0.0510	0.0510	0.0510	0.0510	0.0510	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490
France	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650
Germany	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792
Greece	0.1067	0.1067	0.1067	0.1067	0.1000	0.1000	0.0786	0.0786	0.0786	0.0786	0.0786	0.0786	0.0786
Hungary	19.7500	19.7500	19.7500	19.7500	19.7500	19.7500	16.8400	16.8400	16.8400	16.8400	16.8400	16.8400	16.8400
Iceland	7.8500	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900
Ireland	0.0993	0.0993	0.0993	0.0993	0.0993	0.0993	0.0958	0.0958	0.0958	0.0958	0.0958	0.0958	0.0958
Israel	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200
Italy	0.0974	0.0974	0.0848	0.0848	0.0848	0.0848	0.0848	0.0848	0.0848	0.0848	0.0848	0.0848	0.0738
Japan	10.8000	10.8000	10.8000	10.8000	10.8000	10.8000	10.8000	10.8000	10.8000	10.8000	9.3600	9.3600	9.3600
Korea	33.4000	33.4000	33.4000	33.4000	33.4000	33.4000	32.9000	32.9000	32.9000	32.9000	32.9000	32.9000	32.9000
Luxembourg	0.1000	0.1000	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880
Mexico	1.2100	1.2100	1.2100	1.2100	1.2100	1.2100	1.0900	1.0900	1.0900	1.0900	1.0900	1.0900	1.0900
Netherlands	0.1000	0.1000	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
New Zealand	0.1600	0.1600	0.1600	0.1600	0.1600	0.1600	0.1600	0.1600	0.1600	0.1600	0.1500	0.1500	0.1500
Norway	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Poland	0.3387	0.3387	0.3387	0.3387	0.3387	0.3387	0.2162	0.2162	0.2162	0.2162	0.2162	0.2162	0.2162
Portugal	0.1100	0.1100	0.1100	0.0800	0.0800	0.0750	0.0700	0.0700	0.0700	0.0700	0.0650	0.0650	0.0650
Slovak Republic	3.4000	3.4000	3.4000	3.4000	3.4000	3.4000	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792
Slovenia	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681	0.0681
Spain	0.0783	0.0783	0.0783	0.0783	0.0783	0.0783	0.0783	0.0783	0.0783	0.0783	0.0700	0.0700	0.0700
Sweden	0.5500	0.5500	0.4300	0.4300	0.4300	0.4300	0.4300	0.4300	0.4300	0.4300	0.4300	0.4300	0.4300
Switzerland	0.1650	0.1650	0.1650	0.1650	0.1650	0.1650	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500
Turkey	0.0910	0.0910	0.0910	0.0910	0.0910	0.0910	0.0910	0.0910	0.0910	0.0910	0.0910	0.0655	0.0655
United Kindom	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007

