Belgisch Instituut voor
postdiensten en telecommunicatie

Mededeling van de Raad van het BIPT van 20 april 2021 betreffende elasticiteitenstudies naar postale producten

Niet-vertrouwelijk versie

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INHOUDSOPGAVE

Inleiding

1. Beschouwde elasticiteiten

1. Elasticiteit is een belangrijk begrip in de economie, daar het een mate van gevoeligheid op wijzigingen weergeeft (bijvoorbeeld in het geval van een prijselasticiteit de prijsgevoeligheid). De prijselasticiteit van de vraag geeft bijvoorbeeld weer in welke mate de gevraagde hoeveelheid naar bepaalde goederen of diensten zal reageren op een wijziging in de prijs van deze goederen of diensten.

2. Meestal wordt er een negatief verband vastgesteld tussen prijs en gevraagde hoeveelheid. Voor de meeste producten of diensten is het immers zo dat bij een hogere prijs minder producten of diensten worden gevraagd. Omgekeerd wordt er bij een lagere prijs veelal een hogere vraag vastgesteld.

3. De reactiesterkte waarmee de gevraagde hoeveelheid op een prijswijziging zal reageren wordt gemeten door middel van de hoogte van de prijselasticiteit. Bedraagt de prijselasticiteit in absolute waarde minder dan 1 dan spreken we van een inelastische vraag, wat betekent dat de gevraagde hoeveelheid relatief minder sterk zal wijzigen dan de verandering in prijs. Omgekeerd spreken we van een elastische vraag indien de prijselasticiteit meer dan 1 bedraagt, wat inhoudt dat de mate waarin de vraag zal wijzigen relatief gezien sterker zal zijn dan de wijze waarop de prijs veranderde.

4. Bij een prijselasticiteit van de vraag gaat het dus om volgende vergelijking (Abraham, Buyst, De Bruyne, et al; 2000) :

   Prijselasticiteit:

   $$E_p^V = \frac{\text{relatieve verandering van de gevraagde hoeveelheid}}{\text{relatieve verandering van de prijs}}$$

   Oftewel:

   $$E_p^V = \frac{\frac{\Delta Q}{Q_1}}{\frac{\Delta P}{P_1}}$$

5. De econometrische analyse die werd uitgevoerd raakt ook aan enkele kruiselingse elasticiteiten. Bij de kruiselingse elasticiteit gaat het om de mate waarin de vraag naar een product reageert op een prijsverandering van een ander product. Een negatieve kruiselingse elasticiteit wijst op goederen die elkaar aanvullen, zogenaamde complementaire goederen. Een positieve kruiselingse elasticiteit wijst daarentegen op goederen die (in bepaalde mate) als alternatieven kunnen bekeken worden, zogenaamde substitutiegoederen.

6. Hierboven gaven we het voorbeeld van de prijselasticiteit maar er kunnen uiteraard allerhande soorten elasticiteiten worden berekend. In deze studie hebben we tevens oog voor een bedelingsfrequentie-elasticiteit. Deze elasticiteit geeft de mate weer waarin het volume van de gevraagde hoeveelheid postdiensten gaat wijzigen als gevolg van een verandering van het aantal bedelingen per week, gegeven een welbepaalde vaste prijs. Het gaat in dit geval zodoende om volgende vergelijking:

Bedelingsfrequentie-elasticiteit:

$$E_b^V = \frac{\text{relatieve verandering van de gevraagde hoeveelheid}}{\text{relatieve verandering van de bedelingsfrequentie}}$$

Oftewel:

$$E_b^V = \frac{\frac{\Delta Q}{Q_1}}{\frac{\Delta B}{B_1}}$$

2. Retroacten

7. Reeds in 2016[1] publiceerde het BIPT een samenvatting van een elasticiteitenstudie uitgevoerd door M.A.S. (Market Analysis & Synthesis) in opdracht van het BIPT. Het ging toen om een elasticiteitenstudie uitgevoerd middels een online enquête bij particulieren, zelfstandigen en kmo's, en een schriftelijke bevraging bij grote ondernemingen en openbare diensten.

8. Een update van de elasticiteitscoëfficiënten drong zich op na enkele jaren in een postale markt in beweging. Tevens was er de wens om de scope van de studie uit te breiden. Door het aantal invalshoeken te vergroten konden de inzichten verruimd en onderling afgetoetst worden. Immers, elke methodologie heeft zijn voordelen, beperkingen en nadelen. Zo wenste het BIPT voor deze editie bovenop een enquête zowel een literatuurstudie, een onderhoud met postale operatoren te voorzien als een econometrische analyse uit te voeren.

9. De literatuurstudie, de bevraging van postale operatoren en het opstellen én analyseren van de enquêtes bij particulieren en professionelen werd uitgevoerd door WIK-Consult. M.A.S. zorgde voor de afname van deze enquêtes. London Economics voerde tot slot de econometrische analyse uit op basis van tijdreeksen aangeleverd door bpost. Tijdens de maanden april en mei 2019 werd de vragenlijst voor de enquête opgesteld. Waarna de enquête tussen mei en juli 2019 werd afgenomen. Tijdens deze periode liepen tevens de gesprekken met drie operatoren. Daarna volgde de analyse en het opstellen van het rapport. Daaraan werd tot slot de econometrische analyse van London Economics toegevoegd. Op basis van de data aangeleverd door bpost in december 2019 en maart 2020, kwam ook dat rapport tot stand.
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10. De betrokken operatoren kregen vanaf 24 juni 2020 de mogelijkheid om opmerkingen en aanduidingen van vertrouwelijkheid te maken. Dit resulteerde in enkele herformuleringen en het ontstaan van een niet-vertrouwelijke versie. Gegeven specifieke bemerkingen en vragen van bpost, op datum van 12 augustus 2020, aangaande de gehanteerde methodologie bij de econometrische analyse, vond een meeting tussen bpost, London Economics en het BIPT plaats op 16 september 2020. In navolging van deze call verfijnde London Economics het model verder, om tegemoet te komen aan de bezorgdheden van bpost. Deze verfijning van het model had echter geen (significante) impact op de bekomen resultaten. Een aangepaste versie van het rapport werd vervolgens op 30 september 2020 overgemaakt aan bpost. Bpost liet daarna op 5 februari 2021 weten geen aanvullende opmerkingen te hebben, hoewel sommige resultaten voor hen toch enigszins verrassend bleven.

[1] Mededeling van de Raad van het BIPT van 24 oktober 2016 betreffende de resultaten van de studie naar elasticiteiten van postale producten binnen de Belgische postale markt

Methodologie

3. Enquête bij postale gebruikers (bijlage 1)

11. Op het gebied van aanpak werd bij de opstelling van de bevraging van postale gebruikers gekozen voor de zogenaamde 'zachte monadische test'.[2] Individuele vragen voor verwachtingen omtrent de vraag voor een gegeven prijsdaling/-stijging worden hierbij apart gehouden en de volgorde ervan wordt gerandomiseerd om strategische/patroonmatige antwoorden te minimaliseren. Aangezien de zachte monadische aanpak de strategische antwoorden vermindert en toch een redelijke omvang van de steekproef behoudt, werd er voor die aanpak gekozen. Respondenten werden uitgesloten als ze werknemer van een postale operator waren om bias in de antwoorden te vermijden. Bovendien werden ook respondenten die geen postdiensten gebruiken, buiten beschouwing gelaten. Na uitsluiting van deze gevallen werd een steekproefomvang bekomen van 2.072 voor de enquête voor particuliere gebruikers en van 2.019 voor de enquête voor zakelijke gebruikers.

12. Om te zorgen voor een representatieve evaluatie van de particuliere gebruikers, werden de gevallen gewogen volgens het natuurlijke voorkomen van leeftijd, geslacht en gewest in de populaties boven 18 jaar. Aangezien uit de initiële analyse bleek dat sommige respondenten gewag maakten van onredelijk hoge hoeveelheden van brieven en pakjes die ze zullen versturen, werd er specifiek voor die groep van de enquête een extra controle uitgevoerd. Aangezien de verdelingen van de jaarlijkse postvolumes aangegeven door de particuliere gebruikers voor elke individuele prijs en datum geen normale verdeling benaderden volgens de toegepaste test van Kolmogorov-Smirnov, werd de door Tukey (1977)[3] ontwikkelde methode toegepast om uitschieters op te sporen en te verwijderen.

4. Literatuurstudie (bijlage 1)

13. Prijselasticiteitsonderzoek in verband met de vraag naar brieven is in het verleden in de literatuur uitvoerig aan bod gekomen, terwijl andere belangrijke bepalende factoren voor vraag naar post veel minder aandacht kregen. Vooral de elasticiteit van de vraag die onderworpen is aan de algemene dienstkwaliteit komt slechts in een paar studies aan bod en de elasticiteit van de vraag met betrekking tot aparte kwalitatieve aspecten, zoals besteldagen per week, werd in de literatuur nauwelijks onderzocht. Recent onderzoek (bijvoorbeeld Rodriguez et al. 2018, Cazals et al. 2018) focust meer en meer op e-substitutie in plaats van op de prijs als de voornaamste bepalende factor voor de vraag naar postdiensten (behalve economische activiteit).

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[2] Voor zijn vragenlijst van 2016 hanteerde M.A.S. de zogenoemde 'ladderingtechniek', die eigenlijk een van de vaakst gebruikte methodes is om prijselasticiteit aan het licht te brengen. Het voordeel van die techniek is dat intra-individuele vergelijking mogelijk is. De bevraagden kunnen alle opties op de tafel meteen vergelijken en daarna verwachtingen in verband met hun gedrag formuleren. Het nadeel van die techniek is evenwel dat het vatbaar is voor strategische en patroonmatige antwoorden ("patern").

[3] Tukey, J. W. (1977). Exploratory data analysis. Reading, PA: Addison-Wesley.

5. Interview met postale operatoren (bijlage 1)

14. In de context van de studie werden drie postoperatoren, actief in België, geïnterviewd: de historische operator en aanbieder van de universele dienst bpost, de voornaamste concurrent in het postsegment TBC-Post[4] en een concurrent in het pakjessegment, namelijk PostNL. De interviews werden afgenomen doorheen mei en juni 2019. Op basis van de interviews zijn uitvoerige notities gemaakt en nagelezen door de bevraagden om de juistheid van de ingenomen standpunten te garanderen.

6. Econometrische analyse (bijlage 2)

15. Bpost leverde twee databestanden aan die werden gebruikt voor de econometrische analyse. Allereerst het bestand aangeleverd in december 2019, dat maandelijkse gegevens bevatte aangaande volume en prijzen van januari 2014 tot en met juni 2019. Er was hier zowel oog voor de belangrijkste producten voor residentiële klanten (nationale brievenpost met en zonder prioriteit, nationale aangetekende zendingen en prepaid pakketten gekocht aan het lokket) als deze voor professionele klanten (nationale brievenpost met en zonder prioriteit, nationale aangetekende zendingen, prepaid pakketten, niet-geadresseerde reclame, geadresseerde reclame (Direct Mail) en tijdschriften en kranten). Voor professionele klanten werd er gewerkt met een gemiddelde prijs op basis van omzet en volume en werd er tevens een onderscheid gemaakt tussen normale ophaling (zoals bij particulieren in postbus, postaal punt of pakketautomaat) en aflevering van grotere volumes zendingen rechtstreeks in masspost centra. In maart 2020 leverde bpost vervolgens ook zijn langst mogelijke tijdreeks voor particuliere en professionele geadresseerde brievenpost aan, met jaarcijfers betreffende volume en prijzen gaande van 2010 tot en met 2019.

16. De modellering werd gebaseerd op drie primaire benaderingen. De eerste benadering omvat het gebruik van de geaggregeerde jaarlijkse tijdreeksgegevens uit de tweede verstrekte dataset om een algemene of meer geaggregeerde langetermijnelasticiteit te schatten. De tweede en meer gedetailleerde benadering is het combineren van de maandelijkse naar product opgesplitste gegevens om een soort panel dataset per product en tijd te creëren. Vervolgens werd de schatting van de elasticiteit onderzocht door een interactie van de helling en constante parameterschattingen met combinaties van de categorische dummy's die de producten definiëren, samen met andere variabelen zoals de jaar/tijd trend, en seizoensgebonden dummy-variabelen. Tot slot, werd als derde benadering de PCAIDS-methode[5] gebruikt, die het mogelijk maakt de eigen en de kruiselingse prijselasticiteit van verwante producten te berekenen.

Resultaten

7. Enquête bij postale gebruikers, interview met operatoren en literatuurstudie (bijlage 1)

17. Binnen dit hoofdstuk bekijkt men de resultaten van de enquête (uit 2019) bij postale gebruikers, en vergelijkt men deze met de resultaten van de enquête uit 2016 en de informatie uit de literatuurstudie. Daarenboven wordt ook tekstueel de input van de operatoren belicht.

[4] Mosaïc SPRL (TBC Post) legde eind 2019 de boeken neer; L'Echo 14 December 2019: "TBC Post, le seul rival de bpost dans l'activité de courrier, depose le bilan".
[5] Een uitbreiding van het AIDS-model, oftewel 'Almost Ideal Demand System'.

18. Voor de prijselasticiteit van de vraag voor particuliere gebruikers (tabel 1), werden de volgende hoofdpunten vastgesteld:

- De consumenten raamden dat 61% van de traditionele, op papier gebaseerde, postdiensten reeds vervangen worden door elektronische diensten. Een verdere substitutie van 5procent-punten wordt verwacht voor 2020. In de interviews bevestigden de postoperatoren dat de eerste e-substitutiebeweging reeds achter de rug is, maar dat verdere e-substitutie verwacht wordt.
- De vastgestelde prijselasticiteiten in de enquête van 2019 voor alle diensten die worden verstrekt onder het stelsel van de universele dienst (niet-prioritair, prioritair en aangetekende post en pakjes) zijn zeer elastisch (tussen -1,69 en -2,9), zoals uit de onderstaande tabel blijkt. De prijselasticiteiten die in 2019 zijn vastgesteld, lijken op het eerste gezicht over de gehele lijn hoger in vergelijking met de waarden die zijn vastgesteld in 2016 en de historische reeksen uit de literatuur. De enquêteresultaten in 2019 hebben echter enkel betrekking op particuliere gebruikers, terwijl de enquête van 2016 en de literatuur (meestal) resultaten weergeven voor beide groepen van gebruikers gecombineerd - particulier en zakelijk. Vandaar dat voor een juiste vergelijking ook een gemiddelde is berekend voor de waarden die vastgesteld zijn in 2019 voor particuliere en zakelijke gebruikers.
- Uit de vergelijking van de gemiddelden voor 2019 blijkt dat de prijselasticiteiten vastgesteld voor niet-prioritaire en prioritaire brieven een beetje lager zijn dan in 2016, maar nog altijd hoger dan de historische reeksen in de literatuur. De waarden die in de literatuur gevonden zijn werden echter meestal afgeleid via een andere methode (veelal een econometrische analyse) hetgeen de lagere waarden zou kunnen verklaren.
- Ook de resultaten van de literatuur wijzen op hoge prijselasticiteiten voor pakjes, zelfs boven de waarden die vastgesteld zijn in de enquête van 2019.
- Tijdens de interviews met Belgische operatoren is erop gewezen dat aangetekende post een van de meest gevoelige diensten is om te worden vervangen door elektronische diensten, hetgeen de verklaring zou kunnen zijn voor de hoge prijselasticiteit die is vastgesteld.[6]
- In het interview verklaarden de operatoren ook dat de vraag naar aangetekende post voornamelijk wordt bepaald door de gegarandeerde bezorging met wettelijk aanvaard bewijs van afgifte, eerder dan door de prijs. Wat de pakjes betreft, merkten de operatoren tijdens de interviews op dat wegens de concurrentie de prijselasticiteit heel hoog is.
- Het feit dat particuliere klanten hogere elasticiteiten vertonen voor hogere prijsniveaus kan de vertekening bevestigen die inherent is aan enquêtemethodes voor de raming van elasticiteiten, met name dat ze de neiging hebben om hoge niveaus van uitgaven te vermijden zonder daarom te beseffen of ze inderdaad in staat zouden zijn om het product te vervangen door een ander.[7]

Tabel 1: Prijselasticiteit van de vraag - Particuliere klanten

Productcategorieën	Enquête WIK/MAS 2019/20 (particulier)	Enquête WIK/MAS 2019/20 (part.+zak.)	Enquête MAS 2016 (part.+zak.)	Historische reeks uit literatuur (part.+zak.)
Niet-prioritaire brief (0-50 gram)	-1,69	-1,35	-1,51	-0,2 tot -0,9
Prioritaire brieven (0-50 gram)	-1,77	-1,46	-1,51	-0,1 tot -0,8

[6] Het tariefniveau van een aangetekende zending ligt daarenboven ook vele malen hoger dan dit van reguliere brievenpost, wat een hogere prijsgevoeligheid zou kunnen uitlokken.
[7] In het bijgevoegde rapport gaat WIK-Consult dieper in op deze problematiek van vertekening door enquêtemethodes en hoe dit maximaal werd gecounterd in deze studie.

Aangetekende post (0-50 gram)	-1,91	-1,34	-0,28	-0,1 tot -0,8
Pakjes (0-2 kg)	-2,90	-2,04	-1,45	-0,8 tot -3,5

Bron: WIK-Consult

19. Voor de bestelfrequentie-elasticiteit van de vraag voor particuliere gebruikers (Tabel 2), werden de volgende hoofdpunten vastgesteld:

- De vastgestelde berekende gemiddelde waarde (tweede kolom) voor niet-prioritaire standaardbrieven ligt binnen de marge die uitgaande van de literatuur verwacht wordt[8]. Uit de interviews wordt opgemaakt dat particuliere klanten de huidige bestelfrequentie voor brieven goed vinden (3 werkdagen vanaf verzending voor non-prior en 1 voor prior), ook al werd verwacht dat de prioritaire brieven gevoeliger zouden zijn voor de bestelfrequentie.
- Voor aangetekende post en pakjes werd een veel hogere gevoeligheid voor de bestelfrequentie vastgesteld dan in de enquête van 2016. Tijdens de interviews is erop gewezen dat er op de markt een trend is naar bezorging op alle dagen en dat dit zelfs de marktnorm zou kunnen worden (bepaald door grote e-retailhandelaars).

Tabel 2: Bestelfrequentie-elasticiteit van de vraag – Particuliere klanten

Productcategorieën	Enquête WIK/MAS 2019/20 (part.)	Enquête WIK/MAS 2019/20 (part.+zak.)	Enquête MAS 2016 (part.+zak.)
Niet-prioritaire brief (0-50 gram)	0,40	0,22	-0,46
Prioritaire brieven (0-50 gram)	-0,38	-0,25	-0,46
Aangetekende post (0-50 gram)	2,52	1,40	0,36
Pakjes (0-2 kg)	1,60	0,90	0,28

Bron: WIK-Consult

20. Voor het zakelijke segment (tabel 3 en 4) werden de volgende hoofdpunten vastgesteld:

- In totaal is de prijselasticiteit duidelijk kleiner voor zakelijke gebruikers in vergelijking met de particuliere gebruikers; de hoogste waarde die voor zakelijke gebruikers is waargenomen in de enquête van 2019 is -1,17 tegenover -2,90 particulier (pakjes). Dit werd ook bevestigd in de interviews, waarin de operatoren verklaarden dat er een lage prijsgevoeligheid is voor de resterende post gebruikt door ondernemingen en dat verdere e-substitutie zal afhangen van de mogelijkheid van de ondernemingen om te investeren in IT-structuur en niet van de prijzen en/of de kwaliteit.
- Uit het literatuuroverzicht bleek dat de vraag naar postdiensten, in het bijzonder voor zakelijke gebruikers, grotendeels bepaald werd door andere parameters dan prijs, zoals macro-economische ontwikkeling.

[8] Het literatuuroverzicht bevatte slechts enkele studies uit het Verenigd Koninkrijk, waar een betere verzendingstermijn voor post een licht positief effect had op de postale vraag; typisch tussen 0,2 en 0,5.

- In het algemeen stelt men in de enquête van 2019 vast dat hoe hoger het postvolume van een onderneming is, hoe minder uitgesproken ze zal reageren op prijsveranderingen. Andere factoren lijken belangrijker te zijn. Er wordt met andere woorden een hogere vraag/prijselasticiteit vastgesteld bij kmo's in vergelijking met grote ondernemingen, die gebruik maken van masspost[9]. Er lijkt met andere woorden een verschil te zijn in de capaciteit om te kunnen wijzigen van communicatiemethode tussen kleinere dan wel grotere ondernemingen. Dit zou verklaard kunnen worden door een lagere gemiddelde prijs per brief en hoge omschakelingskosten die zich voordoen door geïntegreerde systemen en procedures van grote ondernemingen en hun aanbieder van masspostbezorging. Anderzijds zou ook het inschattingsvermogen van grotere ondernemingen correcter kunnen zijn, waarbij kleinere ondernemingen mogelijk, net als particulieren, hun mogelijkheid om volume te verlagen of te transfereren naar alternatieve diensten zouden kunnen overschatten.
- De vastgestelde prijselasticiteit is hoger voor prioritaire brieven dan voor niet-prioritaire brieven, wat intuïtief correct lijkt aangezien er een reeks alternatieven bestaan voor tijdkritische berichten, zoals e-mail, spoedzendingen en ook niet-prioritaire brieven kunnen als vervanging dienen. Dezelfde boodschap kwam naar voren uit het literatuuroverzicht. In de enquête van 2019 werd een prijselasticiteit voor prioritaire brieven vastgesteld die vergelijkbaar was met de specifieke elasticiteit in 2016 voor masspost - zakelijke gebruikers (-1,15 tegenover -0,95).
- Bevraagden bevestigden ook dat de vraag naar pakjes in de zakelijke markt nogal prijsgevoelig is wegens de sterkere concurrentie en het opduiken van volumekortingen. De vastgestelde prijselasticiteit van -1,17 is de hoogste waarde voor het zakelijke segment, maar nog altijd niet zo hoog als vastgesteld in de marge van in de literatuur (tot -3,5).
- Voor ongeadresseerde post, direct mail en tijdschriften was de omvang van de steekproeven erg klein; de resultaten stroken evenwel met de enquête van 2016 en het betrouwbaarheidsinterval bevat de waarde nul niet. Daarom stelden we voor om deze waarden te gebruiken. De waarden wijzen op een inelastische vraag; respectievelijk -0,81, -0,86 en -1 en ze zijn iets lager dan of bijna gelijk aan de enquête van 2016. Volgens de bevraagden ligt de focus voor deze diensten minder op de prijs maar meer op de afstemming met marketing. Dus of de post bij de eindklanten toekomt voor een bepaalde datum wanneer de marketingcampagne begint. De bevraagden merkten op dat voor tijdschriften zoals magazines en kranten, de prijselasticiteit varieert; hoger voor dagbladen en lager voor maandbladen. Maandbladen worden echter niet dagdagelijks geleverd en kennen veelal een hogere prijs als dagbladen, zodat de verzendkosten relatief gezien minder belangrijk worden.
- Het effect van bestelfrequentie op vraag is in de enquête van 2019 afgenomen in vergelijking met 2016 en in het algemeen lijken zakelijke klanten zich niet te bekommeren om een hogere of lagere bestelfrequentie. Wat wel telt is dat de zendingen toekomen (post), afgestemd zijn op de marketingstrategie (DM) of bezorgd worden op een specifieke dag/week in heel België (tijdschriften). Dat wordt bevestigd door de bevraagden. Wat tijdschriften betreft merkten ze op dat enkel bpost bezorging over heel België op een bepaalde dag/week kan aanbieden.
- Voor ongeadresseerde post, direct mail en magazines, kunnen de resultaten wegens de kleine omvang van de steekproef niet duidelijk geïnterpreteerd worden. De waargenomen prijselasticiteiten liggen echter in de lijn van de enquête van 2016 en vallen binnen het betrouwbaarheidsinterval.
- Voor pakjes merkten de bevraagden op dat er een trend is naar bezorging op dezelfde dag (vergelijkbaar met de particuliere markt), aangedreven door grote partijen, die alle marktpartijen dwingen om te volgen.

[9] Verzenders van omvangrijke hoeveelheden post (bulkpost) brengen veelal hun volume rechtstreeks binnen bij de masspost centra van bpost, in plaats van gebruik te maken van het reguliere netwerk van postbussen, postkantoren of postpunten.

Tabel 3: Prijselasticiteit van de vraag - Zakelijke klanten

Productcategorieën	Enquête WIK/MAS 2019/20 (zakelijk)	Enquête WIK/MAS 2019/20 (part.+zak.)	MAS 2016 (part. + zak.)	Historische reeks uit literatuur (part.+zak.)
Gewone brief (0-50 gram)	-1	-1,35	-1,51 normale ophaling – particulier en zakelijk -0,95 masspost - zakelijke gebruikers	-0,2 tot -0,9 (niet-prioritaire brieven) -0,2 tot -1,17 (grote partijen post)
Prioritaire brieven (0-50 gram)	-1,15	-1,46	-1,51 normale ophaling – particulier en zakelijk -0,95 masspost - zakelijke gebruikers	-0,1 tot -0,8 (prioritaire brieven)
Aangetekende post (0-50 gram)	-0,76	-1,34	-0,28 normale ophaling – particulier en zakelijk -0,81 masspost - zakelijke gebruikers	-0,1 tot -0,8 (prioritaire brieven)
Pakjes (2-10 kg)	-1,17	-2,04	-1,45 normale ophaling – particulier en zakelijk -1,12 masspost (2-10 kg) – zakelijke gebruikers	-0,8 tot -3,5 (postpakketten en pakjes)
Ongeadresseerde post	-0,81*	n.v.t.	-0,98 (niet-geadresseerde zendingen)	-0,2 tot -1,17 (grote partijen post)
Direct mail	-0,86*	n.v.t.	-0,95 (brieven via masspost - zakelijke gebruikers)	-0,2 tot -1,4 (direct mail)
Tijdschriften	-1*	n.v.t.	-0,97 (tijdschriften)	-0,1 tot -0,9 (tijdschriften)

Bron: WIK-Consult.

*Ondanks de kleine omvang van de steekproef, stroken de resultaten met M.A.S. 2016 en vallen ze in het betrouwbaarheidsinterval.

Tabel 4: Bestelfrequentie-elasticiteit van de vraag - Zakelijke klanten

Productcategorieën	Enquête WIK/MAS 2019/20 (zakelijk)	Enquête WIK/MAS 2019/20 (part.+zak.)	MAS 2016 (part.+zak.)
Gewone brief (0-50 gram)	0,03	0,22	-0,27
Prioritaire brieven (0-50 gram)	-0,12	-0,25	-0,27

Aangetekende post (0-50 gram)	0,27	1,40	0,21
Pakjes (2-10 kg)	0,20	0,90	0,28 gewoon 0,45 masspost
Ongeadresseerde post	0,21*	n.v.t.	0,32
Direct mail	0,20*	n.v.t.	0,27
Tijdschriften	-0,09*	n.v.t.	0,27

Bron: WIK-Consult.

*Ondanks de kleine omvang van de steekproef, stroken de resultaten met M.A.S. 2016 en vallen ze in het betrouwbaarheidsinterval.

8. Econometrische analyse (bijlage 2)

21. Binnen dit hoofdstuk bekijken we de resultaten van de econometrische analyse op basis van de twee datasets die bpost opleverde. Daar waar er bij de enquêteresultaten een risico is op overschatting van de prijsgevoeligheid, doordat (met name particuliere) respondenten de neiging hebben om hoge niveaus van uitgaven te vermijden zonder daarom te beseffen of ze inderdaad in staat zouden zijn om het product te vervangen door een ander, is er hier potentieel het risico op het omgekeerde fenomeen. Bij deze econometrisch analyse was de langst mogelijke tijdsperiode waarvoor data beschikbaar was slechts 10 jaar (2010-2019), de accuraatheid zou echter toenemen met een langere tijdreeks. Daarenboven wordt het effect van de hogere tariefverhogingen sinds 2018 waarschijnlijk onderschat omdat de invloed op langere termijn nog niet opgenomen is. Enkel de volumewijziging in 2018 en 2019 (partieel) zit reeds in deze analyse.

22. Door de econometrische analyse[10] werden volgende hoofdpunten vastgesteld (tabel 5) aangaande de prijselasticiteit van de vraag:

    - Tabel 5 schetst de belangrijkste econometrische schattingen van de elasticiteit. Alle gepresenteerde schattingen zijn statistisch significant. De schattingen variëren van ongeveer -[VERTROUWELIJK] tot -[VERTROUWELIJK], wat eerder in lijn is met de literatuur. Bulkbrieven blijken hier elastischer, hoewel dit enigszins gevoelig is voor de gekozen specificatie. Grote pakketten lijken het meest elastisch te zijn, wat erop zou kunnen wijzen dat er sterke concurrentie bestaat voor deze diensten.
    - Voor nationale brieven, zowel particulier als zakelijk, via normale ophaling of mass post, bedraagt de gewogen gemiddelde elasticiteit -[VERTROUWELIJK]. Voor pre-paid pakketten is dit -[VERTROUWELIJK].

Tabel 5: Prijselasticiteit van de vraag

	Nationale brieven	Pakket pre-paid	Direct Mail and niet-geadresseerde post
Particulier	-[VERTROUWELIJK]	-[VERTROUWELIJK]	n.a.

[10] Voor meer informatie aangaande het gehanteerde model verwijzen we naar het integraal rapport van London Economics in bijlage.

Zakelijk (normale ophaling)	-[VERTROUWELIJK]	-[VERTROUWELIJK]	n.a.
Zakelijk (mass post)	-[VERTROUWELIJK]	-[VERTROUWELIJK]	-[VERTROUWELIJK]
0-2 kg	n.a.	-[VERTROUWELIJK]	n.a.
2-10 kg	n.a.	-[VERTROUWELIJK]	n.a.
Gewogen gemiddelde	-[VERTROUWELIJK]	-[VERTROUWELIJK]	-[VERTROUWELIJK]

*Schatting via OLS regression
Bron: London Economics Europe

23. Door de econometrische analyse (tabel 6) werden volgende hoofdpunten vastgesteld aangaande de kruiselingse prijselasticiteit tussen prioritiare en non-prioritaire brieven:

- Verdere schatting van de elasticiteit en de kruiselingse prijselasticiteit werd gedaan met behulp van het PCAIDS-model. Met het PCAIDS-model kan men een systeem van eigen en kruiselingse prijselasticiteiten kalibreren door beperkingen op te leggen aan de gegevens. Een belangrijk element voor de afweging van het prijsbeleid is de snelheid van levering. We merken op dat de directe econometrische schatting van de afzonderlijke elasticiteiten voor snelheid per product geen significante of plausibele resultaten opleverde, en dit was waarschijnlijk deels te wijten aan het feit dat de niet-prioritaire briefzending voor particulieren gebruikers (zodus via postzegel) pas recentelijk (januari 2019) werd ingevoerd.
- In de onderstaande tabel wordt melding gemaakt van kruiselingse prijselasticiteiten voor nationale brieven, gedifferentieerd naar snelheid (prioriteit) en gekalibreerd op particuliere gebruikers. Data hieraangaande waren slechts beperkt voor handen, de non-prior postzegel werd in januari 2019 geïntroduceerd terwijl de dataset met maandelijkse gegevens slechts liep tot en met juni 2019. Eerder schatten wij de prijselasticiteit voor nationale brieven voor particuliere klanten op -[VERTROUWELIJK] (zie bovenstaande tabel 5). Niet-prioritaire brieven lijken zwakke substituten te zijn in vergelijking met brieven met prioriteit, en ze zijn slechts iets inelastischer dan brieven met prioriteit, hoewel verder onderzoek nodig is omdat deze categorie relatief nieuw is.

