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Estimating the Effects of UPU Terminal Dues, 2014 – 2017

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Imagine a Frenchman, an American tourist, a Brazilian football player, a Chinese businessman, and an English banker—all standing in a queue at the local office of La Poste waiting to post a first class letter to a friend in France. When the Frenchman arrives at the counter, the clerk says in clear voice, "63 cents, monsieur, if you please!" Not too surprising, since € 0.63 is the current domestic postage rate in France. However, when the American arrives, the clerk consults a complicated chart with the heading "UPU" before announcing "38 cents for the Yank!" Next the Brazilian footballer is charged 29 cents. The clerk is just about to request the same from the Chinese gentlemen, when he says, "I am from Hong Kong". "Eh bien," says the clerk, "only 27 cents for you!" Finally, when the English banker arrives at the counter, the postal clerk looks around, leans over, and whispers quietly in his ear. The price for the Englishman is a secret!

Of course, if a postal clerk behaved in such a manner there would be a riot of indignation led, no doubt, led by the Frenchman, who finds that he is being charged most of all. Yet if these gentlemen mailed the same letters to France from their respective national homes, La Poste will, in a manner similar to this example, charge very different rates for delivery of identical letters depending on the origin of the letter. Why? Because national post offices do not charge each other the equivalent of domestic postage for delivery of inbound international mail. Instead, delivery rates are established in an agreement renegotiated every four years at the Universal Postal Union, an intergovernmental organization founded in 1874. Rates for delivery of inbound international mail are called "terminal dues" by the UPU; they are unrelated to either domestic postage or actual delivery costs.

The most recent agreement on terminal dues is set out in the Universal Postal Convention which was adopted by the UPU Congress held in Doha in 2012. It establishes different delivery rates for mail depending on the country of origin in roughly the manner suggested above. The Doha Convention also allows post offices to agree on alternative rates for bilateral exchanges. Such rates are almost invariably kept secret by post offices despite the public nature of their services. Nonetheless, bilateral rates are affected by the UPU standard because the UPU rate is regarded as the default if no alternative is agreed.

The 2012 UPU agreement on terminal dues is effective from the beginning of 2014 until the end of 2017. Rates apply to the delivery of inbound international “letter post” items, that is, ordinary letters, flats (large flat envelopes), and "small packets" (parcels weighing up to 2 kg). Rates for small packets are especially important for the future. With paper mail declining rapidly, e-commerce is widely seen as the best hope for sustaining international postal services. At the same time, global express companies are actively developing their own services to meet the needs of e-commerce, so UPU ratemaking raises questions of fair competition.

Although the economics of postal services have been widely studied for two decades, almost all scholarly attention has centered on national services. International postal policies have received little attention from academics, government officials, or regulators. One explanation for this neglect is the bewildering complexity of international postal relations and a discouraging absence of relevant data. Most persons outside the postal sector — and indeed, most officials within the postal sector — find terminal dues obscure in the extreme.

This paper suggests that despite such obstacles it is possible to *estimate* the effects of the 2012 UPU terminal dues agreement on the exchange of international letter post items in the years 2014 to 2017. Estimates will necessarily be approximate because they depend on assumptions and uncertain statistics. Nonetheless, even a rough model of the effects of the UPU terminal dues system is sufficient to illuminate the main effects and point the way to reform. I encourage others to improve upon my analysis and subject the international postal system to long overdue scrutiny.

1. HOW TO ESTIMATE DISTORTIONS CREATED BY UPU TERMINAL DUES

As most postal officials and all neutral observers have long recognized, the way to eliminate distortions in payments for delivery of international letter post items is for each post office to charge other post offices the domestic postage that would be due for delivery of similar letter post items. Domestic postage is the proper standard for two reasons. First, while it is impossible to obtain accurate delivery cost data for most post offices, one may reasonably rely on domestic postage rates as a proxy for costs. In most countries, and in almost all industrialized countries, national law requires domestic postage rates to be cost-based. A second and more basic reason is suggested by the imaginary scene in the French post office. In the modern world it is unjustifiable to discriminate against and among foreign mailers in the pricing of universal postal services which are provided by state enterprises and ensured by government.

To estimate the economic distortions caused by terminal dues a spreadsheet model has been developed that calculates the differences between delivery charges established by the UPU terminal dues system and, in contrast, produced by equivalent domestic postage rates. In principle, the main steps in developing a model to estimate terminal dues distortions are:

- Estimate the volumes of outbound and inbound letter post mail for each UPU member country and territory.
- Allocate the outbound letter post mail sent from each origin county or territory to each destination country or territory.
- Calculate the terminal dues charge that is payable under the UPU Convention for each bilateral flow in each direction.
- Calculate the amount of "domestic postage terminal dues" that represents the equivalent domestic postage would be charged for delivery of each bilateral flows in each direction.

The extent to which the amount of terminal dues payable under the UPU Convention deviates from the equivalent domestic postage provides a reasonable estimate of the distortion created by the UPU Convention.

In practice, none of these steps is straight forward. The only comprehensive source of international mail volumes is the UPU database. The quality of data is dubious in many cases, and several prominent postal operators do not contribute volume data. A still more formidable problem is allocation of total volumes to bilateral flows. Since bilateral mail volumes are not publicly available, it is necessary to use another indicator to allocate outbound mail volumes. This model uses average trade in services revenues as the distribution key because the total outbound mail per country is roughly proportional to the distribution of trade in services. However, bilateral trade in services data is available only for the 36 countries which are members of the Organisation for Economic Co-operation and Development (OECD) or which report trade in services data to the OECD — hereafter, "the OECD countries". These 36 OECD countries account for about 83 percent of all outbound mail and 78 percent of all inbound mail. More importantly, the 36 OECD countries include all the 24 industrialized countries that, I will argue, constitute the critical component of the UPU terminal dues system, the so-called "Group 1.1".

The spreadsheet model first estimates the mail flows among the 36 OECD countries and between these countries and the rest of the world. Allocation of international mail is developed in three steps.

First, bilateral flows are estimated for the exchange of mail among the 27 member countries of the European Union (as of 2011) and the three additional member countries of the European Economic Area: Iceland, Liechtenstein, and Norway. The set of 30 EU and EEA countries — hereafter, simply "the EU countries" — is the starting point because recent studies prepared for the European Commission offer more relevant information than is available for most other countries and because the EU countries are generally better about reporting trade in services data to the OECD. The allocation process begins with reported or estimated outbound volumes for each country. For the EU countries, total outbound letter post volume in 2011 is estimated to be about 2.5 billion items, about 55 percent of the global total. For each EU country, it is necessary to estimate what proportion of outbound mail is destined for other EU countries. This is done based partly on trade in services data and partly on other postal data. The proportion of intra-EU mail that each country should receive is estimated in a similar manner. Since totals from the outbound allocation do not necessarily align with the anticipated amounts of inbound mail for each country, it is necessary to perform a series of adjustments that increase the mail sent to countries that get less than expected and decrease the mail sent to countries that get more than expected. These adjustments are constrained by the logical requirement that in any exchange among a given set of countries, total outbound volume must equal total inbound volume.

It must be emphasized that the result of this process is not necessarily reflective of actual bilateral mail flows. This process merely creates a reasonably plausible allocation pattern that fits with known facts and credible assumptions. Such a hypothetical allocation pattern is, I suggest, good enough to test the effects of a particular terminal dues arrangement since it is the *differences* between different terminal dues systems that are most important rather than the absolute amounts.

The second step in the allocation process is estimating the bilateral flows among the OECD countries and between the OECD countries and the rest of the world. In this step, intra-EU bilateral flows previously estimated are kept fixed, and flows to and from the United States are excluded. Again, mail flows and volume estimates are adjusted so that (1) the allocation of outbound mail volumes using trade in services data results in plausible inbound mail volumes per country and (2) total outbound volume equals total inbound volume for intra-OECD mail flows collectively.

Finally, bilateral mail flows between the US and all countries in the world are added. US bilateral mail flows can be estimated from data available from the US Postal Regulatory Commission. Although approximate and incomplete, these estimates appear superior to estimates that can be derived using trade in services data.

Calculation of terminal dues charges due under the Convention and the equivalent domestic postage charges likewise requires assumptions, chiefly about the composition of international letter post mail. The domestic rate equivalent to terminal dues is not the full retail postage rate but something closer to the discounted rates available to bulk domestic mailers. Typically, a bulk domestic mailer receives a discount of about 15 to 25 percent from the retail rate because the post office does not collect bulk mail and bulk mail is already sorted to some extent by the mailer. Both terminal dues and domestic postage charges depend on the distribution of letter post items among weight steps and the relative proportions of letters, flats, and small packets. According to a UPU study, in 2009 the average weight for a typical international letter post item was 81.8 grams. Average weights for letters, flats, and small packets were 19.7, 124, and 354 grams respectively. The average weight of letter post items is rising as more and more letters are lost to email and the number of small parcels increases with the growth of e-commerce. In the model, the proportions of letters, flats, and small packets changes from year to year based on specified assumptions about the decline or growth about the individual components of the letter post since 2009. Domestic rates for the industrialized countries are taken from a survey of 2013 rates. Domestic rates for developing countries are estimated from two UPU surveys which provided the postage rates for all countries in 2008 and the postage rates for some countries 2011.

Using such data, estimates, and assumptions, a spreadsheet model has been constructed. It calculates the terminal dues charged for delivery of international letter post items exchanged in a hypothetical but plausible pattern of bilateral flows among the 36 OECD countries and between those countries and the rest of the world. Terminal dues can be calculated and compared using UPU terminal dues, equivalent domestic postage, or alternative methods. This model can then be "rolled forward" to the years 2014 to 2017, the effective period for the terminal dues adopted by the 2012 UPU Congress, by specifying assumptions about the growth or decline in mail volumes, increases (or decreases) in the proportion of small packets, and increases (or decreases)in domestic postage rates.

In the following discussion, calculations for years 2014 to 2017 are derived from a "base scenario" unless otherwise indicated. The assumptions of the base scenario are shown in Table 1. The key assumptions are that the volume of letters and flats will decline by 4 percent per year, the volume of small packets will increase by 12 percent per year, and domestic postage rates in the industrialized countries will increase by 4 percent per year.[1] The terminal dues equivalent to domestic postage is assumed to be 70 percent of the priority domestic postage rates.[2]

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[1] The change in domestic postage rates can be adjusted for individual countries. For the United States, domestic postage rates are assumed to increase by only 2 percent in the years 2015, 2016, and 2017 because rate increases for most items are limited to the rate of inflation.

[2] This is the assumption used by the UPU. A 70 percent discount for all inbound international mail be thought of a 20 percent discount for priority or first class mail and a 40 percent discount for non-priority or advertising mail, where the proportion of priority to non-priority mail is 50 percent.

Table 1. Base scenario

	2014	2015	2016	2017
Volume growth (decline) [1]				
Letter post (LP)	-10.0%	-4.0%	-4.0%	-4.0%
Letters and flats (PG)	-10.0%	-4.0%	-4.0%	-4.0%
Small packets (E)	15.0%	12.0%	12.0%	12.0%
Percent of volume				
Letter post (LP)	100%	100%	100%	100%
Letters and flats (PG)	82%	80%	77%	74%
Small packets (E)	18%	20%	23%	26%
Increase in domestic rates [2]				
TD Grp 1.1	4%	4%	4%	4%
TD Grps 1.2 and 2	6%	3%	3%	3%
TD Grps 3, 4, and 5	15%	3%	3%	3%
Average weight per item (gr)				
Letter post (LP)	98.3	105.6	113.7	122.5
Letters and flats (PG)	42.9	42.9	42.9	42.9
Small packets (E)	354	354	354	354
Items per kilogram				
Letter post (LP)	10.18	9.47	8.79	8.16
Letters and flats (PG)	23.33	23.33	23.33	23.33
Small packets (E)	2.83	2.83	2.83	2.83

[1] In first column volume is from 2011 to 2014.
[2] In first column increase in domestic rates is from 2013 for TD Grp 1.1; from 2011 for TD Grps 1.2 and 2; from 2008 for TD Grps 3, 4, 5. In the model, domestic postage rates may be vary from general assumptions.

At the end of the paper, two alternative scenarios are considered briefly. One assumes a more rapid decline in letters and flats together with a more rapid increase in small packets. The other assumes that most Group 1.1 countries align terminal dues with domestic postage, but that a few large, politically powerful countries are able to insist upon UPU terminal dues in bilateral relations in which it is to their advantage.

2. UPU TERMINAL DUES SYSTEM OF 2012

In 2012, the Universal Postal Union included 192 member countries.[3] Twenty-nine are classified as industrialized countries while 163 are developing countries. International mail, the raison d'être of the UPU, is divided very unevenly among member countries. **Figure 1** shows the distribution of outbound and inbound international mail (as estimated in

[3] Not all UPU member countries are independent nations. Some are territories or collections of territories ruled by other nations.

the current model). Ten countries account for 56 percent of all outbound mail, and 20 countries for 81 percent. At the other end of the spectrum, the bottom 103 countries *collectively* account for less than 1 percent of outbound international mail. Inbound international mail is marginally less concentrated because the largest post offices tend to export more mail than they import.

Table 2. UPU terminal dues groups, 2012 Convention

TD Group	Number of member countries and territories[1]	Percent of outbound international mail	Percent of outbound international mail	Entry into Target System
1.1	41	77%	73%	2002
1.2	13	8%	4%	2010
2	22	4%	6%	2012
3	39	7%	10%	2016
4	54	3%	4%	
5	49	1%	2%	

[1] The table does not includes member countries or territories for which it was not possible to develop estimates for outbound and inbound letter post.

The UPU terminal dues system takes account of disparities among countries by classifying member countries according to six groups. Composition of these groups is summarized in Table 2 and **Figure 2**. Group 1.1 dominates. It consists of the most industrialized countries and accounts for more than three-quarters of all outbound letter post. Only 24 of the 41 members of Group 1.1 are nations of substantial size. All but seven are members of the European Union or European Economic Area.[4] Group 1.2 consists of small but relatively prosperous countries such as Aruba, Bermuda, Hong Kong, Kuwait, Qatar, and Singapore. Group 2 includes advanced developing countries in the European Union (Croatia, Cyprus, Czech Republic, Estonia, Hungary, Malta, Poland, Slovakia), the Caribbean (Antilles, Barbados, Montserrat, St. Kitts, Trinidad and Tobago), the Middle East (Bahrain, Saudi Arabia) and Asia (South Korea, Macao). Group 3 includes less developed

[4] The 17 major EU/EEA member countries of Group 1.1 are Austria, Belgium, Denmark, Finland, France, Germany, Great Britain (United Kingdom), Greece , Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, and Sweden. The 7 major countries from outside the EU/EEA area are Australia, Canada, Israel, Japan, New Zealand, Switzerland, and United States. The other 17 Group 1.1 members are Falkland Islands (Malvinas), French Polynesia, Gibraltar, Guernsey, Isle of Man, Jersey, Liechtenstein, Martinique, Monaco, New Caledonia, Norfolk Island, Pitcairn Island, Reunion, San Marino, Tristan da Cunha, Vatican, and Wallis and Futuna Islands.

countries but also prospective industrial giants such as Brazil, China, and Russia. Group 4 is made up of still less developed countries, but also includes India. Group 5 is composed of the least developed countries.

The 2012 Doha Congress established three schedules of terminal dues rates for the six terminal dues groups.[5] One terminal dues schedule applies to Group 1.1. A second applies to Groups 1.2 and 2. The remaining 142 countries in Groups 3, 4, and 5 apply a third terminal dues schedule.

For letter post items exchanged among members of Group 1.1 — that is, for intra-Group 1.1 flows only — the terminal dues charge is expressed in the form of X per kg and Y per item. X and Y are nominally aligned with 70 percent of the priority (first class) domestic postage rate in the destination country using a formula that depends on the domestic postage for a 20-gram letter and a 175-gram flat. The terminal dues rate is then constrained by "cap" (upper limit) and "floor" (lower limit) provisions. The cap and floor limits are fixed amounts per kilogram and per item, which increase by 3 percent each year. In addition, terminal dues are further limited by a secondary cap that provides that rates cannot increase more than 13 percent annually.

Figure 3 shows the terminal dues charges for *a kilogram of typical letter post* items exchanged in 2014 among the 24 substantial countries in Group 1.1. In any given year, composition of a kilogram of typical letter post depends on assumptions about the growth of individual components of the letter post (letters, flats, small packets).[6] As shown in Table 1, under the base scenario in 2014 a typical kilogram of letter post includes 10.18 items with an average weight of 98.3 g. In Figure 3, the equivalent domestic postage rates

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[5] There are additional nuances which are omitted for purposes this analysis. In addition to establishing terminal dues, the UPU Convention provides that members in terminal dues Groups 1.1, 1.2, 2, and 3 shall make contributions to a "quality of service" fund that is established for the benefit of members in Groups 3, 4, and 5. The level of contribution differs according to terminal dues group and is expressed as a percentage of the terminal dues owed to the destination country. Post offices in Groups 1.1, 1.2, and 2 (and Group 3 after 2015) may also participate in a voluntary quality of service measurement program of the UPU (unrelated to the quality of service fund). Countries which participate in this program may receive up to 5 percent higher or lower terminal dues based on the degree to which they deliver inbound international mail within specified time limits.

[6] In this figure, terminal dues are shown in Special Drawing Rights, the unit of currency used by the UPU. The SDR represents a basket of major currencies defined by the International Monetary Fund. On 3 March 2014, 1 SDR was equal to USD 1.559 and EUR 1.1234.

for delivery of a kilogram of typical letter post mail are shown as solid blue columns (on the left). The hollow red columns (in the middle) show the rates that are implied by the UPU's formula relating terminal dues to domestic postage rates. The actual UPU terminal dues rates are shown as solid red columns (on the right). They result from application of cap and floor rates of SDR 5.29 and 3.66, respectively. In only one country, Iceland, does the link to domestic postage rates actually determine the terminal dues rate. In all other Group 1.1 countries, terminal dues rates are set by the cap and floor constraints or by the secondary cap on annual increases. Linkage to domestic postage is an illusion.