DSTI/ICCP/CISP(2011)3/FINAL

	01-07-2009	24-09-2009	01-10-2009	01-01-2010	24-01-2010	01-02-2010	01-04-2010	01-05-2010	24-05-2010	01-07-2010	07-07-2010	24-08-2010	01-09-2010
Australia	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Austria	0.0400	0.0400	0.0400	0.0350	0.0350	0.0350	0.0350	0.0350	0.0350	0.0301	0.0301	0.0301	0.0301
Belgium	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	79.0260	77.2860	77.2860	76.2360	77.9940	75.7980	74.9820	74.9460	75.3060	76.2720	76.2720	76.6920	76.6920
Czech Republic	2.3100	2.3100	2.3100	1.9600	1.9600	1.9600	1.9600	1.9600	1.9600	1.6600	1.6600	1.6600	1.6600
Denmark	0.5400	0.5400	0.5400	0.5400	0.5400	0.5400	0.5400	0.4400	0.4400	0.4400	0.4400	0.4400	0.4400
Estonia	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600
Finland	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490	0.0490
France	0.0450	0.0450	0.0450	0.0450	0.0450	0.0450	0.0450	0.0450	0.0450	0.0300	0.0300	0.0300	0.0300
Germany	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792
Greece	0.0786	0.0786	0.0786	0.0624	0.0624	0.0624	0.0624	0.0624	0.0624	0.0624	0.0624	0.0624	0.0624
Hungary	16.8400	16.8400	16.8400	14.1300	14.1300	14.1300	14.1300	14.1300	14.1300	14.1300	14.1300	14.1300	14.1300
Iceland	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	7.4900	6.5000
Ireland	0.0964	0.0964	0.0964	0.0968	0.0968	0.0968	0.0968	0.0968	0.0968	0.0803	0.0803	0.0803	0.0803
Israel	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200	0.2200
Italy	0.0770	0.0770	0.0770	0.0770	0.0770	0.0770	0.0770	0.0770	0.0770	0.0660	0.0660	0.0660	0.0660
Japan	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600
Korea	32.9000	32.9000	32.9000	31.4000	31.4000	31.4000	31.4000	31.4000	31.4000	31.4000	31.4000	31.4000	31.4000
Luxembourg	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880
Mexico	1.0900	1.0900	1.0900	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Netherlands	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0560	0.0560	0.0560
New Zealand	0.1500	0.1500	0.1500	0.1500	0.1500	0.1500	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
Norway	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.4500	0.4500	0.4500	0.4500
Poland	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677
Portugal	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0650	0.0600	0.0600	0.0600	0.0550	0.0550
Slovak Republic	0.0792	0.0792	0.0792	0.0792	0.0792	0.0635	0.0635	0.0635	0.0635	0.0635	0.0635	0.0635	0.0635
Slovenia	0.0681	0.0523	0.0523	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495	0.0466	0.0466	0.0466	0.0466
Spain	0.0700	0.0700	0.0613	0.0613	0.0613	0.0613	0.0551	0.0551	0.0551	0.0551	0.0551	0.0551	0.0551
Sweden	0.3200	0.3200	0.3200	0.3200	0.3200	0.3200	0.3200	0.3200	0.3200	0.2650	0.2650	0.2650	0.2650
Switzerland	0.1500	0.1500	0.1500	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400
Turkey	0.0655	0.0655	0.0655	0.0655	0.0655	0.0655	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313
United Kindom	0.0471	0.0471	0.0471	0.0471	0.0471	0.0471	0.0418	0.0418	0.0418	0.0418	0.0418	0.0418	0.0418
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007