Tabel 6: Eigen prijselasticiteit en kruiselingse prijselasticiteit voor particuliere gebruikers op basis van prioriteit (prioritaire versus niet-prioritaire brieven)

Nationale brieven	Prioritair	Non-prioritair
Prioritair	-[VERTROUWELIJK]	[VERTROUWELIJK]
Non-prioritair	[VERTROUWELIJK]	-[VERTROUWELIJK]

Bron: London Economics Europe

Publicaties

24. In bijlage kan u de volledige versies van zowel het rapport van WIK-Consult als de econometrische studie van London Economics terugvinden. Deze rapporten gaan nog dieper in op de gehanteerde methodologieën en de bespreking van de bekomen resultaten. Het gaat hierbij evenwel om niet-vertrouwelijke versies van de beide studies, dus zonder de data en secties die door de betrokken operatoren als vertrouwelijk werden bestempeld.

Axel Desmedt
lid van de Raad

Jack Hamande
lid van de Raad

Luc Vanfleteren
lid van de Raad

Michel Van Bellinghen
voorzitter van de Raad

Study for the Belgian Institute for Postal services and Telecommunications (BIPT)

Elasticities regarding price and delivery frequency for postal services for residential and business customers

Final Report

Non-confidential version

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Bad Honnef, 24 November 2020

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Imprint

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Executive Summary

This study aimed to clarify the impact of price and distribution frequency on demand for postal products in Belgium, which are provided by bpost under the universal service regime. The study is based on a representative survey among residential and business customers conducted from May to July 2019. In total, more than 4000 residential and business customers in Belgium were interviewed. WIK-Consult managed the complete study and research institute M.A.S. performed the surveys. In 2016, M.A.S. performed a similar study.

To provide context to the survey, the team studied available literature on the same topic, held interviews with postal operators and analysed historic market data. The study started in April 2019 and ended December 2019. Below, the main observations are discussed, first for the residential segment followed by the business segment.

The following tables present the survey results of 2019 and 2016 for the residential market in respect to the effect price has on demand. The last column of the table contains the proposed values of price elasticities for residential users. As all values calculated based on the survey conducted in 2019 lay within the confidentiality interval and the intervals did not contain the value '0', we consider the results to be reliable and maintain the same values as the survey results. We already wish to note that these survey results are based on changes in absolute price.

Price elasticity of demand – Residential customers					
Product categories	**Survey WIK/MAS 2019/20 (res)+**	**Survey WIK/MAS 2019/20 (res+bus)****	**MAS 2016 (res+bus)**	**Historic isolated range from literature (res+bus)**	**Proposed values 2019/20 (res)**
Non-priority letter (0-50 gram)	-1.69	-1.35	-1.51	-0.2 to -0.9	-1.69
Priority letters (0-50 gram)	-1.77	-1.46	-1.51	-0.1 to -0.8	-1.77
Registered mail (0-50 gram)	-1.91	-1.34	-0.28	-0.1 to -0.8	-1.91
Parcels (0-2 kg)	-2.90	-2.04	-1.45	-0.8 to -3.5	-2.90

Source: WIK-Consult

* Residential users specific

** Residential and Business users. Average based on found values for residential and business users in the 2019 survey order to compare these results with those of the MAS survey in 2016, which combined residential and business users.

For the price elasticitiy of demand for residential users, following main points were observed:

- Consumers estimated that 61% of traditional paper-based postal services are already replaced by electronic services. A further 5% (-points) substitution is expected for 2020. In the interviews the postal operators confirmed that the first e-substitution shift has already taken place, but that further e-substitution is expected.

- Observed price elasticities in the 2019 survey for all services provided under the USO regime (non-priority, priority and registered mail and parcels) are highly elastic (between -1.69 to -2.9) as shown in the table above. The price elasticities found in 2019 seem at first glance overall higher compared to the values found in 2016 and the historic ranges from the literature. However, the survey results in 2019 are for residential users only, where the survey in 2016 and the literature (mostly) display results for both user groups combinded – residential and business. Hence for a proper comparison, we have calculated an average for the values found in 2019 for residential and business users.
- Comparing the 2019 averages shows that price elasticities found for non-priority and priority letters are slightly lower than in 2016, but still higher than the historic ranges found in the literature. As noted before, the values found in the literature were mostly derived with a different method (econometric analysis) where they attempt to measure and isolate the price effect from other effects impacting the demand, which might explain the lower values.
- For registered mails and parcels, in 2019 the price elasticities found are quite higher than the values found in 2016. However, the results of the literature point to high price elasticities for parcels, even beyond the values found in the 2019 survey. From the interviews with Belgium operators, it was noted that registered mail is one of the most sensitive services for being replaced with electronic services, which might explain the high price elasticity found.

  However, operators stated in the interview also that the driver of demand for registered mail is mainly guaranteed delivery with legally accepted proof of delivery rather than price. Regarding parcels, the operators noted during the interviews that due to competition, price elasticity is quite high especially in the consumers-to-consumer segment.
- We note also that residential customers are more sensitive to price increase regarding the items with higher price levels. As the prices of postal services have considerably gone up in Belgium, this might help explain the higher price sensitivity in comparison with past econometric studies and the past MAS study in 2016 which involved lower price levels.
- The fact hat residential customers show higher eslaticities for higher price levels may confirm the biais inherent to survey methods for estimating elasticities, notably that they tend to avoid high spending levels without necessarily realising whether they would indeed have the capacity to subsitute the product with another.

The following table presents the findings with respect to the impact of delivery frequency on demand for residential customers. We have applied the same structure as above for the comparison of the 2019 survey with the 2016 survey. We already wish to note that these survey results are based on changes in relative price, as opposed to the ones for residential customers.

Delivery frequency elasticity of demand – Residential customers

Product categories	Survey WIK/MAS 2019/20 (res)	Survey WIK/MAS 2019/20 (res+bus)	MAS 2016 (res+bus)	Proposed values 2019/20 (res)
Non-priority letter (0-50 gram)	0.40	0.22	-0.46	0.40
Priority letters (0-50 gram)	-0.38*	-0.25*	-0.46	0
Registered mail (0-50 gram)	2.52	1.40	0.36	2.52
Parcels (0-2 kg)	1.60	0.90	0.28	1.60

Source: WIK-Consult. *The confidence interval contains the value '0', hence customers are ambivalent and, therefore, we advise to use the value '0' as price elasticity.

For the delivery frequency elasticitiy of demand for residential users, following main points were observed:

- The found calculated average value (second column) for standard non-priority letters lies within the range expected from the literature[1]. From the interviews it is noted that residential users are fine with the current delivery frequency for letters (3 working days from sending for non-priority and 1 for priority). However priority letters were expected to be more sensitive to delivery frequency.
- For registered mails and parcels, a much higher sensitivity to delivery frequency was found than in the 2016 survey. From the interviews, it was noted that there is a trend in the market to every day delivery and that this could even become the market standard (set by large e-retailers).

The following tables present the survey results of 2019 for the business market in respect to the effect that price and delivery frequency have on demand.

1 The literature review showed only a few studies from the UK where improved mail routing time had a weakly positive effect on postal demand; typically in the range between 0.2 and 0.5. See 4.3.

Price elasticity of demand – Business customers					
Product categories	**Survey WIK/MAS 2019/20 (bus)**	**Survey WIK/MAS 2019/20 (res+bus)**	**MAS 2016 (res + bus)**	**Historic isolated range from literature (res+bus)**	**Proposed value 2019/20**
Normal letter (0-50 gram)	-1	-1.35	-1.51 normal collection – residential and business -0.95 mass post –business users	-0.2 to -0.9 (non-priority letters) -0.2 to -1.17 (bulk mail)	-1
Priority letters (0-50 gram)	-1.15	-1.46	-1.51 normal collection – residential and business -0.95 mass post –business users	-0.1 to -0.8 (priority letters)	-1.15
Registered mail (0-50 gram)	-0.76	-1.34	-0.28 normal collection – residential and business -0.81 mass post – business users	-0.1 to -0.8 (priority letters)	-0.76
Parcels (2-10 kg)	-1.17	-2.04	-1.45 normal collection – residential and business -1.12 Mass post (2-10 kg) – business users	-0.8 to -3.5 (postal packages and parcels)	-1.17
Unaddressed mails	-0.81*	Na	-0.98 (non-addressed items)	-0.2 to -1.17 (bulk mail)	-0.81
Direct mail	-0.86*	Na	-0.95 (letters through mass post –business users)	-0.2 to -1.4 (direct mail)	-0.86
Periodicals	-1*	Na	-0.97 (periodicals)	-0.1 to -0.9 (periodicals)	-1

Source: WIK-Consult.

*Despite small sample size, results are in line with M.A.S. 2016 and fall in the confidence interval.

Delivery frequency elasticity of demand – Business customers				
Product categories	**Survey WIK/MAS 2019/20 (bus)**	**Survey WIK/MAS 2019/20 (res+bus)**	**MAS 2016 (res+bus)**	**Proposed value 2019/20 (bus)**
Normal letter (0-50 gram)	0.03*	0.22	-0.27	0
Priority letters (0-50 gram)	-0.12*	-0.25	-0.27	0
Registered mail (0-50 gram)	0.27	1.40	0.21	0.27
Parcels (2-10 kg)	0.20	0.90	0.28 normal 0.45 mass post	0.2
Unaddressed mails	0.21**	Na	0.32	0
Direct mail	0.20**	Na	0.27	0.2
Periodicals	-0.09**	Na	0.27	0

Source: WIK-Consult.

*Confidence interval contained '0'.

**Despite small sample size, results are in line with M.A.S. 2016 and fall in the confidence interval.

For the business segment, following main points were observed:

- Overall, the price elasticity is clearly less for business users compared with residential users; the highest value observed for business users in the 2019 survey is -1.17 versus -2.90 residential (parcels). This was also confirmed in the interviews, where operators stated that there is low price sensitivity for the remaining mail used by businesses and that further e-substitution will depend on companies' ability to invest in IT structure and not on prices and/or quality.
- From the literature review it was noted that the demand for mail services, especially for business customers, was determined to a large extent by other parameters than price like macro-economic development.
- In general, we found in the 2019 survey that the higher the mailing volume of a company, the less pronounced it will react to changes in price. Other factors seem to be more important. Or said otherwise, there is a higher demand/price elasticity observed for small medium-sized enterprises compared to large companies using mass post. This might be explained by a lower average price per letter andhigh switching costs occurring due to integrated systems and procedures of large companies and their supplier of mass post-delivery
- Observed price elasticity is higher for priority letters compared to non-priority letters, which is intuitive as there is a set of alternatives for time-critical messages like e-mail, express mailings and non-priority letters can serve as substitute as well. The same message was obtained from the literature review. The 2019 survey found a price elasticity for priority letters comparable to the specific elasticity in 2016 for mass post – business users (-1.15 versus -0.95).
- Interviewees also confirmed that parcels in the business market are rather price sensitive due to higher competition and the appearance of volume discounts. The found price elasticitiy of -1.17 is the highest value for the business segment, but still not as high as found in the literature range (up to -3.5).
- For unaddressed mail, direct mail and periodicals, the sample sizes were quite small; however, the results are in line with the 2016 survey and the confidence interval does not contain the value zero. Therefore, we proposed to use these values. The values indicates an inelastic demand; respectively -0.81, -0.86 and -1 and are slightly lower or almost the same as in the 2016 survey. According to interviewees, for these services the focus is less on price but more on the alignment with marketing. Hence, whether the mail arrives with end customers before a certain date when the marketing campaign starts. Interviewees noted that for periodicals like magazines and newspapers, the price elasticity varies; higher for daily newspapers and lower for monthly magazines.
- The effect of delivery frequency on demand has decreased in the survey from 2019 compared to 2016 and in general business customers do not seem to bother for a higher or lower delivery frequency. What does matter is that it arrives (mail), is aligned with marketing strategy (DM) or is delivered on a specific day/week across Belgium (periodicals). This is confirmed by the interviewees. In regards to periodicals they noted that only bpost can offer delivery throughout Belgium on a certain day/week.

- For unaddressed mail, direct mail and magazines, a small sample size prevents clear interpretations of the results. However, the observed price elasticities are in line with the 2016 survey and fall within the confidence interval; hence we propose to use them.
- For parcels, interviewees noted there is a trend towards same day delivery (similar as in the residential market) driven by large parties, which force all market parties to follow.

Introduction

Scope and structure of the study

The aim of this study is to state the price and distribution elasticity coefficients of the various postal products in the current market situation.

The next paragraph defines the term elasticity followed by chapter 2, which describes the methodology and the results of the representative survey in Belgium among residential and business customers in 2019. Thereafter, to provide context to the survey findings, chapter 3 gives an overview of the opinions of the three postal operators as communicated in the interviews held with them. Chapter 4 provides more context by summarising the results of a literature review mainly on price elasticity of demand. The last chapter 5 contains the overall conclusions.

Definition of elasticity

The demand for postal services is determined by several factors. This includes endogenous factors (e.g. prices, quality), but also exogenous factors (e.g. general economic development, availability and usage of (electronic) substitutes). The elasticity of demand describes how the demand responses to changes of their explanatory factors, i.e. the percentage change in volume in relation to a percentage change in this factor.[2]
As price is typically the most relevant factor in determining demand, the expression 'price elasticity' is often used for the elasticity of demand with respect to price and we will follow this convention. However, one has to be careful as some studies analyse other factors and use other measures, e.g. the change in revenue with respect to price. The term price elasticity in this context would describe the change in overall revenue subject to price changes and not the change in demand.

One distinguishes between own price elasticity and cross price elasticity of services. The survey performed for this study focused on how respondents would respond in terms of demand when there are variations in the price of that service, assuming all other factors remain the same, hence the own price elasticity of demand. With cross-price elasticity of demand, one looks at the impact of the price of one service on the demand of another service. However, indirectly, more competition and related lower price for substitute services might have played a role for respondents when answering the survey.

Elasticities might be positive (the higher the explanatory factor, e.g. delivery frequency, the higher the demand) or negative (the higher the price, the lower the demand) and the absolute value describes the sensitivity of demand in relation to the explanatory factor. Price elasticities with an absolute value greater than 1 refer to elastic demands, i.e. a change in price results in a more than proportional change in demand, while an absolute value below 1 refers to an inelastic demand, i.e. a change in the explanatory factor yields a less than proportional change in demand. For example, a price elasticity of -0.3 means that a 10% increase in price results in a 3% decrease in demand.

Typically, there will be a distinction between the price elasticity of services of an individual company and the price elasticity of certain services in the market. Price changes of one firm may decrease their demand because customers are switching to competitors while price changes in a whole market may decrease total market volume as customers are switching to other products

2 A detailed discussion of price elasticity and the structure of postal demand is, for example, provided in Appendix A, Chapter II of USPS Office of Inspector General (2013), Analysis of Postal Price Elasticity, OIG White Paper RARC-WP-13-008, May 2013.

(or stop buying at all). In the Belgian letter segment of the postal market, this distinction is of less relevance as in most other markets as competition is limited[3] and price changes of the incumbent with a large market share will affect the total market volume (even if some customers may switch to competitors). The estimated price elasticities of single universal service providers could therefore be seen as price elasticities of the whole letter market.

3 Bpost has, within the letter segment, a market share of more than [CONFIDENTIAL]%.

Market survey 2019 on price elasticity and impact of delivery frequency on demand

Methodology market survey 2019

In 2016, the research institute M.A.S. already performed research into the demand elasticities for price and delivery frequency for the USO-related services in Belgium using a survey among private and self-employed persons as well as SMEs and larger companies or (governmental) organisations. The main differences between the survey conducted by M.A.S. in 2016 and the survey done in 2019 by WIK-Consult in combination with M.A.S. are highlighted in the table below.

Table 1 Comparison M.A.S. 2016 and WIK-Consult 2019

	M.A.S. 2016	WIK-Consult 2019	
	Residential and business user	Residential user	Business user
Questionnaire	Laddering technique; Non-randomised items; Relative price changes and absolute changes in frequency; Considered price range: -10% to +40%	Soft monadic approach; Randomised items; Absolute price changes and absolute changes in frequency; Considered price range: -10% to +40%	Soft monadic approach; Partially randomised items Relative price changes and absolute changes in frequency; Considered price range: -10% to +40%
Survey	CAWI and pen & paper survey	CAWI	CAWI and pen & paper survey
Possible disadvantages	Strategic and patterned responses	Stronger stated reaction on absolute price changes compared to % changes	Limited risk of strategic and patterned responses (partially randomised)

Source: WIK-Consult.

For their 2016 questionnaire, M.A.S. applied the so-called laddering technique, which is in fact one of the most commonly used methods to elicit price elasticity. It has the advantage of providing within subject comparison. The interviewees are able to directly compare all options on the table and then express expectations regarding their behaviour. The disadvantage of this technique is, however, that it is prone to strategic and patterned responses. This may have been aggravated in the study conducted by M.A.S in 2016, in which respondents had to assess their future consumption behaviour with regard to letters and other postal services following price changes with easy-to-follow 10% steps. This may have played a role for the results on price elasticities that were predominately close to -1 which indicates that the interviewed persons and business tended to subtract the same percentage from their expected demand as the price increase suggested.

An alternative approach to the laddering technique applied by M.A.S. is the so called monadic approach, which can be done in two ways – hard and soft. Essentially, the monadic approach tries to minimise the occurrence of biases and strategic responses by displaying only one pricing (or delivery frequency) scenario for each product to a selected group of respondents asking for their assessment of how this will impact their demand for this specific product. The elasticity is then estimated across interviewed persons and businesses. This is the hard type of monadic test. Since each respondent is presented with only one scenario with respect to price and

frequency changes, any information on within subject elasticity can be derived. At the same time, this method reduces the number of responses per scenario (hence a much larger sample size is required).

The soft monadic test loosens the criterion of strict separation of questions on respondents' reactions to price variation, but still keeps the individual questions for demand expectations for a given price de-/increase separate and randomises their sequence (and possibly as well the specific prices in the consumer scenario and % in the business user scenario) to mitigate strategic / patterned responses. Since the soft monadic approach reduces the strategic responses while maintaining a reasonable sample size, we have chosen that approach for our research.

There are also other approaches for the examination of price elasticity or sensitivity. Three of the most commonly known methods are the van Westendorp technique, the Gabor Granger approach, and conjoint experiments. However, all three of them are more likely used to determine initial price setting for new products than for examining price elasticity for existing services.[4]

The surveys for this study were conducted by M.A.S. The survey for the residential users was implemented as an online survey (CAWI) on a representative online panel comprising more than 250,000 members in Belgium.

The survey of the business users were conducted using a mixed method approach. Some questionnaires were sent by post as a pen and paper survey and some respondents received an online version of the questionnaire. Small and medium enterprises, a quarter of the companies with up to 49 employees and (local) public services were questioned via an online survey. The remaining business users and federal public services received a written survey.[5]

Responding to the surveys – both residential or business – took about 15 minutes. The respondents had to answer about 16 to 39 questions. The surveys were conducted between end of May and the beginning of July 2019. The questionnaires were available in both Dutch and French.

The questionnaires developed by WIK-Consult in 2019 followed roughly the same structure of the questionnaires employed by M.A.S. in 2016. The main structure of the questionnaires is depicted in Table 2.

4 For a comprehensive overview see Lipovetsky, S; Magnan, S.; Zanetti Polzi, A (2011): Pricing Models in Marketing Research. *Intelligent information Management* 3 (5), pp.167-174.

5 As it is not always clear within larger companies who is responsible and forwarding of electronic invitations to fill in the survey leads to minimal response.

Table 2 Structure of the questionnaire for residential and business users

	Topics	
Sections	Residential user survey	Business user survey
Section 1	Socio-demographics	Geographic and sectoral data
Section 2	Current annual mailing volume of • non-priority letters (0-50 gram) • priority letters (0-50 gram) • registered mail (0-50 gram) • parcels, including returns that have to be paid for themselves (0-2 kilogram)	Current annual mailing volume of • normal letters (0-50 gram) • priority letters (0-50 gram) • registered mail (0-50 gram) • parcels, including returns that have to be paid for themselves (2-10 kilogram) • unaddressed mail • direct mail • periodicals
Section 3	Price elasticity of demand for postal services	Price elasticity of demand for postal services
Section 4	Frequency of delivery elasticity of postal services	Frequency of delivery elasticity of postal services
Section 5	Substitution by electronic communication services	Substitution by electronic communication services

Source: WIK-Consult.

Although both questionnaires are similar in structure, they differ with regards to the implementation of the third section. In section 3, respondents were asked to indicate how their annual mailing volume with regards to the postal services described in Figure 1 would change, if the price fluctuated from about -10% to about +40%. However, residential users were presented with ***absolute*** prices and business users with the respective ***reduction in percentage*** in 10%-increments. This difference in implementation was mainly due to the fact that the prices paid by residential users are publicly known, while those paid by companies are set individually.

Furthermore, the items for the questions in sections 3 and 4 were ***randomized*** to avoid order effects. This was possible in the online survey for residential customers and SME but only partially for the remaining business customers, who received pen and paper surveys. These contained a limited randomization of 28 versions per language, whereby for each version 27 questions were kept constant, but for one question the order of the sub questions was reversed. The results of the different 28 versions were then compared to filter out order effects.

The data was evaluated by WIK-Consult. We excluded respondents from both analyses if they were employed by a postal operator in order to avoid bias in the responses. Furthermore, those respondents, which do not use any postal services were not considered either. After excluding those cases, we yield a sample size of 2,072 for the survey of residential users and 2,019 for the business user survey.

In order to ensure a representative evaluation of the residential users, the cases were weighted according to the natural occurrence of age, gender and region in the populations over 18 years. Since our initial analysis showed that some respondents stated unreasonable high amounts of letters and packages that they are going to send, we have carried out an additional check especially for this survey group. Since the distributions of the annual mailing volumes indicated by the residential users for each individual price and date did not approach a normal distribution according to the applied Kolmogorov-Smirnov test, the method developed by Tukey (1977) was applied to detect and remove outliers.[6] The advantage is that this method makes no

6 When looking at the histograms, the single data showed a mostly skewed distribution.

distributional assumptions nor does it depend on a mean or standard deviation, instead it uses percentiles. The lower quartile (q1) is the 25th percentile, and the upper quartile (q3) is the 75th percentile of the data. The inter-quartile range (IQR) is defined as the interval between q1 and q3. Tukey (1997) defined q1-(1.5*IOR) and q3+(1.5*IOR) as "inner fences", q1-(3*IOR) and q3+(3*IOR) as "outer fences", the observations between an inner fence and its nearby outer fence as "outside", and anything beyond outer fences as "far out". According to this methodology, we excluded all cases which go beyond the outer fences. Overall, an average of 5% of the cases was removed from the dataset.[7]

The data for business users has not been weighted. Also, no further data cleansing was applied. M.A.S., who conducted the fieldwork and collected the business data based on a representative sample. For this purpose M.A.S applied quotes within their sampling approach based on business categories (self-employed, SMEs, large companies and government services) and number of employees. As far as the private sector is concerned, information on the sector itself (primary, secondary, etc.) and the region were taking into account when sampling.

The following tables show the details of the Belgium business population (in absolute figures and percentages) and the collected sample of business customers, which demonstrate that the sample is representative by region, sector and employee class and therefore a very good reflection of the business population in Belgium.

Furthermore, companies may have substantially more heterogeneous needs in relation to postal services than residential users. These needs depend on different conditions, such as the size of the company or sector in which they operate, or their general main field of activity. Thus, we opted against removal of cases with extreme value.

7 Annex 6 contains boxplots that show the distribution of the mailing volumes by prices and delivery frequency. The extreme values outside the outer fence have already been cleared. The remaining outliers are not depicted in the figures.

Table 3 Population details of business customers in Belgium

Overzicht POPULATIE private sector naar gewest, sector en werknemersklasse *(absolute aantallen)*

	Vlaams Gewest				Waals + Brussels Gewest				TOTAAL			
	Primaire sector	Secundaire sector	Tertiaire sector	Totaal	Primaire sector	Secundaire sector	Tertiaire sector	Totaal	Primaire sector	Secundaire sector	Tertiaire sector	Totaal
Zelfstandigen	45359	113077	455159	613595	26920	67535	280516	374972	72279	180613	735675	988567
Werkgever met < 5 werknemers	2186	21212	64645	88042	1326	13533	47775	62632	3512	34744	112419	150675
Werkgever met 5 tot 49 werknemers	666	11676	27148	39489	162	6447	17544	24153	828	18123	44692	63643
Werkgever met 50 en + werknemers	169	1576	2527	4272	3	715	1974	2692	172	2291	4501	6964
TOTAAL	46997	149665	547917	744580	27492	89386	348391	465270	74489	239052	896308	1209849

Bron: RSZ, RSVZ (Rijksinstituut voor de Sociale Verzekeringen der Zelfstandigen), FOD Economie, KMO, Middenstand en Energie (Aantal oprichtingen, schrappingen en BTW-plichtige ondernemingen volgens economische activiteit, plaats maatschappelijke zetel en werknemersklasse), 2017

Overzicht POPULATIE private sector naar gewest, sector en werknemersklasse *(procentuele verdeling)*

	Vlaams Gewest				Waals + Brussels Gewest				TOTAAL			
	Primaire sector	Secundaire sector	Tertiaire sector	Totaal	Primaire sector	Secundaire sector	Tertiaire sector	Totaal	Primaire sector	Secundaire sector	Tertiaire sector	Totaal
Zelfstandigen	4%	9%	38%	51%	2%	6%	23%	31%	6%	15%	61%	82%
Werkgever met < 5 werknemers	0%	2%	5%	7%	0%	1%	4%	5%	0%	3%	9%	12%
Werkgever met 5 tot 49 werknemers	0%	1%	2%	3%	0%	1%	1%	2%	0%	1%	4%	5%
Werkgever met 50 en + werknemers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
TOTAAL	4%	12%	45%	62%	2%	7%	29%	38%	6%	20%	74%	100%

Source: M.A.S.

Table 4 Realised sample details of business customers in Belgium

Overzicht GEREALISEERDE STEEKPROEF private sector naar gewest, sector en werknemersklasse *(absolute aantallen)*

	Vlaams Gewest				Waals + Brussels Gewest				TOTAAL			
	Primaire sector	Secundaire sector	Tertiaire sector	Totaal	Primaire sector	Secundaire sector	Tertiaire sector	Totaal	Primaire sector	Secundaire sector	Tertiaire sector	Totaal
Zelfstandigen	29	53	280	362	13	37	153	203	42	90	433	565
Werkgever met < 5 werknemers	12	60	342	414	17	47	165	229	29	107	507	643
Werkgever met 5 tot 49 werknemers	6	89	169	264	6	40	88	134	12	129	257	398
Werkgever met 50 en + werknemers	6	89	118	213	5	31	98	134	11	120	216	347
TOTAAL	53	291	909	1253	41	155	504	700	94	446	1413	1953

Overzicht GEREALISEERDE STEEKPROEF private sector naar gewest, sector en werknemersklasse *(procentuele verdeling)*

	Vlaams Gewest				Waals + Brussels Gewest				TOTAAL			
	Primaire sector	Secundaire sector	Tertiaire sector	Totaal	Primaire sector	Secundaire sector	Tertiaire sector	Totaal	Primaire sector	Secundaire sector	Tertiaire sector	Totaal
Zelfstandigen	1%	3%	14%	19%	1%	2%	8%	10%	2%	5%	22%	29%
Werkgever met < 5 werknemers	1%	3%	18%	21%	1%	2%	8%	12%	1%	5%	26%	33%
Werkgever met 5 tot 49 werknemers	0%	5%	9%	14%	0%	2%	5%	7%	1%	7%	13%	20%
Werkgever met 50 en + werknemers	0%	5%	6%	11%	0%	2%	5%	7%	1%	6%	11%	18%
TOTAAL	3%	15%	47%	64%	2%	8%	26%	36%	5%	23%	72%	100%

Source: M.A.S.

Calculation of price elasticity and the elasticity of delivery frequency on demand

To ensure coherence, we used stated values for the expected mailing volume in 2020 for both the current pricing scenario and delivery frequency and the hypothetical scenarios for the calculation of price elasticity and the elasticity of delivery frequency on demand.

The calculation of the general price elasticity for each postal service and user group was performed in two steps: The first step involved calculating the individual elasticity in terms of price and frequency on average across all scenarios for each residential or business user. For this purpose, we used adjusted versions of the basic formula for the calculation of elasticities. The individual price elasticities $e_{u,p,s}$ (1) and the elasticity of delivery frequency on demand $e_{u,f,s}$ (2) for each user for each postal service is given by the equations

$$e_{u,p,s} = \frac{\sum_{i=1}^{n} \frac{\partial Q_{i,u,s}}{\partial P_{i,s}} * \frac{P_s}{Q_{u,s}}}{N} \quad (1)$$

$$e_{u,f,s} = \frac{\sum_{i=1}^{n} \frac{\partial Q_{i,u,s}}{\partial F_{i,s}} * \frac{F_s}{Q_{u,s}}}{N} \quad (2)$$

where P_s is the current price and F_s is the current frequency of delivery of the respective postal service s, $Q_{u,s}$ is the user expected mailing volume for 2020 given the current price P_s and delivery frequency F_s. The terms $\partial P_{i,s}$and $\partial F_{i,s}$ denotes the change in price and delivery frequency between the current pricing and frequency scenario for s and scenario n. Lastly, the term $\partial Q_{i,u,s}$ denotes the changes of users mailing volume between the current scenario and scenario n. In order to derive an average value for both elasticities per user the sum of elasticities across all scenarios is divided by the total number of scenarios N considered for each postal service. The following table shows in detail which scenarios were used to calculate elasticity.