Since Group 1.1 terminal dues vary by number of pieces as well as by weight, the cap and floor rates will be higher or lower if a kilogram of letter post items includes (in 2014) more or fewer than 10.18 items or, in other words, if the average letter post item weighs less or more than 98.3 grams. This relationship can be expressed as a rate per item for items of varying weights. For example, the per item/per kg cap for Group 1.1 terminal dues yields a delivery charge of SDR 0.52 for a typical letter post item weighing 98.3 grams (in 2014). For a 20-gram letter, the cap rate is SDR 0.34; for a 124-gram flat, SDR 0.58; and for a 340-gram small packet, SDR 1.07. See **Figure 4**.

The terminal dues schedule for Groups 1.2 and 2 — which can be combined as "Group 122" for purposes of this paper — is the same as for Group 1.1 except that the cap is lower. Indeed, the cap is almost the same as the floor — SDR 3.77 versus SDR 3.66 for a kilogram of typical letter post in 2014 — so that Group 122 rates are, in practice, a uniform negotiated rate specified by kilogram and by item. See **Figure 5**. Group 122 rates apply to letter post mail exchanged among Group 122 countries and between those countries and Group 1.1 countries.

Terminal dues for Groups 3, 4, and 5 ("Group 345") are set at a fixed amount per kilogram, SDR 4.16 in 2014 rising to SDR 4.43 in 2017.[7] These rates apply to letter post mail exchanged among all 142 Group 345 countries as well as letter post mail sent to or received from countries in the other terminal dues groups. Although it costs much more to deliver

[7] Technically, a Group 345 country has the option of switching to a weight and piece based formula if a bilateral flow exceeds 75 tonnes per year. The POC has estimated that 5 percent of bilateral flows to or from developing countries exceed 50 tonnes per year and 3 percent exceed 100 tonnes. My impression, however, is that the piece-weight option is only very rarely, if ever, applied to such flows.

fifty 20-gram letters than five 200-gram small packets, Group 345 rates do not decrease as the number of items per kilogram decreases. Group 345 rates are therefore relatively inexpensive for delivery of light weight letters but relatively expensive rates for delivery of heavy small packets (as shown in Figure 4).

The UPU has organized these three terminal dues schedules into two larger categories, the "target system" and the "transitional system". The target system includes the schedules for Groups 1.1 and 122. The transitional system refers to the schedule for Group 345. In 2016, Group 3 will move from the transitional system to the target system, but its schedule of terminal dues will remain the same.[8] The terms "target" and "transitional" are more political than operational. They refer to the UPU's public commitment — first adopted in the 1999 Congress and reaffirmed at each subsequent congress — to move towards a worldwide "country-specific payment system," that is, a system in which terminal dues for each country is appropriately related to domestic postage.[9] As is apparent from the above discussion, however, the UPU has in fact taken no steps to actually accomplish this purported goal. For virtually all countries terminal dues remain, as in 1999, negotiated rates based on political considerations unrelated to domestic postage. In the 2012 Doha Congress, the UPU overwhelmingly rejected a proposal to develop a concrete proposal for applying country-specific terminal dues to the Group 1.1 countries beginning in 2018.

3. LETTER POST EXCHANGED AMONG GROUP 1.1 COUNTRIES

The Group 1.1 countries — or more simply, the "industrialized countries" — dominate the global postal system to such a degree that the 2012 terminal dues system may be viewed as essentially an agreement of the industrialized countries to fix terminal dues rates among themselves together with secondary arrangements that define relations

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[8] However, the shift to the target system will impose on Group 3 countries additional record-keeping requirements.

[9] See 1999 Convention, Article 3 ("The provisions of the present Convention concerning the payment of terminal dues are transitional arrangements, moving towards a country specific payment system"). The UPU introduced different rates for industrialized countries and developing countries in the 1989 Convention in an effort to limit remail competition. In the 2004 Convention, terminal dues provisions for "industrialized countries" and "developing countries" were re-labeled "target" and "transitional".

between the industrialized countries and the developing countries and relations among the developing countries.

Intra-Group 1.1 mail accounts for about 60 percent of all letter post mail handled by the global postal system. In the basic scenario, intra-Group 1.1 mail will come to 2.6 billion items in 2014. As shown in **Figure 6**, intra-Group 1.1 flows may be divided into four major sets of flows. Since 17 of the 24 Group 1.1 member countries are also members of the EU (or EEA), intra-EU mail constitutes more than half of all intra-Group 1.1 mail. Although intra-EU mail is akin to "domestic" within the European Union and purportedly governed by the EU Postal Directive, the UPU Convention still casts a long shadow over intra-EU postal relations because UPU terminal dues are regarded as the applicable rate in the absence of alternative arrangements. The second largest component of the intra-Group 1.1 system is the bilateral exchange between the US and Canada, about 12 percent of the intra-Group 1.1 total. This exchange is so specific to a single bilateral relationship that it is omitted from the analysis in this paper.[10] The exchange of mail between the EU and the US accounts for another 11 percent of the intra-Group 1.1 total. The remaining 21 percent is composed primarily of flows among the five remaining industrialized countries (Switzerland, Israel, Japan, Australia, and New Zealand) and between them and the EU and US.

For Group 1.1 countries, the UPU terminal dues system establishes delivery charges for inbound international mail which are well below equivalent domestic postage. If domestic postage represents fair compensation for the delivery of domestic mail, then most Group 1.1 post offices are significantly underpaid for delivery of inbound international mail even though, once received by the destination post office, such mail is sorted, transported, and delivered together with domestic mail. In practice, Group 1.1 post offices are giving each other a hefty discount for domestic delivery of international mail. As **Figure 7** shows, the discount ranges from New Zealand, which may be slightly overpaid to generous Norway, which is giving its sister posts a 75 percent discount for a kilogram of typical letter post mail. The average discount is about 44 percent. The discount is even greater for small packets, on average about 55 percent. See **Figure 8**. This is partly due to the low cap and partly to the

[10] The exchange of letter post items between the United States and Canada is subject a special terminal dues agreement between the U.S. Postal Service and Canada Post, and the physical characteristics of this mail are appear to be significantly different from typical international mail.

fact that underlying formula fails to take into account differences between letters and small packets.

The mismatch between terminal dues and domestic postage is magnified by the fact that some Group 1.1 countries are net exporters of international mail while others are net importers. Other things being equal, if terminal dues generally understate costs of delivery in the Group 1.1 countries, then it is better to be a net exporter than a net importer. **Figure 9** shows the estimated outbound and inbound intra-Group 1.1 volumes in 2014, arranged according the estimated imbalance between outflows and in flows (excluding the large US-Canada exchange).

If the terminal dues discounts for inbound international mail are multiplied by the estimated volume of mail, the resulting total underpayment per country is shown in **Figure 10**. Overall, under the assumptions of the base scenario, the total discount provided for delivery of inbound international mail is about SDR 855 million, a weighted average discount of 43 percent. An average discount of 53 percent for small packets accounts for most this amount, SDR 490 million. The UPU terminal dues discount thus represents a significant factor relative to the overall market.

On the outbound side of the ledger, Group 1.1 post offices also benefit from reduced rates for delivery of their outbound mail. Collectively, the discount for Group 1.1 countries is the same for outbound services as for inbound services since the same post offices are both senders and receivers. However, for an individual post office, outbound discounts may or may not offset inbound losses. Total underpayments for delivery of outbound intra-Group 1.1 letter post mail are shown in **Figure 11**.

For each country, the net effect of the discounts is the benefit of the discount for outbound mail less the loss (if any) due to the discount for inbound mail. See **Figure 12**. In general, the scheme benefits the post offices from larger countries at the expense of post offices from smaller countries. Under the base scenario, the main winners are Germany, Netherlands, Spain, United Kingdom, and United States.[11] The main losers are the Nordic countries, Switzerland, Italy, France, Japan, and Ireland. In this manner, the terminal dues

[11] Canada, too, may be a winner but its status is unclear to me due to uncertainty about the appropriate domestic postage rates.

system creates an effective intra-Group 1.1 subsidy that flows from mailers in losing countries to mailers in winning countries. The intra-Group 1.1 subsidy will amount to about SDR 276 million in 2014 and will increase as domestic postage rates increase and small packets become a larger proportion of letter post mail.

4. POTENTIAL DISTORTIONS IN INTRA-GROUP 1.1 COMPETITION

Post offices compete with private operators and increasingly with each other in the market for international delivery services. Competition takes place primarily in the outbound market as competitors vie for the business of organizations that send out large volumes of international documents and parcels. UPU terminal dues can give the national post office a substantial competitive advantage in this contest. An example will illustrate the issues. Let us consider the market of letter post items sent from the United States to Denmark, summarized in Table 3.

Table 3. United States to Denmark letter post, 2014

	Vol	Wt (Kg)	TD/kg (SDR)	TD (SDR)	Disc %
Discount on outbound LP					
Outbound domestic postage TDs	2.31	0.23	12.12	2.76	
Outbound UPU TDs	2.31	0.23	5.29	1.20	
— Outbound discount			6.83	1.55	56%
Discount on inbound LP					
Inbound domestic postage TDs	0.82	0.08	8.49	0.69	
Inbound UPU TDs	0.82	0.08	4.01	0.32	
— Inbound discount			4.48	0.36	53%
Sources of outbound discount					
Discount on inbound mail				0.36	23%
Intra-Grp 1.1 subsidy				1.19	77%

Under the UPU terminal dues system, the US Postal Service obtains delivery by Post Denmark for SDR 5.29 per kg. In contrast, Post Denmark will charge a competitor of USPS — a private express company or the US office of another post office[12] — a price similar to

[12] Several post offices provide international delivery services through offices located outside their national territories. In the postal world, these are called "ETOEs" or "extraterritorial offices of exchange". Several European and non-European post offices have ETOEs in the United States. The UPU has adopted

equivalent domestic postage (70 percent of the priority rates under the assumptions of the base scenario). In other words, Post Denmark would treat a competitor of USPS the same as it would treat a domestic bulk mailer. In Denmark, the equivalent domestic postage rate would thus be about SDR 12.12 per kg, more than double the price available to USPS.[13] According to the estimated flows in the spreadsheet model, the Postal Service will send 2.3 million kg of letter post items to Denmark in 2014. Post Denmark will charge the US Postal Service SDR 1.20 million instead of the SDR 2.76 million that a competitor would have to pay. Post Denmark is providing USPS a total discount worth SDR 1.55 million.

Where does the money come from to compensate Post Denmark for this discount? Documents and parcels from the US are no less costly for Post Denmark to deliver than similar Danish documents and parcels, so the discount is not justified by cost savings. However, the discount for delivery of American mail is partially offset by the fact that the US Postal Service provides a discount for Danish mail sent to the United States. In 2014, Post Denmark will send to the United States about 0.82 million kg of letter post items and receive a discount of SDR 4.48 per kg, a total discount of SDR 0.36 million. From the perspective of Post Denmark, the discount for delivery of Danish mail in the United States partially compensates for the discount that it provides for delivery of American mail in Denmark. The USPS must recover the revenue that it loses in discounting delivery of Danish mail by charging higher rates to American mailers.[14] Meanwhile, Post Denmark is left with an uncompensated discount of SDR 1.19 million. This shortfall must be made up by Danish mailers. It is Denmark's contribution to the net gain of SDR 13 million that USPS derives from intra-Group 1.1 exchanges in 2014.

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various restrictions on competition by ETOEs, practices which appear to violate US and EU competition laws.

[13] Some postal officials argue that the retail priority domestic postage in Denmark is associated with a higher level of service than accorded inbound international mail and that therefore the appropriate base rate for calculating terminal dues should be a less expensive domestic postage. In the example in the text, using a less expensive Danish domestic postage level as the base rate would change the numbers but not the conclusions.

[14] Under US postal law, most inbound international mail services are classified as a “market dominant products”, and most outbound mail services are classified as “competitive products”. Since there is a statutory price cap on market dominant products, a discount for one market dominant product must be made up by higher rates for other market dominant products (assuming, as is the case, that USPS uses all of the price increases permitted by the cap). In effect, the UPU terminal dues system permits the Postal Service to use discounts on market dominant inbound mail to subsidize discounts for competitive outbound mail.

In this manner, the UPU terminal dues system reinforces the competitive position of the US Postal Service in the US to Denmark market. For USPS bulk international mail products like International Priority Airmail (bulk letter mail) and International Surface Air Lift (bulk advertising mail), the cost of delivery in Denmark is a large proportion of the total product cost. These are highly competitive businesses. Since the actual cost of delivery in Denmark is reflected in the price that Post Denmark charges its own domestic customers and the Postal Service pays only a fraction of this price, the Postal Service is able to sell bulk international mail services to Denmark at prices that are almost surely below the marginal cost of production. Bulk mail service to Denmark appears to be a profitable product in the accounts of the Postal Service only because the UPU terminal dues system materially understate the true costs of the service.

The US-Denmark example was not chosen at random. It happens that in 2012 the Postal Service acknowledged the false accounting and competitive advantages that flow from the UPU terminal dues system. In proceedings before the US Postal Regulatory Commission, the Postal Service opposed proposals to require that terminal dues for delivery of inbound international letter post mail should be aligned with domestic postage rates, or unconstrained by caps, with the following declarations:

> Depending on the type of mail, *terminal dues rates are a significant factor in setting outbound international mail rates*, as terminal dues represent an attributable cost to the Postal Service in delivery of outbound international mail. *Increasing terminal dues rates, especially significant increases resulting from elimination of the cap or directly tying the rates to domestic mail rates, would result in a considerable increase in the cost of delivery of letter post mail abroad*. To offset this increase, the Postal Service would be forced to cover its costs with rate increases to the mailers. As a result, outbound international mail rates would rise, creating a hardship for both individual and business mailers.
>
> As an illustration, the Postal Service estimates that if the cap in terminal dues were eliminated in the upcoming Convention cycle, *rates for outbound international mail would increase as shown below*:
>
> - Depending on the destination country, First Class Mail International (FCMI) rate increases would range from 5 percent to well over 60 percent, affecting primarily the general public, i.e., individual mailers who rely on FCMI for international mailings.

- *Depending on the destination, International Priority Airmail (IPA) and International Surface Air Lift (ISAL) rate increases would be significantly higher than the 5-60 percent range stated above — nearly 150 percent increase for mail to Denmark*, more than 120 percent increase for mail to Norway, and an estimated 70 percent increase for mail to France; large business mailers who use IPA and ISAL services would be severely impacted.[15]

In short, according to the Postal Service, the UPU terminal dues system misstate actual costs to such an extent that it can price competitive bulk mail services to Denmark at 40 percent of a normal market price.

Such potential distortions of competition are generalized in **Figure 13**. The total potential distortion available to a post office, shown as a light red column, is the sum of all outbound discounts. Outbound discounts may be viewed as a combination of the intra-Group 1.1 subsidy, the red rectangle, and the loss on the delivery of inbound mail, the blue rectangle. For a post office, the most favorable competitive situation is a positive intra-Group 1.1 subsidy and a regulator that is willing to overlook the losses on inbound mail when assessing the lawfulness of outbound tariffs.

5. LETTER POST EXCHANGES BETWEEN GROUP 1.1 AND OTHER COUNTRIES

According to the estimated flows in the spreadsheet model, Group 1.1 countries have a negative imbalance with respect to Group 122 countries. In 2014, they will send out 265 million letter post items and receive 373 million items in return. On the other hand, the industrialized countries have a positive imbalance with the Group 345 countries. In 2014, they will send out 382 million letter post items and receive 319 million items in return. Each exchange represents about 15 percent of all international postal services. (It should be emphasized again, however, that these figures are very rough estimates only.)

The terminal dues rates that Group 1.1 countries charge Group 122 and Group 345 countries per kilogram of typical letter post mail are shown in Figure 5, above. For a kilogram of average letter post, terminal dues are about 25 percent less than applied to intra-Group 1.1 mail. Terminal dues rates for small packets are especially noteworthy.

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[15] U.S. Postal Service, "Comments of the United States Postal Service" (27 Aug 2012) in U.S. Postal Regulatory Commission docket no. PI2012-1, Section 407 Inquiry, at pages 7-8 (emphasis added).

Because the Group 122 terminal dues formula is piece and weight-based while the Group 345 terminal dues formula is weight-based only, Group 122 countries receive an extra discount for delivery of small packets sent to industrialized countries. See **Figure 14**. For the delivery of a kilogram of typical (354 g) small packets in 2014, a Group 1.1 post office will charge a Group 122 post office, SDR 2.16. On average, this is 48 percent lower than would be charged a Group 345 country (SDR 4.16), 53 percent lower than would be charged another Group 1.1 country (SDR 5.03), and 65 percent less than domestic postage (SDR 6.67). In short, the 2012 terminal dues system gives Group 122 post offices a "sweat spot" of significant competitive advantage in the international distribution of relatively heavy e-commerce small packets.[16]

Although the volumes of mail sent by individual Group 122 countries to Group 1.1 countries are unknown, overall international mail volumes make clear that UPU terminal dues system is substantially affecting the flow of letter post mail from some Group 122 countries. In particular, according to the spreadsheet model and the base scenario Hong Kong and Singapore will collectively export 310 million items while importing only 45 million. (The spread model is based on 2011 data and almost certainly understates the actual imbalance.) Similarly, China is using the international postal system to export large and rapidly increasing quantities of e-commerce parcels to industrialized countries.[17]

The broad consequences of the UPU terminal dues system for the exchange of letter post mail between the Group 1.1 countries and the rest of the world are shown in **Figure 15** (inbound) and **Figure 16** (outbound). By delivering inbound mail at a discount, Group 1.1 countries are effectively subsidizing Group 122 and Group 345 countries. In 2014, the total underpayment by Group 122 countries will be on the order of SDR 173 million, due mostly to underpayment for delivery of small packets. Underpayments by Group 345 countries will be roughly SDR 110 million. Although substantial, these underpayments are

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[16] The distortions created by the piece/weight-based terminal dues applicable to Group 122 countries and the weight-based terminal dues applicable to Group 345 can be used together. For example, an e-commerce business in China could take advantage of both terminal dues schedules by mailing relatively heavy small packets from Hong Kong (a Group 122 "country") and light weight small packets from mainland China (a group 345 country). The cross over point is about 80 grams. See Figure 4.