## DSTI/ICCP/CISP(2011)3/FINAL

	01-10-2010	24-11-2010	01-12-2010	01-01-2011	24-01-2011	01-02-2011	24-02-2011	01-04-2011	01-05-2011	05-05-2011	24-05-2011	01-06-2011	01-07-2011
Australia	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Austria	0.0301	0.0301	0.0301	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0201	0.0201
Belgium	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452	0.0452
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chile	76.0620	75.8100	75.8100	76.0620	75.7860	75.7860	75.0300	74.7480	76.1580	76.1580	76.4640	76.4640	77.2860
Czech Republic	1.6600	1.6600	1.6600	1.3700	1.3700	1.3700	1.3700	1.3700	1.3700	1.3700	1.3700	1.3700	1.0800
Denmark	0.4400	0.4400	0.4400	0.4400	0.4400	0.4400	0.4400	0.4400	0.3300	0.3300	0.3300	0.3300	0.3300
Estonia	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600	1.6600
Finland	0.0490	0.0490	0.0440	0.0440	0.0440	0.0440	0.0440	0.0440	0.0440	0.0440	0.0440	0.0440	0.0440
France	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0200
Germany	0.0792	0.0792	0.0336	0.0336	0.0336	0.0336	0.0336	0.0336	0.0336	0.0336	0.0336	0.0336	0.0336
Greece	0.0624	0.0624	0.0624	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495	0.0495
Hungary	14.1300	14.1300	11.8600	11.8600	11.8600	11.8600	11.8600	11.8600	11.8600	11.8600	11.8600	11.8600	11.8600
Iceland	6.5000	6.5000	6.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000
Ireland	0.0803	0.0803	0.0780	0.0558	0.0558	0.0558	0.0558	0.0558	0.0558	0.0558	0.0558	0.0558	0.0558
Israel	0.2200	0.2200	0.2200	0.0687	0.0687	0.0687	0.0687	0.0687	0.0687	0.0687	0.0687	0.0687	0.0687
Italy	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0660	0.0530
Japan	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600	9.3600
Korea	31.4000	31.4000	31.4000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000
Luxembourg	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880	0.0880
Mexico	1.0000	1.0000	1.0000	0.3912	0.3912	0.3912	0.3912	0.3912	0.3912	0.3912	0.3912	0.3912	0.3912
Netherlands	0.0560	0.0560	0.0560	0.0420	0.0420	0.0420	0.0420	0.0420	0.0420	0.0420	0.0420	0.0420	0.0420
New Zealand	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1400	0.1200	0.1200	0.0748	0.0748	0.0748	0.0748
Norway	0.4500	0.4500	0.4500	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Poland	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.1677	0.0966
Portugal	0.0550	0.0500	0.0500	0.0500	0.0500	0.0500	0.0450	0.0450	0.0450	0.0450	0.0400	0.0400	0.0400
Slovak Republic	0.0635	0.0635	0.0635	0.0635	0.0635	0.0530	0.0530	0.0530	0.0530	0.0530	0.0530	0.0530	0.0530
Slovenia	0.0466	0.0466	0.0466	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0438	0.0409
Spain	0.0495	0.0495	0.0495	0.0445	0.0445	0.0445	0.0445	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400
Sweden	0.2650	0.2650	0.2650	0.2650	0.2650	0.2650	0.2650	0.2650	0.2650	0.2650	0.2650	0.2650	0.2650
Switzerland	0.0800	0.0800	0.0800	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700
Turkey	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313
United Kindom	0.0418	0.0418	0.0418	0.0418	0.0418	0.0418	0.0418	0.0266	0.0266	0.0266	0.0266	0.0266	0.0266
United States	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007

	24-08-2011	01-09-2011	01-11-2011	01-12-2011
Australia	0.0900	0.0900	0.0900	0.0900
Austria	0.0201	0.0201	0.0201	0.0201
Belgium	0.0452	0.0452	0.0452	0.0383
Canada	N/A	N/A	N/A	N/A
Chile	77.1600			
Czech Republic	1.0800	1.0800	1.0800	1.0800
Denmark	0.3300	0.3300	0.3300	0.3300
Estonia	1.6600	1.6600	1.6600	1.6600
Finland	0.0440	0.0440	0.0440	
France	0.0200	0.0200	0.0200	0.0200
Germany	0.0336	0.0336	0.0336	0.0336
Greece	0.0495	0.0495	0.0495	0.0495
Hungary	11.8600	11.8600	11.8600	11.8600
Iceland	5.5000	5.5000	5.5000	5.5000
Ireland	0.0558	0.0558	0.0558	0.0558
Israel	0.0687	0.0687	0.0687	0.0687
Italy	0.0530	0.0530	0.0530	0.0530
Japan	9.3600	9.3600	9.3600	9.3600
Korea	30.5000	30.5000	30.5000	30.5000
Luxembourg	0.0880	0.0880	0.0880	0.0880
Mexico	0.3912	0.3912	0.3912	0.3912
Netherlands	0.0420	0.0270	0.0270	0.0270
New Zealand	0.0748	0.0748	0.0588	0.0588
Norway	0.3000	0.3000	0.3000	0.3000
Poland	0.0966	0.0966	0.0966	0.0966
Portugal	0.0350	0.0350	0.0350	0.0350
Slovak Republic	0.0530	0.0530	0.0530	0.0530
Slovenia	0.0409	0.0409	0.0409	0.0409
Spain	0.0400	0.0400	0.0400	0.0400
Sweden	0.2650	0.2650	0.2650	0.2650
Switzerland	0.0700	0.0700	0.0700	0.0700
Turkey	0.0313	0.0313	0.0313	0.0313
United Kindom	0.0266	0.0266	0.0266	0.0266
United States	0.0007	0.0007	0.0007	0.0007