Table 5 Scenarios

Postal service	User group	Pricing scenarios	Scenarios for delivery frequency
Non-priority letters	Residential user	0.90€; **0.92€**; 0.98€; 1.05€; 1.10€; 1.15€; 1.35€	2 days, 3 days, 4 days, **5 days**
Non-priority letters	Business user	-10%, **0%**; +10%; +20%; +30%; +40%	2 days, 3 days, 4 days, **5 days**
Priority letters	Residential user	0.90€; **0.97€**; 1.05€; 1.10€; 1.19€; 1.28€; 1.39€	2 days, 3 days, 4 days, **5 days**
	Business user	-10%, 0%; +10%; +20%; +30%; +40%	2 days, 3 days, 4 days, **5 days**
Registered mail	Residential user	6.08€; **6.80€**; 6.98€; 7.47€; 7.84€; 8.98€; 9.60€	4 days, **5 days**, 6 days
	Business user	-10%, **0%**; +10%; +20%; +30%; +40%	4 days, **5 days**, 6 days
Parcels	Residential user	6.20€; **6.90€**; 7.30€; 7.60€; 8.20€; 9.10€; 9.60€	**5 days**, 6 days, 7 days
	Business user	-10%, **0%**; +10%; +20%; +30%; +40%	**5 days**, 6 days, 7 days
Unaddressed mail	Business user	-10%, **0%**; +10%; +20%; +30%; +40%	4 days, **5 days**, 6 days
Direct mail	Business user	-10%, **0%**; +10%; +20%; +30%; +40%	4 days, **5 days**, 6 days
Periodicals	Business user	-10%, **0%**; +10%; +20%; +30%; +40%	2 days, 3 days, 4 days, **5 days**

Source: WIK-Consult. The information in bold letters refers to the current scenario.

As described in the previous chapter, we presented absolute prices to residential users and relative price changes to business users. For the former, we attempt to stage in the same range from -10% to +40% compared to the current price for each postal service. However, we have adjusted prices to simulate actual prices. Hence, there were no clear intervals between the steps, which prevented respondents from adapting their answers to specific intervals. Since, the business user indicated the demand for each postal service based on relative price changes, we directly used percentage changes in price, quantity and frequency to calculate elasticities.

The second step involved the calculation of an average price elasticity or elasticity of delivery frequency of demand for each postal service among all users within a user group – residential and business. For this purpose a weighted average was calculated so that the results are representative for Belgium, as described in the methodology section.[8] We also calculated 95% confidence intervals (CI). If the CI did not contain '0' and the average elasticity fell within the CI, the outcome is deemed reliable.

For the business users, however, we conducted some additional analysis. Within the questionnaire we distinguished between business users that utilize postal services by way of normal collection or via bulk mail.[9] Therefore, we have calculated an average value for the elasticities among business users using normal collection and bulk mail. However, the number of cases for the second category was too small to derive clear results. Nevertheless, we have left the standalone figures for bulk mail in to give an indication; but caution should be exercised when interpreting the results due to the small sample size.

Furthermore, our initial analysis showed that the price elasticity for business users is less influenced by the particular delivery mode but more by the overall mailing volume of a company. This means that companies operate differently depending on how much they actually send. In order to take these differences into account, joint evaluation of the data has been adopted. Since multiple answers were possible, especially for those using both delivery modes, all individual responses were included in the analysis. First, the companies were divided into four 'mailing intensity classes' of the same size, based on their mailing volume indicated for each postal service in 2019. Then, the demand elasticity for each of these mailing intensity classes is calculated. In the following, these classes are referred to as companies with a 'very low mailing volume', 'low mailing volume', 'high mailing volume', and 'very high mailing volume'. How the classes for each postal service are divided is listed under the corresponding tables section 2.4.

Outcome market survey 2019 - residential users

The figures below show that the majority of consumers who use postal services in Belgium send out non-priority letters (86%). According to residential users, they send about 15 non-priority letters per year on average. Even if the other services are used by a much smaller proportion of consumers, the absolute figures per consumer, who uses a certain category mail, are not significantly below this first category; a residential user who uses priority mail respectively packages, send sends out on average 12 priority letters and 6 packages a year.

Moreover, if prices remain the same, consumers do not expect any significant reduction in their mailings. The volume for packages is still expected to grow with 6.3%, but other letters and registered mail are expected to decline minimal with values between -1.9% (priority letters) and -4.7% for letters without priority.

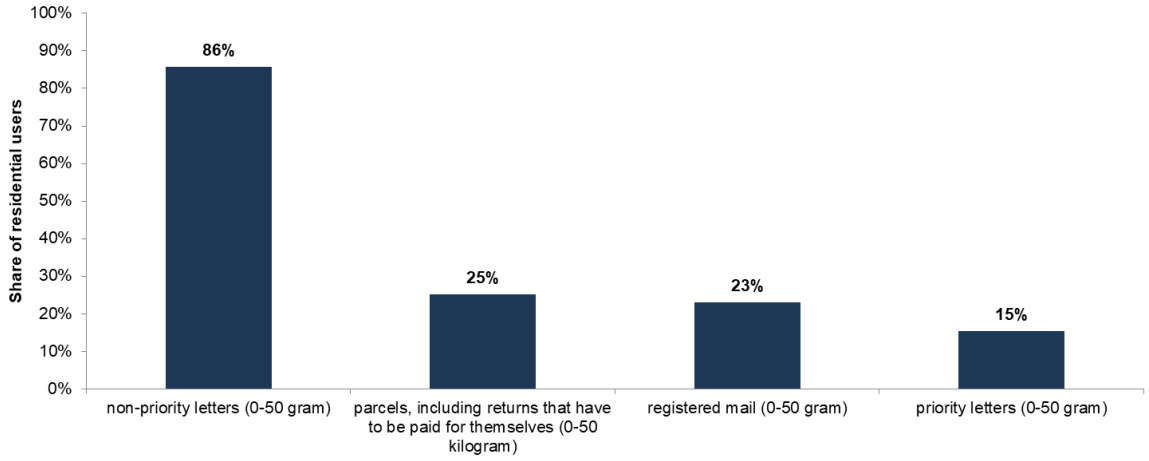
For parcels, however, the situation is slightly different. Customers are indicating that they do expect to send slightly more parcels on average in the following year. Although this difference does not seem to be significant either, the figures reflect the general perception that parcels in particular will continue to rise in importance in the future.

In general, this data indicates that some substitution has already taken place in recent years and is no longer as pronounced today. This is confirmed by the estimations of the respondents. In the survey, they stated that in 2019 they were already substituting 61% of the postal services

8 This is not the case for business users, see the explanations in the methodology section.
9 In the terminology of bpost it is also called masspost. Throught the entire repored both terms 'bulk mail' and 'masspost' will be used interchangeable.

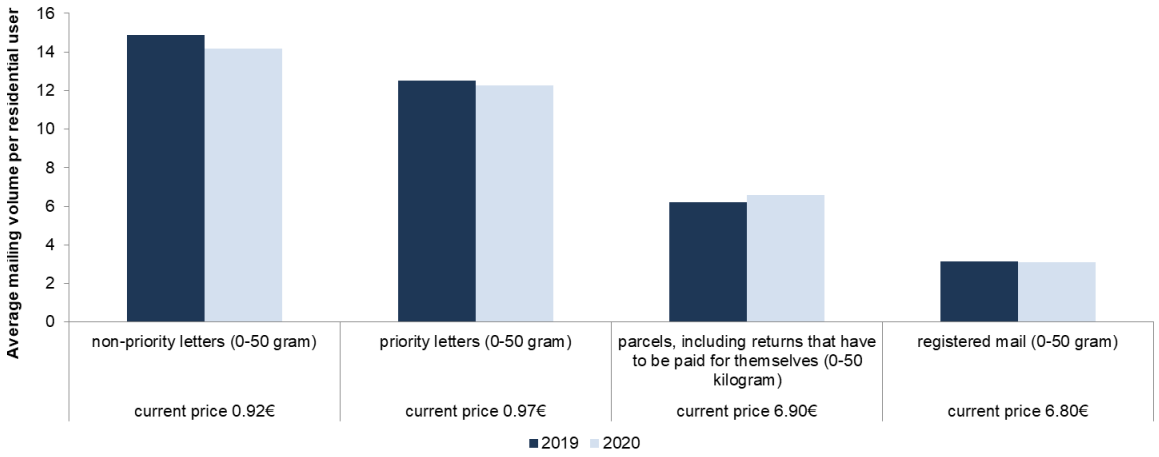
they had previously used with other services. For 2020 they expect the substitution rate to rise to about 66% (+5%-points).

Figure 1 Share of residential users using different postal services



Source: WIK-Consult. N=2072.

Figure 2 Average/maximal mailing volume for residential users



Source: WIK-Consult. N=2072. The circles indicate the maximum value stated in each case. Results after adjusting for outliers.

In the following, the impact of price changes and changes in delivery frequency on consumer mailing volumes will be examined individually for each postal service.

1.1.1 Non-priority letters

As indicated in the above, non-priority letters are used by a large number of customers. Currently the price for sending a letter is 0.92 Euro, if sold per 10.[10] Six hypothetical prices were formed from 0.90 Euro to 1.35 Euro. As stated in the methodology section and section 2.2, extreme outliers were removed and for each respondent individual price elasticity was calculated. Thereafter, an average price elasticity among all respondents was determined inclusive the related confidence interval (CI) at 95% reliability.

Overall, demand for non-priority letters is very elastic; in general a 1% increase in price results in a decrease of demand for non-priority letters by 1.69% on average among all customers (95%-CI [-2.01;1.36]). In addition to the decreasing volume, it can also be observed that the fluctuations in the distribution become smaller. The higher the price, the more uniform consumers' responses are in terms of their mailing volume. Both effects indicate that price and volume may have an exponential rather than a linear relationship for non-priority letters. The applied method of confronting customers with absolute prices instead of relative %-changes might have contributed to this high elasticity found. We would nonetheless wish to emphasize that the use of absolute prices on the other hand also moderates the risk of strategic and patterned responses (for instance that a 10% increase in price would provoke a response that indicates a 10% decrease in volume). Moreover, for residential users, the 'individual' tariffs are known, since their tariffs don't really depend on volume[11] and sales channel[12] and relative price increases are less relevant Hence, we have used absolute prices. These comments also apply to the following sections (1.1.2-1.1.4) concerning residential users.

Comparable results are also achieved when considering the delivery frequencies. Currently, letters in Belgium are delivered 5 days a week. This may change in the future if the Universal Service Provider would cease to provide universal services or if the universal service obligations should be altered. To assess the behaviour of consumers in this case, we have created hypothetical scenarios for the case that delivery will only occur two, three or four times a week.

The effect of a reduction in frequencies is not as strong as that of an increase in prices. The elasticity is around 0.40 (95%-CI [0.26;0.55]). Since this value is greater than 0 and less than 1, demand according to classical economic theory is considered relatively inelastic. In other words, demand changes relatively less than the frequency decreases. If the delivery frequency would be reduced by one day (or 1/5th, 20%), the mailing volume would decrease by 8%.

All in all, it appears that the price at least for non-priority letters is driving demand more strongly than delivery frequency.

1.1.2 Priority letters

As described in the introductory chapter, only a few customers still use priority letters.[13] Nevertheless, the average number of priority letters per customer is almost similar to that of non-priority letters. However, if customers are asked what they would do if prices change, they reduce demand in a similar way to non-priority letters.

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10 More than [CONFIDENTIAL]% of all stamps are being sold per 10.

11 Only a mall discount per 5 or 10 items.

12 Difference bought online versus at the counter.

13 Non-priority stamps were introduced in January 2019.

The hypothetical prices considered were between 0.90 Euro and 1.39 Euro; again in the -10 and +40% range. The price elasticity found for priority letters is comparable with the one of non-priority letters. The elasticity is -1.77 indicating that a 1% increase in price might lead to a 1.77% decrease in the mailing volume of priority letters (95%-CI [-3.05;-0.49]). This value is close to the value determined for non-priority letters, but slightly higher, most likely due to substitution of priority letters by non-priority letters as indicated in the interviews (see section 3).

In terms of delivery frequency, the calculated elasticity has a negative value (-0.38) implying that if the delivery frequency increases, the demand will decrease. However, the confidence interval includes the value zero (95%-CI [-1.02;0.27]), which indicates that customers do not really care. The low absolute value points in any instance to an inelastic demand.

In summary, for letters, regardless of whether they have priority or not, price in particular plays a more decisive role than delivery frequency. Consumers also react similarly to changes. Above all, the low response to changes in delivery frequency signalizes the fact that especially time-critical letters are not sent as priority letter but as registered mail, as the following section demonstrates.

1.1.3 Registered mail

Registered mail is sent the least; 23% of Belgian's residential users, who use registered mail, send about 3 letters a year. The same behaviour of residential users as observed by non-priority and priority mail, repeats itself; an increase in the price leads to a disproportional decrease in the expected mailing volume (see sections in the above). However, registered mail is even more sensitive for price; if the price increases by about 1% the mailing volume will decrease by approximately 1.91% (95%-CI [-2.51;-1.32]).

This stronger reaction of consumers on price compared with non-priority and priority mail, although having the almost the same perceptual changes in price, might be explained by the higher base prices of this particular postal services (6.80 €) compared to the non-priority and priority letters (around 1 €).

Also different from the previous findings for non-priority and priority letters is the result in terms of changes in delivery frequency. The calculated elasticity of 2.52 indicates a very elastic demand (95%-CI [1.64;3.39]).

1.1.4 Parcels

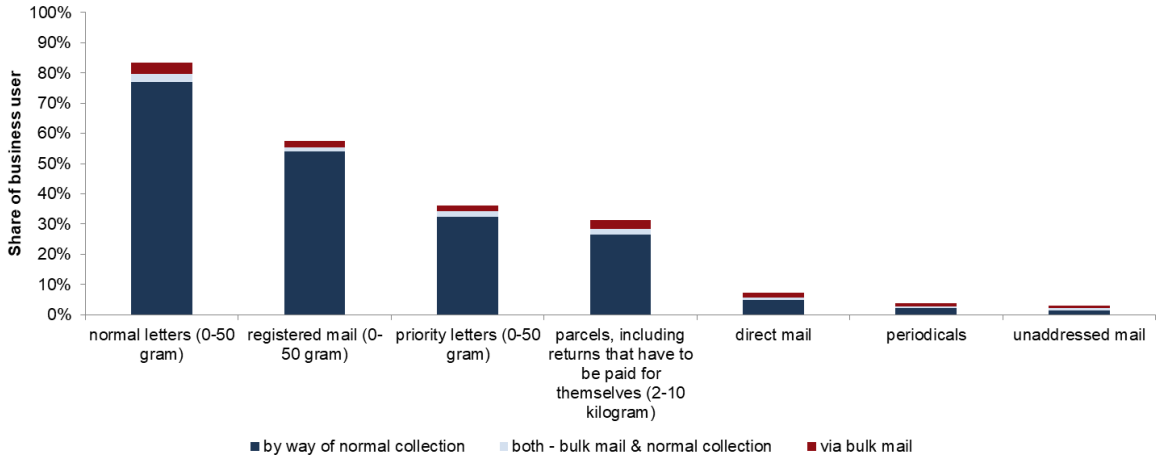
The demand for parcel services is particularly price-elastic in the considered interval from -10 to 40% from the current status quo. A slight rise in prices would immediately cause demand to fall sharply. Overall, demand fell by nearly 3% with a price increase of only 1% (95%-CI [-3.21;-2.60]). From the interviews we noted that higher competition plays a role and possible substitution by letter post.

The demand for parcels increases also when the delivery frequency rises. The demand can be considered as elastic since elasticity equals 1.60 (95%-CI [0.90;2.30]). On average, if parcels will be delivered six times a week instead of 5 times (+20%), demand will rise by about 30%.

Outcome market survey 2019 – business users

Approximately 85% of our sample of business users utilizes postal services. Similar to the residential customers, the majority of business customers tend to use normal letters. In addition, regardless of the specific postal service, most businesses send out letters and other items by way of normal collection. Only a small portion of the companies in the sample send letters, parcels or periodicals via bulk mail.[14] The largest share of companies using bulk mail is found among those who send unaddressed mails, periodicals and direct mails.

Figure 3 Share of business users using different postal services

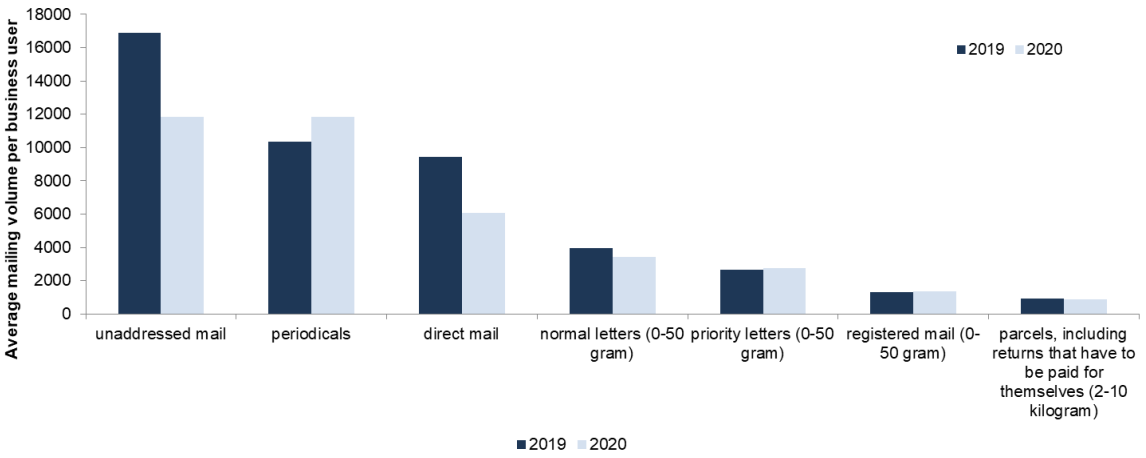


Source: WIK-Consult. N=2019.

As expected, the volume sent via bulk mail is generally higher than the volume sent by way of normal collection. While for most postal services the expected mailing volume in 2020 is more or less identical to that in 2019, there are some differences for unaddressed mails, as well as for periodicals, direct mails and normal letters. According to the data, the mailing volumes for these postal services will decrease in 2020 even without changes in price or delivery frequency. This could be an indication of substitution by mostly electronic services. The data also show that e-substitution continues to be more pronounced among companies than among residential users. Companies claim to have already substituted 50% of the postal services in 2019 and expect for 2020 that this will increase to 58% (+8%-points).

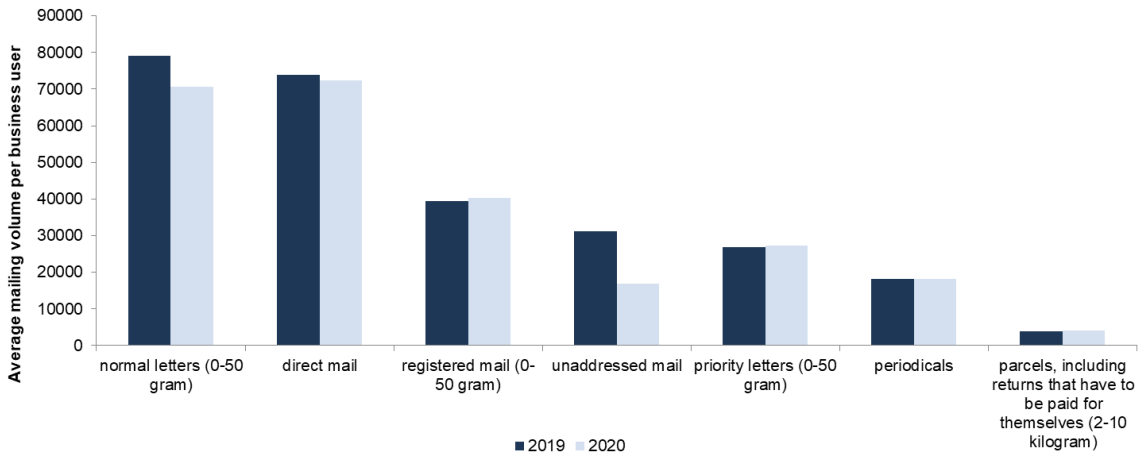
14 Also called masspost.

Figure 4 Average mailing volume of business users by way of normal collection



Source: WIK-Consult. From left to right: N=62; N=75; N=147; N=1683; N=729; N=1163; N=632.

Figure 5 Average mailing volume of business users via bulk mail



Source: WIK-Consult. From left to right: N=1683; N=147; N=1163; N=62; N=729; N=75; N=632.

1.1.5 Normal letters

For normal letters the elasticity decreases with the amount sent; companies with a generally high mailing volume are reacting less prominent to changes in price than companies sending only a few normal letters each year. This development will be more prominent for the other postal services discussed in this document (see Annex 7 for detailed graphs). The elasticity for companies in each mailing intensity category is shown in the following table.

Table 6 Price elasticities for normal letters

Mailing intensity classes and delivery mode	Elasticities (CI)
1-59 normal letters in 2019	-1.06 (95%-CI [-1.21;-0.90])
60-299 normal letters in 2019	-1.21 (95%-CI [-1.33;-1.08])
300-1999 normal letters in 2019	-1.00 (95%-CI [-1.12;-0.88])
> 2000 normal letters in 2019	-0.71 (95%-CI [-0.83;-0.59])
Normal collection	-1.03 (95%CI [-1.10;-0.96])
Mass post	-0.71 (95%CI [-0.92;-0.49])
Total	**-1,00 (95%-CI [-1.07;-0.94])**

Source: WIK-Consult. Respondents: N=1683; Responses: N=1739.

In all four volume categories companies will reduce demand if prices rise. For companies that will send more than 2000 letters, the elasticity is the lowest (-0.71). In this case demand is considered to be inelastic. If prices increase by 1%, demand for normal letters will drop by 0.71%. This result is mirrored by the findings of the evaluation of bulk mail. Even if the results for bulk mail, due to the small sample size, are less reliable to interpret, the elasticity is lower than that of normal collection. Possible explanation might be that for companies with large mailing volumes, there are high switching costs due to integration of systems and operational processes. In addition, prices may have less priority than service quality.

It is noteworthy that in general, for normal letters, business users react less sensitive to changes in prices than residential users. However, the price elasticity of around minus one can also result from the survey technique.[15]

In comparison to the residential users, who reacted only slightly or not at all to changes in delivery frequency, the reaction of business users is even less sensitive. The elasticity is almost zero regardless of the grouping.

Table 7 Elasticity of delivery frequency of normal letters

Mailing intensity classes and delivery mode	Elasticities (CI)
1-59 normal letters in 2019	0.05 (95%-CI [-0.04;0.13])
60-299 normal letters in 2019	0.08 (95%-CI [-0.04;0.20])
300-1999 normal letters in 2019	0.07 (95%-CI [-0.04;0.17])
>2000 normal letters in 2019	-0.07 (95%-CI [-0.28;0.15])
Normal collection*	0.03 (95%-CI [-0.04;0.11])
Mass post	0.04 (95%-CI [-0.16;0.24])
Total	**0.03 (95%-CI [-0.03;0.10])**

Source: WIK-Consult. Respondents: N=1683; Responses: N=1739.

- Normal collection method; so being brought to one of the postal offices versus mass poist, where delivery is directly to the sorting centres.

15 Please see the argumentation in the methodology section.

1.1.6 Priority letters

For priority letters, the estimated elasticity differs more strongly depending on average mailing volumes per business user in comparison with standard letters. The elasticity for companies in each mailing intensity category is illustrated in the following table.

Table 8 Price elasticities of priority letters

Mailing intensity classes and delivery mode	Elasticities (CI)
1-59 priority letters in 2019	-1.41 (95%-CI [-1.60;-1.22])
60-299 priority letters in 2019	-1.33 (95%-CI [-1.55;-1.10])
300-1999 priority letter in 2019	-1.01 (95%-CI [-1.22;-0.80])
>2000 priority letters 2019	-0.74 (95%-CI [-0.88;-0.60])
Normal collection	-1.21 (95%-CI [-1.31;-1.10])
Mass post	-0.68 (95%-CI [-0.88;-0.47])
Total	-1.15 (95%-CI [-1.25;-1.05])

Source: WIK-Consult. Respondents: N=633; Responses: N=766.

Again, in all four volume categories, companies will reduce demand if prices increase. For companies that will send more than 2000 letters, the elasticity is the lowest (-0.74). In this case demand is considered to be inelastic. If prices increase by 1%, demand for priority letters will drop by 0.74%. Companies in the category 'very low mailing volume' will reduce mailing volume by about 1.41% if prices increase by 1%. On average, the price elasticity of priority mail for business users is in the same range as for normal letters.

Elasticity for delivery frequency is not as low as for normal letters (close to 0) but also very inelastic, hence business users are not sensitive for delivery frequency when it considers normal and priority letters.

Table 9 Elasticity of delivery frequency for priority letters

Mailing intensity classes and delivery mode	Elasticities (CI)
1-59 priority letters in 2019	0.03 (95%-CI [-0.22;0.27])
60-299 priority letters in 2019	-0.56 (95%-CI [-1.95;0.79])
300-1999 priority letter in 2019	0.09 (95%-CI [-0.11;0.30])
> 2000 priority letters in 2019	0.06 (95%-CI [-0.03;0.17])
Normal collection	-0.13 (95%-CI [-0.57;0.31])
Mass post	0.02 (95%-CI [-0.17;0.13])
Total	**-0.12 (95%-CI [-0.51;0.37])**

Source: WIK-Consult. Respondents: N=1683; Responses: N=1739.

1.1.7 Registered mail

The differences between those who send a lot of registered mails and those who send less are similar to those of standard letters; the higher the mailing volume of a company, the less elastic is their demand. However, companies generally react less strongly to changes in this service category. In total, an increase of the price by 1% would lead to a reduction of mailing volume by about 0.76%.

Table 10 Price elasticities for registered mail

Mailing intensity classes and delivery mode	Elasticities (CI)
1-9 registered mails in 2019	-0.96 (95%-CI [-1.18;-0.74])
10-39 registered mails in 2019	-0.86 (95%-CI [-1.07;-0.66])
40-249 registered mails in 2019	-0.67 (95%-CI [-0.84;-0.49])
> 250 registered mails in 2019	-0.56 (95%-CI [-0.70;-0.42])
Normal collection	-0.78 (95%-CI [-0.88;-0.68])
Mass post	-0.52 (95%-CI [-0.80;-0.23])
Total	-0.76 (95%-CI [-0.86;-0.67])

Source: WIK-Consult. Respondents: N=999; Responses: N=1188.

The reaction is different for delivery frequency. In general, an increase of delivery frequency will have a positive effect on mailing volume; probably because the service is more expensive and therefore business users appreciate a higher service quality. Again, the higher the companies' mailing volume, the lower the elasticity of delivery frequency on demand.

Table 11 Elasticity of delivery frequency for registered mail

Mailing intensity classes and delivery mode	Elasticities (CI)
1-9 registered mails in 2019	0.46 (95%-CI [0.29;0.66])
10-39 registered mails in 2019	0.16 (95%-CI [0.10;0.22])
40-249 registered mails in 2019	0.20 (95%-CI [0.13;0.09])
> 250 registered mails in 2019	0.25 (95%-CI [0.16;0.35])
Normal collection	0.27 (95%-CI [0.21;0.32])
Mass post	0.26 (95%-CI [0.10;0.42])
Total	0.27 (95%-CI [0.21;0.32])

Source: WIK-Consult. Respondents: N=999; Responses: N=1188.

1.1.8 Parcels

The results are the same as for the other product categories; as mailing volume increases, sensitivity to price changes decreases. On average, the demand elasticity is around one; the relative change of demand is equal to the relative change of prices.

Table 12 Price elasticities for parcels

Mailing intensity classes and delivery mode	Elasticities (CI)
1-9 postal packages in 2019	-1.39 (95%-CI [-1.71;-1.07])
10-39 postal packages in 2019	-1.18 (95%-CI [-1.40;-0.96])
40-249 postal packages in 2019	-1.18 (95%-CI [-1.37;-0.98])
> 250 postal packages in 2019	-1.01 (95%-CI [-1.20;-0.82])
Normal collection	-1.22 (95%-CI [-1.35;-1.10])
Mass post	-0.85 (95%-CI [-1.11;-0.60])
Total	-1.17 (95%-CI [-1.28;-1.06])

Source: WIK-Consult. Respondents: N=501; Responses: N=669.

However, similar to the registered mails, we do observe a reaction to changes in delivery frequency as can be seen in the following table.

Table 13 Elasticity of delivery frequency for parcels

Mailing intensity classes and delivery mode	Elasticities (CI)
1-9 postal packages in 2019	0.19 (95%-CI [-0.19;0.57])
10-39 postal packages in 2019	0.16 (95%-CI [-0.10;0.42])
40-249 postal packages in 2019	0.19 (95%-CI [-0.10;0.49])
>250 postal packages in 2019	0.26 (95%-CI [-0.04;0.55])
Normal collection	0.21 (95%-CI [0.05;0.37])
Mass post	0.16 (95%-CI [-0.24;0.57])
Total	0.20 (95%-CI [0.05;0.35])

Source: WIK-Consult. Respondents: N=501; Responses: N=669.

1.1.9 Unaddressed mails

Due to the small number of cases, no clear results can be obtained. However, the tendencies are similar to those of the other categories and the values lay within the confidentiality intervals.

Table 14 Price elasticities for unaddressed mails

Mailing intensity classes and delivery mode	Elasticities (CI)
1-99 unaddressed mails in 2019	-1.43 (95%-CI [-2.13;-0.73])
100-999 unaddressed mails in 2019	-0.46 (95%-CI [-0.76;-0.16])
1000-4999 unaddressed mails in 2019	-1.31 (95%-CI [-2.20;-0.42])
> 5000 unaddressed mails in 2019	-0.47 (95%-CI [-1.19;0.25])
Normal collection	-0.90 (95%-CI [-1.27;-0.52])
Mass post	-0.69 (95%-CI [-136;-0.02])
Total	-0.81 (95%-CI [-1.16;-0.46])

Source: WIK-Consult. Respondents: N=55; Responses: N=75.

Table 15 Elasticity of delivery frequency for unaddressed mails

Mailing intensity classes and delivery mode	Elasticities (CI)
1-99 unaddressed mails in 2019	0.07 (95%-CI [-0.52;0.65])
100-999 unaddressed mails in 2019	0.07 (95%-CI [-0.08;0.22])
1000-4999 unaddressed mails in 2019	0.04 (95%-CI [-0.04;0.12])
> 5000 unaddressed mails in 2019	0.46 (95%-CI [-0.45;1.38])
Normal collection	0.36 (95%-CI [-0.25;0.98])
Mass post	0.00 (95%-CI [-0.00;0.00])
Total	0.21 (95%-CI [-0.14;0.56])

Source: WIK-Consult. Respondents: N=55; Responses: N=75.

1.1.10 Direct mail

Due to the small number of cases, no clear results can be obtained. However, the tendencies are similar to those of the other categories and the values lay within the confidentiality intervals.

Table 16 Price elasticities for direct mail

Mailing intensity classes and delivery mode	Elasticities (CI)
1-99 direct mails in 2019	-0.95 (95%-CI [-1.27;-0.62])
100-999 direct mails in 2019	-0.92 (95%-CI [-1.33;-0.51])
1000-9999 direct mails in 2019	-0.91 (95%-CI [-1.19;-0.63])
> 10000 direct mails in 2019	-0.60 (95%-CI [-0.88;-0.33])
Normal collection	-0.86 (95%-CI [-1.05;-0.66])
Mass post	-0.86 (95%-CI [-1.16;-0.58])
Total	-0.86 (95%-CI [-1.02;-0.70])

Source: WIK-Consult. Respondents: N=131; Responses: N=162.