[17] See, e.g., United States Postal Service, Office of Inspector General, "Inbound China ePacket Costing Methodology" (25 Feb 2014), which estimates that Chinese small packets sent to the United States increased by 316 percent from 2011 to 2012 (from 9.5 to 26.8 million) (p. 3).

less than a third of underpayments in the intra-Group 1.1 exchange. On the outbound side, the Group 1.1 post offices are paying Group 122 and Group 345 terminal dues which, on average, are reasonably consistent with a bulk domestic postage rate.

6. SUMMARY INDICATORS AND ALTERNATIVE SCENARIOS

The above analysis suggests three numbers that may be used to summarize the effects of UPU terminal dues. First, the total discount for delivery of intra-Group 1.1 letter post mail. This number is a rough measure of the potential competitive distortions in the exchange of postal and delivery services among industrialized countries. Trade among industrialized countries remains the largest and most competitive portion of the international delivery services sector. It is also the portion in which the economic distortions of the UPU terminal dues are most difficult to excuse, since the UPU terminal dues system appears inconsistent with the spirit, and probably the letter, of both postal and competition laws in the US and EU. A second useful summary figure is the level of intra-Group 1.1 subsidy. This figure indicates the degree to which some industrialized countries benefit at the expense of others. A third indicator is the total discount on delivery of letter post items received from developing countries. While this departure from cost-based rates might be deemed the most defensible of the distortions created by the UPU system, it is not a fair or efficient means of helping truly needy countries. On the contrary, the major beneficiaries appear to China (both Hong Kong and mainland) and Singapore.

By each of these three measures, distortions created by the 2012 UPU terminal dues system will worsen over the period 2014 to 2017. And by each of these measures, the distortive effects will be relatively greater in the critical small packet submarket than in the larger letter post market. See **Figures 17 and 18**.

A fourth indicator may also be suggested, one that indicates the relative apportioning of benefits and burdens flowing from the UPU terminal dues system. The intra-Group 1.1 subsidy reflects only the total transfer of wealth from net payers to net beneficiaries. It fails to take into account the relative sizes of two sets of countries. Moreover, since net payers in the intra-Group 1.1 subsidy are characterized by higher domestic postage rates, they forego relatively more revenue than net beneficiaries in providing low terminal dues for mail received from developing countries.

A measure of relative benefits and burdens is presented in **Figure 19**. This figure shows (1) the total loss from discounts provided for delivery of inbound mail (from all countries) *less* (2) the total discount gained on discounts for outbound intra-Group 1.1 mail *divided by* (3) the number of kilograms of outbound intra-Group 1.1 letter post mail. The amount of outbound mail is used as the denominator because the losers can recoup losses from the UPU terminal dues system only by taxing their own mailers, not by raising terminal dues on inbound mail. While this is a rough measure, it offers one approach to evaluating the relative benefits and burdens implied by the UPU terminal dues system. As shown in Figure 19, under the base scenario, the winners will gain about SDR 1.31 per outbound kilogram whereas the losers will lose about SDR 5.84 per outbound kilogram.

Armed with summary indicators, it is interesting to consider briefly alternatives to the base scenario described above. Suppose, for example, that the shift to e-commerce occurs more quickly than implied in the base scenario. The base scenario assumes that the volume of small packets will grow at a rate of 12 percent per year. In contrast, the European Multi-channel and Online Trade Association (EMOTA) estimates that e-commerce revenues have been growing at substantially higher annual rates (e.g., 17 percent in Europe and 30 percent in Asia Pacific). How would a more rapid increase in small packets and a steeper decline in letters and flats affect the distortions resulting from the terminal dues rates established by the 2012 UPU Convention? Table 4 outlines an alternative "e-commerce scenario" to consider this possibility.

The implications of the e-commerce scenario, as opposed to the base scenario, are shown in **Figures 20 and 21**. The bottom line is that the distortions in intra-Group 1.1 trade will increase substantially, especially in the later years. By 2017, the total intra-Group 1.1 discount will grow to SDR 1.5 billion in the e-commerce scenario (50 percent of domestic postage), compared to SDR 1.1 billion in the base scenario. The intra-Group 1.1 subsidy will increase from SDR 381 million to SDR 479 million. The relative benefits and burdens for the winners and losers will also increase slightly.

Table 4. E-commerce scenario assumptions

	2014	2015	2016	2017
Volume growth (decline) from 2011 [1]				
Letter post (LP)	-15.0%	-10.0%	-10.0%	-10.0%
Letters and flats (PG)	-15.0%	-10.0%	-10.0%	-10.0%
Small packets (E)	30.0%	20.0%	20.0%	20.0%
Percent of volume				
Letter post (LP)	100%	100%	100%	100%
Letters and flats (PG)	82%	80%	77%	74%
Small packets (E)	18%	20%	23%	26%
Increase in domestic rates from 2011 [2]				
TD Grp 1.1	5%	5%	5%	5%
TD Grps 1.2 and 2	5%	5%	5%	5%
TD Grps 3, 4, and 5	15%	4%	4%	4%
Average weight per item (gr)				
Letter post (LP)	107	123	141	161
Letters and flats (PG)	42.9	42.9	42.9	42.9
Small packets (E)	354	354	354	354
Items per kilogram				
Letter post (LP)	9.35	8.14	7.09	6.20
Letters and flats (PG)	23.33	23.33	23.33	23.33
Small packets (E)	2.83	2.83	2.83	2.83

[1] In first column volume is from 2011 to 2014.
[2] In first column increase in domestic rates is from 2013 for TD Grp 1.1; from 2011 for TD Grps 1.2 and 2; from 2008 for TD Grps 3, 4, 5. In the model, domestic postage rates may be vary from general assumptions.

A second alternative approach may be described as a "cherry picker" application of the Convention. Assume that most Group 1.1 post offices move towards alignment of terminal dues and domestic postage but that a few large post offices retain the ability to demand UPU-based terminal dues in bilateral relations in which they receive a net benefit compared to domestic postage. **Figures 22 and 23** assume that five post offices — those of Germany, the Netherlands, Spain, the United Kingdom, and the United States — can require UPU-based terminal dues in each bilateral relationship in which they will benefit by more than SDR 0.25 million annually. No change is made in relations between the Group 1.1 countries and the other countries. Under these assumptions, the distortions are significantly reduced compared to the base scenario. In 2017, the total discount for inbound intra-Group 1.1 letter post declines from SDR 1.1 billion to SDR 0.73 billion. The intra-Group 1.1 subsidy declines only marginally, from SDR 381 million to SDR 323 million. If, however, the cherry picker approach is combined with the e-commerce scenario, by 2017 the total discount for inbound intra-Group 1.1 letter post will rise to SDR 0.94 billion and the intra-Group 1.1 subsidy to SDR 406 million. While a significant improvement over application of the UPU Convention by all Group 1.1 countries, a cherry picker approach preserves the worst features of the UPU terminal dues system for the benefit of handful of post offices.

In very approximate terms, the e-commerce scenario and the cherry picking alternative offer worst case and best case interpretations of the effects of the UPU terminal dues system for the period 2014 to 2017. The e-commerce scenario may be too pessimistic, although the cherry picker scenario is probably too benign. While the UPU terminal dues will not be applied in all bilateral relations among Group 1.1 countries, it is impossible to estimate the effects of such alternative arrangements because specifics are undisclosed by the post offices. At a minimum, at least some major post offices will continue to operate as "cherry pickers".

7. CONCLUSIONS

This paper presents estimates of the distortions in the international letter post market created or encouraged by the terminal dues system adopted by the Universal Postal Union for the period 2014 through 2017. Excluding US-Canada mail and mail exchanged between developing countries (but including mail exchanged between industrialized countries and developing countries), this market may be valued at about SDR 2.5 to 3.0 billion in 2014 where the value of the delivery services provided is measured by equivalent domestic postage. Estimates provided in this paper are very approximate and, especially in regard to specific countries, should be interpreted as illustrative figures based on plausible assumptions rather than firm estimates of actual mail flows. Nonetheless, based upon this analysis, the following general conclusions about the effects of 2012 UPU terminal dues system appear justified:

- The UPU terminal dues system introduces substantial distortions in trade in international postal services. These distortions affect primarily postal exchanges among the industrialized countries, which account for about 60 percent of all international postal services. Distortions are likely to increase significantly over time. The total value of these distortions is a substantial fraction of the total value of the undistorted market, on the order of 25 to 50 percent.

- The UPU terminal dues system creates an intra-Group 1.1 subsidy. That is, it benefits some industrialized countries at the expense of others. The annual transfer of wealth from net payers to net beneficiaries is on the order of hundreds of millions of SDRs. Taking into account the relative sizes of the two groups, the burden on the net payers is substantially more than the gain for the net beneficiaries.
- The UPU terminal dues system is anti-competitive. It creates substantial competitive advantages for national post offices (especially the net beneficiaries) relative to private operators and post offices competing outside their national territories (ETOEs). These advantages are derived both from the false accounting introduced by the UPU terminal dues system and from the intra-Group 1.1 subsidy.
- The UPU terminal dues system creates a subsidy for developing countries. Although significant, the subsidy for developing countries is substantially less than the distortions introduced in intra-Group 1.1 trade. The subsidy for developing countries is derived almost entirely from their right to have mail delivered in the industrialized countries at terminal dues rates substantially below domestic postage. The effective subsidy is, however, unrelated to the needs of specific developing countries. Moreover, the discounted delivery rates available to developing countries create possibilities for distortions wholly unrelated to social purposes. Theee are being exploited for commercial purposes by certain developing countries (and by post offices from industrialized countries that act in collaboration with them).

FIGURES

COUNTRY CODES

AT	Austria	IE	Ireland
AU	Australia	IL	Israel
BE	Belgium	IS	Iceland
CA	Canada	IT	Italy
CH	Switzerland	JP	Japan
DE	Germany	LU	Luxembourg
DK	Denmark	NL	Netherlands
ES	Spain	NO	Norway
FI	Finland	NZ	New Zealand
FR	France	PT	Portugal
GB	Great Britain	SE	Sweden
GR	Greece	US	United States

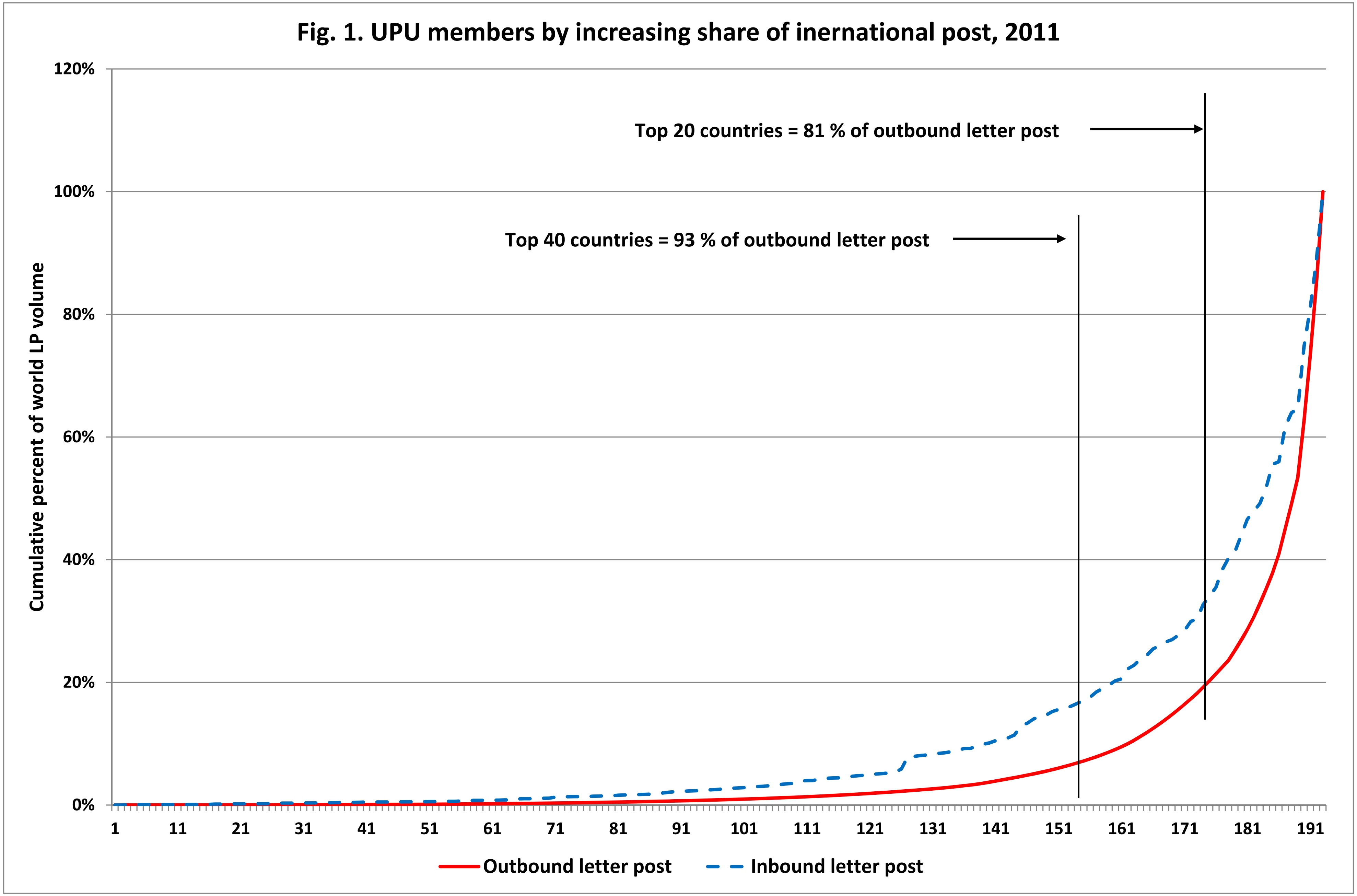
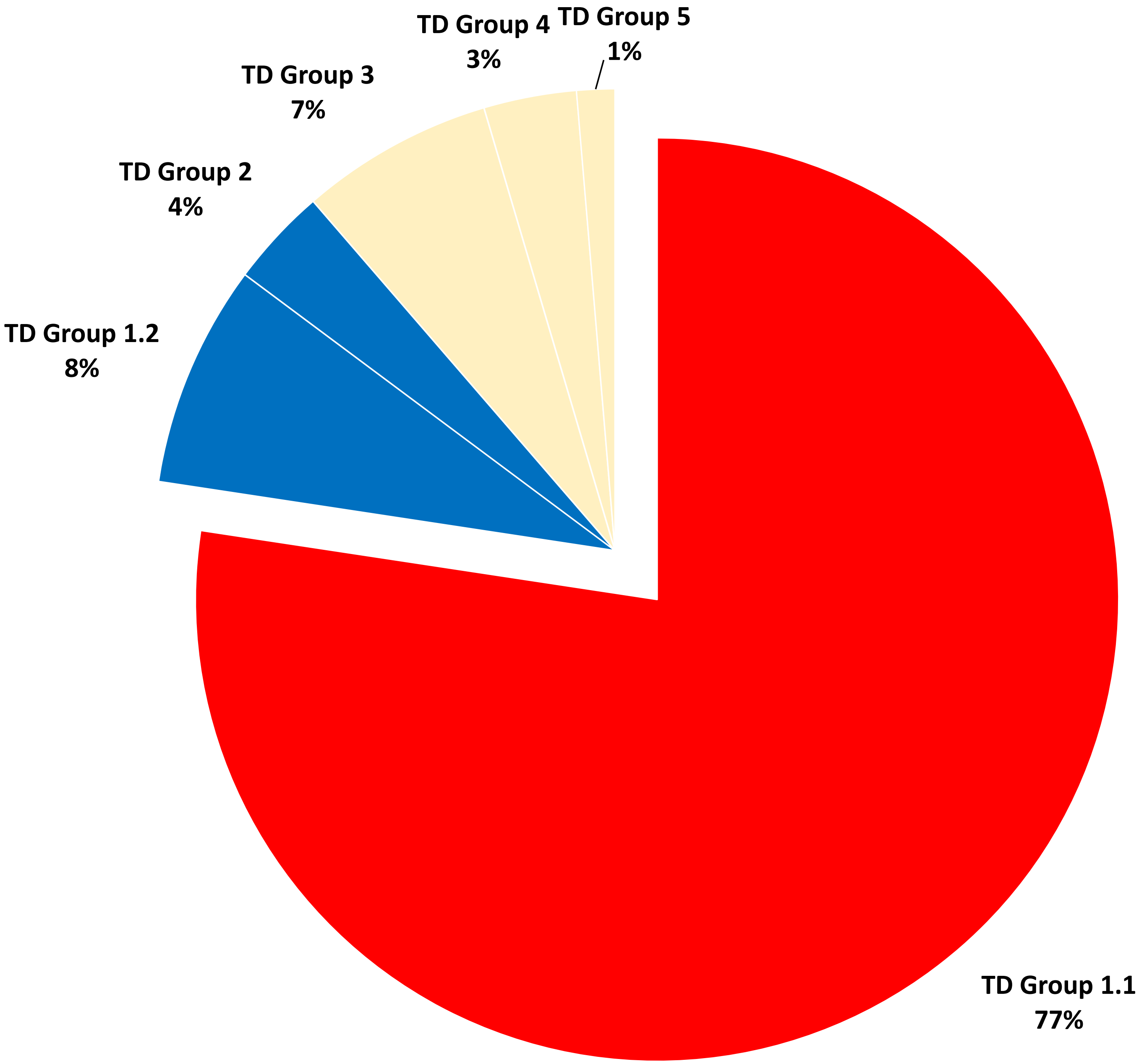