Table 17 Elasticity of delivery frequency for direct mail

Mailing intensity classes and delivery mode	Elasticities (CI)
1-99 direct mails in 2019	0.24 (95%-CI [-0.02;0.49])
100-999 direct mails in 2019	0.15 (95%-CI [0.02;0.28])
1000-9999 direct mails in 2019	0.24 (95%-CI [0.04;0.44])
> 10000 direct mails in 2019	0.17 (95%-CI [-0.04;0.38])
Normal Collection	0.18 (95%-CI [0.06;0.30])
Mass post	0.25 (95%-CI [0.06;0.45])
Total	0.20 (95%-CI [0.10;0.31])

Source: WIK-Consult. Respondents: N=131; Responses: N=162.

1.1.11 Periodicals

Due to the small number of cases, no clear results can be obtained. However, the tendencies are similar to those of the other categories and the values lay within the confidentiality intervals.

Table 18 Price elasticities for periodicals

Mailing intensity classes	Elasticities (CI)
(1-149 magazines in 2019	-1.51 (95%-CI [-2.16;-0.86])
150-1499 magazines in 2019	-1.11 (95%-CI [-1.70;-0.52])
1500-9999 magazines in 2019	-0.78 (95%-CI [-1.12;-0.44])
>10000 magazines in 2019	-0.60 (95%-CI [-1.03;-0.17])
Normal collection	-1.10 (95%-CI [-1.43;-0.77])
Mass post	-0.82 (95%-CI [-1.24;-0.39])
Total	-1.00 (95%-CI [-1.26;-0.75])

Source: WIK-Consult. Respondents: N=66; Responses: N=85.

Table 19 Elasticity of delivery frequency for periodicals

Mailing intensity classes	Elasticities (CI)
1-149 magazines in 2019	0.05 (95%-CI [-0.18;0.28])
150-1499 magazines in 2019	0.27 (95%-CI [-0.03;0.56])
1500-9999 magazines in 2019	0.18 (95%-CI [-0.05;0.40])
>10000 magazines in 2019	-0.11 (95%-CI [-0.47;0.25])
Normal collection	0.14 (95%-CI [0.00;0.27])
Mass post	-0.00 (95%-CI [-0.33;0.32])
Total	-0.09 (95%-CI [-0.05;0.23])

Source: WIK-Consult. Respondents: N=66; Responses: N=85.

Interviews with postal operators

In the context of this study, three postal operators in Belgium were interviewed; incumbent and Universal Service Provider bpost, main competitor in the mail segment TBC-Post[16][17] and a competitor in the parcel segment, namely Post NL.

The interviews were done in May 2019. Based on the interviews, detailed notes have been drafted and reviewed by interviewees to ensure correctness (see Annex 3, 4, and 5). The following paragraphs describe the main findings from these interviews.

Summarised opinions of postal operators

Regarding e-substitution, the following general remarks were noted:

- The first shift has taken place, remaining customers are less price sensitive;
- E-substitution is expected to continue or even accelerate in coming years, but other aspects than price will be driving (e.g. companies' capacity to invest in IT infrastructure);
- Shift most likely comes from small and medium-sized companies as they still use predominantly paper-based communication;
- Business letter (priority and non-priority) and registered mail are the most sensitive for being replaced by electronic services; and
- The success of government initiatives pushing electronic registered mails is limited for different reasons (still more expensive, physical service trusted, legal conditions).

Based on the specific points per interviewed party, the following tables provide per segment the main findings.

Table 20 Main interview statements regarding elasticities for the residential market

Residential customers	
Letters (<50 gram)	[CONFIDENTIAL] and [CONFIDENTIAL] stated that there is a low price sensitivity (given that there is limited alternative for bpost) and probably driven by other aspects.
	Delivery of non-priority letters fine within 3 working days from sending (D+3). For priority this is D+1. Logically for priority letters, demand is quite sensitive for delivery
	Non priority letters are substitutes for priority letters. According to [CONFIDENTIAL], [CONFIDENTIAL].
Letter (50 gram-2 Kg)	Price elasticity is higher as there are competitors in this segment due to the higher price range (3-4 €).
Registered shipments	[CONFIDENTIAL] and [CONFIDENTIAL] confirmed that the driver of demand is not price but more guaranteed delivery with legally accepted proof of arrival, hence price elasticity
Parcels	All parties confirmed that due to competition, price elasticity is quite high, especially C2C but also B2C market segment due to volume contracts.
	However, [CONFIDENTIAL] stressed there is a wide variety of value propositions and related price points, hence related different price sensitivities.
	Arrival certainty is most important, delivery frequency is less important, however as large e-retailer set the standard, the trend is towards every day delivery and/or on a specific time window (when customer claims to be home), so this becomes a basic requirement.

16 New entrant Glejor was considered, however it hasn't yet started its addressed mail activities. It received its license at the end 2018. SPAN Diffusion on the other hand received its license in September 2019.

17 Mosaic SPRL, the company behind TBC Post, went bankrupt at the end of 2019, L'Echo 14 December 2019: "TBC Post, le seul rival de bpost dans l'activité de courrier, depose le bilan"

Source: WIK-Consult

Table 21 Main interview statements regarding elasticities for the business market

Business customers	
Letters (<50 gram)	Low price sensitivity for remaining mail used by businesses. Substitution will depend on companies' capacity to invest in IT infrastructure and not on postal prices and/or quality.
	For priority letters, the sensitivity to delivery frequency will logically be high (D+1) and low for non-priority letters and registered items.
	Non priority letters are substitutes for priority letters. [CONFIDENTIAL].
Letter (50 gram - 2 Kg)	There is a likely substitution between letter post up to 2 kg and parcels up to 2 kg especially for business customers receiving discounts on parcels via volume contracts.
Registered shipments	For registered shipments the sensitivity for delivery frequency depends on the content (B2B high, B2C less high) and the applicable legal conditions.
Parcels	Parcels are quite price sensitive due to higher competition in the market and there is always interest in volume discount but service quality plays a role.
	Demand sensitivity for delivery frequency is higher as there is a market trend towards 'same-day-delivery'. Delivery at least D+1.
	Cross substitution between letter post up to 2 kg and parcels up to 2 kg especially for business customers receiving discounts on parcels via volume contracts.
Periodicals, magazines and newspapers	Price sensitivity varies; high for daily newspapers, lower for weekly periodicals and even lower for monthly periodicals. However, theoretic as price and frequency is fixed (within an SGEI for the period 2016-2020[18]).
	[CONFIDENTIAL]
	Periodicals, magazines and newspapers are sensitive to delivery time as delivery should take place throughout Belgium on a certain day/ week, which only bpost can offer
Direct Mail	For DM it is about delivery on a certain day/week in line with the marketing strategy instead of the frequency itself. [CONFIDENTIAL] noted that DM is more driven by the 'fit' in customers' marketing mix and less on price. However, interviewees also noted that DM is price sensitive as there are alternative communication channels, so if DM become too expensive, customers will shift.
Unaddressed	Price elasticity is also rather low due to the importance of service quality aspects (e.g. the ability to choose between standalone delivery or in bulk etc.). Like with DM, important is the aligning of the delivery with a marketing campaign, so delivery by a specific date.

Source: WIK-Consult

Review literature studies on the elasticity of demand

This section has the following structure: Section 0 provides a brief introduction with relevant definitions and explanations, which shall facilitate the understanding of the literature review and the contextualization of the findings of the reviewed econometric studies. Section 0 provides short descriptions and a summary of the results of relevant econometric studies mostly on price elasticity in postal markets. Paragraph 4.3 summarises the findings from the literature review.

Introduction

Price elasticity research on demand for letters has been addressed extensively in the literature in the past while other key drivers for mail demand were addressed to a much lower extent. Particularly the elasticity of demand subject to the general quality of service is only addressed in

18 This SGEI has been extended, in December 2019, towards the end of 2022: https://nl.metrotime.be/2019/12/09/news/ministerraad-verlengt-contract-persconcessies-bpost-met-twee-jaar/

a few studies and the elasticity of demand with respect to single quality aspects, such as delivery days per week, are barely analysed. Recent research (for example Rodriguez et al. 2018[19], Cazals et al. 2018[20]) focuses increasingly on e-substitution rather than on the price as main driver for postal service demand (beside economic activity)[21]. Existing studies with focus on price elasticities differ in several aspects. Typically, the estimations are conducted for different sets of products (e.g. letter post vs parcels), different levels of aggregation (e.g. total volumes vs. disaggregated volumes) and/or different types of senders (e.g. bulk mailers vs. consumers) and therefore estimated elasticities vary across studies. Last but not least, the studies feature different econometric approaches and types of data sets which may lead to different results. However, the following section does neither discuss the applied economic approaches in detail nor their strengths and weaknesses compared to other methodologies but focus on the objective of investigation and the results of the studies.

For this assignment, we aimed to gather historic information and studies for markets, which are comparable with the concentrated market structure in Belgium at the one hand and at the other hand at markets with a more evolved competition, in order to evaluate how this affects the elasticities. However, the number of studies found is limited and therefore this aspect is less visible. Despite this, it is clear that in certain market segments in the Belgium postal market, competition has more evolved (e.g. parcels) and that the availability of substitutes has indirectly increased the own price elasticity of demand for those services.

Detailed results of reviewed econometric studies

A total of 18 relevant studies were reviewed in detail. Their publication ranged from 2007 to 2018 with data ranging from 196x to 201x. We have summarised the results from the reviewed econometric studies in the following paragraphs:

- Robinson (2007) provides a comprehensive meta-study on price elasticity of mail services, which evaluates a total of 45 studies from six countries (Canada, Finland, France, Portugal, USA and the UK). Overall, the studies' estimations of the price elasticity of demand range between -0.2 to -0.8.[22] While most of these studies provide additional insights for different services and on different levels of aggregation, the studies seem a bit outdated to provide a benchmark for today's price elasticities, given that the studies are based on data sets from the 1960s to the late 1990s. Recent studies showed that price sensitivity decreased with the degree of substitution of postal services with electronic communication services (e-substitution) which can be explained as the most price sensitive users have – most probably – already switched to electronic communication.

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19 Rodriguez, Frank, Soterio Soteri and Stefan Tobias (2018), E-Substitution and the Demand for Business Mail in the UK: Trends and Prospects, in Parcu, P.L., Brenann T.J.J., and Glass V. [Eds.]: The Changing Postal and Delivery Sector, Springer International Publishing, 35-49.

20 Cazals, Catherine, Thierry Magnac, Frank Rodriguez and Soterio Soteri (2018), To What Extent Has E-Substitution Impacted the Demand for Letters and Which Factors Are Constraining Its Advance, in Parcu, P.L., Brenann T.J.J., and Glass V. [Eds.]: New Business and Regulatory Strategies in the Postal Sector, Springer International Publishing, 269-284.

21 Given examples like Denmark, where e-substitution resulted in situation where demand for postal service is going to vanish, the relevance of the price for demand seems to decrease in the future. For more details on the Danish case, see for example Anderson, Peter, Sofia Bengtsson and Johanna Eriksson (2018), The Danish Problem: Soon Everybody's? A Comparative Analysis of Digitization Effects on Letter Volumes, in Parcu, P.L., Brenann T.J.J., and Glass V. [Eds.]: New Business and Regulatory Strategies in the Postal Sector, Springer International Publishing, 285-297.

22 Robinson, Alan (2007), A review of price elasticity models for postal products, Pitney Bowes Research „The Future of Mail", 2007-1.

- Cazals et al. (2011) conducted a meta study on econometric estimations of price elasticities extending the study of Robinson (2007) with estimates on price elasticities in France, Finland, Portugal, the UK and the USA (based on data sets ranging from the 1960s to 2008). All reviewed econometric models indicate an inelastic demand of most postal services, i.e. price elasticities with absolute values above -1. Generally, the price elasticities range between -0.6 and -0.8 with some raw exceptions below -1, e.g. the price elasticity of demand for parcel services.[23]
- Veruete-McKay et al. (2011) model the demand for total addressed inland letter traffic by three traffic streams, i.e. First Class non-pre-sort traffic; Second Class non-pre-sort traffic; and other (mainly pre-sort) traffic. The three demand relationships, one for each of the product categories, are estimated using single equation econometric time series error correction models and the long run coefficients entering the error correction models for each of the three traffic streams were estimated using Dynamic Ordinary Least Square (DOLS) models. Based on quarterly data on addressed mailings in the UK from Q4 1976 to Q1 2008, the authors estimated own-price elasticities in range between -0.31 (for Second Class, non-priority letters) and -0.77 (for First Class, priority letters). The table below summarises all long-run elasticities with respect to different drivers for the three traffic streams:

Elasticity of demand with respect to	First Class non-pre-sort	Second Class non-pre-sort	Other (mainly pre-sort)	Total traffic
Economic activity	1.65	0.65	1.10	1.09
First Class non-pre-sort price	**-0.77**	0.31	ns	-0.07
Second Class non-pre-sort price	0.33	**-0.31**	ns	-0.01
Other (mainly pre-sort) price	ns	ns	**-0.44**	-0.24
Quality of service	ns	0.52	ns	0.13
Price of non-mail advertising	ns	ns	0.44	0.24
Proportion of internet advertising	na	na	-1.75	-0.95

ns: no statistical significance at 5%-level; na: not applicable
Total traffic estimated elasticities and time trend effects were calculated by weighting the estimated coefficients in each of the traffic streams by their respective traffic volume share in 2007/08

In a second step, the authors estimated the elasticities of demand for different contents of the letters, i.e. for social mailings, commercial mailings and direct mail. The results show that demand for letters with commercial (mainly transactional) content as well as letters with social content is inelastic with respect to the letter price with price elasticities in the range between -0.19 (commercial) and -0.43 (social). In contrast, price elasticity of direct mail is up to -1.35, i.e. the demand would be elastic and a price increase of 10% would result in a volume decline of 13.5%. The table below summaries the elasticities of demand for the different contents:

Elasticity of demand with respect to	Method 1			Method 2		
	Social	Commercial	Direct Mail	Social	Commercial	Direct Mail

23 Cazals, Catherine, Frédérique Fève, Jean-Pierre Florens (2011), Tarification non lineaire et demande de courrier, Study for the Belgian Institute for Postal services and Telecommunications (BIPT).

Economic activity	ns	0.97	1.87	ns	0.96	2.04
Own price	**-0.43**	**-0.19**	**-1.35**	**-0.29**	**-0.19**	**-0.74**
Quality of service	0.43	0.34	ns	0.49	0.36	ns
Price of telecommunication services	na	0.10	ns	na	0.12	ns
Proportion of internet advertising	na	na	-1.79	na	na	-3.31

ns: no statistical significance at 5%-level; na: not applicable

In a final step, the authors combined both approaches to estimate the long-run elasticities for total volume. The overall price elasticity is estimated to range between -0.31 to -0.44 and the quality elasticity is between 0.13 and 0.29, i.e. an increase in the quality of service has a weak positive impact on demand.[24] The following table summarises the final results for long-run elasticities:

Elasticity of demand with respect to	Inland letter traffic model by broad product stream	Inland letter traffic model by content type (Method 1)	Inland letter traffic model by content type (Method 2)
Economic activity	1.09	1.07	1.11
Own price	**-0.33**	**-0.44**	**-0.31**
Quality of service	0.13	0.28	0.29
Price of telecommunication services	ns	0.07	0.09
Proportion of internet advertising	-0.95	-0.36	-0.66

ns: no statistical significance

- Cazals et al. (2011b) follow the methodological approach of Veruete-McKay et al. (2011) to estimate the elasticity of demand for three types of letter services (social, commercial mail, direct mail) with respect to different factors, including their prices, the price of telecommunication services, the general economic development and the quality of service. Based on data from Royal Mail and the Consumer Panel Survey, which includes data on the sending and receiving of letters from private households in the UK, the authors estimate the elasticity of demand for the financial years 2002/03 to 2007/08. The price elasticities range between -0.12 (commercial mail) and -0.92 (direct mail), resulting in an overall price elasticity of -0.31 to -0.35.[25] The table below summarises the estimation results:

24 Veruete-McKay, Leticia, Soterios Soteri, John C. Nankervis, and Frank Rodriguez (2011), Letter Traffic Demand in the UK: An Analysis by Product and Envelope Content Type, Review of Network Economics, 10(3), September 2011.

25 Cazals, Catherine, Jean-Pierre Florens, Leticia Veruete-McKay, Frank Rodriguez and Soterios Soteri (2011b), UK letter mail demand: A content based time series analysis using overlapping market survey statistical techniques, in Crew M.A., Kleindorfer P.R. [Eds.]: Reinventing the Postal Sector in an Electronic Age, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 91-108.

Elasticity of demand with respect to	Social	Commercial		Direct Mail	Total	
		Unrestricted*	Restricted*		Unrestricted*	Restricted*
Economic activity	ns	0.98	1.02	1.98	1.10	1.14
Own price	**-0.52**	**-0.17**	**-0.12**	**-0.92**	**-0.35**	**-0.31**
Quality of service	0.44	0.34	0.33	ns	0.28	0.27
Price of telecommunication services	na	0.11	0.12	ns	0.08	0.09
Proportion of internet advertising spend	na	na	na	-2.33	-0.47	-0.47

ns: no statistical significance at 5%-level; na: not applicable
* Restricted refers to an estimation setup with the hypothesis that own-price elasticity and the telecommunication price elasticities were equal and opposite in sign for commercial mail and unrestricted to an estimation setup without this hypothesis.

- Martin et al. (2012) projected the development of small letter volumes in Australia by estimating short- and long-run price determinants of demand based on vector correction modelling techniques. The estimates are based on data from Australia for the period July 1995 to September 2010. The total amount of small letters was delineated in two categories, i.e. pre-sort barcoded volumes (bulk mail) and other small letters. The price elasticity was only estimated for other small letters and equals -0.31 in the long-run. In the short-run, the analysis shows that prices are weakly exogenous and volume does not respond to shocks.[26]

- Fève et al. (2012) discuss the volume forecasting framework applied by Royal Mail and its Inland Letter Traffic Model (ILMT). Based on quarterly data from Q1 1976 to Q2 2003, the model estimates long-run own-price elasticities in the range between -0.32 (Other mail, mainly pre-sort) and -0.72 (First Class non-pre-sort). The ILMT also provides an estimate for the elasticity of demand with respect to quality of service. However, the estimates are only statistically significant for Second Class (non-priority) letters.[27] The table below summarises the long-run elasticities of mail demand estimated via the ILTM:

26 Martin, Vence L. Chris Paterson and Jessie Xiaokang Wang (2012), Forecasting letter volumes: augmenting econometric baseline projections, in Crew M.A., Kleindorfer P.R. [Eds.]: Multi-modal competition and the Future of Mail, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 60-76.

27 Fève, Frederique, Jean-Pierre Florens, Leticia Veruete-McKay, Soterios Soteri and Frank Rodriguez (2012), Uncertainty and projections of the demand for mail, in Crew M.A., Kleindorfer P.R. [Eds.]: Multi-modal competition and the Future of Mail, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 77-93.

Elasticity of demand with respect to	First Class non-pre-sort	Second Class non-pre-sort	Other (mainly pre-sort)	Total traffic
Economic activity	1.37	0.44	1.15	1.02
First Class non-pre-sort price	**-0.72**	0.55	na	-0.03
Second Class non-pre-sort price	0.53	**-0.47**	na	0.00
Other (mainly pre-sort) price	na	na	**-0.32**	-0.16
Quality of service	ns	0.49	na	0.12
Price of non-mail advertising	na	na	0.32	0.16

ns: no statistical significance at 5%-level; na: not applicable
Total traffic estimated elasticities and time trend effects were calculated by weighting the estimated coefficients in each of the traffic streams by their respective traffic volume share in 2007/08.

- Cigno et al. (2013) apply an econometric model derived from the random-coefficients discrete-choice logit model to estimate own-price and cross-price elasticities of 15 different letter services of company USPS. The study is based on price, revenue, and volume data time series of observations corresponding to the postal financial years 1972 to 2011. The own-price elasticities range between -0.846 (First Class single-piece items) and -3.516 (parcels). Due to the high level of disaggregation of services, these estimates have to be read carefully as cross-price elasticities have to be taken into account: given a proportional price increase, price elasticity of First Class single-piece letters, flats and parcels read -0.285 as consumers will substitute this service with other letter services, e.g. First Class pre-sorted items.[28] The table below summarises the estimated own-price and cross-price elasticities of demand for relevant products and illustrates that disaggregated estimations yield higher elasticities than the overall elasticity (measured as fixed weight index, FWI). Additionally, the last row (RPP) sum contains the elasticity of revenue per item with respect to price, i.e. the change in average revenue as result of a price adjustment[29]:

	Own-Price elasticities	Overall Price elasticities (FWI SUM)	Revenue Price elasticities (RPP SUM)
First-Class Single-Piece LFP	-0.846	-0.285	-0.763
First-Class Presort LFP	-0.878	-0.268	-0.492
First-Class Single-Piece Cards	-2.288	-0.557	-1.105
First-Class Pre-sort Cards	-1.646	-0.292	-0.328
Periodicals In-County	-2.920	-0.871	-1.040
Periodicals Outside County	-1.549	-0.142	-0.811
Standard non-Carrier-Route LFP	-1.131	-0.251	-0.467
Standard Carrier-Route LFP	-1.441	-0.338	-0.543
Parcel Post & Parcel Select	-3.516	-2.364	0.045
Bound Printed Matter	-2.013	-0.454	-0.316
Media & Library Mail	-3.549	-1.709	-1.960
Penalty, Franked and Free Mail	0.000	1.920	2.334

LFP: Letters, Flats & Parcels

28 Cigno, Margaret M., Elena S. Patel and Edward S. Pearsall (2013), Estimates of US postal price elasticities of demand derived from a random-coefficients discrete-choice normal model, in Crew M.A., Kleindorfer P.R. [Eds.]: Reforming the Postal Sector in the Face of Electronic Competition, Kluwer Academic Publishers, 76-88.

29 Note that the price elasticity of revenue per piece is typically greater (in absolute magnitude) than the price elasticity of demand.

- Jarosik et al. (2013) updated and extended the econometric analysis of Veruete-McKay et al. (2011) by an additional 15 quarters of information for the UK, i.e. applied data for the period Q4 1976 to Q4 2011. During this period, the UK entered a severe recession, faced technological progress, increasing competition in the upstream market and significant price increases for some products. For the total traffic, price elasticity was estimated to range between 0 (Second class non-pre-sort) and -0.28 (Other, mainly pre-sorted mailings).[30] The table below summarises their estimates for the long-run elasticities for domestic addressed letter traffic:

Elasticity of demand with respect to	First Class non-pre-sort	Second Class non-pre-sort	Other (mainly pre-sort)	Total traffic
Economic activity	1.40	0.78	0.78	0.86
First Class non-pre-sort price	**-0.44**	0.24	ns	-0-03
Second Class non-pre-sort price	0.27	**-0.24**	ns	0.00
Other (mainly pre-sort) price	ns	ns	**-0.42**	-0.28
Relative price of Second class and Other	ns	1.36	-0.38	0.00
Quality of service	ns	0.79	ns	0.14
Price of non-mail advertising	ns	ns	0.67	0.44
Proportion of internet advertising spend	ns	ns	-1.12	-0.73

ns: no statistical significance at 5%-level; na: not applicable
Total traffic estimated elasticities and time trend effects were calculated by weighting the estimated coefficients in each of the traffic streams by their respective traffic volume share in 2007/08.

- Nikali (2014) analyses the effect of e-substitution on price elasticities in the B2B, the B2C, and the C2C segment based on annual data from Finland covering the period 1991 to 2012. The estimations of the price elasticities in each segment for different periods shows that price elasticities decreased with the degree of e-substitution, i.e. with the availability and usage of electronic communication services.[31] In a related paper, Nikali (2014b) estimates the demand elasticities for postal services in three segments and their correlation with the telecommunication service price. The analysis shows that price elasticity in the C2C segment is around 0 and significance levels are low, i.e. price seems to be of no relevance for the demand of private customers. In the B2B segment, price elasticity is estimated to be -0.37 with a slight decrease to -0.35 due to e-substitution over time. However, there is no strong correlation with the price for telecommunication services. In contrast, there is a strong correlation in the B2C segment, and the own-price elasticity decreased significantly from -1.38 (in the period 1991-2007) to -0.77 (in the period 1995-2013).[32] The table below summarises the results of the analysis:

30 Jarosik, Marzena, John Nankervis, Jonathan Pope, Soterios Soteri and Leticia Veruete-McKay (2013), Letter traffic demand in the UK: Some new evidence and review of econometric analysis over the past decade, in Crew M.A., Kleindorfer P.R. [Eds.]: Reforming the Postal Sector in the Face of Electronic Competition, Kluwer Academic Publishers, 194-210.

31 Nikali, Heikki (2014), Character of Substitution and Its Significance for Letter Demand: The Finnish Case, in Finger, M., Bukovc, B., Burham, M. [Eds.]: Postal Services in the Digital Age, Ios Press: Amsterdam, 15-29.

32 Nikali, Heikki (2014b), Sender-receiver-segment-based demand analysis for letters, Paper for the eighth bi-annual conference on "The Economics of the Postal Sector in the Digital World" in Toulouse, April 2014.

Time period	**B2B** No strong cross price elasticity with telecommunication services	**B2C** **Strong cross price elasticity with telecommunication services**	**C2C** Cross price elasticity with telecommunication services
	Own-Price elasticities		
1991-2007	-0.37	-1.38	-0.004^{ns}
1991-2009	-0.37	-0.93	0.12^{ns}
1995-2013	-0.35	-0.77	0.04^{ns}

ns: no statistical significance

- Bozzo et al. (2014) apply single-equation error-correction models (ECMs) to examine the change in own-price elasticities of three product categories (First Class Mail, Standard Mail and Periodicals) of USPS. The estimations of the long-run own-price elasticities, based on quarterly data for the period Q4 1992 to Q4 2012 with tests for structural breaks, indicate relatively stable own-price elasticities which range between -0.114 (Periodicals) to -0.589 (Standard Non-profit Enhanced Carrier Route (ECR)). Applying the 2012 volumes as weights, overall price elasticity is estimated to be around -0.33.[33] The table below summarises the estimated own-price elasticities and a comparison with the estimates from USPS' baseline model:

Product	**USPS Baseline models**	**ECM**	
	Data through FY 2011	Data through FY2011	Data through FY 2012
Standard Regular [bulk mail]	-0.335	-0.306	-0.312
Standard ECR [bulk mail]	-0.782	-0.555	-0.549
Standard Non-profit [bulk mail]	-0.265	-0.191	-0.180
Standard Non-profit ECR [bulk mail]	-0.542	-0.577	-0.589
Periodicals [bulk mail]	-0.122	-0.085	-0.114
First Class Single-piece LFP	-0.189	-0.151	-0.144
First Class Work-shared LFP [bulk mail]	-0.434	-0.385	-0.393
Average (2012 volume weights)	-0.397	-0.329	-0.330

Non-profit: available for some authorized mailers.
ECR/Enhanced Carrier Route: pre-sorted bulk mail service.
LFP: Letters, flats, packets.
Work-shared: pre-sorted bulk mail service.

- Cigno et al. (2014) conduct a similar analysis of the change in price elasticities of USPS products under explicit consideration of internet penetration in the USA based on quarterly data from 1991 to 2011. The application of a mixed General Least Square (GLS) estimation indicates that price elasticities are rather constant over time and internet penetration has only minor effects on the price elasticity. However, the estimation reveals that the own-price elasticity of some products decreases with the price, i.e. demand becomes less elastic as prices increase. The estimates of the own-

33 Bozzo, A. Thomas, Kristen L. Capogrossi, B. Kelly Eaking, John Picket and Mithuna Srinivasan (2014), Is demand for market dominant products of the United States Postal Service becoming more own-price elastic?, in Crew, M.A, Brennan T.J.J. [Eds.]: The Role of the Postal and Delivery Sector in a Digital Age, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 28-45.

price elasticities range between -0.08 (First Class single-piece items) and -1.528 (International Outbound First Class), showing inelastic demand for most categories.[34]

- Swinand and Hennessy (2014) address the problem of estimating the price elasticity given a huge range of different postal products by applying a proportionality calibrated almost ideal demand system (PC-AIDS) model. Based on monthly data from Irish AnPost for the period 2001 to 2011, the model is applied to estimate the price elasticities for a set of products differentiated by payment method, i.e. stamps, metered items, and bulk mail items. Departing from an estimate with a linear approximate AIDS (LA-AIDS) model, the PC-AIDS model is calibrated for the price of one product and its overall elasticity to take into account that cross-price elasticities are lower for less elastic demand functions. Based on the LA-AIDS model, price elasticities range between -0.22 (stamps) and -1.17 (bulk mail). Applying the PC-AIDS models, and therefore accounting for decreases in overall demand for postal services, yields price elasticities between -0.22 and -0.39.[35] The table below summarises the results:

	% Change in Price								
	LA-AIDS			PC-AIDS (calibrated for stamped postage)			PC-AIDS (calibrated for metered postage)		
% Change in Quantity	Stamps	Metered	Bulk	Stamps	Metered	Bulk	Stamps	Metered	Bulk
Stamps	**-0.22**	0.88	0.02	**-0.39**	0.10	0.12	**-0.22**	0.02	0.03
Metered	0.80	**-0.39**	0.17	0.10	**-0.38**	0.12	0.02	**-0.22**	0.03
Bulk	0.07	0.18	**-1.17**	0.12	0.12	**-0.37**	0.03	0.03	**-0.22**

- Bzhilyanskaya et al. (2015) apply an AIDS model to estimate own-price and cross-price elasticities of the average revenue per piece of USPS domestic mail services.[36] In total they provide a 20x20 matrix with own-price and cross-price elasticities based on quarterly data from USPS from the period Q1 1977 to Q4 2013. The estimates for different levels of aggregation, i.e. for total mail volume, at product groups level and at product level, illustrate that the own-price elasticities tend to increase with the level of disaggregation. At the highest level, i.e. for total mail volume, the revenue per piece elasticity of the price, i.e. how the revenue per piece changes if the price changes, equals -0.706 and the demand elasticity of price -0.578. The table below provides an overview of the price elasticities of revenue per piece at product group level. The row sum indicates the change in total volume, i.e. takes into account the substitution of services with other postal services if prices for all services are increased proportionally. Overall, price elasticities of revenue per item range between -0.139 to -0.925 for letter services and equal -1.208 for parcel services at this aggregation level. Assuming a

34 Cigno, Magaret M., Katalin L. Clendenim and Edward S. Pearsall (2014), Are US postal price elasticities changing? in Crew, M.A, Brennan T.J.J. [Eds.]: The Role of the Postal and Delivery Sector in a Digital Age, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 46–64.

35 Swinand, Gregory and Hugh Hennessy (2014), Estimating Demand Elasticities using the PCAIDS Method, in Crew, M.A, Brennan T.J.J. [Eds.]: The Role of the Postal and Delivery Sector in a Digital Age, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 65–74.

36 Note that the price elasticity of revenue per piece is typically greater (in absolute magnitude) than the price elasticity of demand.

proportional price increase of all products, price elasticities range between -0.606 and -0.856.[37]

Price elasticities of Revenue Per Piece (RPP) at product Group Level	First Class mail	Second class mail	Periodicals	Standard regular mail	Standard nonprofit mail	Packages services	Row sum elasticity
First Class mail	**-0.804**	0.12	-0.080	0.079	-0.037	0.043	**-0.677**
Second class mail	0.524	**-1.063**	-0.033	-0.170	-0.000	-0.113	**-0.856**
Periodicals	-1.477	-0.162	**-0.139**	0.902	0.131	0.139	**-0.606**
Standard regular mail	0.162	-0.091	0.099	**-0.925**	0.020	0.045	**-0.690**
Standard non-profit mail	-0.770	-0.010	0.148	0.200	**-0.316**	0.097	**-0.652**
Packages services	0.376	-0.237	0.065	0.197	0.040	**-1.208**	**-0.767**

Row sum elasticity: Change in total volume

- Nikali (2016) analyses the development of newspaper and magazine volumes in Finland in the context of e-substitution. Based on annual data from 1990 to 2014, the analysis considers separate price elasticities for newspapers (-0.61) and magazines (-0.23) to explain the change in demand for the two products. The price elasticity captures the effect on demand of the price of each product for the customer without a separate analysis of the delivery price. This means the elasticity captures decreases in demand based on increases of the retail price as well as on increases in the delivery price.[38]

- Rodriguez et al. (2016) apply survey data from Royal Mail to update and expand the analysis of Veruete-McKay (2011). In a first step, the elasticities of demand were estimated for commercial mail, i.e. from business senders. The long-run elasticity for the commercial mail stream was estimated to equal -0.9. In a second step, commercial mail was disaggregated to allow a detailed analysis of six content types (e.g. invoices, financial statements) and six sender groups (e.g. banks, government), i.e. 36 traffic types in total. Additionally, the traffic stream was divided into three age groups of recipients. However, the authors abstract the price effect in this stage of the analysis and construct an e-substitution index to illustrate the effect of e-substitution on the different traffic types.[39] The table below summarises the estimated elasticities for the total commercial mail stream:

37 Bzhilyanskaya, Lyudmila Y., Magaret M. Cigno and Edward S. Pearsall (2015), A Branching AIDS Model for estimating U.S. Postal Price Elasticities, in Crew, M.A, Brennan T.J.J. [Eds.]: Postal and Delivery Innovation in the Digital Economy, Springer International Publishing 91-113.

38 Nikali, Heikki (2016), Demand for newspapers and magazines in Finland in the digital era, Paper for the ninth bi-annual conference on "The Economics of the Postal Sector in the Digital World" in Toulouse, April 2016.

39 Rodriguez, Frank, Soterios Soteri and Stefan Tobias (2016), The Impact of E-substitution on the Demand for Mail: Some Results from the UK, Paper for the ninth bi-annual conference on "The Economics of the Postal Sector in the Digital World" in Toulouse, April 2016.

Elasticity of demand with respect to	B2X mail (1980/81 to 2012/13)
Economic activity	0.90
Mail price index	-0.13
Telecom price index	0.18
Quality of service	0.19

- De Donder et al. (2017) examine challenges for postal universal service providers in implementing efficiency-enhancing measures in the face of changing demand patterns, i.e. letter volume decline and parcel volume increase, and potential strikes during restructuring measures. The study provides a model theoretical analysis which is calibrated with different parameters, including price elasticities of -0.2 for single-piece items and -0.4 for bulk mailings.[40]

- Fève et al. (2018) estimate the demand for UK international outbound mailings from 17 European countries for the period December 2006 to May 2015 by Ordinary Least Square (OLS), where prices are assumed exogenous, and by methods such as General Method of Moments (GMM) and Two Stage Least Square (2SLS), where prices are endogenous. For aggregated demand, i.e. parcels and letters, the price elasticity is estimated in the range -0.8 to -1.1, subject to the applied model. [41] The table below summaries the results of the estimations with OLS and GMM:

	All international outbound traffic (letters and parcels, Dec 2006 to May 2015)						International outbound Traffic by format (Dec 2006 to Mar 2014)		
	OLS (1)	OLS (2)	OLS (3)	Instrumental GMM (1)	Instrumental GMM (2)	Instrumental GMM (3)	Letters GMM	Letters GMM	Parcel GMM
Prices	-1.1*	-1.0*	-1.0*	-0.9*	-0.9*	-0.8*	-1.5*	-1.1*	-1.5*
GDP	0.6**	1.4*	1.5*	0.6*	1.4*	1.5*	0.9*	1.0*	3.7*
Exchange rate	2.5*	2.1*	2.2*	2.6*	2.0*	2.1*	2.1*	0.6*	ns

* Significant at 5% level; ** Significant at 10% level; ns: no statistical significance
The estimations (1) to (3) refer to different estimations with the presence / absence of dummy variables for destination country, product, format.
The GMM price elasticities should be preferred to the OLS estimates on the basis that this method of estimation provides consistent estimates even if the price index is endogenous.

- Fève et al (2018b) estimate the price elasticity of demand for addressed advertising mail (direct mail) based on a data set from Royal Mail for the period 2011 to 2017. The authors applied Instrument Variable estimation techniques to estimate the price

40 DeDonder, Philippe, Frank Rodriguez und Soterios Soteri (2017), Pricing and Efficiency Decisions for Letter and Parcel Markets when Industrial Relations Matter; TSE Working Paper 17-822

41 Fève, Frederique, Thierry Magnac, Soterios Soteri, and Leticia Veruete-McKay (2018), Price Elasticity and Factors Driving International Export Mail Sent from the UK to Western European Countries, in Parcu, P.L., Brenann, T.J.J., and Glass, V. [Eds.]: The Contribution of the Postal and Delivery Sector, Springer International Publishing, 299-310.

elasticities of customer demand from different sectors, e.g. commercial services, manufacturing, public services etc., and size. Aggregated price elasticity for addressed advertising mail is estimated to equal -0.71 but there are significant differences between sectors. For example, demand of companies from the manufacturing sector or from the Information and communication sector is quite inelastic with values of -0.48 and -0.52, respectively. In contrast, demand from companies from the finance and insurance sector or utilities is highly elastic with values of -1.52 and -2.60 respectively. In a second step, the authors categorized retail advertisement customers, which show an overall price elasticity of -0.84, in four sub-groups with different demand patterns, i.e. from continuous and loyal customers (stayers) to infrequent customers (round-trippers). Interestingly, the stayers show a very high price sensitivity with a price elasticity of -1.88. The same applies for the round-trippers with a price elasticity of -1.47. For the other two groups, the estimated price elasticities are rather low (-0.25 and -026) but statistically not significant.[42]

Summarised findings of the literature review

The literature review delivered an indication of historic ranges for price elasticities as shown in below table. It should be noted that these were mainly econometric studies isolating the price effect, hence lowering the resulting values. Furthermore, a mixture of residential and business customers was researched, which lowered the resulting values once more. This might explain the (higher) price elasticities found in our 2019 survey. [43] Moreover, differences can be country specific due to the level of competition, the development of e-commerce and electronic alternatives to letter mail and the general dependance on postal services.[44]

Table 22 Indication of historic ranges for price elasticities from the literature

Product category	Price elasticity
Total addressed letter mail volume	-0.2 to -0.4
Priority letters	-0.1 to -0.8
Non-priority letters	-0.2 to -0.9
Single-piece letters	-0.1 to -0.8
Bulk mail	-0.2 to -1.17
Direct mail	-0.2 to -1.4

42 Fève, Frederique, Thierry Magnac, Leticia Veruete-McKay and Soterios Soteri (2018), How sensitive is Letter Advertising Mail in the UK, in Parcu, P.L., Brenann, T.J.J., and Glass, V. [Eds.]: New Business and Regulatory Strategies in the Postal Sector, Springer International Publishing, 207-217.

43 The price elasticities in this study are based on a survey in which the respondents made statements about their potential behaviour in the event of a change of the initial situation - price increases and frequency reductions. However, the respondents can still be influenced by other factors which could not be analysed within the framework of the survey. These factors can either increase but also decrease the results. However, it is noted that the resulting price elasticities are higher than the ones found in the literature, which are mostly isolated price elasticities. In addition, in the literature residential and business customers are mostly mixed. Considering that business customers are in general less price sensitive, this lowers the mixed value found in the literature compared to the price elasticities found for residential customers in the survey (and opposite for business customers).

44 In general, a higher marketconcentration leaves customers with less alternative options and hence a lower price sensitivity. However, to which degree this would impact the price elasticity (and hence explain the higher values found in the Belgium survey) was not in the scope of this study. It should be noted that the literature studies were not restricted to the Belgiam market and also applied to postal markets with different marketconcentration and different price levels compared to Belgium.

Periodicals	-0.1 to -0.9
Postal packages and parcels	-0.8 to -3.5

Source: WIK-Consult.

The following general characteristics were noted:

- The demand for mail services is also determined by other parameters than price like macro-economic development, which determines demand to a large extent, particularly for business customers;
- Price elasticity varies per service, but also per customer group; private consumers and smaller senders seem to respond less sensitive to price changes than large business customers;
- However, price elasticity is also subject to the content; e.g. for paper-based invoices, the sender's demand is determined rather by the demand of the companies' customers than the price for the letter to send the invoice. In contrast, other commercial services like direct mail, respond very sensitive on the price;
- Demand for priority mailings reacts more sensitive to price changes, than the demand for non-priority mailings. This is intuitive as there is a set of substitutes for time-critical services, e.g. e-mail, express mailings. Additionally, non-priority services may serve as a substitute for priority services;
- The elasticity for package and parcel services is higher than the demand for letter services. While the parcel market is relatively competitive and a price increase of one operator will shift volumes to other operators; and
- There are only a few studies from the UK taking into account the quality of service's effect on demand for postal services. In this context, quality of service refers to Royal Mail's routing time targets. The studies show that there is a weakly positive effect of quality of service on postal demand; typically in the range between 0.2 and 0.5.

Conclusions

This chapter summarises the main conclusions from the survey. To provide context to the survey findings, we have complemented these with the statements from the operators in the interviews and the findings from the literature review from mainly historic econometric analysis.

As described in the introduction, the survey performed for this study focused on how customers would respond in terms of demand when there are variations in the price and delivery frequency of that service, assuming all other factors remain the same. This includes the competitive situation in the Belgian letter market, where bpost at this point in time still holds a marketshare around 99%. In a more competitive market, it can be assumed that in case of higher retail price and/or lower delivery frequency, customers would consider shifting demand to competitors even before decreasing their demand. Therefore, the values found in the survey can be considered as conservative values for elasticities in more competitive markets.

Conclusions for residential users

Consumers estimated that 61% of traditional paper-based postal services are already replaced by electronic services. A further 5% (-points) substitution is expected for 2020. In the interviews the postal operators confirmed that the first e-substitution shift has already taken place, but that further e-substitution is expected; however, factors other than price (e.g. companies' capacity to invest in IT infrastructure) will be the driving force behind that.

Observed price elasticities in the 2019 survey for all services provided under the USO regime (normal, non-priority, priority and registered mail and parcels) are highly elastic (between -1.69 to -2.9) as shown in the table below (see second column).

Table 23 Overview elasticities of demand by price – residential

Price elasticity of demand – Residential customers					
Product categories	**Survey WIK/MAS 2019/20 (res)**	**Survey WIK/MAS 2019/20 (res+bus)***	**MAS 2016 (res+bus)**	**Historic isolated range from literature (res+bus)**	**Proposed values 2019/20 (res)**
Non-priority letter (0-50 gram)	-1.69	-1.35	-1.51	-0.2 to -0.9	-1.69
Priority letters (0-50 gram)	-1.77	-1.46	-1.51	-0.1 to -0.8	-1.77
Registered mail (0-50 gram)	-1.91	-1.34	-0.28	-0.1 to -0.8	-1.91
Parcels (0-2 kg)	-2.90	-2.04	-1.45	-0.8 to -3.5	-2.90

*For comparison with MAS 2016 figures, an average was used of the found values for residential and business users as the sample sizes for both groups were roughly the same size.

Source: WIK-Consult.

The price elasticities found in 2019 seem at first glance overall higher compared to the values found in 2016 and the historic ranges from the literature. However, the survey results in 2019 are for residential users only, where the survey in 2016 and the literature (mostly) displays results for both user groups combinded – residential and business. Hence for a proper

comparison, we have calculated an average[45] for the values found in 2019 for residential and business users (see third column).

Comparing the 2019 averages shows that price elasticities found for non-priority and priority letters are slightly lower than in 2016, but still higher than the historic ranges found in the literature. As noted before, the values found in the literature were mostly derived with a different method (econometric analysis) where the price effect is isolated from other effects impacting the demand, which might explain the lower values.

For registered mails and parcels, in 2019 the price elasticities found are quite higher than the values found in 2016. However, the results of the literature point to high price elasticities for parcels, even beyond the values found in the 2019 survey. From the interviews with Belgium operators, it was noted that registered mail is one of the most sensitive services for being replaced with electronic services, which might explain the high price elasticity found. However, operators stated in the interview also that the driver of demand for registered mail is mainly guaranteed delivery with legally accepted proof of delivery rather than price. Regarding parcels, the operators noted during the interviews that due to competition, price elasticity is quite high especially in the consumers-to-consumer segment.

The last column of the table contains the proposed values of price elasticities for residential users. As all values calculated based on the survey conducted in 2019 lay within the confidentiality interval and the intervals did not contain the value '0', we consider the results to be reliable and maintain the same values as the survey results.

The following table presents the findings with respect to the impact of delivery frequency on demand. We have applied the same structure as above for the comparison of the 2019 survey with the 2016 survey.

Table 24 Overview elasticities of demand by delivery frequency – residential

Delivery frequency elasticity of demand – Residential customers				
Product categories	**Survey WIK/MAS 2019/20 (res)**	**Survey WIK/MAS 2019/20 (res+bus)**	**MAS 2016 (res+bus)**	**Proposed values 2019/20 (res)**
Non-priority letter (0-50 gram)	0.40	0.22	-0.46	0.40
Priority letters (0-50 gram)	-0.38*	-0.25*	-0.46	0
Registered mail (0-50 gram)	2.52	1.40	0.36	2.52
Parcels (0-2 kg)	1.60	0.90	0.28	1.60

*Confidence interval contains value '0', hence no customer preference

Source: WIK-Consult

As noted in the literature review, only limited data is available on the impact of quality of service (being routing time targets) on demand for postal services, indicating a weakly positive effect on the demand in the range between 0.2 and 0.5. This is in line with the expectation that if service quality improves as a result of increased delivery frequency, demand will rise as well.The calculated average value (second column) for non priority letters lies within the range expected from the literature. In the 2016 survey, however, a negative elasticity was found. It is reasonable to assume that the documented value lies within a confidentiality interval that includes the value zero. Clear statements about the effect of the changes are not possible in this

45 As the sample size in 2019 for residential and business users was roughly equal.

case.[46] Negative price elasticities were also found for priority letters in both surveys – 2016 and 2019. At least for the 2019 study the confidence interval contained the value 0, which initially can be an indication that customers do not have a preference. Hence, irrespective of the statistical outcome, we have set the proposed value for the elasticity at '0'.

From the interviews it is noted that residential users are fine with the current delivery frequency for letters (3 working days from sending for non-priority and 1 for priority). However priority letters were expected to be more sensitive for delivery frequency.

For registered mails and parcels, a much higher sensitivity for delivery frequency was found than in the 2016 survey. From the interviews, it was noted that there is a trend in the market to every day delivery and that this could even become the market standard (set by large e-retailers).

Conclusions for business users

The following table shows that overall, the price elasticities observed in the 2019 survey for business users were slightly lower than or almost equally to those observed in 2016 and fit well within the indicative ranges from the literature. One should note however that, as discussed before, in the found literature most often residential and business customers are taken together.

Table 25 Overview elasticities of demand by price – business

Price elasticity of demand – Business customers					
Product categories	Survey WIK/MAS 2019/20 (bus)	Survey WIK/MAS 2019/20 (res+bus)	MAS 2016 (res + bus)	Historic isolated range from literature (res+bus)	Proposed value 2019/20
Normal letter (0-50 gram)	-1	-1.35	-1.51 normal collection – residential and business -0.95 mass post –business users	-0.2 to -0.9 (non-priority letters) -0.2 to -1.17 (bulk mail)	-1
Priority letters (0-50 gram)	-1.15	-1.46	-1.51 normal collection – residential and business -0.95 mass post –business users	-0.1 to -0.8 (priority letters)	-1.15
Registered mail (0-50 gram)	-0.76	-1.34	-0.28 normal collection – residential and business -0.81 mass post – business users	-0.1 to -0.8 (priority letters)	-0.76
Parcels (2-10 kg)	-1.17	-2.04	-1.45 normal collection – residential and business -1.12 Mass post (2-10 kg) – business users	-0.8 to -3.5 (postal packages and parcels)	-1.17
Unaddressed mails	-0.81*	Na	-0.98 (non-addressed items)	-0.2 to -1.17 (bulk mail)	-0.81
Direct mail	-0.86*	Na	-0.95	-0.2 to -1.4 (direct mail)	-0.86

46 M.A.S does not provide any information on that matter.

Price elasticity of demand – Business customers					
Product categories	Survey WIK/MAS 2019/20 (bus)	Survey WIK/MAS 2019/20 (res+bus)	MAS 2016 (res + bus)	Historic isolated range from literature (res+bus)	Proposed value 2019/20
			(letters through mass post –business users)		
Periodicals	--1*	Na	-0.97 (periodicals)	-0.1 to -0.9 (periodicals)	-1

*Despite small sample size, results are in line with MAS 2016 and fall in the confidence interval.

Source: WIK-Consult.

Overall, the observed price elasticity is clearly less for business users compared with residential users, the highest value observed for business users in the 2019 survey is -1.17 versus -2.90 residential (parcels). This was also confirmed in the interviews, where operators stated that there is low price sensitivity for the remaining mail used by businesses and that further e-substitution will depend on companies' ability to invest in IT structure and not on prices and/or quality.

Interviewees also noted that price sensitivity for letters is further decreased as competitors mostly compete with bpost in the single piece letter market. From the literature review it was noted that the demand for mail services, especially for business customers, was determined to a large extent by other parameters than price like macro-economic development.

In general, we found in the 2019 survey that the higher the mailing volume of a company, the less pronounced it will react to changes in price. Or said otherwise, there is a higher demand/price elasticity observed for small medium-sized enterprises compared to large companies using mass post. This might be explained by high switching costs occurring due to integrated systems and procedures of large companies and their supplier of mass post-delivery.

Observed price elasticity is higher for priority letters compared to non-priority letters, which is intuitive as there is a set of alternatives for time-critical messages like e-mail, express mailings and non-priority letters can serve as substitute as well. The same message was obtained from the literature review. The 2019 survey found a price elasticity for priority letters comparable to the specific elasticity in 2016 for mass post – business users (-1.15 versus -0.95).

Interviewees also confirmed that parcels in the business market are rather price sensitive due to higher competition and the appearance of volume discounts. The found value of -1.17 is as noted the highest value in the range, but still not as high as found in the literature range (up to -3.5).

For unaddressed mail, direct mail and periodicals, the sample sizes were quite small; however, the results are in line with the 2016 survey and the confidence interval does not contain the value zero. Therefore, we proposed to use these values. The values indicates an inelastic demand; respectively -0.81, -0.86 and -1 and are slightly lower or almost the same as in the 2016 survey. According to interviewees, for these services the focus is less on price but more on the alignment with marketing. Hence, whether the mail arrives with end customers before a certain date when the marketing campaign starts. Interviewees noted that for periodicals like magazines and newspapers, the price elasticity varies; higher for daily newspapers and lower for monthly magazines.

In respect to the impact of delivery frequency on demand for business users, the following table presents the findings. We have applied the same structure as above for the comparison of the 2019 survey with the 2016 survey (where applicable).

Table 26 Overview elasticities of demand by delivery frequency – business

Delivery frequency elasticity of demand – Business customers				
Product categories	**Survey WIK/MAS 2019/20 (bus)**	**Survey WIK/MAS 2019/20 (res+bus)**	**MAS 2016 (res+bus)**	**Proposed value 2019/20 (bus)**
Normal letter (0-50 gram)	0.03*	0.22	-0.27	0
Priority letters (0-50 gram)	-0.12*	-0.25	-0.27	0
Registered mail (0-50 gram)	0.27	1.40	0.21	0.27
Parcels (2-10 kg)	0.20	0.90	0.28 normal 0.45 mass post	0.2
Unaddressed mails	0.21**	Na	0.32	0
Direct mail	0.20**	Na	0.27	0.2
Periodicals	-0.09**	Na	0.27	0

*Confidence interval contained '0'
**Despite small sample size, results are in line with MAS 2016 and fall in the confidence interval.

Source: WIK-Consult

The effect of delivery frequency on demand has decreased in the survey from 2019 compared to 2016 and in general business customers do not seem to bother for a higher or lower delivery frequency. What does matter is that it arrives (certainty of mail delivery), is aligned with marketing strategy (DM) or is delivered on a specific day/week across Belgium (periodicals). This is confirmed by the interviewees. In regards to periodicals they noted that only bpost can offer delivery throughout Belgium on a certain day/week.

For priority letters, the confidence interval contained the value '0' which implies that business users seem neutral about the delivery frequency, which might explain the found negative elasticity (where a positive value would have been expected). Therefore, we propose an elasticity of '0'.

For unaddressed mail, direct mail and magazines, a small sample size prevents clear interpretations of the results. However, the observed price elasticities are in line with the 2016 survey and fall within the confidence interval; hence we propose to use them.

For parcels, interviewees noted there is a trend towards same day delivery (similar as in the residential market) driven by large parties, which force all market parties to follow.

Annexes

1. Empty questionnaire for residential and business customers
2. Empty questionnaire for interviews with operators
3. Interview notes from bpost
4. Interview notes from TBC Post
5. Interview notes from Post NL
6. Boxplots with results per surveyed product category – residential users
7. Impact of price changes per surveyed product category – business users

Annex 1 Empty questionnaire for residential customers

[BIPT: PRIJSELASTICITEIT]- Particulieren

[Please insert short general intro for respondents without any specific information on the topic of the survey.] Studie naar de dienstverlening aangaande communicatie.

Q1. Bent u werkzaam bij een van de postdienstverleners zoals bpost, TBC Post, Glejor, DHL, UPS, DPD, Kiala, enz.?

○ Ja ➔ *stop enquête*
○ Neen

Introductie

*Wij voeren momenteel in opdracht van het Belgisch Instituut voor Postdiensten en Telecommunicatie (BIPT) een onderzoek naar de houding van de gebruikers van bpost ten aanzien van de prijszetting en bezorgfrequentie van een reeks postproducten. Het gaat hierbij uitsluitend om uw **privé** verstuurde brieven en paketten.*

Hiertoe stellen wij u nu een aantal vragen Het interview duurt maximaal 15 minuten. Alvast hartelijk bedankt voor uw medewerking !

*Wij hebben helemaal geen intentie om te verkopen; wij zijn enkel geïnteresseerd in uw mening. Deze enquête is volledig anoniem: alle gegevens die u ons verschaft zullen samen worden behandeld met de gegevens van alle andere ondervraagden en dat gebeurt **geheel vertrouwelijk**. Uw gegevens worden enkel gebruikt in het kader van dit onderzoek.*

ALGEMENE VRAGEN

Q2. Wat is uw geboortejaar ?

Q3. U bent … ?

○ Man ○ Vrouw

Q4. Wat is de postcode van uw woonplaats ?

VERZENDINGSGEDRAG

Q5. Heeft u dit jaar – 2019 - fysieke post **verzonden via bpost** (e-mail of andere digitale vormen dus niet meegerekend)? *Het gaat hier enkel om binnenlandse post verzonden vanuit België. (Meerdere antwoorden mogelijk)*

- □ Ja, briefpost zonder prioriteit (0 – 50 gram)
- □ Ja, briefpost met prioriteit (0 – 50 gram) [MOUSEOVER]
- □ Ja, aangetekende zendingen (0- 50 g)
- □ Ja, postpakketten, inclusief terugzendingen die men zelf dient te betalen (0- 2 kg)
- □ Neen (ik heb geen fysieke post verstuurd) ➔ *stop enquête*

[MOUSEOVER: Het onderscheid tussen prioritaire en non-prioritaire postzegels werd pas in 2019 ingevoerd. Prioritaire briefpost wordt de werkdag na verzending bezorgd, non-prioritaire briefpost echter binnen de drie werkdagen na verzending.]

Q6. Voor elke vorm van fysieke post die u verzendt: kunt u een schatting geven van het aantal poststukken dat u dit jaar (2019) gemiddeld via bpost heeft verstuurd/gaat versturen? Per product kan u kiezen of u het aantal geschatte stukken ofwel per week ofwel per maand ofwel per jaar opgeeft. U dient per lijn slechts 1 antwoord te geven. *=> [FILTER if true in Q5]*[47]

Het betreft:	**Per week**		**Per maand**		**Per jaar**
Briefpost zonder prioriteit (0 – 50g)		**OF**		**OF**	
Briefpost met prioriteit (0 – 50g)		**OF**		**OF**	
Aangetekende zendingen (0 – 50g)		**OF**		**OF**	
Postpakketten (inclusief terugzendingen, die men zelf dient te betalen) (0 – 2kg)		**OF**		**OF**	

Q7. Voor elke vorm van fysieke post die u verzendt: Gelieve aan te geven hoe u denkt dat het aantal artikelen dat u in 2020 zal verzenden zich zal ontwikkelen. Per product kunt u kiezen

47 The complete 2019 figures were asked (Q6) including a partial forecast for the remainder of 2019. This was done in advance of asking the forecast for 2020 (Q7) to enable the customer to have comparable timeperiods and consider all markettrends. Thereafter in Q 8-11, we asked for the similar 2020 forecast where all conditions as expected remain constant, except for the indicated prices changes. The same approach is used for business customers.We could have also used the available 2018 figures as baseline towards the 2020 forecast, but the figures for 2019 were expected to enable the customer to better predict 2020.

of u het aantal geschatte stukken ofwel per week ofwel per maand ofwel per jaar opgeeft. U dient per lijn slechts 1 antwoord te geven. *=> [FILTER if true in Q5]*

Het betreft:	**Per week**		**Per maand**		**Per jaar**
Briefpost zonder prioriteit (0 – 50g)		**OF**		**OF**	
Briefpost met prioriteit (0 – 50g)		**OF**		**OF**	
Aangetekende zendingen (0 – 50g)		**OF**		**OF**	
Postpakketten (inclusief terugzendingen, die men zelf dient te betalen) (0 – 2kg)		**OF**		**OF**	

ANALYSE VAN DE KEUZES ***(scenario's op basis van Q6)***

Prijskeuzes

In de volgende vragen wordt u voor elk type postproduct dat u in dit jaar - 2019 - heeft verzonden / of denkt te verzenden, een reeks fictieve tarieven getoond.

Kunt u voor elke vermelde hypothetische prijs aangeven hoeveel stuks u volgend jaar - 2020 - zou verzenden met bpost?
Belangrijk : wat ook de vermelde prijs is, de kwaliteit van het postproduct en dienstverlening blijven ongewijzigd !
Iedere prijs per stuk (ieder vak) dient apart bekeken te worden; u moet dus NIET het aantal stuks dat u denkt te versturen in 2020 verdelen over de verschillende prijzen!

Gelieve dit voor de volgende scenario's te doen – indien van toepassing [FILTER if true in Q5]

Q8. **Voor briefpost zonder prioriteit [RANDOMISE SEQUENCE AND SHOW INDIVIDUALLY Q8.1 through Q8.6]**

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 0,92 (op basis van 10 tegelijkertijd gekochte stuks).

€ 0,90: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 0,90 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 0,92.

€ 0,98: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 0,98 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 0,92.

€ 1,05: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,05 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 0,92.

€ 1,10: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,10 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 0,92.

€ 1,15: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,15 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 0,92.

€ 1,35: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,35 per stuk zou moeten betalen*

Q9. **Voor briefpost met prioriteit [RANDOMISE SEQUENCE AND SHOW INDIVIDUALLY Q9.1 through Q9.6]**

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 0,97 (op basis van 10 tegelijkertijd gekochte stuks).

€ 0,90: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 0,90 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 1,00.

€ 1,05: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,05 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 1,00.

€ 1,10:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,10 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 1,00.

€ 1,19:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,19 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 1,00.

€ 1,28:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,28 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 1,00.

€ 1,39:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 1,39 per stuk zou moeten betalen*

Q10. **Voor aangetekende zendingen (normale brief) [RANDOMISE SEQUENCE AND SHOW INDIVIDUALLY Q10.1 through Q10.6]**

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,80.

€ 6,08:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 6,08 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,80.

€ 6,98:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 6,98 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,80.

€ 7,47:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 7,47 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,80.

€ 7,84:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 7,84 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,80.

€ 8,98:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 8,98 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,80.

€ 9,60:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 9,60 per stuk zou moeten betalen*

Q11. **Voor Pakjes (0-2kg, gekocht aan het loket)** **[RANDOMISE SEQUENCE AND SHOW INDIVIDUALLY Q11.1 through Q11.6]**

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,90.

€6,20 :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 6,20 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,90.

€ 7,30 :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 7,30 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,90.

€ 7,60 :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 7,60 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,90.

€ 8,20 :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 8,20 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,90.

€ 9,10 :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 9,10 per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden. De huidige prijs per stuk is € 6,90.

€ 9,60 :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als u € 9,60 per stuk zou moeten betalen*

Keuzes in verband met bezorgingsfrequenties

In de volgende vragen wordt u voor elk type postproduct dat u in dit jaar - 2019 - heeft verzonden, een reeks fictieve bezorgfrequenties getoond. Een bezorgingfrequentie is het aantal dagen per week dat een bepaald type postproduct afgeleverd kan worden bij de bestemming. Bijvoorbeeld: voor brievenpost komt de postbode op dit moment vijf dagen per week langs maar dit aantal dagen zou kunnen dalen of stijgen. In dat geval wordt ook de leveringstermijn beïnvloed, omdat bij bijvoorbeeld slechts drie bezorgingsdagen per week de zending niet altijd daags nadien zal kunnen worden bedeeld.
Kunt u voor elke vermelde hypothetische bezorgfrequentie aangeven hoeveel stuks u volgend jaar - 2020 - zou verzenden met bpost?
Belangrijk : wat ook de vermelde bezorgfrequentie is, de prijs blijft ongewijzigd !
U dient dus voor elke bezorgfrequentie een schatting te maken hoeveel stuks u zou versturen in 2020 met bpost.
Iedere bezorgfrequentie (ieder vak) dient apart bekeken te worden; u moet dus NIET het aantal stuks die u denkt te versturen in 2020 verdelen over de verschillende bezorgfrequenties(lijnen)!

Q12. **Voor brieven zonder prioriteit [RANDOMISE SEQUENCE AND SHOW INDIVIDUALLY Q12.1 through Q12.3]**

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 4 dagen per week zou bezorgd worden bij uw bestemming.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 3 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 3 dagen per week geleverd wordt bij uw bestemming.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 2 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 2 dagen per week geleverd wordt bij uw bestemming.