Fig. 1. UPU members by increasing share of inernational post, 2011
Cumulative percent of world LP volume
120%
100%
80%
60%
40%
20%
0%
Top 20 countries = 81 % of outbound letter post
Top 40 countries = 93 % of outbound letter post
1
11
21
31
41
51
61
71
81
91
101
111
121
131
141
151
161
171
181
191
Outbound letter post
Inbound letter post

Fig. 2. Outbound letter post by UPU terminal dues group, 2011



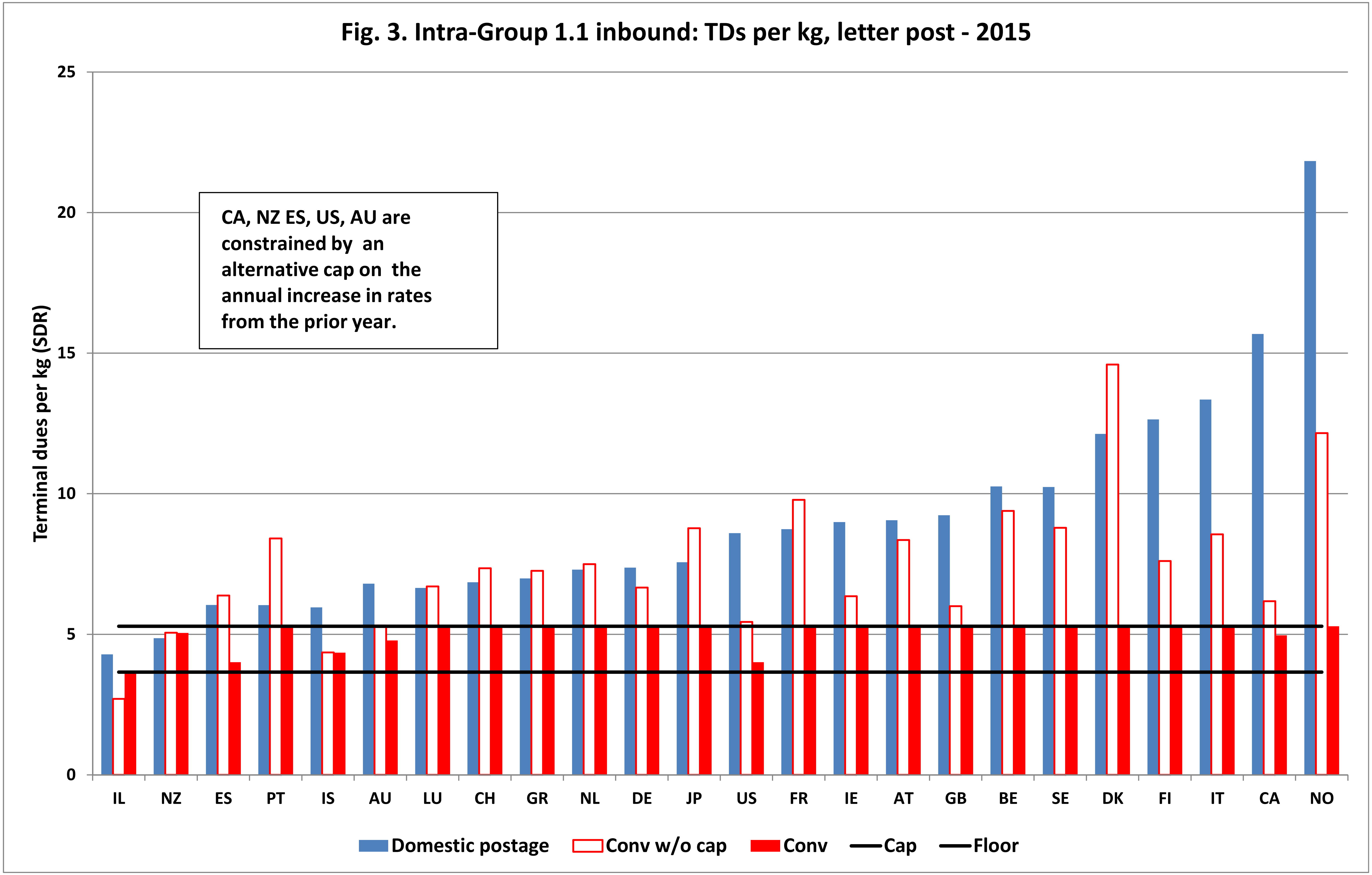


Fig. 3. Intra-Group 1.1 inbound: TDs per kg, letter post - 2015
CA, NZ ES, US, AU are constrained by an alternative cap on the annual increase in rates from the prior year.
Terminal dues per kg (SDR)
25
20
15
10
5
0
IL
NZ
ES
PT
IS
AU
LU
CH
GR
NL
DE
JP
US
FR
IE
AT
GB
BE
SE
DK
FI
IT
CA
NO
Domestic postage
Conv w/o cap
Conv
Cap
Floor

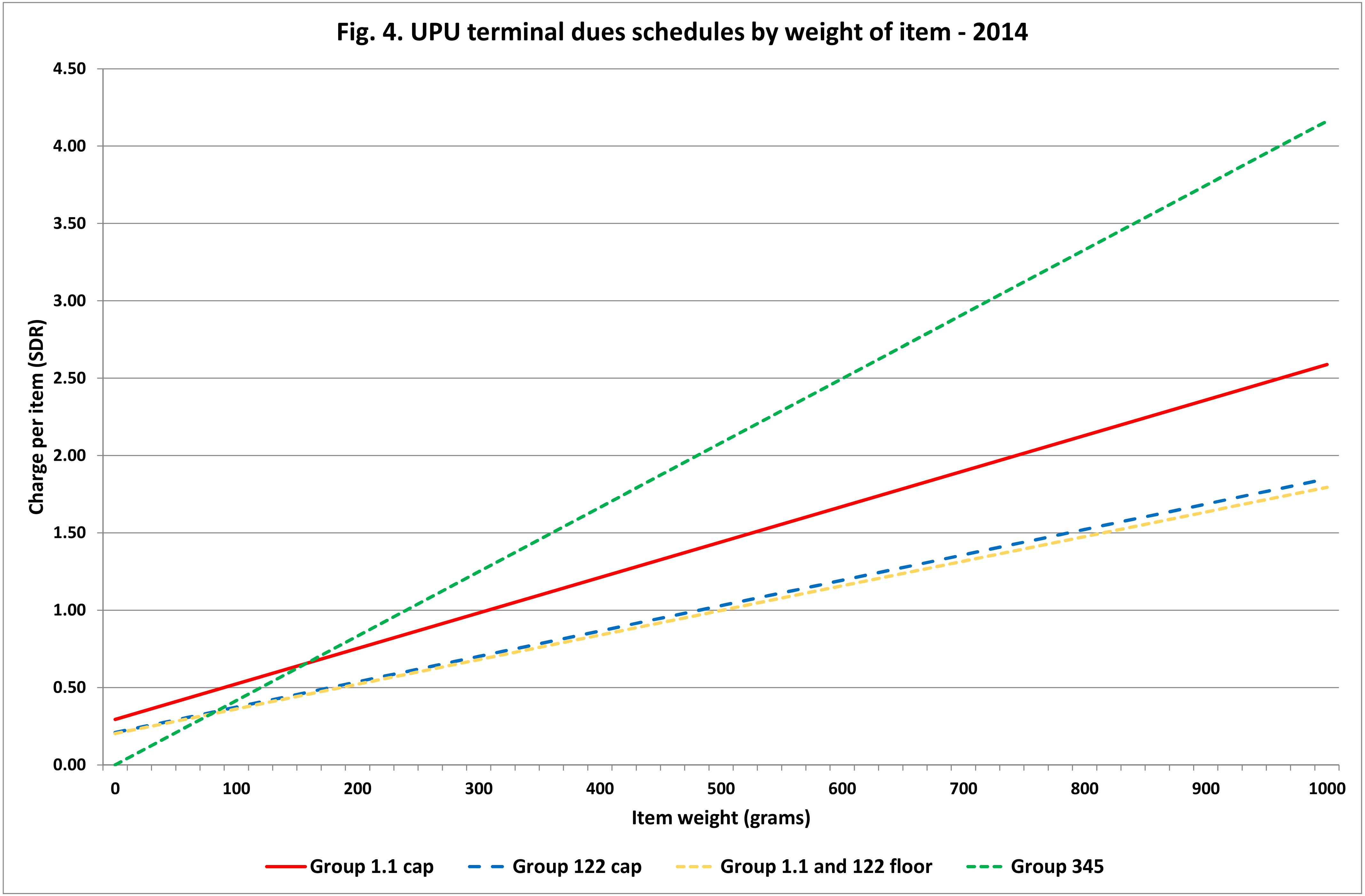


Fig. 4. UPU terminal dues schedules by weight of item - 2014
Charge per item (SDR)
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
100
200
300
400
500
600
700
800
900
1000
Item weight (grams)
Group 1.1 cap
Group 122 cap
Group 1.1 and 122 floor
Group 345

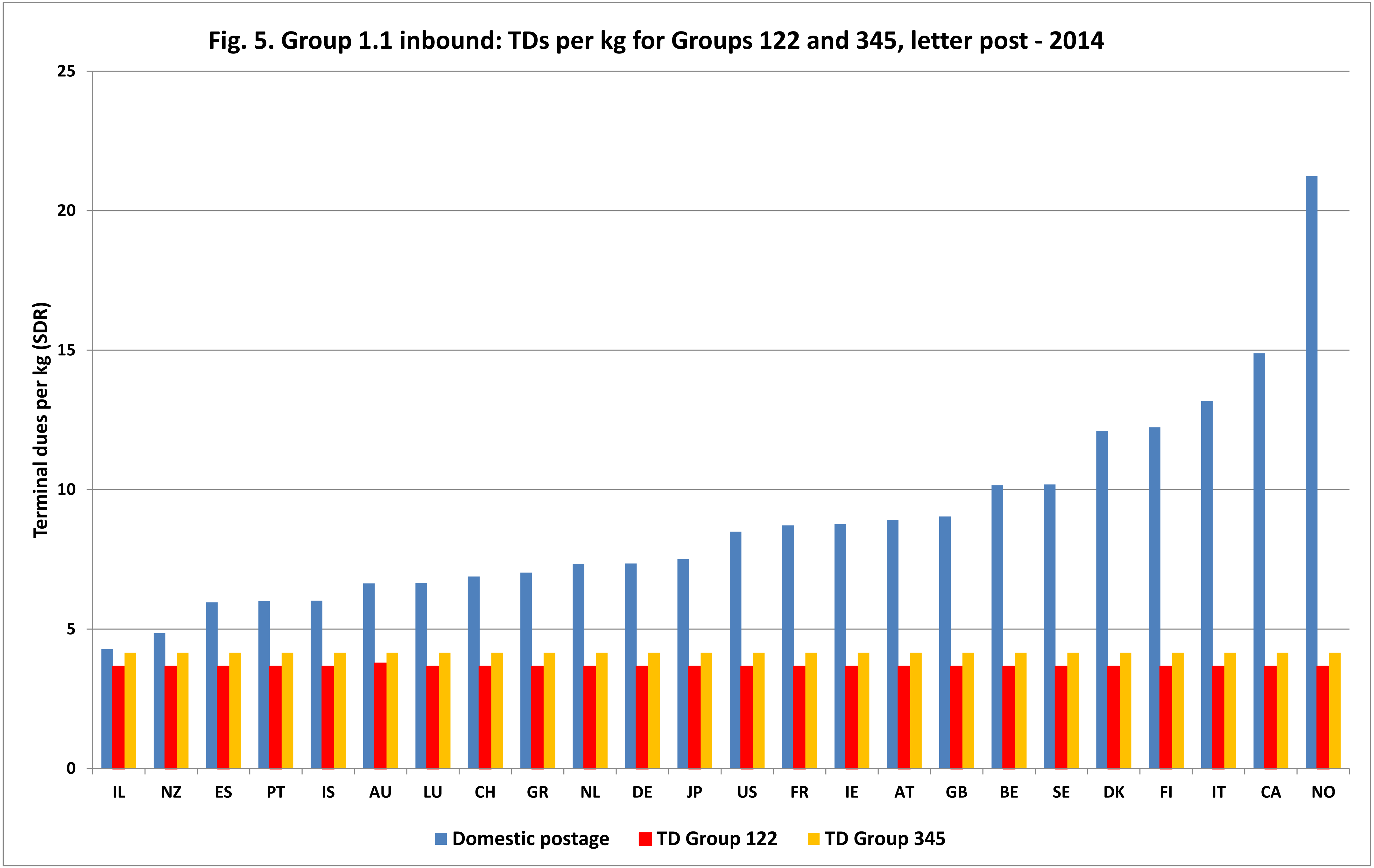
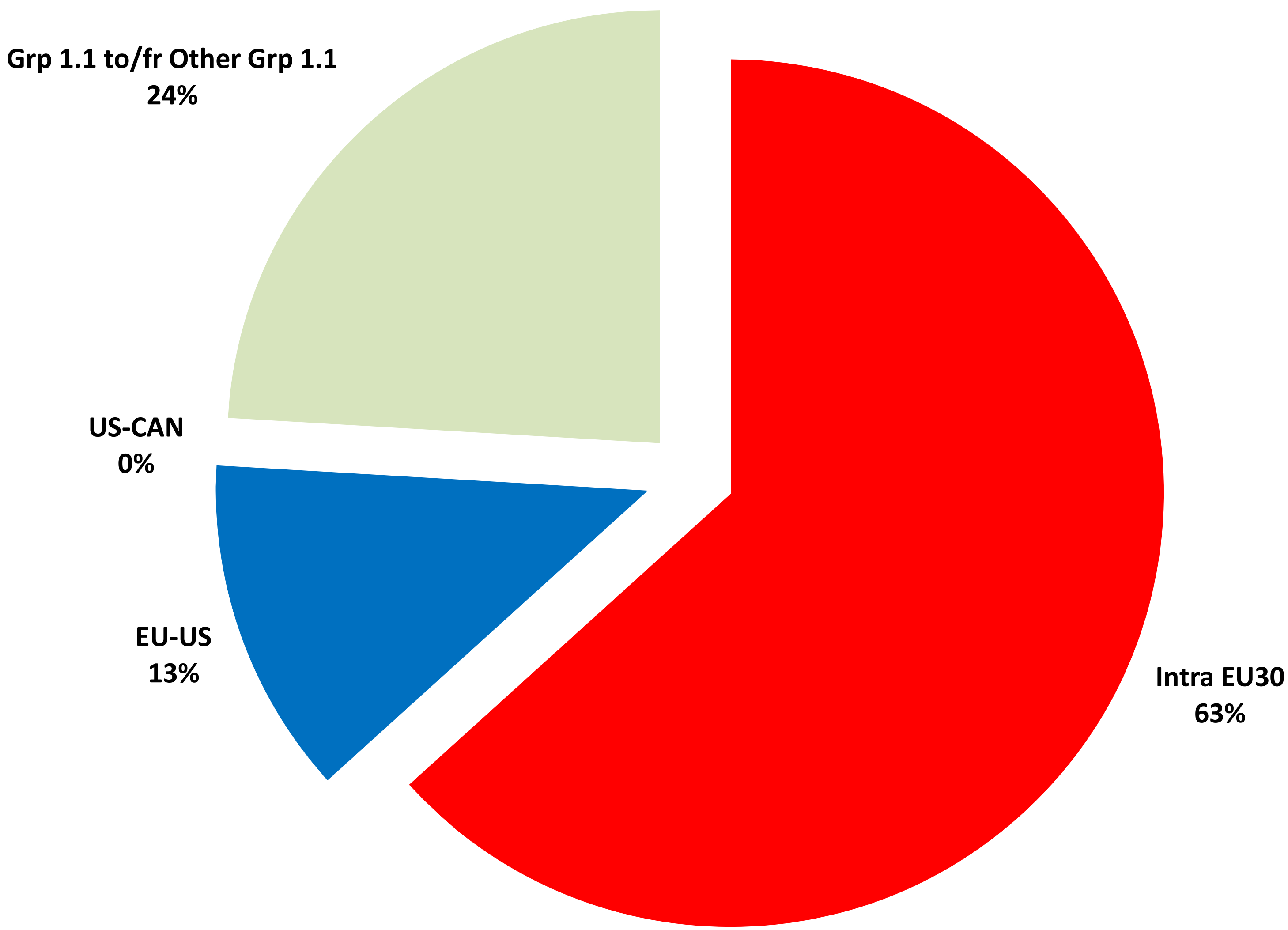


Fig. 5. Group 1.1 inbound: TDs per kg for Groups 122 and 345, letter post - 2014
Terminal dues per kg (SDR)
25
20
15
10
5
0
IL
NZ
ES
PT
IS
AU
LU
CH
GR
NL
DE
JP
US
FR
IE
AT
GB
BE
SE
DK
FI
IT
CA
NO
Domestic postage
TD Group 122
TD Group 345