Q13. **Voor brieven met prioriteit [RANDOMISE SEQUENCE AND SHOW INDIVIDUALLY Q13.1 through Q13.3]**

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 4 dagen per week zou bezorgd worden bij uw bestemming.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 3 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 3 dagen per week geleverd wordt bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 2 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 2 dagen per week geleverd wordt bij uw bestemmeling.

Q14. **Voor aangetekende zendingen (normale brief) [RANDOMISE SEQUENCE AND SHOW INDIVIDUALLY Q14.1 through Q14.3]**

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 4 dagen per week bezorgd wordt bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 6 dagen per week geleverd wordt bij uw bestemmeling.

Q15. **Voor Pakjes (~~2-10kg~~ 0-2 kg) [RANDOMISE SEQUENCE AND SHOW INDIVIDUALLY Q15.1 through Q15.3]**

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 6 dagen/week:	☐	← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 6 dagen per week bezorgd wordt bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 7 dagen/week:	☐	← Vul hier het aantal in dat u denkt te zullen versturen met bpost in 2020 als de post 7 dagen per week geleverd wordt bij uw bestemmeling.

Q16. Elektronische communicatie zoals email en elektronische rekeningen vervangt deels de traditionele briefpost. Kunt u aangeven welk % van uw vroegere briefpost op dit moment (2019) al in elektronisch formaat ontvangen wordt? En welk % verwacht u voor volgend jaar (2020)?

2019	☐	**%**
2020	☐	**%**

Annex 2 Empty questionnaire for business customers

BIPT: PRIJSELASTICITEIT- Ondernemingen

[Please insert short general intro for respondents without any specific information on the topic of the survey.] Studie naar de dienstverlening aangaande communicatie.

Q1. Is uw bedrijf verbonden aan een postdienstverleners zoals bpost, TBC Post, Glejor, DHL, UPS, DPD, Kiala, enz.?

○ Ja ➔ *stop enquête*
○ Neen

Introductie

*Wij voeren momenteel in opdracht van het Belgisch Instituut voor Postdiensten en Telecommunicatie (BIPT) een onderzoek uit naar de houding van de gebruikers van bpost ten aanzien van de prijszetting en bezorgfrequentie van een reeks postproducten. Het gaat hierbij uitsluitend om uw **zakelijk** verstuurde brieven en paketten.*

Hiertoe stellen wij u nu een aantal vragen Het interview duurt maximaal 15 minuten.

Alvast hartelijk bedankt voor uw medewerking !

*Wij hebben helemaal geen intentie om te verkopen; wij zijn enkel geïnteresseerd in uw mening. Deze enquête is volledig anoniem: alle gegevens die u ons verschaft zullen samen worden behandeld met de gegevens van alle andere ondervraagden en dat gebeurt **geheel vertrouwelijk**. Uw gegevens worden enkel gebruikt in het kader van dit onderzoek.*

ALGEMENE VRAGEN

Q2. U bent een… ? *Slechts 1 antwoord mogelijk.*

○ zelfstandige (éénmanszaak)
○ vrij beroep uit (dokter, advocaat, …)
○ Privé onderneming, zoals NV, BVBA,…
○ Openbare dienst (nationaal, regionaal, lokaal, …)

FILTER SOW IF Q2 is not "zelfstandige" (éénmanszaak)

Q3. Bij benadering, hoeveel werknemers werken in uw bedrijf, **uzelf** meegerekend ? *Slechts 1 antwoord mogelijk.*

○ 1-4
○ 5-49
○ 50-200
○ Meer dan 200

Q4. In welke sector is uw bedrijf actief ? *Slechts 1 antwoord mogelijk.*

Primaire sector

○ Landbouw, jacht en bosbouw
○ Visserij

Secundaire sector
○ Winning van delfstoffen
○ Industriële sector / vervaardiging van producten
○ Productie en distributie van elektriciteit, gas, …
○ Bouw

Tertiaire sector
○ Groot- en kleinhandel
○ Horeca
○ Vervoer en opslag
○ Financiële dienstverlening (verzekeringen, kredieten, banken, …)
○ Dienstverlening aan bedrijven (bv. : HR, consultancy, IT, interim, …)
○ Dienstverlening aan particulieren (bv. kapper, verzorging, reisbureaus, …)

Quartaire sector (publieke sector)
[Only if Q1 is: *Openbare dienst (nationaal, regionaal, lokaal, …)* **]**
○ Openbaar bestuur
○ Onderwijs
○ Gezondheidszorg
○ Maatschappelijke dienstverlening (socio-culturele & persoonlijke dienstverlening)
○ Kunst, amusement en recreatie

Q5. Wat is de postcode van de gemeente waar de hoofdzetel van uw bedrijf is gevestigd ?

Q6. Wat is uw functie binnen het bedrijf ?

○ Verantwoordelijke voor de postdiensten
○ Verantwoordelijke voor de logistiek
○ Bedrijfsleider
○ Andere *(specifieer)* : ……

VERZENDINGSGEDRAG

Q7. Heeft uw bedrijf dit jaar – 2019 – fysieke post **verzonden via bpost** (e-mail of andere digitale vormen dus niet meegerekend)? *Het gaat hier enkel om binnenlandse post verzonden vanuit België. (Meerdere antwoorden mogelijk)*

□ Ja, normale briefpost (0 – 50 gram)
□ Ja, briefpost met prioriteit (0 – 50 gram)
□ Ja, aangetekende zendingen (0- 50 gram)
□ Ja, postpakketten, inclusief terugzendingen die men zelf dient te betalen (2- 10 kg)
□ Ja, niet-geadresseerde zendingen
□ Ja, direct mail.
□ Ja, tijdschriften
□ Neen (ik heb geen fysieke post verstuurd) ➔ *stop enquête*

Q8. Op welke manieren heeft u deze vormen van post verstuurd?
[FILTER if true in Q7]

	Via normale ophaling*	Via masspost*

Normale briefpost	□	□
Briefpost met prioriteit	□	□
Aangetekende zendingen	□	□
Postpakketten	□	□
Niet-geadresseerde zendingen	□	□
Direct mail	□	□
Tijdschriften	□	□

* Met een normale ophaling wordt bedoeld: ophaling door de postbode aan rode brievenbussen, in postkantoren, postpunten of aan hoofdzetel. Een Masspost center is een gecentraliseerd collectiepunt voor grote hoeveelheden postale items. [SHOW as information]

Q9. Voor elke vorm van fysieke post die uw bedrijf verzendt: kunt u een schatting geven van het aantal poststukken dat uw bedrijf dit jaar (2019) gemiddeld via bpost denkt te gaan versturen ? Per product kunt u kiezen of u het aantal geschatte stukken ofwel per week ofwel per maand ofwel per jaar opgeeft. U dient per lijn slechts 1 antwoord te geven.
[FILTER IF true in Q8]

Het betreft:	**Per week**		**Per maand**		**Per jaar**
Normale briefpost (via normale ophaling)		**OF**		**OF**	
Briefpost met prioriteit (via normale ophaling)		**OF**		**OF**	
Aangetekende zendingen (via normale ophaling)		**OF**		**OF**	
Postpakketten (inclusief zelf betaalde terugzendingen) (via normale ophaling)		**OF**		**OF**	
Niet geadresseerde zendingen (via normale ophaling)		**OF**		**OF**	
Direct mail (via normale ophaling)		**OF**		**OF**	
Tijdschriften (via normale ophaling)		**OF**		**OF**	
Briefpost (via masspost)		**OF**		**OF**	

Het betreft:	Per week		Per maand		Per jaar
Briefpost met prioriteit (via masspost)		OF		OF	
Aangetekende zendingen (via masspost)		OF		OF	
Postpakketten (via masspost)		OF		OF	
Niet-geadresseerde zendingen (via masspost)		OF		OF	
Direct mail '(via masspost)		OF		OF	
Tijdschriften (via masspost)		OF		OF	

Q10. Voor elke vorm van fysieke post die uw bedrijf verzendt: kunt u een schatting geven van het **aantal poststukken dat uw bedrijf volgend jaar (2020) gemiddeld via bpost denkt te gaan** versturen? Per product kunt u kiezen of u het aantal geschatte stukken ofwel per week ofwel per maand ofwel per jaar opgeeft. U dient per lijn slechts 1 antwoord te geven. **[FILTER IF true in Q8]**

Het betreft:	Per week		Per maand		Per jaar
Normale briefpost (via normale ophaling)		OF		OF	
Briefpost met prioriteit (via normale ophaling)		OF		OF	
Aangetekende zendingen (via normale ophaling)		OF		OF	
Postpakketten (inclusief zelf betaalde terugzendingen) (via normale ophaling)		OF		OF	
Niet geadresseerde zendingen (via normale ophaling)		OF		OF	
Direct mail (via normale ophaling)		OF		OF	

Het betreft:	Per week		Per maand		Per jaar
Tijdschriften (via normale ophaling)		**OF**		**OF**	
Briefpost (via masspost)		**OF**		**OF**	
Briefpost met prioriteit (via masspost)		**OF**		**OF**	
Aangetekende zendingen (via masspost)		**OF**		**OF**	
Postpakketten (via masspost)		**OF**		**OF**	
Niet-geadresseerde zendingen (via masspost)		**OF**		**OF**	
Direct mail (via masspost)		**OF**		**OF**	
Tijdschriften (via masspost)		**OF**		**OF**	

ANALYSE VAN DE KEUZES

Prijskeuzes
In de volgende vragen wordt u voor elk type postproduct dat uw bedrijf in dit jaar -2019- denkt te gaan versturen, een fictieve prijsverandering getoond.

Kunt u voor elke vermelde prijsverandering aangeven hoeveel stuks u (uw bedrijf) het volgend jaar – 2020 - zou verzenden met bpost bij de opgegeven hypothetische prijs?
Belangrijk : wat ook de vermelde prijs is, de kwaliteit van het postproduct en dienstverlening blijven ongewijzigd !
Ieder prijsniveau (ieder vak) dient apart bekeken te worden; u moet dus NIET het aantal stuks die u denkt te versturen in 2020 verdelen over de verschillende prijsniveaus !

Gelieve dit voor de volgende scenario's te doen – indien van toepassing [FILTER IF true in Q8]

Q11. **Voor briefpost (via normale ophaling)** **VOORSTEL MAS: FOR QUESTIONS Q11-Q38 PER TAALROL 28 VERSIES WAARBIJ VOOR ELKE VERSIE VOOR 1 VRAAG DE VOLGORDE VAN DE SUBVRAGEN OMGEDRAAID WORDT)**

In 2019 zal u X stuks hebben verzonden.

-10% t.o.v. huidige prijs:		**Per jaar**	←	*Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige*

		gemiddelde prijs - 10% per stuk zou moeten betalen

In 2019 zal u X stuks hebben verzonden.

+10% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q12. **Voor briefpost met prioriteit (via normale ophaling)**
[SHOW INDIVIDUALLY Q12.1 through Q12.5]

In 2019 zal u X stuks hebben verzonden.

-10% t.o.v. huidige prijs:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q13. **Voor aangetekende zendingen (via normale ophaling)**
[SHOW INDIVIDUALLY Q13.1 through Q13.5]

In 2019 zal u X stuks hebben verzonden.

-10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q14. **Voor Pakjes (2-10kg)(via normale ophaling)**
[SHOW INDIVIDUALLY Q14.1 through Q14.5]

In 2019 zal u X stuks hebben verzonden.

-10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige*

			gemiddelde prijs - 10% per stuk zou moeten betalen

In 2019 zal u X stuks hebben verzonden.

+10% :		**Per jaar**	←	*Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% :		**Per jaar**	←	*Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% :		**Per jaar**	←	*Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% :		**Per jaar**	←	*Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q15. **Voor niet geadresseerde zendingen (via normale ophaling)**
[SHOW INDIVIDUALLY Q15.1 through Q15.5]

In 2019 zal u X stuks hebben verzonden.

-10% :		**Per jaar**	←	*Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% :		**Per jaar**	←	*Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% :		**Per jaar**	←	*Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q16. **Voor direct mail (via normale ophaling)**
[SHOW INDIVIDUALLY Q16.1 through Q16.5]

In 2019 zal u X stuks hebben verzonden.

-10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q17. **Voor tijdschriften (via normale ophaling)**
[SHOW INDIVIDUALLY Q17.1 through Q17.5]

In 2019 zal u X stuks hebben verzonden.

-10% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q18. **Voor briefpost (via masspost)**
[SHOW INDIVIDUALLY Q18.1 through Q18.5]

In 2019 zal u X stuks hebben verzonden.

-10% t.o.v. huidige prijs:		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q19. **Voor briefpost met prioriteit (via masspost)**
[SHOW INDIVIDUALLY Q19.1 through Q19.5]

In 2019 zal u X stuks hebben verzonden.

-10% t.o.v. huidige prijs: | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q20. **Voor aangetekende zendingen (via masspost)**
[SHOW INDIVIDUALLY Q20.1 through Q20.5]

In 2019 zal u X stuks hebben verzonden.

-10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q21. **Voor Pakjes (2-10kg)(via masspost)**
[SHOW INDIVIDUALLY Q21.1 through Q21.5]

In 2019 zal u X stuks hebben verzonden.

-10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q22. **Voor niet geadresseerde zendingen (via masspost)**
[SHOW INDIVIDUALLY Q22.1 through Q22.5]

In 2019 zal u X stuks hebben verzonden.

-10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q23. **Voor direct mail (via masspost)**
[SHOW INDIVIDUALLY Q23.1 through Q23.5]

In 2019 zal u X stuks hebben verzonden.

-10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Q24. **Voor tijdschriften (via masspost)**
[SHOW INDIVIDUALLY Q24.1 through Q24.5]

In 2019 zal u X stuks hebben verzonden.

-10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs - 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+10% : | | **Per jaar** | ← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 10% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+20% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 20% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+30% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 30% per stuk zou moeten betalen*

In 2019 zal u X stuks hebben verzonden.

+40% :		**Per jaar**	← *Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als u uw huidige gemiddelde prijs + 40% per stuk zou moeten betalen*

Keuzes in verband met bezorgingsfrequenties **[FILTER IF true in Q8]**

In de volgende vragen wordt u voor elk type postproduct dat u in het jaar 2019 heeft verzonden, een reeks fictieve bezorgfrequenties getoond. Een bezorgingfrequentie is het aantal dagen per week dat een bepaald type postproduct afgeleverd kan worden bij de bestemmeling. Bijvoorbeeld: voor brievenpost komt de postbode op dit moment vijf dagen per week langs, maar dit aantal dagen zou kunnen dalen of stijgen. In dat geval wordt ook de leveringstermijn beïnvloed, omdat bij bijvoorbeeld slechts drie bezorgingsdagen per week de zending niet altijd daags nadien zal kunnen worden bedeeld.

Kunt u voor elke vermelde bezorgfrequentie aangeven hoeveel stuks u (uw bedrijf) volgend jaar - 2020 - zou verzenden met bpost aan die opgegeven hypothetische bezorgfrequentie ?
Belangrijk : wat ook de vermelde bezorgfrequentie is, de prijs blijft ongewijzigd !
U dient dus voor elke bezorgfrequentie een schatting te maken van hoeveel stuks u zou versturen in 2020 met bpost.
Iedere bezorgfrequentie (ieder vak) dient apart bekeken te worden; u moet dus NIET het aantal stuks die u denkt te versturen in 2020 verdelen over de verschillende bezorgfrequenties(lijnen)!

Q25. **Voor briefpost (via normale ophaling)**
[SHOW INDIVIDUALLY Q25.1 through Q25.3]

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als deze post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 3 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 3 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 2 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemmeling.

Q26. **Voor briefpost met prioriteit (via normale ophaling)**
[SHOW INDIVIDUALLY Q26.1 through Q26.3]

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als deze post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 3 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 3 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 2 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemmeling.

Q27. **Voor aangetekende zendingen (via normale ophaling)**
[SHOW INDIVIDUALLY Q27.1 through Q27.2]

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 4 dagen per week zou blijven bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 6 dagen per week zou bezorgd worden bij uw bestemmeling.

Q28. **Voor Pakjes (2-10kg)(via normale ophaling)**
[SHOW INDIVIDUALLY Q28.1 through Q28.2]

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 6 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 7 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 7 dagen per week zou bezorgd worden bij uw bestemmeling.

Q29. **Voor niet geadresseerde zendingen (via normale ophaling)**
[SHOW INDIVIDUALLY Q29.1 through Q29.2]

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 6 dagen per week zou bezorgd worden bij uw bestemmeling.

Q30. **Voor direct mail (via normale ophaling)**
[SHOW INDIVIDUALLY Q30.1 through Q30.2]

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 6 dagen per week zou bezorgd worden bij uw bestemmeling.

Q31. **Voor tijdschriften (via normale ophaling)**
[SHOW INDIVIDUALLY Q31.1 through Q31.3]

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 3 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 3 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 2 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemmeling.

Q32. **Voor briefpost (via masspost) [SHOW INDIVIDUALLY Q32.1 through Q32.3]**

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als deze post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 3 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 3 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 2 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemmeling.

Q33. **Voor briefpost met prioriteit (via masspost) [SHOW INDIVIDUALLY Q33.1 through Q33.3]**

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als deze post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 3 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 3 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 2 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemmeling.

Q34. **Voor aangetekende zendingen (via masspost) [SHOW INDIVIDUALLY Q34.1 through Q34.2]**

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 6 dagen per week zou bezorgd worden bij uw bestemmeling.

Q35. **Voor Pakjes (2-10kg)(via masspost)** **[SHOW INDIVIDUALLY Q35.1 through Q35.2]**

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 6 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 7 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 7 dagen per week zou bezorgd worden bij uw bestemmeling.

Q36. **Voor niet geadresseerde zendingen (via masspost)**
[SHOW INDIVIDUALLY Q36.1 through Q36.2]

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 6 dagen per week zou bezorgd worden bij uw bestemmeling.

Q37. **Voor direct mail (via masspost)** **[SHOW INDIVIDUALLY Q37.1 through Q37.2]**

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 4 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden (inclusief te betalen terugzendingen).

Bij een bezorging van 6 dagen/week: ☐ ← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 6 dagen per week zou bezorgd worden bij uw bestemmeling.

Q38. **Voor tijdschriften (via masspost)**
[SHOW INDIVIDUALLY Q38.1 through Q38.3]

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 4 dagen/week:		← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 4 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 3 dagen/week:		← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 3 dagen per week zou bezorgd worden bij uw bestemmeling.

In 2019 zal u X stuks hebben verzonden.

Bij een bezorging van 2 dagen/week:		← Vul hier het aantal in dat u denkt te zullen versturen in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemmeling.

Q39. Elektronische communicatie zoals bijvoorbeeld elektronische rekeningen of declaraties kan deels de traditionele briefpost vervangen. Kunt u aangeven welk % van uw vroegere uitgaande briefpost op dit moment (2019) door u al in elektronisch formaat naar uw klanten verstuurd wordt? En welk % verwacht u voor volgend jaar (2020)?.

2019		**%**
2020		**%**

Annex 3 Interview notes from bpost

[CONFIDENTIAL]

Annex 4 Interview notes from TBC-Post

TBC-Post explained that it is a private postal company in Belgium, with a license to provide all USO services in Belgium from 2013 onwards. From the beginning it was clear that the strict license conditions applicable at that time (e.g. 80% coverage within 5 year) would not be enforced upon TBC-Post. The yearly revenue was around 5.5 million € in 2018, which amounts to a market share between 1-2% in the registered mail and below 1% in the regular B2C mail market.

Around 100 people are employed by TBC-Post of which 80% is working in the delivery itself and 20% as staff. The main focus is on registered mail, however, other regular mail services are provided as well to customers who want a one stop shop. TBC has 250 service points across the whole of Belgium where addressees can collect a registered mail shipment in case they were not at home upon the attempt to deliver the registered letter at their address. TBC-Post has some 100 service points in Belgium where the stamps of TBC-Post can be purchased and where letters can be dropped into a mailbox.

TBC-Post remarked that bpost is still the party with the crucial delivery network in Belgium and that this can't be replicated, hence why TBC requested access to this delivery network (which was rejected). Therefore, even if bpost would significantly increase its prices for physical mail delivery, TBC-Post would not be able to offer these services in the same manner as bpost.

1) **Please indicate on a scale from 1 (not) to 5 (very important) how sensitive residential customers are to price for the different products:**

Price sensitivity	1	2	3	4	5
Briefpost zonder prioriteit (0-50 gram)	X				
Briefpost met prioriteit (0-50 gram)	X				
Briefpost zonder prioriteit (50 gram – 2 Kg)		X			
Briefpost (50 gram – 2 Kg) met prioriteit		X			
Pakket (0-2Kg)				X	
Pakket (2-10 Kg)				X	
Aangetekende / waarde zendingen	X				

Regarding letter post up to 50 grams, there is no alternative for bpost, hence the sensitivity to price is very low. In the category letter post up to 2 KG, prices are higher (range 3-4 €) and therefore other operators (including TBC-Post) are able to compete and provide alternatives .

In the parcels market, there is more competition (GLS, UPS etc), hence the focus of customers is much more on price. In regard to registered shipments, it is about either very swift delivery and/or guaranteed delivery with a, legally valid, confirmation of either the sending and/or the receipt. Therefore, the trust end customers have in the service provider is crucial.

2) Please indicate on a scale from 1 (not) to 5 (very important) how sensitive *business* customers are to *price* for the different products:

Price sensitivity	1	2	3	4	5
Briefpost zonder prioriteit (0-50 gram)			X		
Briefpost met prioriteit (0-50 gram)				X	
Briefpost zonder prioriteit (50 gram – 2 Kg)				X	
Briefpost (50 gram – 2 Kg) met prioriteit				X	
Pakket (0-2 Kg)			X		
Pakket (2-10 Kg)			X		
Aangetekende / waarde zendingen		X			
Direct mail				X	
Tijdschriften / Kranten				X	
Niet geadresseerde zendingen				X	

In respect to letter post, business customers are interested in volume discounts especially after the recent price increases by bpost. In respect to letters provided in bulk to the provider, there is no competition for bpost. The competition can only compete in the single piece letter market.

Regarding parcels, the same logic; customers are interested in volume discounts. However, service quality plays a role as well. Bpost still stronghold in the B2C market, competitors limited competing in the B2B market.

TBC-Post noted that for direct mail, the price is important as here are other communication channels which are alternatives for direct mail, so if direct mail becomes too expensive, customers will shift. The same applies for unaddressed mail.

TBC-Post added that they have limited experience related to the delivery of newspapers and unaddressed mail. TBC-Post is still expanding its delivery network.

With regards to question 3&4: TBC-Post operates with different routing times / delivery freuqencies: in well covered areas, delivery takes place on a daily basis while in other areas delivery is provided every second or third day (which may result in routing times from D+1 to D+3).

3) Please indicate on a scale from 1 (not) to 5 (very important) how sensitive *residential* customers are to *delivery frequency* for the different products:

Delivery frequency sensitivity	1	2	3	4	5
Briefpost zonder prioriteit (0-50 gram)		X			
Briefpost met prioriteit (0-50 gram)				X	
Briefpost zonder prioriteit (50 gram – 2 Kg)		X			
Briefpost (50 gram – 2 Kg) met prioriteit				X	
Pakket (0-2 Kg)				X	
Pakket (2-10 Kg)				X	
Aangetekende / waarde zendingen					X

For normal letters, delivery within 3 working days from sending (D+3) is fine. For priority letters this is D+1. Parcels are quite sensitive to delivery frequency as this is mostly e-commerce, where customers want their products rather fast. But there is a wide variety as well (e.g. same-day delivery options from large e-retailers, to a certain delivery day/week). Registered shipments are attempted to deliver by next working day, but 99% within 2 working days after sending. TBC-Post stated that delivery frequency / transit time is less important as long as specific deadlines are met.

4) Please indicate on a scale from 1 (not) to 5 (very important) how *business* customers are to *delivery frequency* for the different products:

Delivery frequency sensitivity	1	2	3	4	5
Briefpost zonder prioriteit (0-50 gram)		X			
Briefpost met prioriteit (0-50 gram)				X	
Briefpost zonder prioriteit (50 gram – 2 Kg)		X			
Briefpost (50 gram – 2 Kg) met prioriteit				X	
Pakket (0-2 Kg)				X	
Pakket (2-10 Kg)				X	
Aangetekende / waarde zendingen				X	
Direct mail			X		
Tijdschriften / Kranten				X	
Niet geadresseerde zendingen			X		

Same as for residential users, letters with priority need to be delivered D+1. This becomes even more important for large companies, where it takes already a couple of days before the letter leaves the company itself due to internal routing (department, central post function).

For parcels D+1 is also applicable.

Sensitivity to delivery for registered items depends on the content; B2B it is high, for B2C less high. The sensitivity is directly linked to the applicable legal conditions, e.g. the cancellation of rental agreements based on the confirmed shipment date of the registered letter).

For direct mail, delivery frequency is less important as delivery can be planned to align marketing campaigns, but twice a week should be sufficient, so D+2. More important than the delivery frequency is that items are delivered by a specific date.

TBC-Post has little experience with newspapers and unaddressed mail, however noted that certain periodicals are delivered throughout Belgium exactly on a certain day in the week (Tuesday or Wednesday). This does not only apply to daily newspapers but also for weekly or monthly journals as the publishers want their magazines to be delivered on a certain day. To ensure this, delivery frequency seems more important. However, this is a service only bpost can deliver at that scale.

Similar as direct mail: For unaddressed items, the delivery before a certain week / day is more important than the delivery frequency; for example an advertising where a certain promotion runs from week x.

5) Which services do you consider as substitutes for one another? Hence if the price is increased for a product in the left column, do you observe relevant demand shifting towards another product service? Please indicate on a scale from 1 (no relevant demand shifting) to 5 (significant degree of demand shifting) per line (or % if more detailed information is available).

For residential customers

Demand shifting from:	***To:***	Briefpost zonder prioriteit (0-50 gram)	Briefpost met prioriteit (0-50 gram)	Briefpost zonder prioriteit (50 gram – 2 Kg)	Briefpost (50 gram – 2 Kg) met prioriteit	Pakket (0-2Kg)	Pakket (2-10 Kg)	Aangete-kende / waarde zendingen
Briefpost zonder prioriteit (0-50 gram)		X	1	_	_	_	_	1
Briefpost met prioriteit (0-50 gram)		4	X	_	_	_	_	1
Briefpost zonder prioriteit (50 gram – 2 Kg		_	_	X	1	1	_	1
Briefpost (50 gram – 2 Kg) met prioriteit		_	_	4	X	4	_	1
Pakket (0-2Kg)		_	_	2	2	X	_	1
Pakket (2-10 Kg)		_	_	_	_	_	X	1
Aangetekende / waarde zendingen		_	_	_	_	2	2	X

A couple of years ago bpost removed the split between prio and non prio letters and guaranteed that 95% of the letters were delivered in D+1. After the recent price increases, bpost introduced the economy price of non prio letter again to give the customer the option.

For business customers

Demand shifting from:	***To***	Briefpost zonder prioriteit (0-50 gram)	Briefpost met prioriteit (0-50 gram)	Briefpost zonder prioriteit (50 gram – 2 Kg	Briefpost (50 gram – 2 Kg) met prioriteit	Pakket (0-2 Kg)	Pakket (2-10 Kg)	Aangete-kende / waarde zendingen	Direct mail	Tijdschriften /Kranten	Niet geadres-seerde zendingen
Briefpost zonder prioriteit (0-50 gram)		X	1	_	_	_	_	1	_	_	_
Briefpost met prioriteit (0-50 gram)		4	X	_	_	_	_	1	_	_	_
Briefpost zonder prioriteit (50 gram – 2 Kg		_	_	X	_	_	_	1	_	_	_
Briefpost (50 gram – 2 Kg) met prioriteit		_	_	4	X	4	_	1	_	_	_

Demand shifting from:	***To***	Briefpost zonder prioriteit (0-50 gram)	Briefpost met prioriteit (0-50 gram)	Briefpost zonder prioriteit (50 gram – 2 Kg)	Briefpost (50 gram – 2 Kg) met prioriteit	Pakket (0-2 Kg)	Pakket (2-10 Kg)	Aangete-kende / waarde zendingen	Direct mail	Tijdschriften /Kranten	Niet geadres-seerde zendingen
Post pakket (0-2 Kg)		_	_	_	_	X	_	1	_	_	_
Post pakket (2-10 Kg)		_	_	_	_	_	X	1	_	_	_
Aangetekende / waarde zendingen		1		1	1	2	2	X	_	_	_
Direct mail		1	_	_	_	_	_	1	X	_	4
Tijdschriften / Kranten		_	_	_	_	1	_	_	_	X	_
Niet geadresseer-de zendingen		_	_	_	_	_	_	_	_	_	X

There can be substitution from parcels to letters up to 2 KG with and without priority depending on the volume contracts of business customers.

6) Which postal services are the most affected by substitution effects of electronic communication services in your consideration and in which rate? Any research / data available?

Business letters (Prio & Eco) and especially transactional mail (e.g. invoices) & Registered Mail are most sensitive for being substituted by electronic services. The Minister pushed for electronic registered mail but so far only 1 company qualified for providing electronic registered emails. Currently this electronic service is still more expensive than physical registered mail and less convenient. Also customers know they can trust the traditional physical variant and considering the importance and possible (legal) consequences of non-delivery are reluctant to switch.

7) Price elasticity is reinforced by competition as customers can switch more easily from either comparable postal services or to substitutes from competitors. For which postal services does this apply in your opinion and in which magnitude? Any research / data available?

Business letters and registered mail. (10%)

Parcels (50%)

Even with large price increases, tbc and other competitors would not have the capacity to collect (& deliver) a large share of residential mail.

8) Are there any other relevant developments for the relevant services, which might impact the future demand in relation to price and the distribution frequency?

TBC-Post noted that there is an ever increasing use of mobile devices by the public, which drives further e-substitution. There are offers for hybrid services, so letters are electronically sent, printed and physically delivered.

In future, there will be additional e-substitution: so far, only large business senders have switched to digital alternatives while many small and medium-sized companies still use paper-based communication. Additionally, there is still a strong preference for paper-based communication / invoices etc. Might change in the future.

Annex 5 Interview notes from PostNL

PostNL described that PostNL in Belgium has 6 divisions:

1. Parcels; part of Benelux operation, Own sales team with focus on BeNeLux with operational depots in the different regions of Belgium.
2. Pharma; delivery of parcels/goods to pharmacies, hospitals, wholesalers.
3. International; focus on mail and light weight packets, direct mail. transit to international destinations, e.g. Brazil and UK.
4. Extra@Home; delivery of XL goods (two-man or 1-man handling) including value added service like the installation of freezers and or electronics with customers at home.
5. PS Nachtdistributie. In-night express; B2B over-night express.
6. Mikropakket; express services for high value goods with a focus on speed and reliability.

Additionally, PostNL provides value added services for e-commerce (MyParcel), e.g. labeling and other support for e-retailers but no physical activities (like warehousing)

In regard to parcels, PostNL considers itself the 2nd largest player in the Belgium B2C market after bpost. It however noted that the formal market share data from bpost indicates another integrator due to the fact that there is not a clear definition of the markets, BIPT reports on and hence that reported market shares can be interpreted in multiple manners (express deliveries are mixed with deferred parcels, B2B with B2C, market share includes value added services and hence inflate market shares, transit streams included).

PostNL noted that in Belgium it is only active in the parcels segment, hence their answers on the following questions only apply to the parcel services.

PostNL noted that demand is driven by several aspects; price could not be considered separately from other service specifications (e.g. transit time, quality etc.)

1) Please indicate on a scale from 1 (not) to 5 (very important) how sensitive residential customers are to price for the different products:

Price sensitivity	1	2	3	4	5
Pakket (0-2 Kg)				X	
Pakket (2-10 Kg)				X	

PostNL noted that price is linked to the service; there are different qualities which are priced at differently price points. Additionally, customers are heterogeneous: some recipients / senders rate transit time higher and have a willingness to pay while others are more focused on lower price and less on transit time.

PostNL stated that [CONFIDENTIAL].

2) Please indicate on a scale from 1 (not) to 5 (very important) how sensitive business customers are to price for the different products:

Price sensitivity	1	2	3	4	5
Pakket (0-2 Kg)				X	

Pakket (2-10 Kg)				X	

Same logic for business customers: The product offering is menu based; customers can add service levels with related price points. There is a trend towards specified delivery times (eg a specific segment of the day and or a specific day).

Post-NL / carriers try to maximize the number of successful delivery in the first attempt and to avoid multiple delivery attempts, e.g. by providing evening delivery, time window delivery etc.

3) Please indicate on a scale from 1 (not) to 5 (very important) how sensitive residential customers are to delivery frequency for the different products:

Delivery frequency sensitivity	1	2	3	4	5
Pakket (0-2 Kg)				X	
Pakket (2-10 Kg)				X	

Standard at PostNL is 6 days a week D+1 delivery. The trend is going to daily delivery and to specific time windows depending on the availability of the consumer (the receiver).

4) Please indicate on a scale from 1 (not) to 5 (very important) how business customers are to delivery frequency for the different products:

Delivery frequency sensitivity	1	2	3	4	5
Pakket (0-2 Kg)				X	
Pakket (2-10 Kg)				X	

PostNL noted that large e-retailers use delivery frequency as a marketing tool and that they set the trend by going to 7 days a week delivery. In this highly competitive market with minimal 10-15 nationwide carriers, the competition will have to provide the services requested by large e-retailers.

5) Which services do you consider as substitutes for one another? Hence if the price is increased for a product in the left column, do you observe relevant demand shifting towards another product service? Please indicate on a scale from 1 (no relevant demand shifting) to 5 (significant degree of demand shifting) per line (or % if more detailed information is available).

Demand shifting from:	***To:***	Briefpost zonder prioriteit (0-50 gram)	Briefpost met prioriteit (0-50 gram)	Briefpost zonder prioriteit (50 gram – 2 Kg)	Briefpost (50 gram – 2 Kg) met prioriteit	Pakket (0-2Kg)	Pakket (2-10 Kg)	Aangete-kende / waarde zendingen
Pakket (0-2 Kg)		_	_			X	4	
Pakket (2-10 Kg)		_	_	_	_	4	X	

Same for residential and business customers.

PostNL stated that there is potential substitution between smaller and larger parcels as senders (business as well as residential) may consolidate or split shipments.

6) Which postal services are the most affected by substitution effects of electronic communication services in your consideration and in which rate? Any research / data available?

Not applicable for parcels (perhaps in the future with 3D printing).

7) Price elasticity is reinforced by competition as customers can switch more easily from either comparable postal services or to substitutes from competitors. For which postal services does this apply in your opinion and in which magnitude? Any research / data available?

The parcel market is highly competitive with more 10 -15 carriers. The Universal service (for parcels) has no impact on competition / service levels provided in the market. There is no clear delineation / an overlap between express services and deferred parcels, all of these carriers are active in the domestic market in Belgium. Competitor have sufficient capacity to absorb significant market share / volume in the parcel market from bpost.

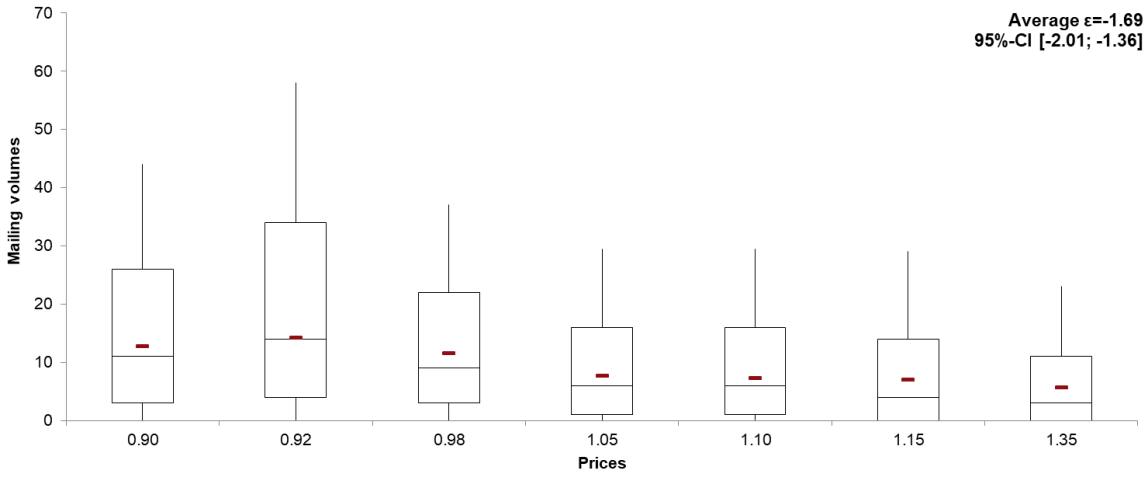
8) Are there any other relevant developments for the relevant services, which might impact the future demand in relation to price and the distribution frequency?

PostNL noted the following developments:

- The different delivery options like frequency and value added services regarding are directly related to price.
- Value added services can be opted with the parcel service and impact the price point as well
- Dynamic growth in the parcel market requires carriers to focus on cost and increased efficiency in their operations
- Large e-retailers like Amazon or Alibaba set standards due to their market position (eg 7 days a week delivery) and put pressure on carriers to provide these services. Carriers have
- Environmental sustainability of delivery services is expected by customers (however, there is no willingness to pay for it, customers simply expect it).

Annex 6 Boxplots[48] with results per surveyed product category – residential users

Figure 6 Distribution of mailing volume for non-priority letters by prices



Source: WIK-Consult. N=1781. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

Considering the current price of € 0.92, one would have expected a higher mailing volume for the one price point at the left side of the graph, which is lower. For residential customers, the median value for the corresponding mailing volume is however for some product categories (slightly) lower (non prioirity letters, registered mail and parcels). However, as this is only one lower price point, this does not mean that further price decreases would not invoke a volume increase. More representative are the five price increases, which show a consistent development for all product categories. For business users (from Figure 14 onwards), this is not observed. Due to the different graphical representation, one would have seen a 'peak' in the lines representing the mailing volume, but the survey results showed a constant line, hence increased mail volumes for all product categories by decreased prices.

48 The boxplots show expected mailing volumes for 2020 based on the different price points and delivery frequencies. Furthermore, a boxplot displays the distribution of data by using five statistical elements – minimum, first quantile, median, third quantile and maximum:

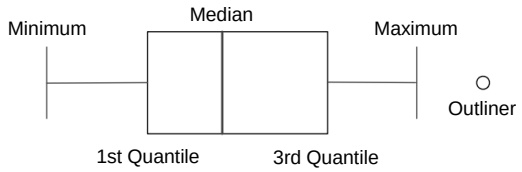
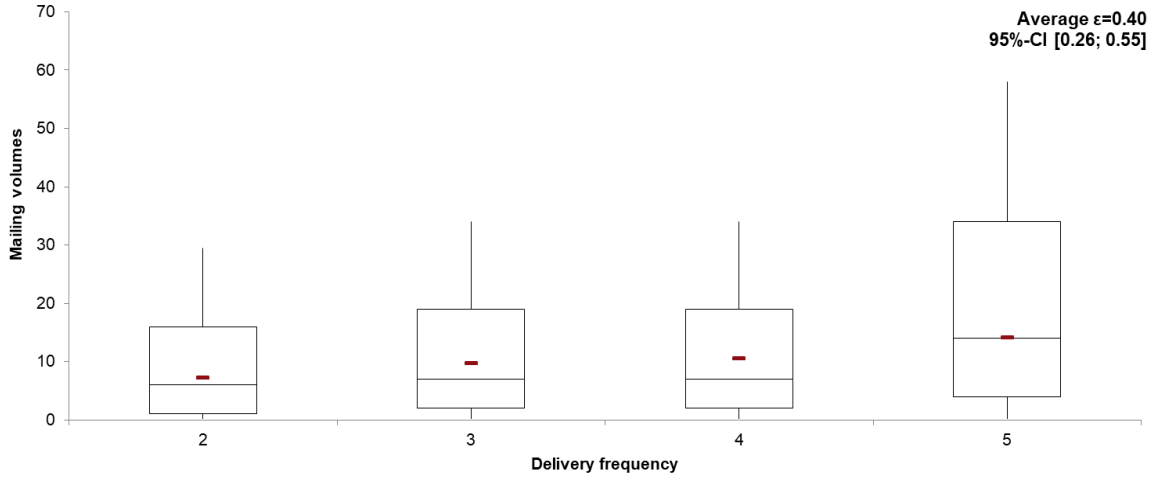
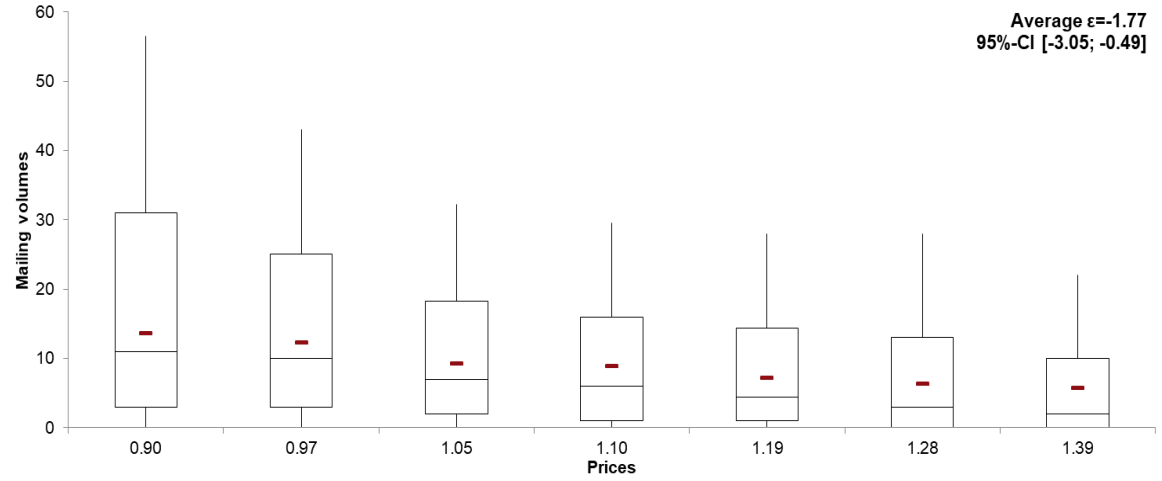


Figure 7 Distribution of mailing volume for non-priority letters by delivery frequencies



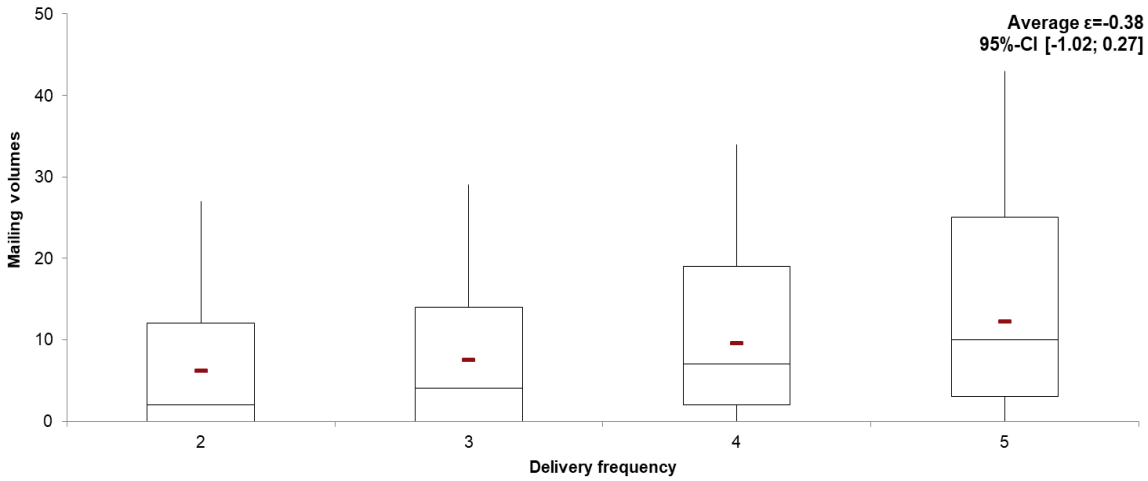
Source: WIK-Consult. N=1781. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

Figure 8 Distribution of mailing volume for priority letters by prices



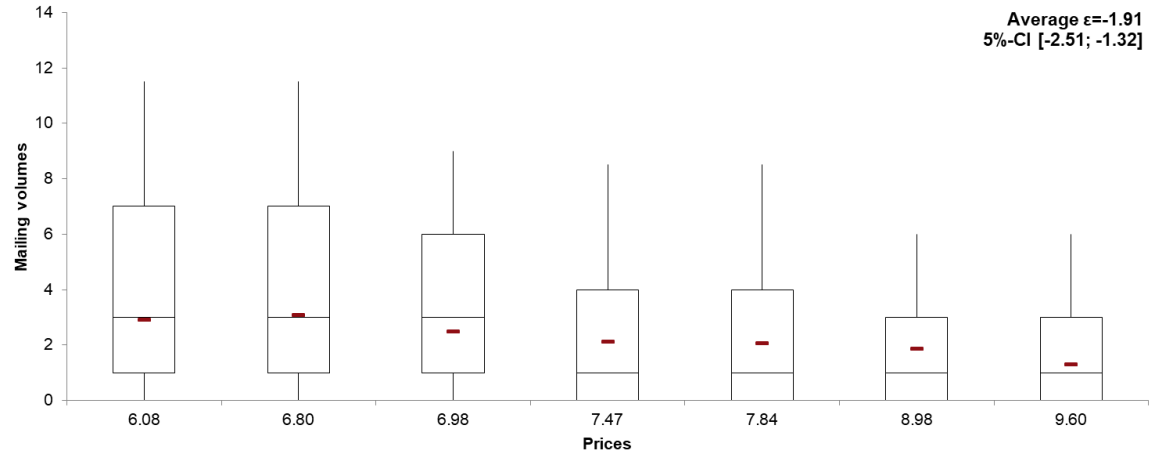
Source: WIK-Consult. N=320. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

Figure 9 Distribution of mailing volume for priority letters by delivery frequencies



Source: WIK-Consult. N=320. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

Figure 10 Distribution of mailing volume for registered mail by prices

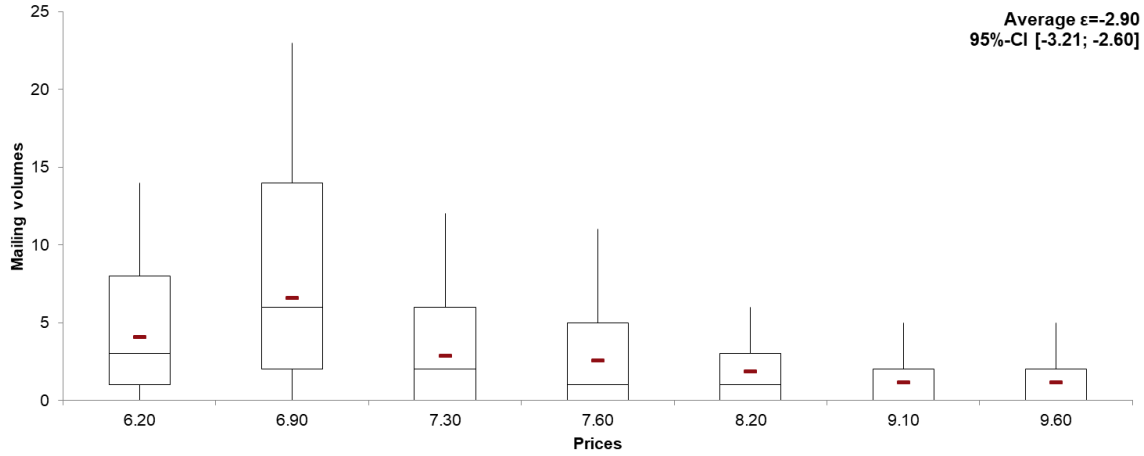


Source: WIK-Consult. N=465. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

Figure 11 Distribution of mailing volume for registered mail by delivery frequencies

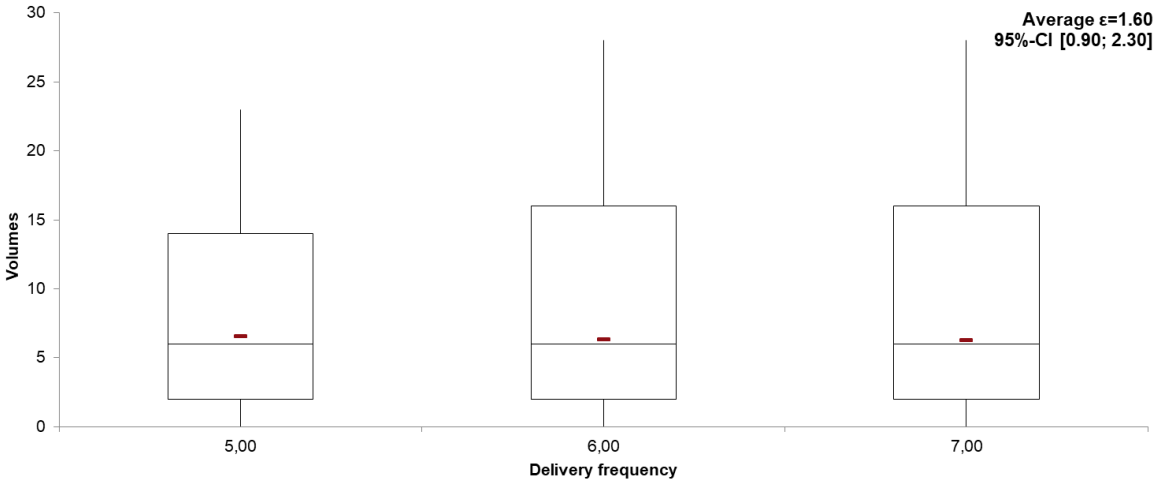
Source: WIK-Consult. N=465. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

Figure 12 Distribution of mailing volume for parcels by prices



Source: WIK-Consult. N=513. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

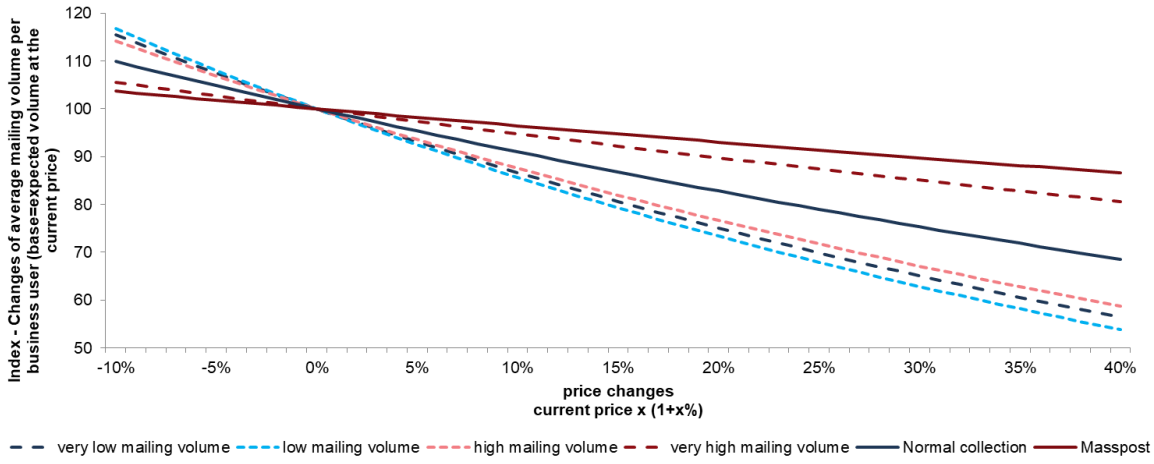
Figure 13 Distribution of mailing volume for postal packages by delivery frequencies



Source: WIK-Consult. N=513. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

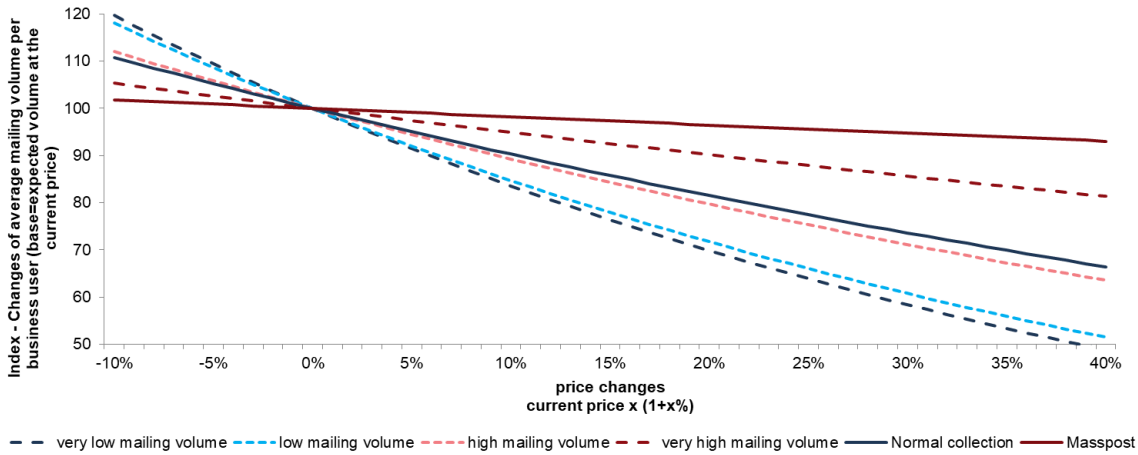
Annex 7 Impact of price changes per surveyed product category – business users[49]

Figure 14 Impact of price changes – normal letters



Source: WIK-Consult. Respondents: N=1683; Responses: N=1739. Mailing intensity classes: 1-59 normal letters in 2019 = very low mailing volume; 60-299 normal letters in 2019 = low mailing volume; 300-1999 normal letters in 2019 = high mailing volume; more than 2000 normal letters in 2019 = very high mailing volume.

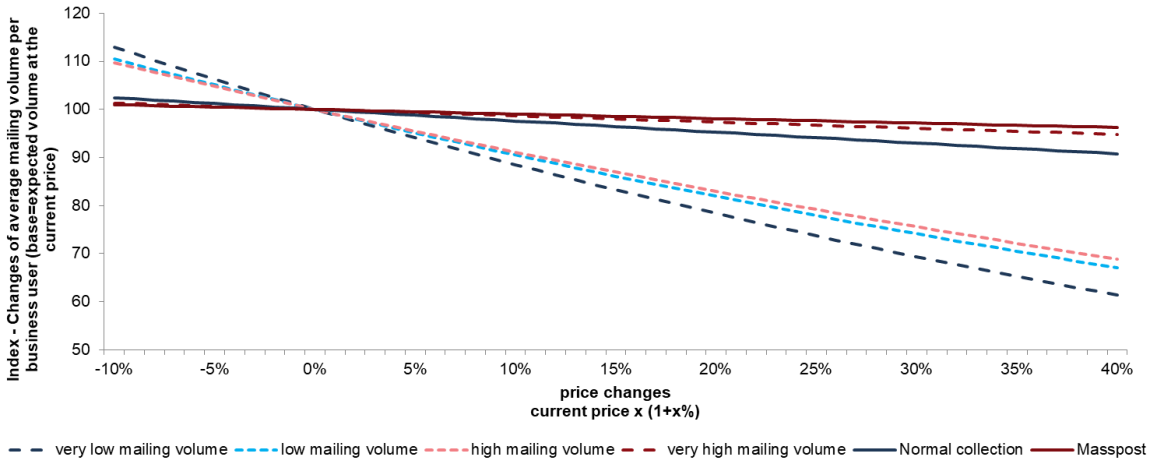
Figure 15 Impact of price changes – priority letters



49 A curve adjustment was carried out.

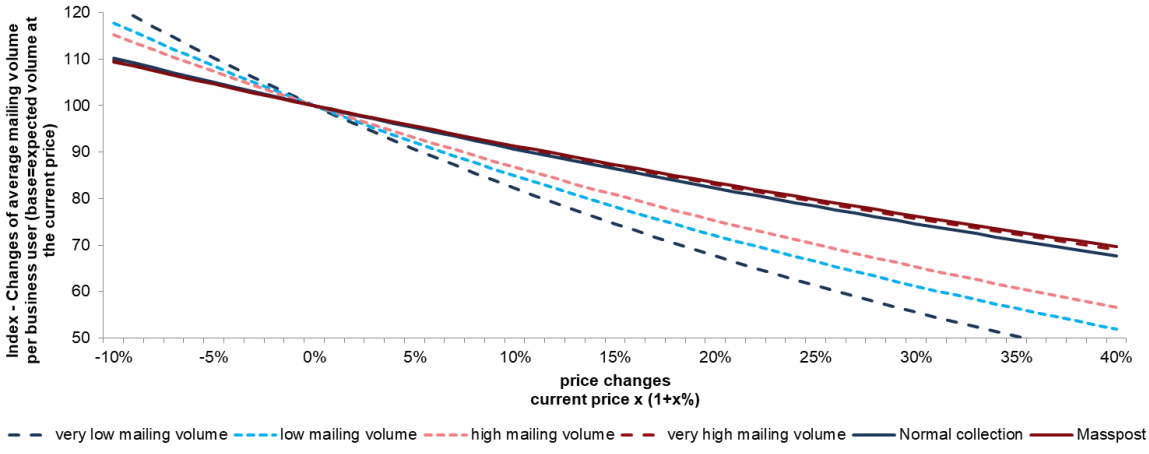
Source: WIK-Consult. Respondents: N=633; Responses: N=766. Mailing intensity classes: 1-59 priority letters in 2019 = very low mailing volume; 60-299 priority letters in 2019 = low mailing volume; 300-1999 priority letter in 2019 = high mailing volume; more than 2000 priority letters in 2019 = very high mailing volume.

Figure 16 Impact of price changes – registered mail



Source: WIK-Consult. Respondents: N=999; Responses: N=1188. Mailing intensity classes: 1-9 registered mails in 2019 = very low mailing volume; 10-39 registered mails in 2019 = low mailing volume; 40-249 registered mails in 2019 = high mailing volume; more than 250 registered mails in 2019 = very high mailing volume.

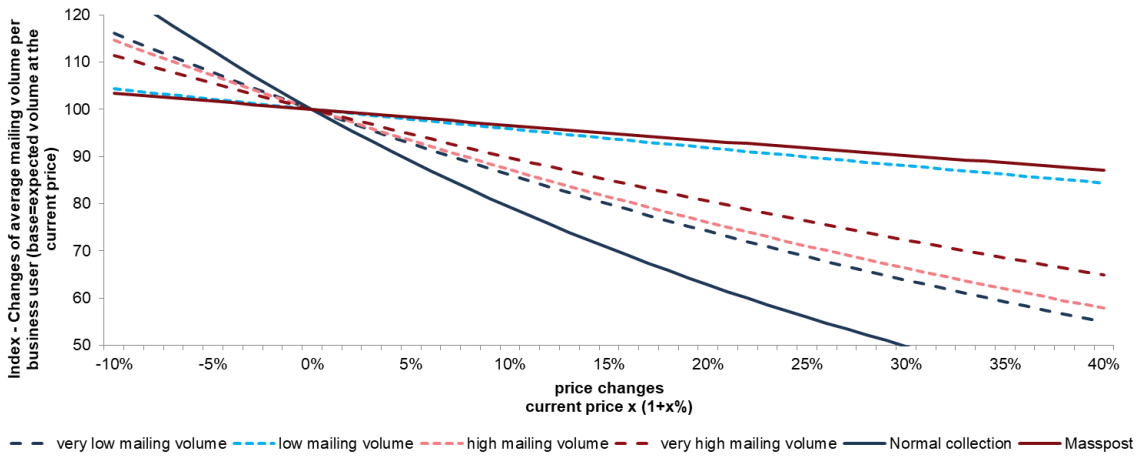
Figure 17 Impact of price changes – parcels



Source: WIK-Consult. Respondents: N=501; Responses: N=669. Mailing intensity classes: 1-9 postal packages in 2019 = very low mailing volume; 10-39 postal packages in 2019 = low

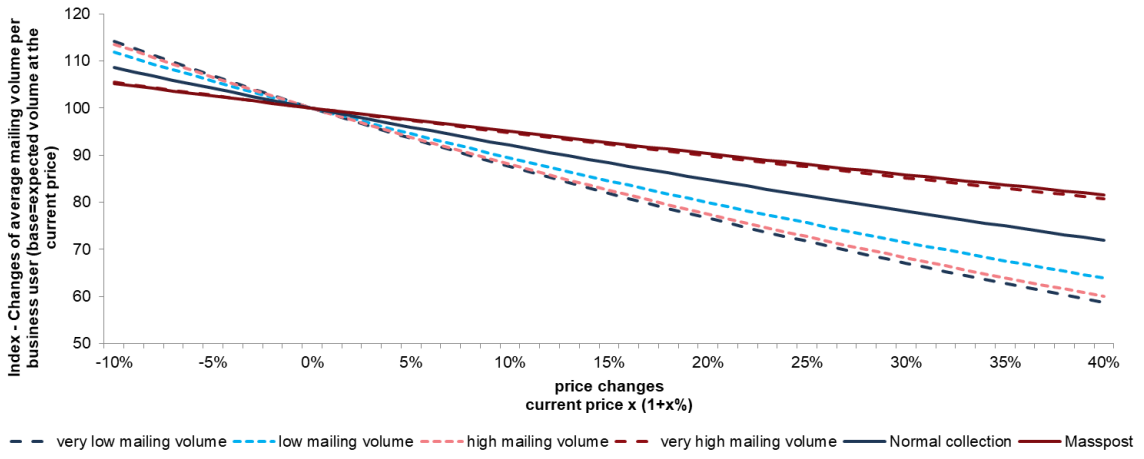
mailing volume; 40-249 postal packages in 2019 = high mailing volume; more than 250 postal packages in 2019 = very high mailing volume.