Fig. 6. Intra-Group 1.1 flows by regions, 2014



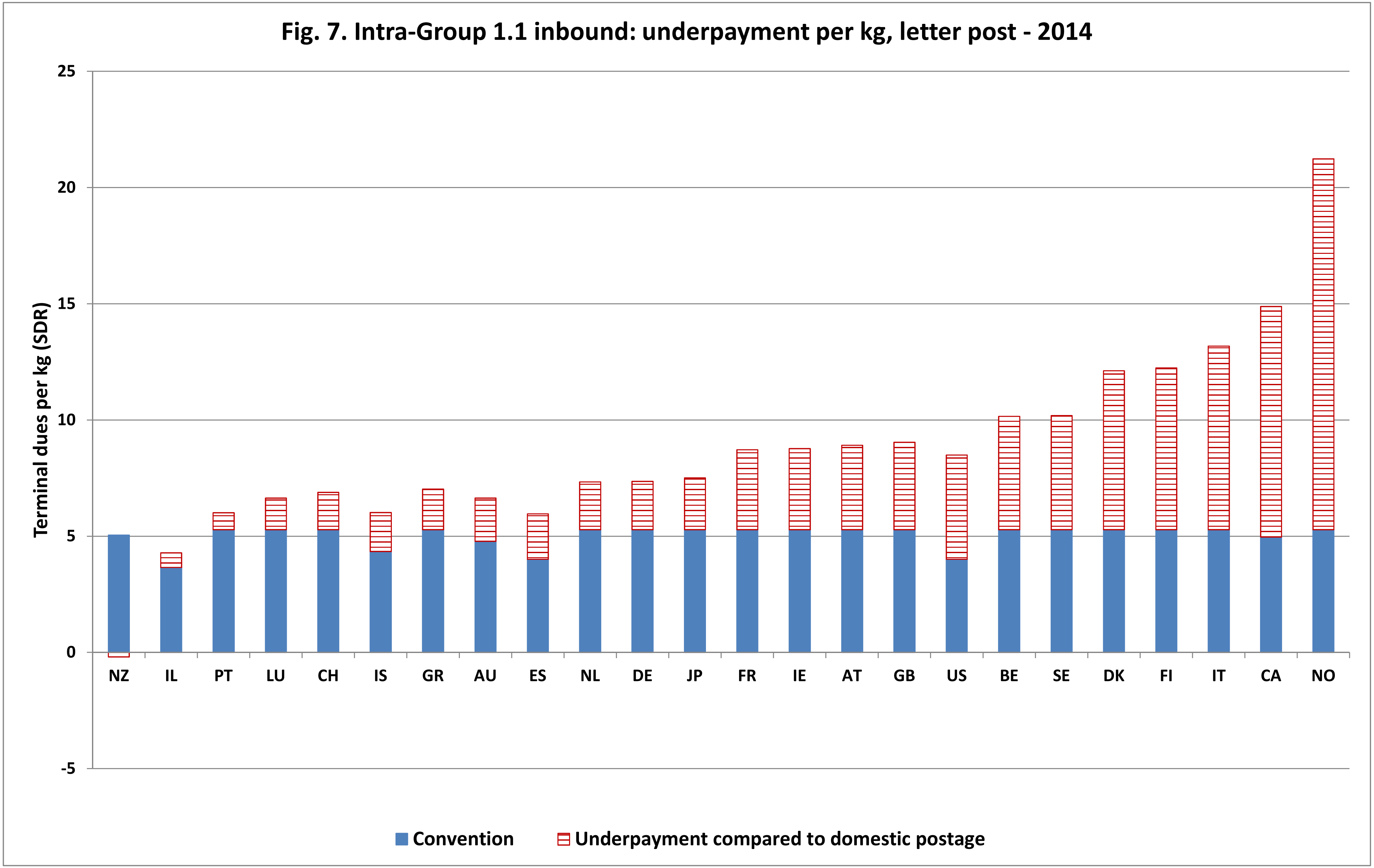


Fig. 7. Intra-Group 1.1 inbound: underpayment per kg, letter post - 2014
Terminal dues per kg (SDR)
25
20
15
10
5
0
-5
NZ
IL
PT
LU
CH
IS
GR
AU
ES
NL
DE
JP
FR
IE
AT
GB
US
BE
SE
DK
FI
IT
CA
NO
Convention
Underpayment compared to domestic postage

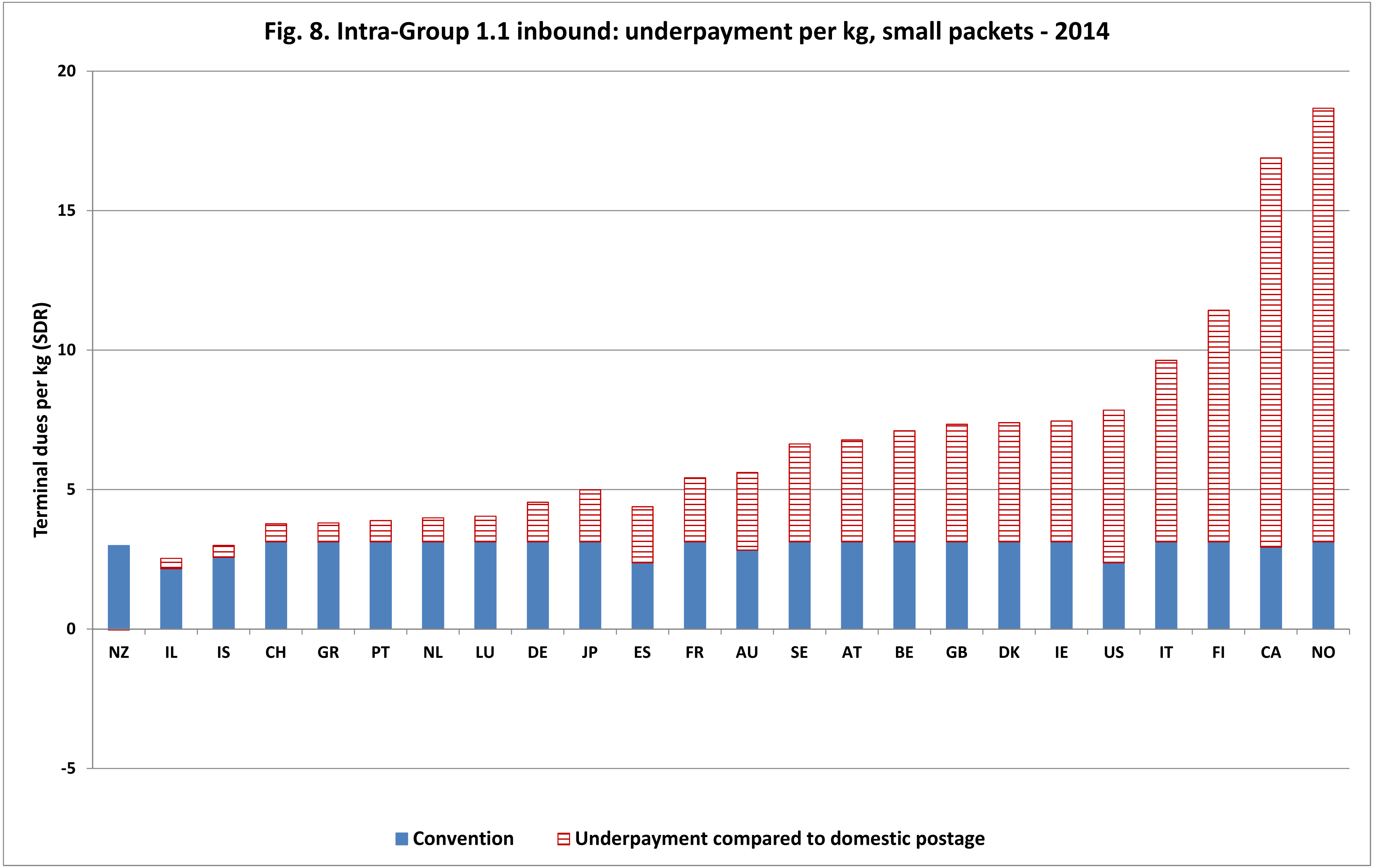


Fig. 8. Intra-Group 1.1 inbound: underpayment per kg, small packets - 2014
Terminal dues per kg (SDR)
20
15
10
5
0
-5
NZ IL IS CH GR PT NL LU DE JP ES FR AU SE AT BE GB DK IE US IT FI CA NO
Convention
Underpayment compared to domestic postage

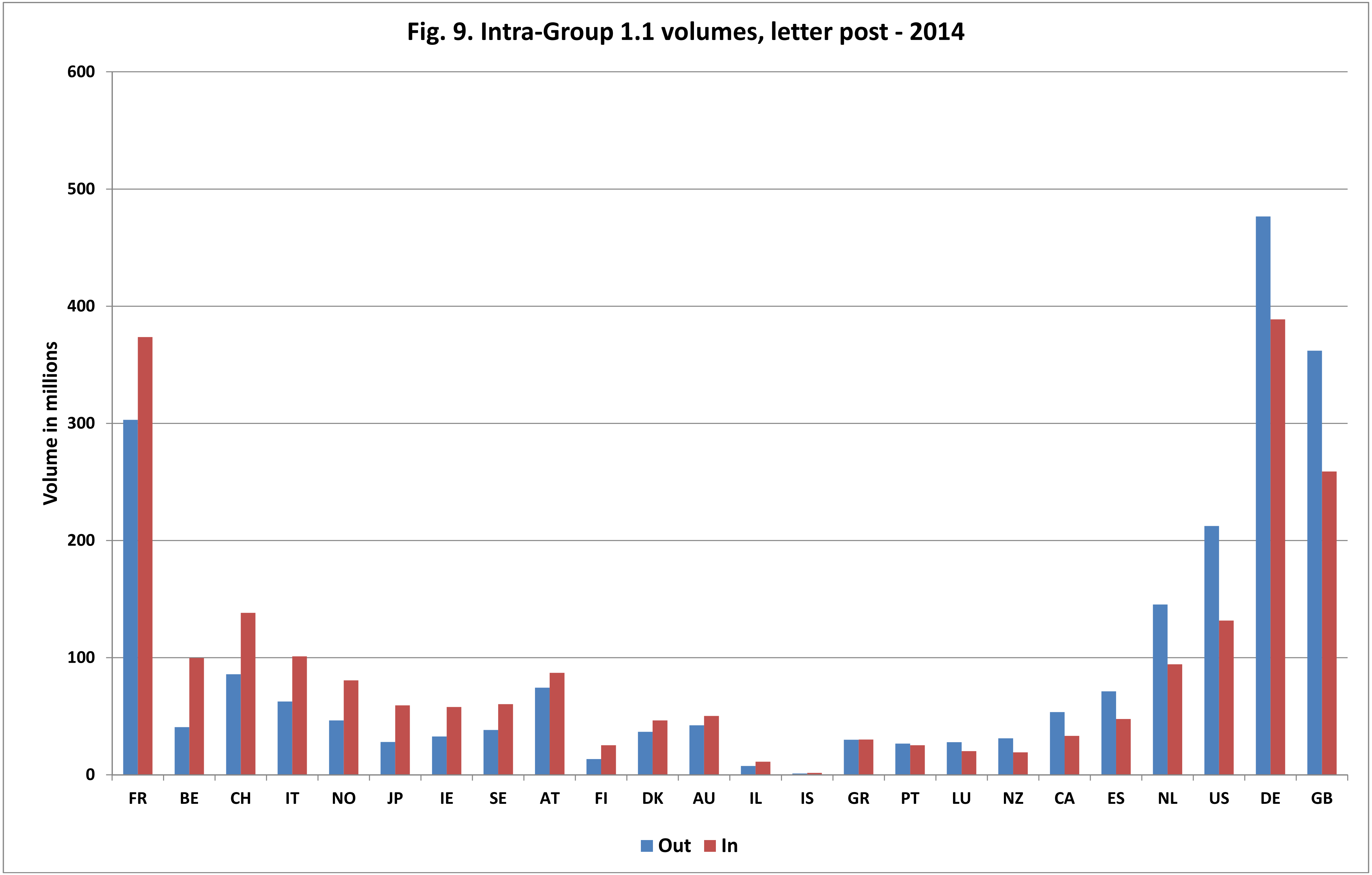


Fig. 9. Intra-Group 1.1 volumes, letter post - 2014
Volume in millions
600
500
400
300
200
100
0
FR
BE
CH
IT
NO
JP
IE
SE
AT
FI
DK
AU
IL
IS
GR
PT
LU
NZ
CA
ES
NL
US
DE
GB
Out
In

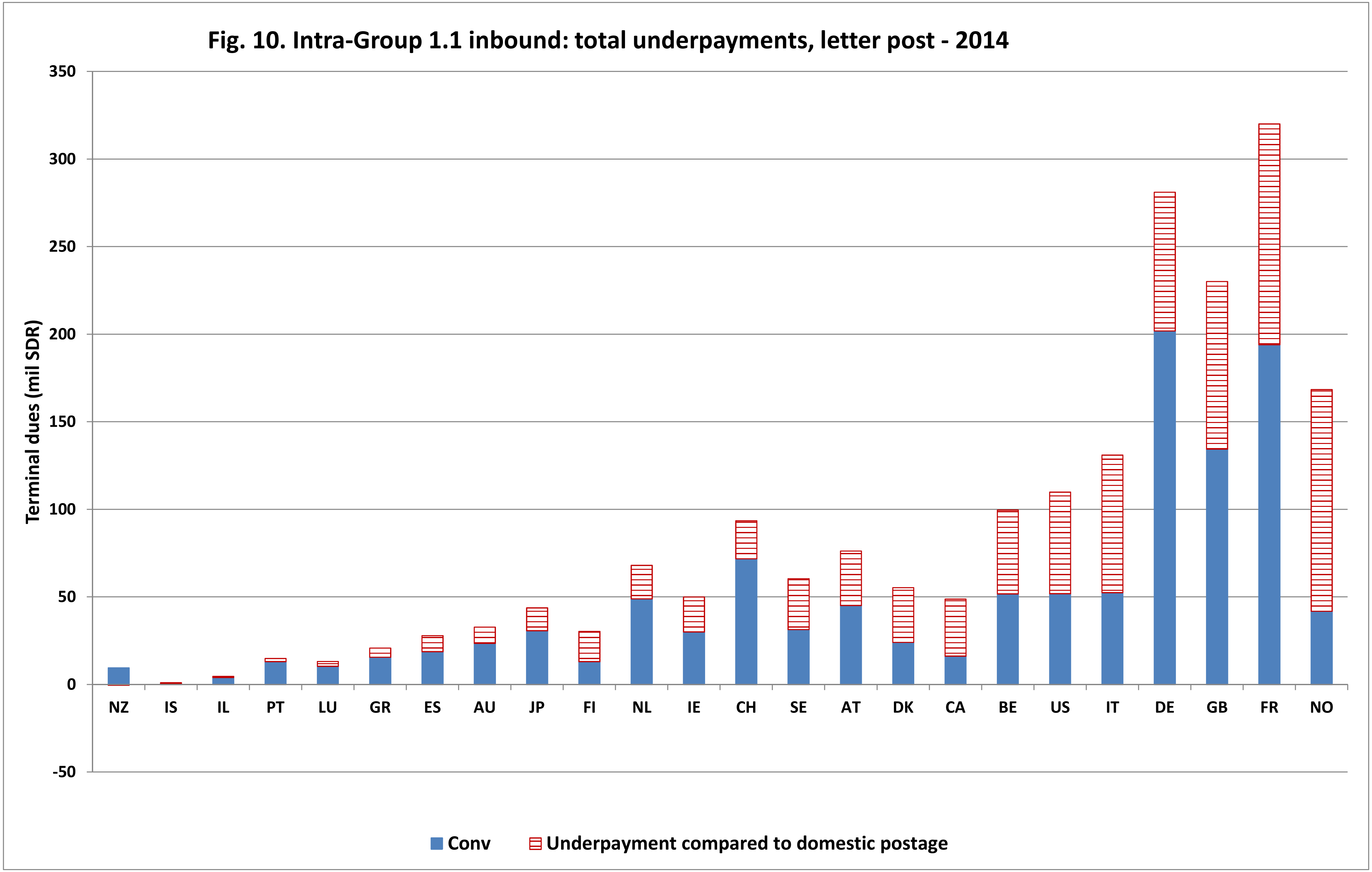


Fig. 10. Intra-Group 1.1 inbound: total underpayments, letter post - 2014
Terminal dues (mil SDR)
350
300
250
200
150
100
50
0
-50
NZ
IS
IL
PT
LU
GR
ES
AU
JP
FI
NL
IE
CH
SE
AT
DK
CA
BE
US
IT
DE
GB
FR
NO
Conv
Underpayment compared to domestic postage

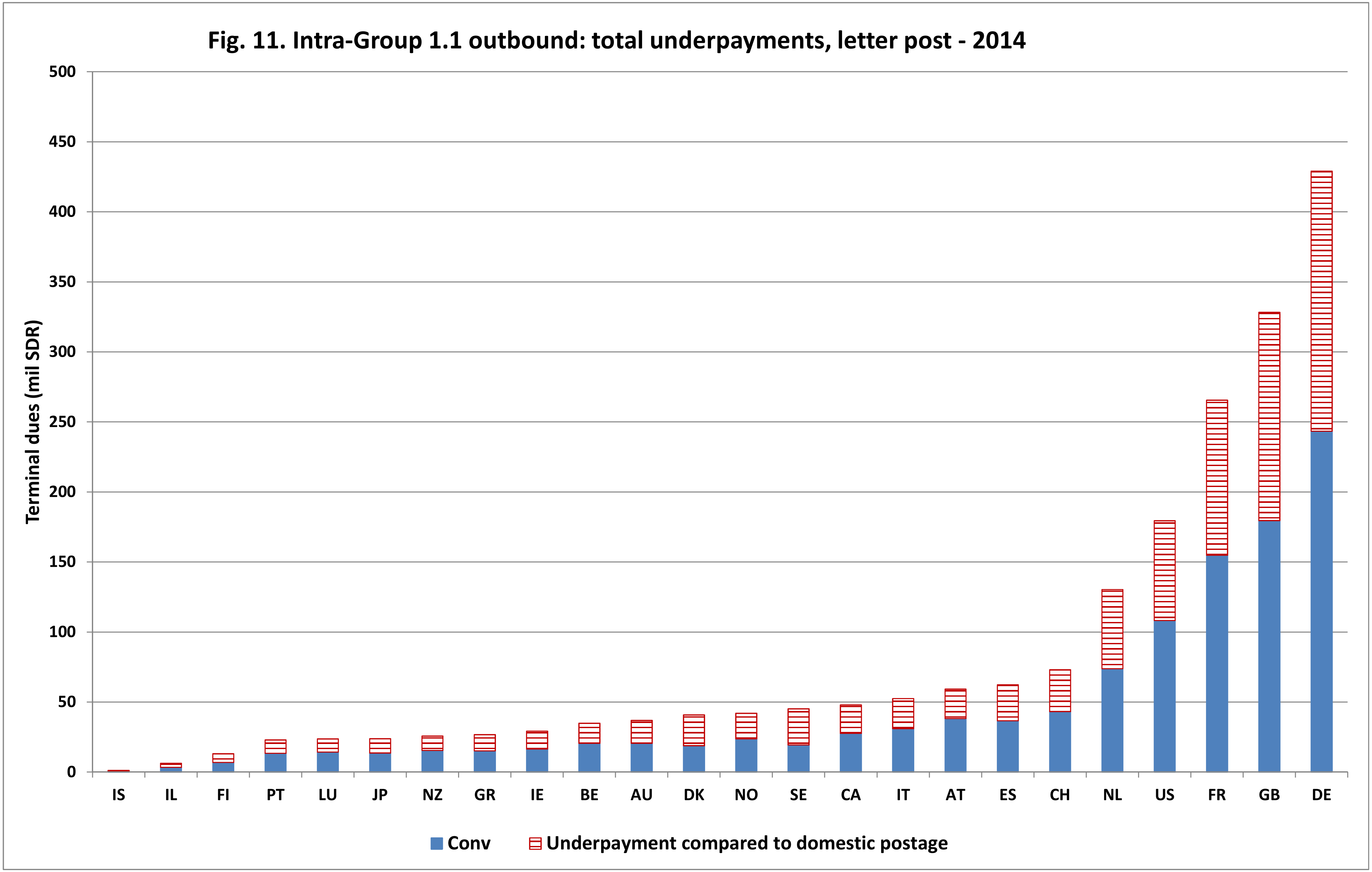


Fig. 11. Intra-Group 1.1 outbound: total underpayments, letter post - 2014
Terminal dues (mil SDR)
500
450
400
350
300
250
200
150
100
50
0
IS
IL
FI
PT
LU
JP
NZ
GR
IE
BE
AU
DK
NO
SE
CA
IT
AT
ES
CH
NL
US
FR
GB
DE
Conv
Underpayment compared to domestic postage

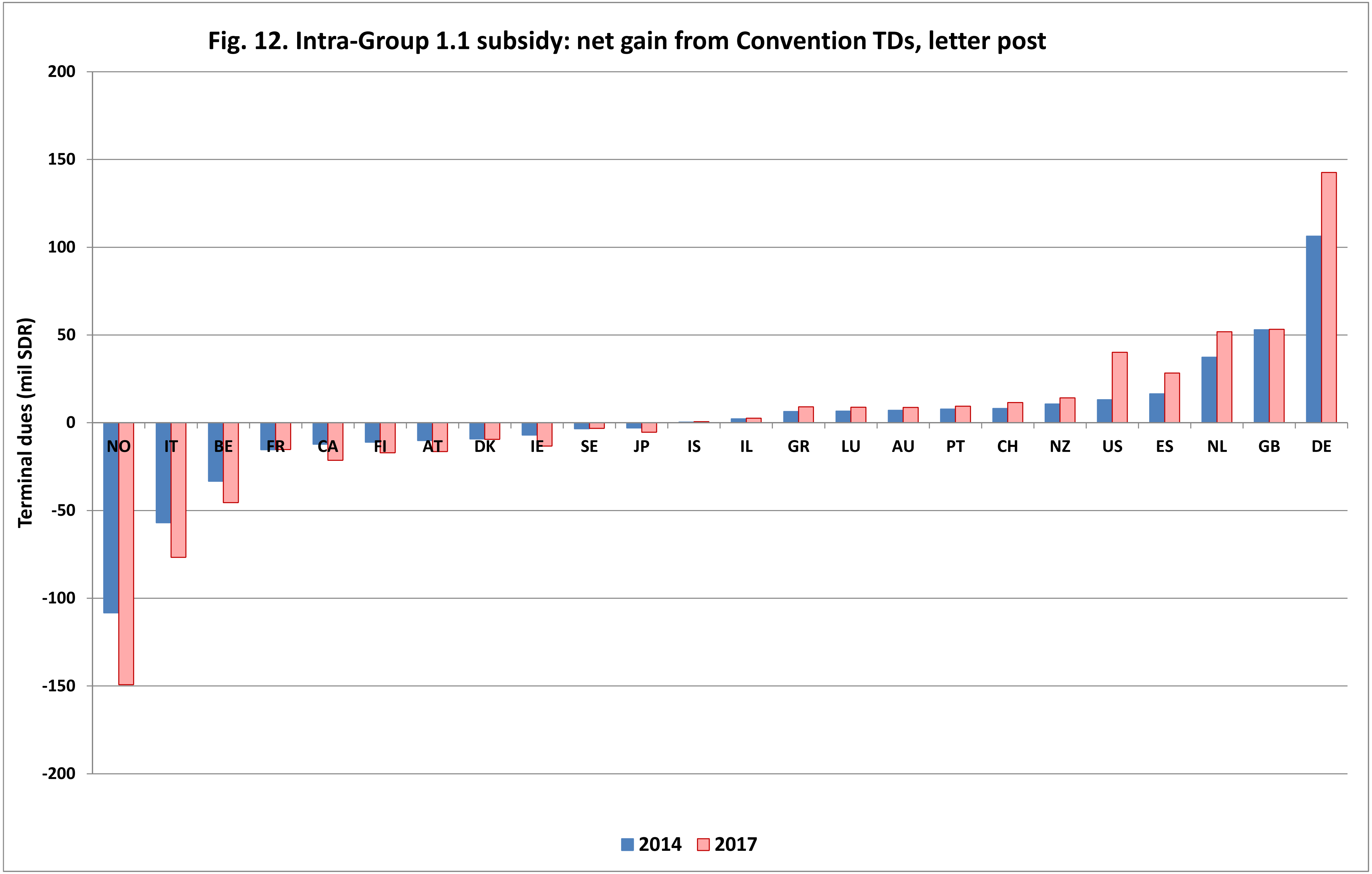


Fig. 12. Intra-Group 1.1 subsidy: net gain from Convention TDs, letter post
200
150
100
50
0
-50
-100
-150
-200
Terminal dues (mil SDR)
NO
IT
BE
FR
CA
FI
AT
DK
IE
SE
JP
IS
IL
GR
LU
AU
PT
CH
NZ
US
ES
NL
GB
DE
2014
2017

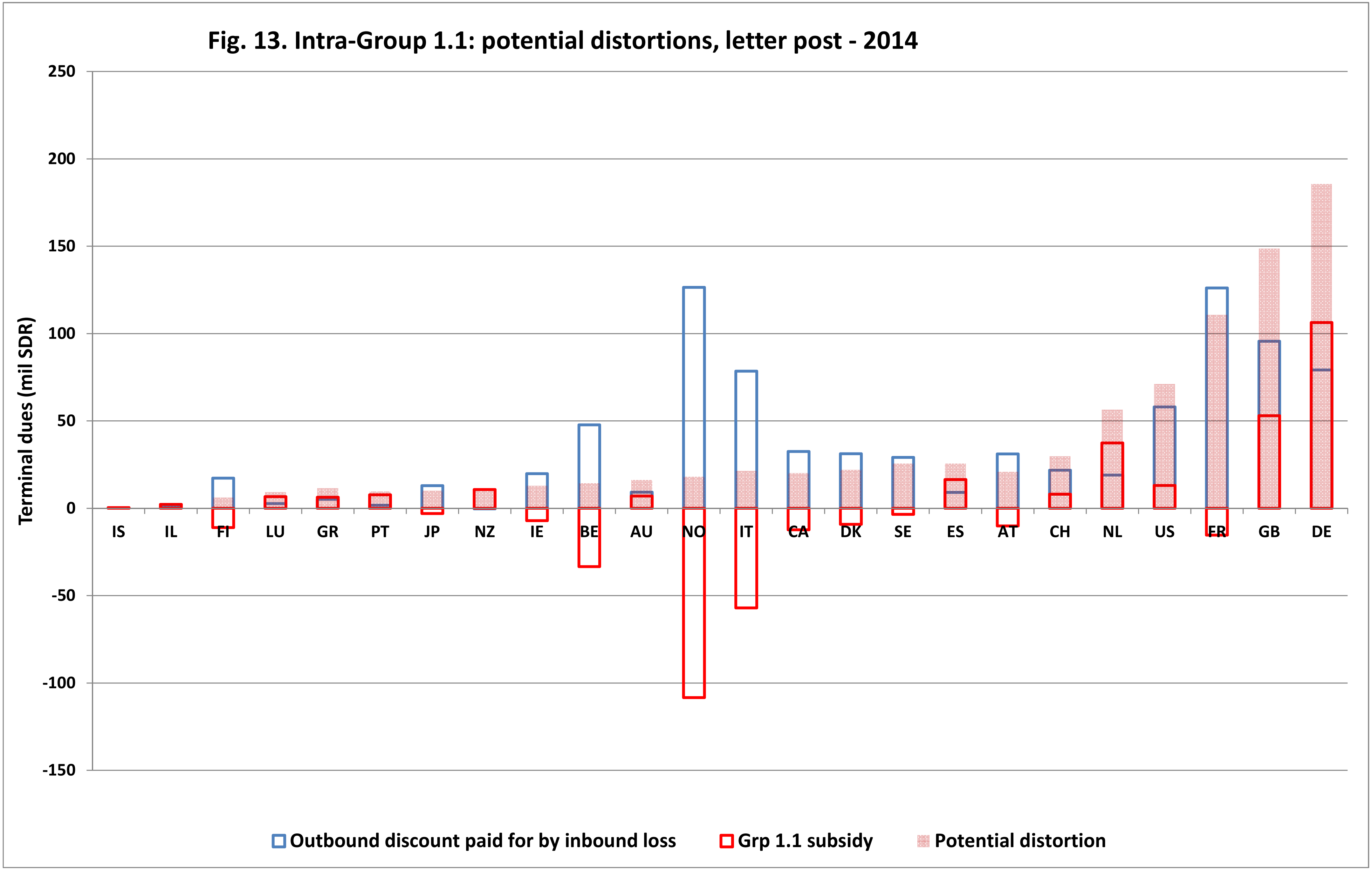


Fig. 13. Intra-Group 1.1: potential distortions, letter post - 2014
Terminal dues (mil SDR)
250
200
150
100
50
0
-50
-100
-150
IS
IL
FI
LU
GR
PT
JP
NZ
IE
BE
AU
NO
IT
CA
DK
SE
ES
AT
CH
NL
US
FR
GB
DE
Outbound discount paid for by inbound loss
Grp 1.1 subsidy
Potential distortion

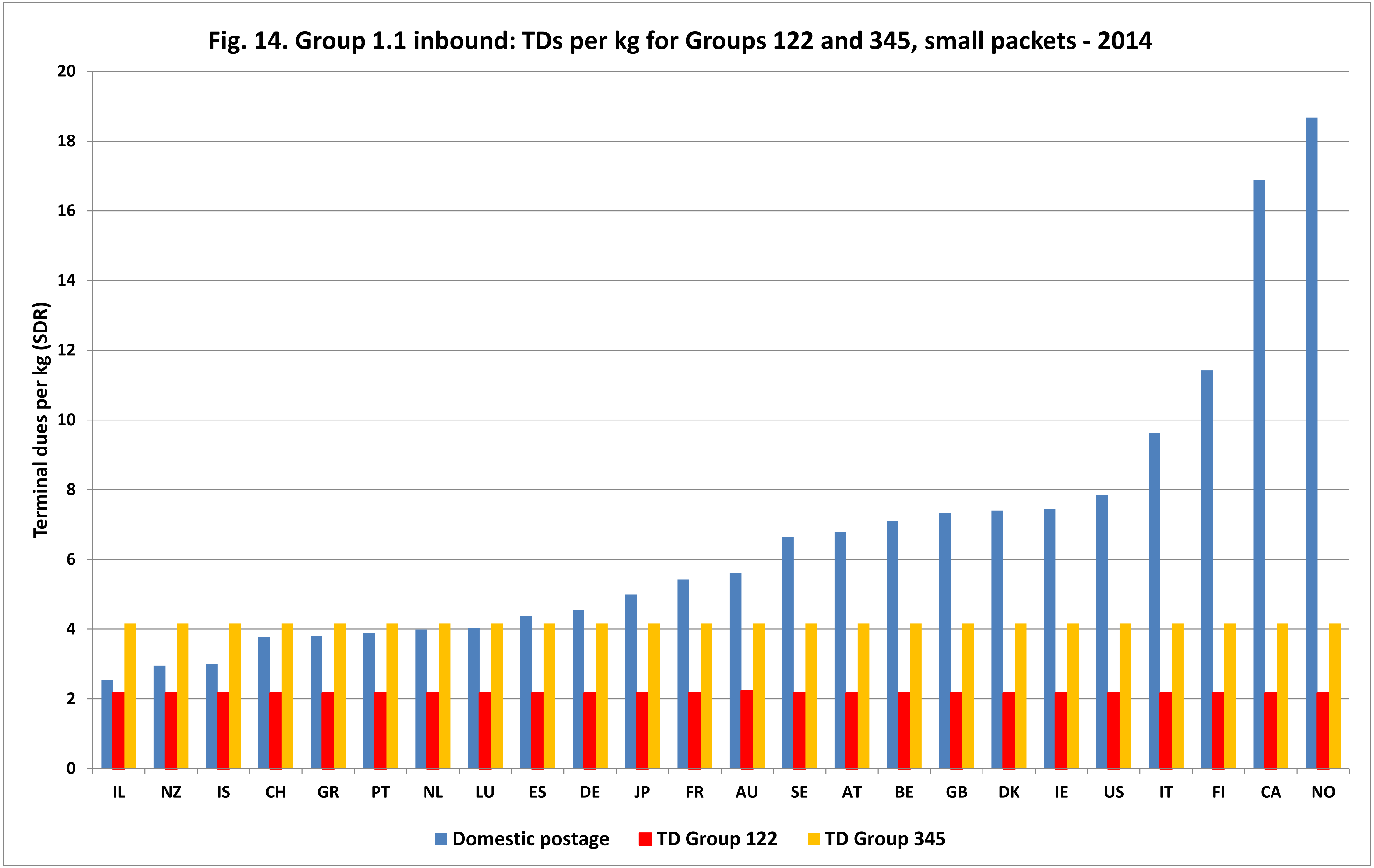


Fig. 14. Group 1.1 inbound: TDs per kg for Groups 122 and 345, small packets - 2014
Terminal dues per kg (SDR)
0
2
4
6
8
10
12
14
16
18
20
IL
NZ
IS
CH
GR
PT
NL
LU
ES
DE
JP
FR
AU
SE
AT
BE
GB
DK
IE
US
IT
FI
CA
NO
Domestic postage
TD Group 122
TD Group 345

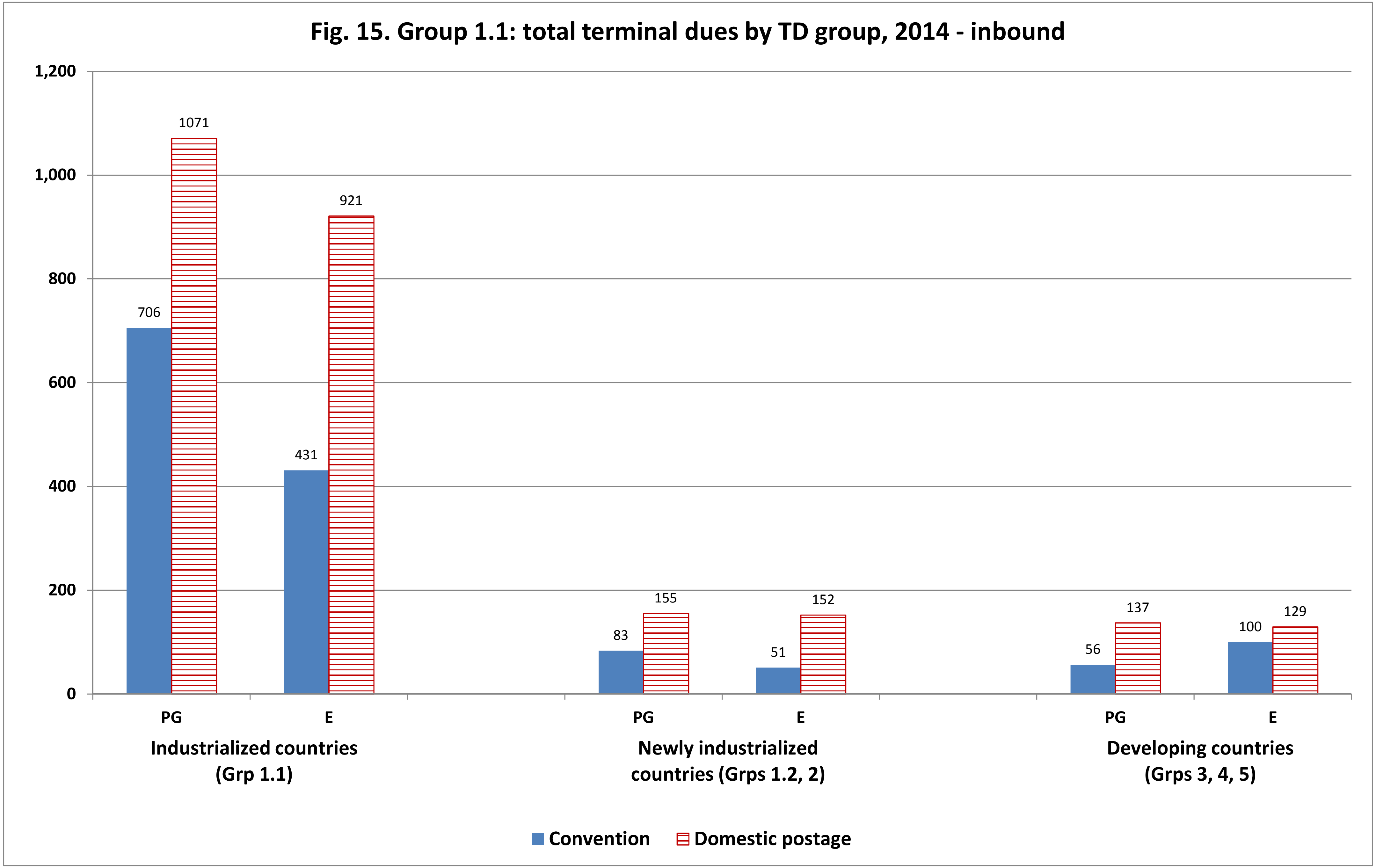


Fig. 15. Group 1.1: total terminal dues by TD group, 2014 - inbound
1,200
1,000
800
600
400
200
0
706
1071
431
921
83
155
51
152
56
137
100
129
PG
E
PG
E
PG
E
Industrialized countries (Grp 1.1)
Newly industrialized countries (Grps 1.2, 2)
Developing countries (Grps 3, 4, 5)
Convention
Domestic postage

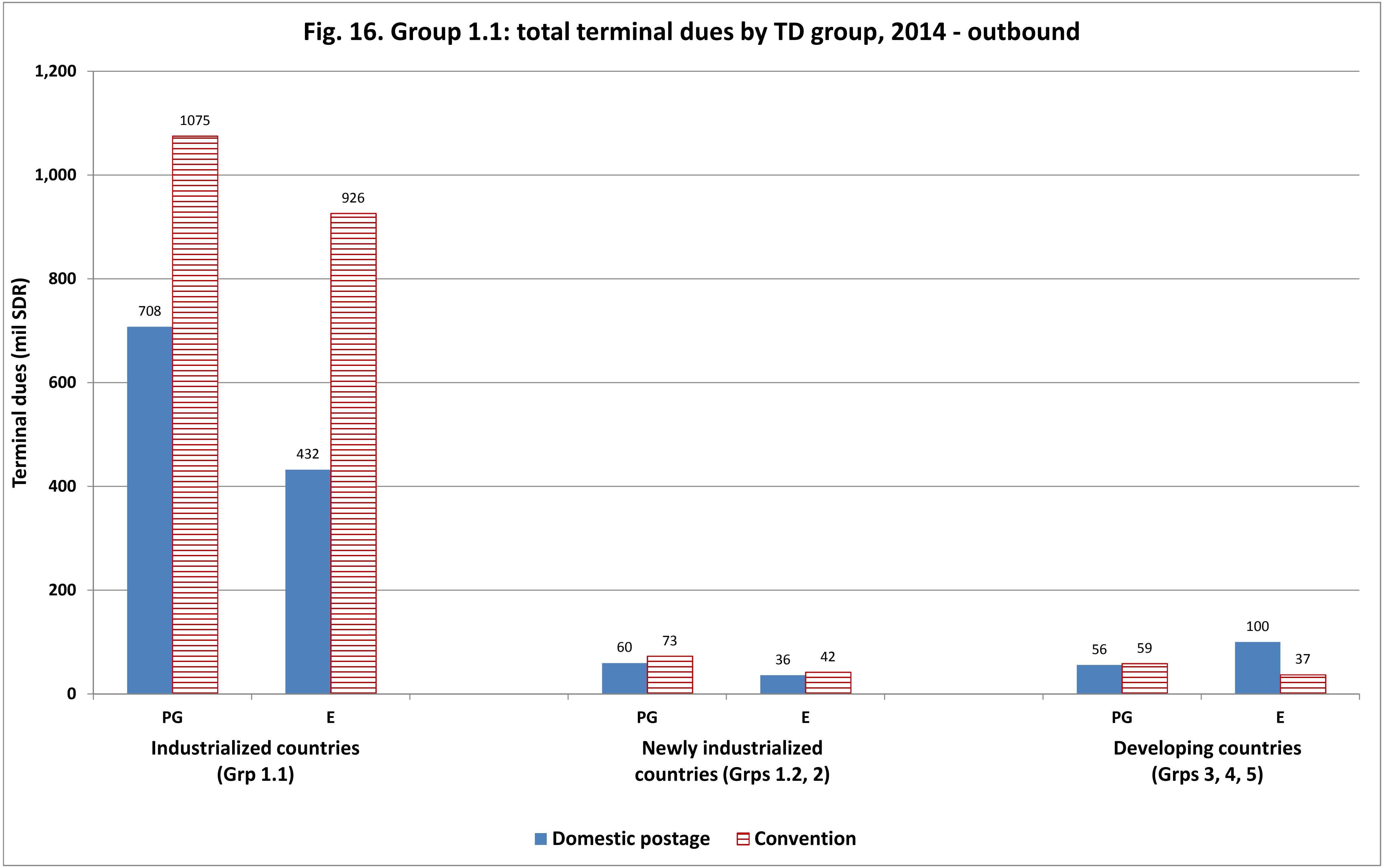


Fig. 16. Group 1.1: total terminal dues by TD group, 2014 - outbound
Terminal dues (mil SDR)
1,200
1,000
800
600
400
200
0
708
1075
432
926
60
73
36
42
56
59
100
37
PG
E
PG
E
PG
E
Industrialized countries (Grp 1.1)
Newly industrialized countries (Grps 1.2, 2)
Developing countries (Grps 3, 4, 5)
Domestic postage
Convention

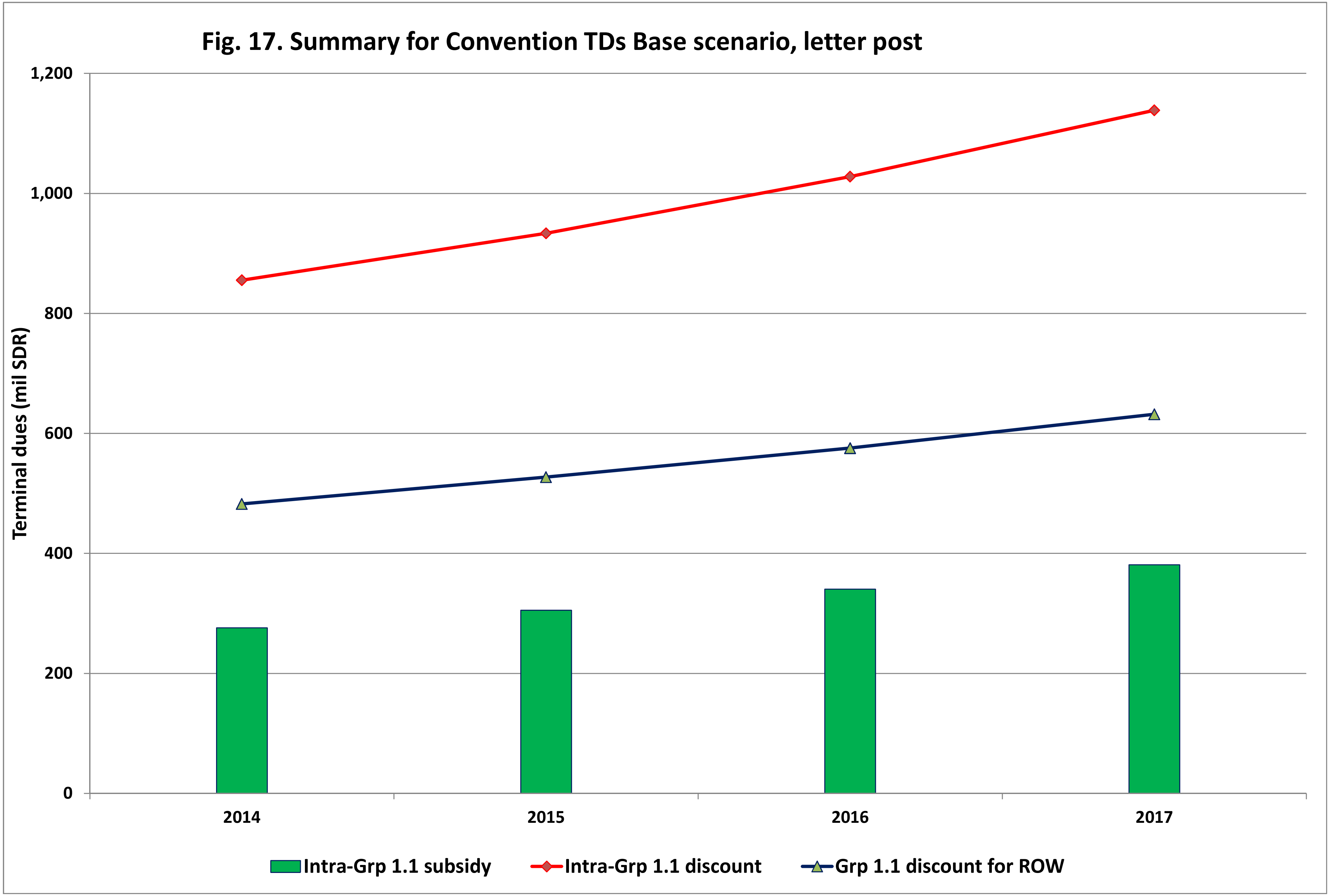


Fig. 17. Summary for Convention TDs Base scenario, letter post
Terminal dues (mil SDR)
1,200
1,000
800
600
400
200
0
2014
2015
2016
2017
Intra-Grp 1.1 subsidy
Intra-Grp 1.1 discount
Grp 1.1 discount for ROW

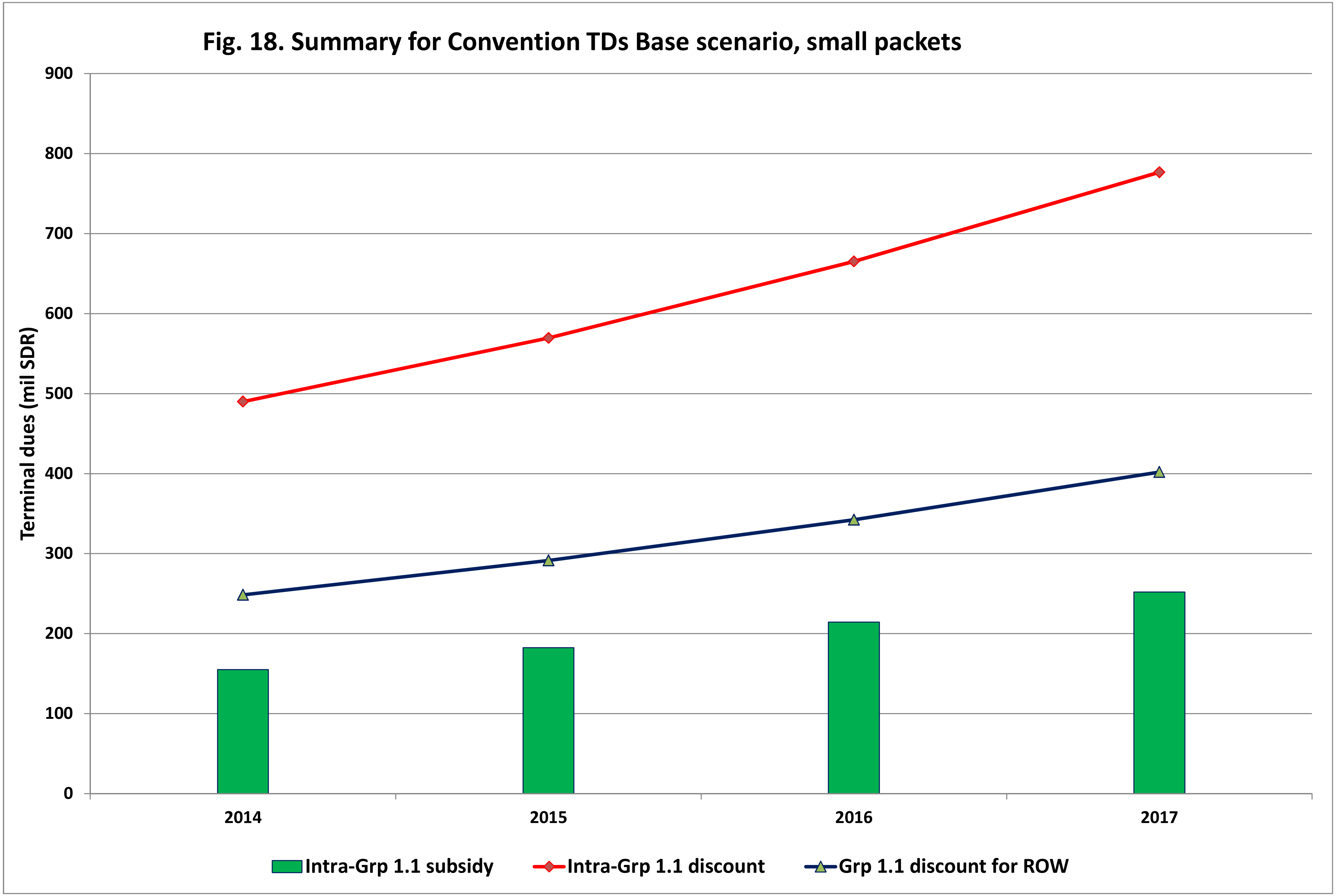


Fig. 18. Summary for Convention TDs Base scenario, small packets
Terminal dues (mil SDR)
900
800
700
600
500
400
300
200
100
0
2014
2015
2016
2017
Intra-Grp 1.1 subsidy
Intra-Grp 1.1 discount
Grp 1.1 discount for ROW

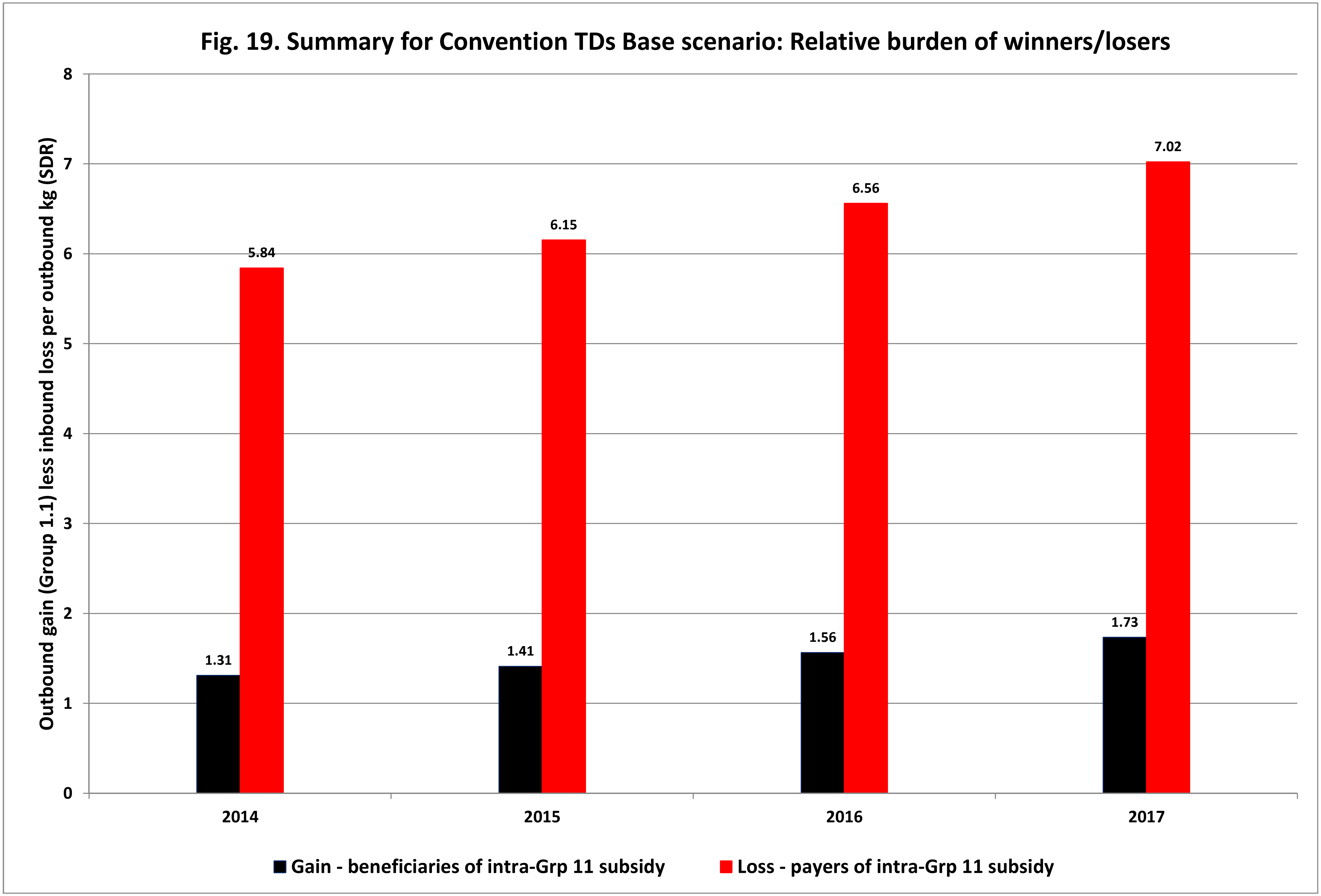


Fig. 19. Summary for Convention TDs Base scenario: Relative burden of winners/losers
Outbound gain (Group 1.1) less inbound loss per outbound kg (SDR)
8
7
6
5
4
3
2
1
0
5.84
6.15
6.56
7.02
1.31
1.41
1.56
1.73
2014
2015
2016
2017
Gain - beneficiaries of intra-Grp 11 subsidy
Loss - payers of intra-Grp 11 subsidy

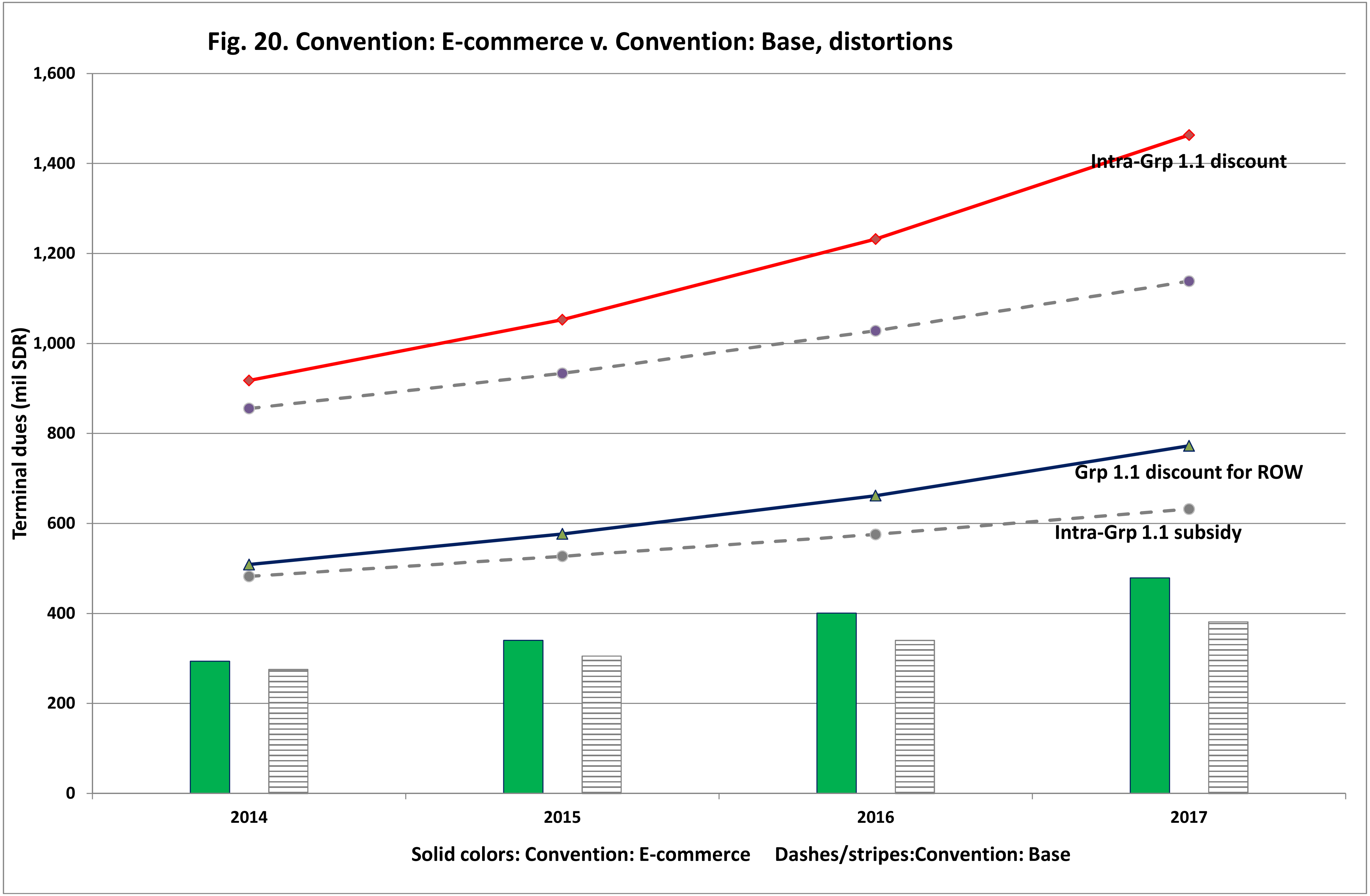


Fig. 20. Convention: E-commerce v. Convention: Base, distortions
1,600
1,400
1,200
1,000
800
600
400
200
0
Terminal dues (mil SDR)
Intra-Grp 1.1 discount
Grp 1.1 discount for ROW
Intra-Grp 1.1 subsidy
2014
2015
2016
2017
Solid colors: Convention: E-commerce
Dashes/stripes:Convention: Base

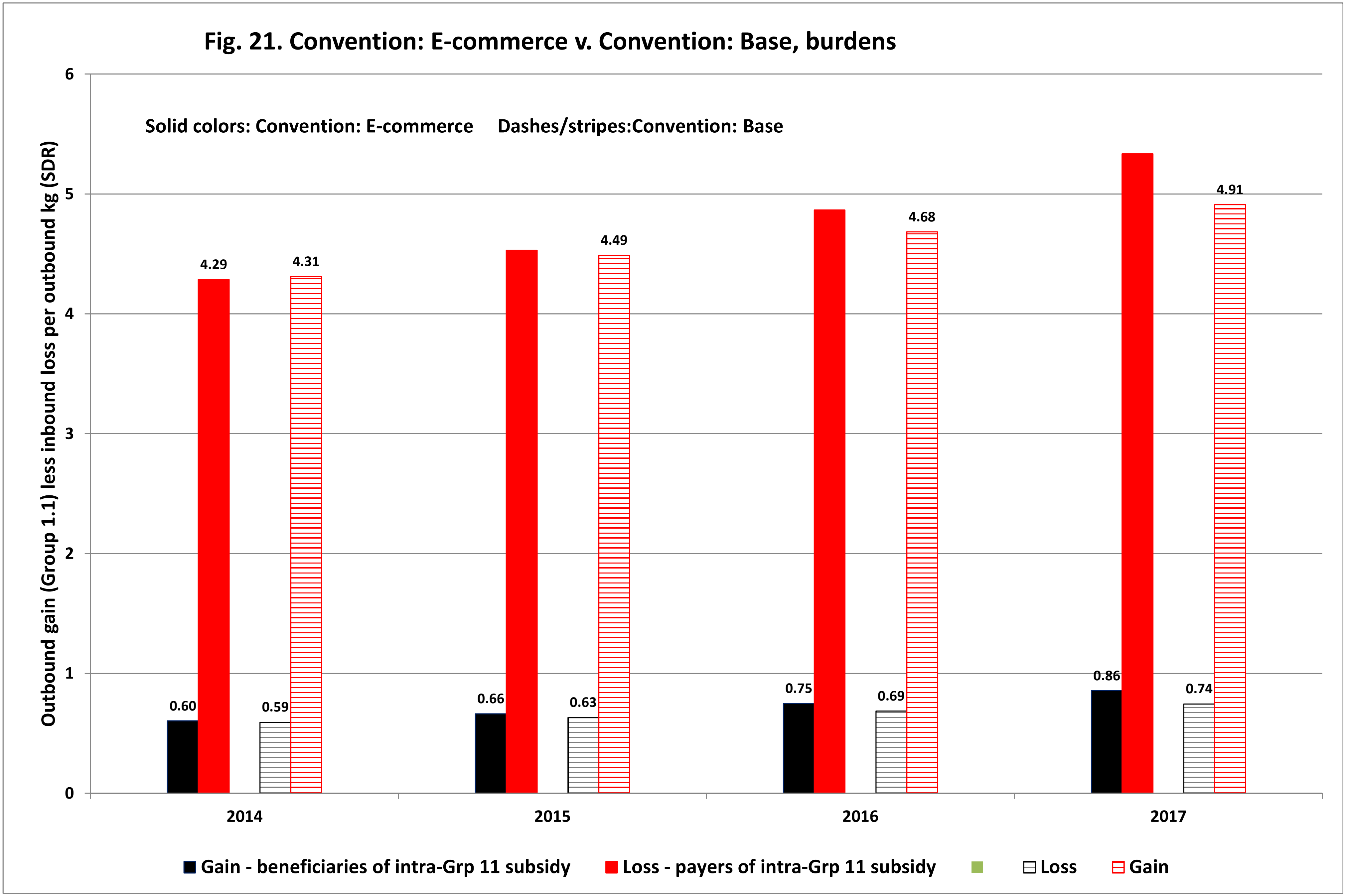


Fig. 21. Convention: E-commerce v. Convention: Base, burdens
Solid colors: Convention: E-commerce
Dashes/stripes:Convention: Base
Outbound gain (Group 1.1) less inbound loss per outbound kg (SDR)
0
1
2
3
4
5
6
0.60
4.29
0.59
4.31
0.66
0.63
4.49
0.75
0.69
4.68
0.86
0.74
4.91
2014
2015
2016
2017
Gain - beneficiaries of intra-Grp 11 subsidy
Loss - payers of intra-Grp 11 subsidy
Loss
Gain

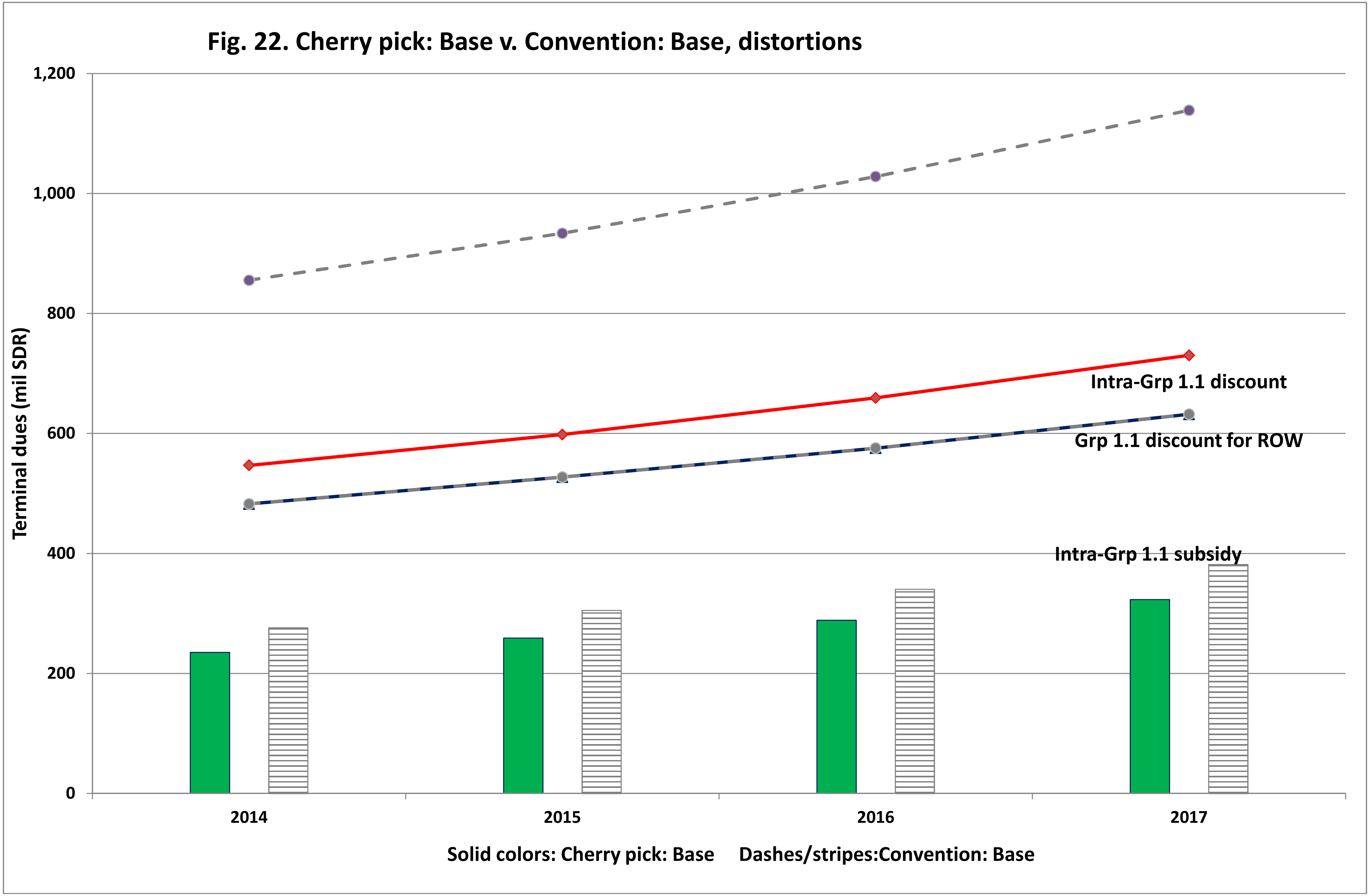


Fig. 22. Cherry pick: Base v. Convention: Base, distortions
1,200
1,000
800
600
400
200
0
Terminal dues (mil SDR)
Intra-Grp 1.1 discount
Grp 1.1 discount for ROW
Intra-Grp 1.1 subsidy
2014
2015
2016
2017
Solid colors: Cherry pick: Base
Dashes/stripes:Convention: Base

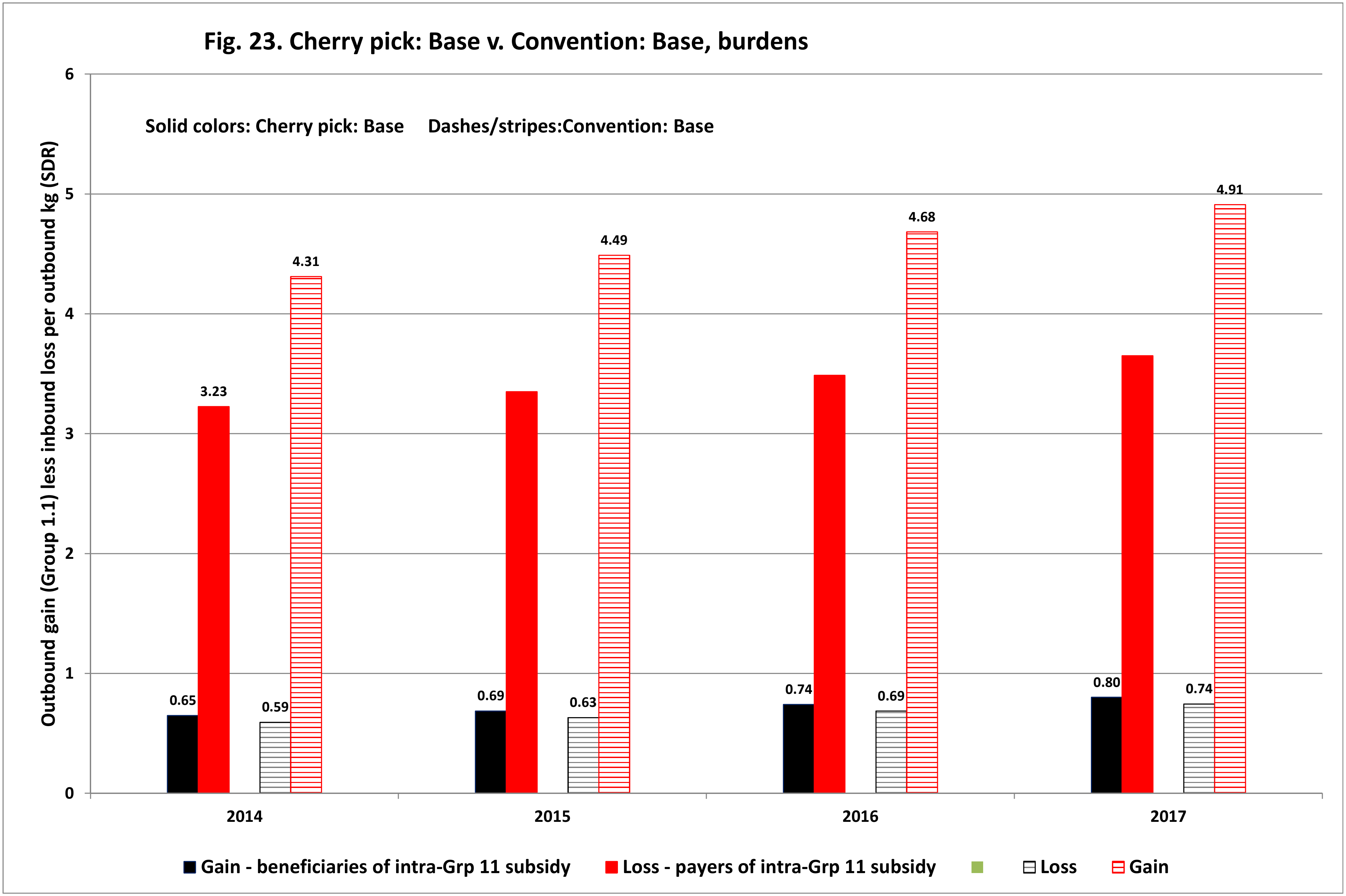


Fig. 23. Cherry pick: Base v. Convention: Base, burdens
Solid colors: Cherry pick: Base
Dashes/stripes:Convention: Base
Outbound gain (Group 1.1) less inbound loss per outbound kg (SDR)
0
1
2
3
4
5
6
0.65
3.23
0.59
4.31
0.69
0.63
4.49
0.74
0.69
4.68
0.80
0.74
4.91
2014
2015
2016
2017
Gain - beneficiaries of intra-Grp 11 subsidy
Loss - payers of intra-Grp 11 subsidy
Loss
Gain