Figure 18 Impact of price changes – unaddressed mails



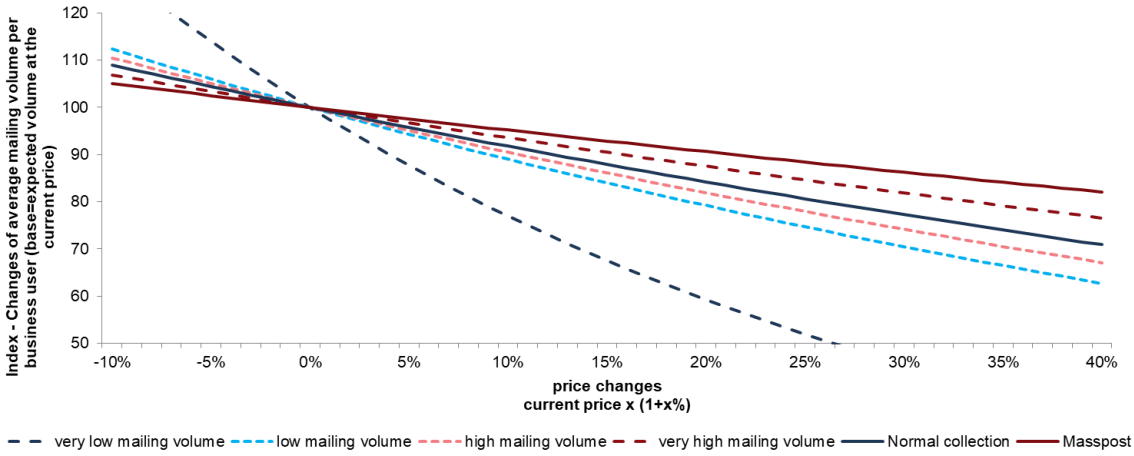
Source: WIK-Consult. Respondents: N=55; Responses: N=75. Mailing intensity classes: 1-99 unaddressed mails in 2019 = very low mailing volume; 100-999 unaddressed mails in 2019 = low mailing volume; 1000-4999 unaddressed mails in 2019 = high mailing volume; more than 5000 unaddressed mails in 2019 = very high mailing volume.

Figure 19 Impact of price changes – direct mails



Source: WIK-Consult. Respondents: N=131; Responses: N=162. Mailing intensity classes: 1-99 direct mails in 2019 = very low mailing volume; 100-999 direct mails in 2019 = low mailing volume; 1000-9999 direct mails in 2019 = high mailing volume; more than 10000 direct mails in 2019 = very high mailing volume.

Figure 20 Impact of price changes – periodicals



Source: WIK-Consult. Respondents: N=66; Responses: N=85. Mailing intensity classes: 1-149 magazines in 2019 = very low mailing volume; 150-1499 magazines in 2019 = low mailing volume; 1500-9999 magazines in 2019 = high mailing volume; more than 10000 magazines in 2019 = very high mailing volume.

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Econometric Estimation of the Price Elasticities of Belgian Postal Products

Non-confidential Final Report to the Belgian Institute for Postal Services and Telecommunications

Prepared by London Economics Europe

LE Europe

September 2020
Non-confidential version

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Acknowledgements

We would like to acknowledge the useful guidance and feedback provided by the BIPT and the data provided by Bpost. Responsibility for the contents of this report remains with LE Europe.

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Executive summary

This report estimates price elasticities for postal products for Belgian Post (bpost) in Belgium. LE Europe was contracted by the Belgian Institute for Post and Telecommunications (BIPT) regulation to complete this report as part of their research programme which informs their policy.

Previous research suggests own-price elasticities for postal products range typically from about -0.2 to -1.2, but some studies and methods suggest rather high (large negative or large absolute value) elasticities, up to circa -3.5. BIPT previously contracted consumer-based marketing type research which suggested elasticities might be higher than much previous research suggests, although consumer surveys may have drawbacks in terms of robustness. This research found some implausible results for delivery frequency (e.g., wrong sign, i.e., willingness-to-pay less for higher quality) and large-but-not-implausible results for some of the main products, such as priority letters (residential -1.77, -1.4 for small quantities professional normal letters).[1] They also perhaps surprisingly find bulk or mass collection mailing to be less elastic than small users mail for letters.

This project's estimates use two data sets provided by bpost via BIPT, one giving monthly data on prices and quantities from 2014 to mid-2019, and a second one having annual data from 2010-2019. Products are defined in the dataset(s) by customer (residential, professional, and bulk/mass), by delivery speed (priority and non-priority), by product type (letters, registered, parcels, newspapers and magazines), and other mail types (direct, unaddressed), and weight (for parcels).

Overall negative trends in letter volumes and positive trends in parcel volumes, along with contemporaneous price rises and the lack of either longer time series or more detailed disaggregated data from bpost and the postal market in Belgium present particular challenges to elasticity estimation. We first present preliminary analysis of trends and data to illustrate the challenges. The graphic overleaf shows the downward trends for letter mail, and seasonality, while parcels have a positive trend (for residential customers). Registered mail appears to have a downward trend but no clear seasonal pattern. Broadly similar patterns are found for non-residential customers (save the lack of a winter holiday spike). A common approach to addressing such challenges is to use detailed econometric models of elasticity.

[1] In spite of some of their counterintuitive results, we note that there are pros and cons to all methods. The consumer approach, for example, enables the researcher to estimate hypothetical changes which are not present in the historical data, and this is thus at least one advantage over the econometric approach, which must rely on actual data.

Residential Mail by Volume (2014 - 2019)

[CONFIDENTIAL]

Source: LE Analysis of BIPT/bpost data

Models

We estimated econometric models of the form:

1) $$lnv = \alpha + \beta lnp + \gamma year + \varepsilon$$

Where *v* is volume, *p* is price, and ln is the natural log; the Greek letters are parameters to be estimated, with β being an estimate of the elasticity. We then conducted some preliminary regression analysis of the annual data to explore the challenges and particularities of the current data and inform our approach on the more detailed monthly dataset. Further, we added dummy variables for the various product and customer types and interacted these with the slope, intercept and year to create more robust analysis of the data. The headline results of our estimation are found in the table below. The overall industry estimate is from the annual aggregate time series data, which was further adjusted for potential competition in the industry.

The next table overleaf outlines our main econometric estimates of elasticities. All the estimates presented are statistically significant. The estimates range from about -[CONFIDENTIAL] to -[CONFIDENTIAL], which is in line with expectations and previous research. Bulk letters are seemingly more elastic, although this is somewhat sensitive to the specification chosen. Large parcels seem to

be the most elastic, which might be suggestive and consistent with strong competition for these items.

Price Elasticities*				
	National Letters	**Parcel Pre-paid**	**Direct Mail and Non-Addressed Mail**	**Industry**
Residential	-[CONFIDENTIAL]	-[CONFIDENTIAL]	n.a.	-[CONFIDENTIAL]
Professional Normal	-[CONFIDENTIAL]	-[CONFIDENTIAL]	n.a.	
Professional Mass/Bulk	-[CONFIDENTIAL]	-[CONFIDENTIAL]	-[CONFIDENTIAL]	
0-2 kg	n.a.	-[CONFIDENTIAL]	n.a.	
2-10 kg	n.a.	-[CONFIDENTIAL]	n.a.	
Weighted-average	-[CONFIDENTIAL]	-[CONFIDENTIAL]	-0.51	

*Estimated via OLS regression

Source: LE Europe Analysis of bpost data provided by BIPT

Further estimation of elasticities and cross-price elasticities was done using the PCAIDS model. The PCAIDS model allows one to calibrate a system of own- and cross-price elasticities by imposing restrictions on the data, which can be useful when data are insufficient given the parameters needed to be estimated. An important element for consideration of policy for pricing is speed of delivery. We note that direct econometric estimation of separate elasticities for speed by product did not yield significant nor plausible results, and this was likely due to the fact that non-priority service for residential customers was only recently introduced.[2] We thus applied the PCAIDS method in this case.

The table below reports cross-price elasticities for national letters differentiated by speed and calibrated on residential customers. We previously estimated that the price elasticity for national letters for residential customers was -[CONFIDENTIAL] (see Table: Price Elasticities above). Non-priority letters seem to be weak substitutes when compared to letters with priority, and they are only slightly more inelastic than letters with priority, although further investigation should be needed as this category is relatively new. Notably the estimates were carried out using the most recent split (revenue shares) of the data which is only for a partial year.

Own and Cross-Price Elasticities for National Letters by Speed, calibrated on Residential Customers		
National Letters	Priority	Non-Priority
Priority	--[CONFIDENTIAL]	-[CONFIDENTIAL]
Non-Priority	-[CONFIDENTIAL]	--[CONFIDENTIAL]

[2] Non-priority for large (bulk) mailers was only recently introduced (start of 2020). Therefore, data was not yet available.

Source: LE Europe Analysis of bpost data provided by BIPT

Another set of products where the PCAIDS model might be used to estimate a consistent set of own and cross-price elasticities would be between profession and mass customers, for unaddressed and direct mail, and we present these results below.

In line with the overall industry, the three postage products are inelastic, as shown in the table below which is calibrated on the own-price elasticity for non-addressed and direct mail for bulk customers (-[CONFIDENTIAL]). Cross-price effects are further reported to be all positive (indicating substitutes). It is likely that to some extent non-addressed and direct franked mail is a substitute for mass non-addressed mail, but not for direct mail. This might be broadly in line with prior knowledge and expectation. Similarly, non-addressed and direct mail for professional customers seem to be closer substitutes for direct and non-addressed mail for bulk customers.

Own and Cross-Price Elasticities for Non-Addressed and Direct Mail, calibrated on Professional Customers via Mass collection

Non-Addressed and Direct Mail	Non-Addressed Mail	Direct Mail	Non-Addressed Mail and Direct Mail (Professional Customers)
Non-Addressed Mail	--[CONFIDENTIAL]	-[CONFIDENTIAL]	-[CONFIDENTIAL]
Direct Mail	-[CONFIDENTIAL]	--[CONFIDENTIAL]	-[CONFIDENTIAL]
Non-Addressed Mail and Direct Mail (Bulk/Mass Customers)	-[CONFIDENTIAL]	-[CONFIDENTIAL]	--[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

Conclusions

We have estimated elasticities for bpost products across a wide variety of postal products using two different data sets, annual and monthly, from bpost and two different methods. Particular challenges exist in elasticity estimation as contemporaneous price rises, and exogenous time trends have driven mail volumes down. However, some products, such as parcels, have had positive exogenous trends. Differences in seasonality and the introduction and changing of the product mix including product quality change create further challenges. Data challenges are particular in this case as data were limited, and our experience is more disaggregated data (such as by weight, if there are other parameters to bulk, such as size discounts, etc.), longer time series, and more operational detail/accuracy would likely improve estimation.

Despite these challenges, we estimated a number of the main elasticities using OLS regression and some detailed specifications, combining the data in many cases, and then allowing the elasticities to vary by the product types defined by customer type, speed, product, mail type, and weight as applicable. The headline residential letter elasticity estimated was -[CONFIDENTIAL], while the

bulk/mass letter was estimated to more elastic at -[CONFIDENTIAL]. This is in line with previous research and our own research and expectations. We further checked the sensitivity of these results to a number of panel methods and econometric issues such as autoregressive errors and found the results are unlikely to be sensitive to these estimation issues.

We further investigate elasticities and cross-price elasticities where the regression models did not yield good results using the PCAIDS model. Here, using a headline industry elasticity of -[CONFIDENTIAL], we estimated that there is little difference between priority and non-priority residential letter elasticities (using the most recent shares after the product introduction). The PCAIDS model further provided some suggestive evidence that mass direct mail is less elastic than non-addressed mail, and that franked professional mail is a weak substitute for mass mail. Additional research using the PCAIDS method might be extended or made more robust by more detailed research into the elasticity of the wider industry markets (i.e., using data from the industry rather than just bpost) and possibly nesting[3] products or creating more rich but complex structures among the products.

Overall, we stress that the postal market at the current time is very dynamic. Besides data limitations already listed, other factors such as changing technology and structure, and also factors such as dynamics and changes of the USO (at National or EU level), quality of service (e.g., frequency of delivery) all may be changing in the near future and this would be expected to impact potentially the results, and therefore the BIPT may wish to consider this in developing their ongoing research programme.

[3] This involves allowing some groups of products to be substitutes or compliments and others to be unrelated within the PCAIDS structure.

1 Introduction

1.1 Overview

The postal services regulator in Belgium, the Belgian Institute for Postal Services and Telecommunications (BIPT), after a public procurement process, contracted LE Europe to conduct an econometric study of postal price elasticities in Belgium for bpost, the Belgian national postal operator and Universal Service Provider (USP). This document forms the main report in regards to that study.

A high-level analysis of the existing literature on price elasticity estimation has also been undertaken in accordance with the terms of reference, which are as follows.

1.1.1 Terms of Reference

Before discussing in detail, the methodology employed to estimate the different price elasticities, it is worthwhile briefly restating the Terms of Reference underlying the motivation of this report. These are as follows:

- LE Europe was provided with data from BIPT obtained from bpost. The data is based on monthly tariffs and volumes per category available for the period January 2014 to June 2019 (inclusive);
- Aim: to estimate price elasticity coefficients for a variety of postal products using econometric analysis based on best practice; and
- Result: the estimation of price elasticity coefficients and, where possible, cross-price elasticities for the various postal products, summarised in a table accompanied by a brief description of the methodology applied.

1.1.2 Organisation of the remainder of the document

The rest of this report is organised as follows. Section 2 gives an overview of the existing literature. Section 3 then gives a description of the data and trends. Section 4 presents our methodology and modelling, Section 5 gives econometric analysis, and Section 6 presents our conclusions.

2 Review of previous research

Much of the existing literature has examined the relationship between postal prices and demand by drawing on three broad factors: economic activity, product pricing and substitution. Other notable considerations are population size, demographics and service quality. In more recent years, e-substitution has been added to the list. Yet there are many national nuances that may contribute to variation in price elasticities across international USPs, including differences in product offerings, delivery speeds and alternative communication methods. As such, the following will briefly summarise some of the influential literature involved in establishing best practice in econometrically estimating the price elasticity of postal products.

- Cigno et al (2013) stressed the importance of taking into account both own-prices and cross-prices when determining the elasticities of demand, since ignoring substitutability risks limiting the reliability of the estimates.[4] Employing a random-coefficients discrete-choice logit model, the research derived price elasticity estimates for 15 categories of US postal services for the year 2011. It found that previous elasticity estimates may have underestimated price sensitivity across a range of postal products, albeit the choice of products may partly explain this. Overall, the study concluded that estimates of own-price elasticities, using fixed-weight index prices, range between -0.8 and -3.5, with most in the elastic range.

- Focusing in particular on e-substitution, Nikali (2014) established a negative correlation between price elasticity and substitution when demand for letters in different sender and receiver sectors was investigated. Analysing the period 1991 to 2012 in Finland, the research found substitution had progressed most rapidly in the consumer-to-consumer market, whereas the business-to-consumer market was in its infancy by comparison. The intuition is that when there are many alternatives to letter communication, the main choice factors involved are usability and reliability of the channels. Price is therefore secondary to these considerations, reducing its elasticity.[5] As a result, the paper concluded that price sensitivity appears to reduce as substitutability increases.

- Based on the linear-approximate almost ideal demand system (LA-AIDS) methodology, the proportionally calibrated almost ideal demand system (PCAIDS) model was used in Swinand and Hennessy (2014) to estimate the demand elasticity parameters of a set of postal products provided by the Irish USP, An Post.[6] The paper highlighted the particular usefulness of this approach in cases where data limitations preclude estimation at a detailed product level despite there being good estimates of overall industry demand elasticity. This may be

[4] Cigno, Margaret M., Elena S. Patel and Edward S. Pearsall (2013), Estimates of US postal price elasticities of demand derived from a random-coefficients discrete-choice normal model, in Crew M.A., Kleindorfer P.R. [Eds.]: Reforming the Postal Sector in the Face of Electronic Competition, Kluwer Academic Publishers, 76-88.

[5] Nikali, Heikki (2014), Character of Substitution and Its Significance for Letter Demand: The Finnish Case, in Finger, M., Bukovc, B., Burham, M. [Eds.]: Postal Services in the Digital Age, Ios Press: Amsterdam, 15-29.

[6] Swinand, Gregory and Hugh Hennessy (2014), Estimating Demand Elasticities using the PCAIDS Method, in Crew, M.A, Brennan T.J.J. [Eds.]: The Role of the Postal and Delivery Sector in a Digital Age, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 65–74.

especially relevant where the data captures, for example, the volumes of a particular product but does not tabulate for a customer by weight, format or class. According to the results, there was less variation in the own-price and cross-price elasticities produced by the PCAIDS model than by the LA-AIDS estimate. The elasticities ranged from -0.22 to -0.39 for stamped, metered and bulk mail.

- Using an AIDS model, Bzhilyanskaya et al (2014) estimated a series of price elasticity matrices for domestic mail at the US Postal Service.[7] These matrices corresponded to increasingly disaggregated aspects of mail, including category, shape and class. The paper highlighted that the results of the modelling demonstrated how modern econometric approaches were capable of producing postal price elasticity matrices at a high level of detail and accuracy. Furthermore, the approach showed that own-price elasticities tended to become larger as mail categories were disaggregated. It also found that conventional models omitting the estimation of cross-price elasticities were roughly equal to the sum of the own-price-elasticity and all relevant cross-price elasticities, underscoring the importance of analysing both elasticities as discussed in earlier research.

- Applying a single-equation error correction model, Bozzo et al (2014) investigated the change in own-price product elasticities of the US Postal Service's First Class mail, standard mail and periodicals using quarterly data from Q4 1992 to Q4 2012.[8] The paper found that overall price elasticity was about -0.3 when 2012 volumes were used as weights, with a range of between -0.1 and -0.6 between the product groups.

- Examining the period 2011 to 2017, Fève et al (2018) used an Instrumental Variable estimation approach in determining price elasticities for Royal Mail retail advertising products.[9] Although it found that the overall price elasticity for this product was around -0.7, the level of elasticity tended to increase depending on the industry under analysis. Furthermore, while the finance and insurance and utilities industries were found to be more price sensitive, those in the manufacturing and information and communication sectors were shown to be inelastic. Nevertheless, the study warned that the results should only be viewed as directional in nature due to potential issues of selection bias, with further research encouraged.

[7] Bzhilyanskaya, Lyudmila Y., Magaret M. Cigno and Edward S. Pearsall (2015), A Branching AIDS Model for estimating U.S. Postal Price Elasticities, in Crew, M.A, Brennan T.J.J. [Eds.]: Postal and Delivery Innovation in the Digital Economy, Springer International Publishing 91-113.

[8] Bozzo, A. Thomas, Kristen L. Capogrossi, B. Kelly Eaking, John Picket and Mithuna Srinivasan (2014), Is demand for market dominant products of the United States Postal Service becoming more own-price elastic?, in Crew, M.A, Brennan T.J.J. [Eds.]: The Role of the Postal and Delivery Sector in a Digital Age, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 28-45.

[9] Fève, Frederique, Thierry Magnac, Leticia Veruete-McKay and Soterios Soteri (2018), How sensitive is Letter Advertising Mail in the UK, in Parcu, P.L., Brenann, T.J.J., and Glass, V. [Eds.]: New Business and Regulatory Strategies in the Postal Sector, Springer International Publishing, 207-217.

2.1 Recent studies by bpost

2.1.1 Bpost study

The BIPT provided LE with a study on elasticities completed by bpost for the purposes of this study to further inform our background research. It is worth going over some of the highlights and main points of that study and discussing them here.

The document was provided in Dutch/Flemish only, and we have used an electronic translation tool to create an unofficial translation. The table in English is reproduced below. Of key importance was a table and summary of previous studies along with what our understanding is, was bpost's own study (the first row in the table).

Table 2.1: Summary of Previous Studies, by Bpost

[CONFIDENTIAL]

Source: Bpost

Overall, the study and table would suggest that elasticities tend to be in the range -[CONFIDENTIAL] to -[CONFIDENTIAL], with some products as high as -[CONFIDENTIAL]. The conclusion that private

customers have lower elasticity than professional customers is also consistent with studies in the UK and Ireland for regulators and USPs (and it will be shown with the evidence we have found in this study).

Bpost further discusses their own analysis of headline figures and present results in their figure, reproduced below in Figure 2.2. They previously concluded there is no clear pattern. The conclusion of no clear pattern certainly can be said from the figure, which is made more difficult to read by showing volume declines as positive distances on the bars and increases as negative (assuming we have understood correctly). However, more detailed data and analysis by products, customer types and other factors may shed light on the potential elasticities in question.

Figure 2.2: Analysis of Headline Figures, by bpost

[CONFIDENTIAL]

Source: Bpost (Figure 8)

[CONFIDENTIAL]

2.2 Preliminary analysis and motivation of the challenges

At this point, it is worthwhile to consider some very high-level data analysis as an introduction to the broader and more robust econometric analysis that is presented in the next sections. We use the annual aggregate prices and volumes dataset provided by BIPT from bpost for these purposes in this section of the preliminary analysis.

Over the last several years, bpost has been raising prices while there is a downward trend in main mail types volumes. This means it is hard to differentiate out price elasticity effects from overall trend effects, as prices are rising while volumes are falling simultaneously for different reasons. The following graph shows the percentage change in volume and price for residential letters from a time series of aggregate annual data from 2010 to 2019 provided by bpost via BIPT for this study. The data are the change (first difference) in the natural log of price D.lnp, and volume, D.lnv, year-on-year.

Figure 2.1: Annual % change residential letters price and volume (2011 - 2019)

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

[CONFIDENTIAL]

A better view of things can be seen by using an OLS regression and the predicted values along with the scatter. We present the results in terms of regression output and graphical below. The regression is the lnv regressed on lnp for residential letters from the aggregate annual data series provided. We note this is exploratory work to illustrate some of the issues and overall trends, correlations, and there are noticeably only 10 observations in this simple preliminary approach.

Figure 2.2: Residential Mail annual data OLS univariate regression results

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

From the table above, there is a fairly high R-squared value at 89%, and a significant negative elasticity coefficient of -1.47. The figure below shows the line fit and the scatter of actual data. Note

that since the variables are in logs, then the slope coefficient on lnp in the log-log space is in fact the elasticity estimate. However, as this is a univariate regression, the interpretation of the coefficient is not usually[10] interpretable as an 'all else equal' estimate, since potentially omitted variables might bias the estimate (and the elasticity is generally an 'all else equal' concept or, mathematically, a partial derivative).

Figure 2.3: Residential letter mail annual predicted vs actual values from OLS regression

[10] Unless one can be sure there are no omitted variables, then the total derivative is the same as the partial derivative.

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

It is illustrative to consider further the same approach to mass or bulk mail, so we conducted the same regression on the same data and period and sample for bulk mail, and present the results and scatter diagrams in the next figures.

Figure 2.4: Bulk mail OLS regression results annual data (2010 - 2019)

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

Curiously, now, the coefficient on lnp is positive and significant (0.40). This is unexpected and violates the law of economic demand. Violations of basic theory and strong priors are suggestive of modelling problems. Also, notably the R^2 has dropped significantly. The scatter diagram below should be inspected to tell us more.

Figure 2.5: Bulk mail predicted vs actual, OLS annual 2010-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

From the scatter diagram, it is clear that something is wrong. In fact, what is happening is we have used just bulk mail aggregated across two products, when there are two product categories (in this dataset), bulk priority letter and direct mail. Thus, the pooling or not of data across categories may have important effects on the estimates. Conversely, disaggregating the data too much may leave too few observations to disentangle the contemporaneous trends. In the case of the above data, noting that the clusters of products are the two different product types, the appropriate thing to do is to allow both the slopes and intercepts to vary by product type, and so we present the regression and graphic results of this in the next panels.

Figure 2.6: Bulk mail elasticity regression with dummy variables, annual 2010-19

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

Where now i.idx is an indicator index, or set of dummy variables, which indexes the products and creates a dummy variable for each. The variable lnp, has been split into two variables, or interacted with the dummy variable for priority letters (lnp_mas_prlet), and direct mail (ln_mas_dm), thus allowing the slope or elasticity estimate to vary by product type. Notice that the number of observations is doubled, while the number of parameters is only five (two slopes, constant, the dummy, and the variance), so the degrees of freedom in the estimation goes from seven to 15.

Now both the priority letters and direct mail coefficients are of the correct sign. We see now a better fit and more sensible coefficients of plausible signs and values; however, the coefficient estimate for bulk priority letters is not statistically significant. The issue here is the contemporaneous time trends and the price versus volume changes.

It is useful again to observe the scatter and fitted lines nonetheless, and the line of the insignificant coefficient can still be displayed as our best estimate, which we do in the figure below. We further included the fit of residential letters in the graphic.

Figure 2.7: Actual vs fitted values, residential and bulk by product, annual 2010-19

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

The figure now is showing a reasonable fit. The green line is the mass priority letters and the lack of variation across lnv and lnp within that grouping is obvious, leading to the insignificant coefficients. The very steep slope of the red line, the mass direct mail is also obvious, although notably we did not include year or a time trend variable or other control variables.

Our initial analysis further considered modelling of the price elasticities with disaggregated letter products from the bpost monthly dataset. This led to inconclusive results and insignificant coefficients on the main variable of interest, price (or ln(price) in fact). As was demonstrated in the previous analysis, due to the short time-frame and lack of observations, and the likelihood of contemporaneous correlation of the time trend with both price rises and volume falls, the likelihood was that simple models and disaggregated models would lead to poor and inconclusive results.

The next table shows a fully disaggregated model, where the customer is residential, product letters and speed priority. The effect estimated by the coefficient is insignificant and the confidence interval is very wide, almost to -[CONFIDENTIAL] to [CONFIDENTIAL].

Figure 2.8: Disaggregated letter regression detailed outputs, residential priority letters

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

Allowing the model to be disaggregated by professional letters gives the following results with a high and significant elasticity.

Figure 2.9: Disaggregated letter regression detailed outputs, professional priority letters

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

The following shows the impact of such a model where the coefficient on lnp is quite large (-[CONFIDENTIAL]) but the estimated statistical impact is not significant.

A next step might be to consider to aggregate the products, and consider slope and dummy intercepts.

Figure 2.10: Disaggregated letter regression detailed outputs

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

2.3 Conclusions to this section

The prior evidence is that postal price elasticities tend to be not too elastic or from about -0.2 to perhaps -1.2. Studies not using econometric methods have found higher price elasticities, although consumer surveys may have drawbacks in terms of robustness. Previous work by bpost found inconclusive results. We note that the accuracy or statistical error of the estimates would be improved by better data and/or more observations.

Recent attempts to study price-quantity relationships have not revealed clear patterns and this is suggestive of the need for more in-depth quantitative study. A lack of observations any dataset will always be problematic in terms of conclusions and robustness. The problem is made more challenging by a wide range of products in postal operations, and contemporaneous time trends for different products. One solution to this is to pool products over time and attempt to model elasticities this way. A preliminary analysis of annual bpost data showed how elasticity estimates will be potentially sensitive to the modelling and definition of products. Thus, this motivates the challenges and the more detailed econometric approach which is conducted in the remainder of the report.

Our initial analysis of this data suggested that collinearity and other issues including lack of data and using proxy measures such as time/year for actual unmeasured independent variables such as e-substitution might be clouding the results, which led us to conclude various models with aggregated

products and modelling of product and quality and customer slope and intercepts would be the best way forward.

3 Data and trends

3.1 Section introduction

This section studies the data that has been used in the econometric analysis to estimate the price elasticities of bpost postal products and then also looks at trends and summary statistics. The data have been provided directly from BIPT, who obtained the data from bpost. The data were presented in the form of a monthly time series dataset which for most of the postal products, extending from January 2014 to June 2019. We also received an annual aggregate time series for a selected number of products from 2010-2019, as discussed previously.

The BIPT/bpost dataset contains information about the volumes and tariffs at which postal products are priced, and is divided into three customer segments, namely: i) residential customers; ii) professional mail (via normal collection); iii) professional mail (via mass collection). Postal products across customers' segments in some cases are further disaggregated by speed (priority or non-priority) in case of national letters;[11] and weight (0-2 kg or 2-10 kg) in case of pre-paid parcels. Other postal products included in the dataset are: non-addressed mail, direct mail, national registered mail and magazines/newspapers.

We then categorized and coded the data into our database using an integer-based coding system to code each price and volume figure according to the following. In summary then the data are headline stamp/postal prices and volumes by month for the following categories/products.

1. Customers (3 types): residential, professional, bulk/mass
2. Speed (2 types): priority, non-priority (where applicable)
3. Product (3 types): letters, parcels, other-mail/mags
4. Weight (2 types): 0-2kg, 2-10kgs (where applicable)
5. Other_mail_indicator (3 types): registers, direct, mags, other

One note on the above data is we were only provided with headline stamp or franking and bulk prices, and any discounts or if actual average price would vary by further weight-step or format variations, we are not aware of, this could potentially impact the actual implicit price and the quality-adjusted volume versus pure count volume figures. Our understanding is that the volume data provided are pure count volumes from bpost's estimates. It should be noted that there may be further issues with this data as our understanding is that stamped mail price and volume data is from counter/retail sales[12] and actual letter counts were not available.[13]

[11] Bulk non-priority mail has been introduced in 2020; by franking machine or stamps (since 2019).

[12] Counter sales, and lags with sales and actual volumes may vary by product type for example. For example, parcels are usually paid and sent directly at the counter whereas stamps, consumers might purchase them and then stamp a letter out of a book of stamps over time. Franking with a machine is somewhere in-between as the user regularly tops-up the credits on a monthly basis (in usual circumstances).

[13] This is somewhat surprising given that our experience from over 20 years of international mail regulatory economic experience is that operational and commercial data should be available to provide counts of mail items by customer type. For example, total volumes machined and hand sorted should be fully measured as should total volumes franked, as the franking machine is in effect a billable counting machine.

A further dataset was made available with a longer time series, 2010 to 2019, but with fewer categories. This is potentially useful to further consider longer term trends and price impacts, since a number of factors including the recession, recovery, and e-substitution have been driving mail volumes on the longer-term trends. We proceed with the data made available.

3.2 Data and descriptive statistics

In the ensuing analysis of this subsection, we transform the time-series into cross-sectional data in order to have one variable for each volume and one variable for price, which will facilitate summary statistics and trend analysis. Table 3.1 and Table 3.2 below, report the summary statistics of prices and volumes across postal products within the three customer segments.

Table 3.1: Summary Statitics of Tariffs

[CONFIDENTIAL]

*Stamp sold per 10
**Note that this table displays monthly data for the year 2014-2019. National Letters without priority within Residential customers were introduced in 2019, priced at 0.92. The tariff for National Letters with Priority in 2019 is higher, at 0.97.
Source: LE Europe Analysis of bpost data provided by BIPT

Table 3.2: Summary Statistics of Volumes (000s)

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

3.3 Postal Product Trends for bpost

As a first step in any econometric study of postal price elasticities, it is useful to consider graphical and preliminary descriptions of the data. Our previous discussion motivated some of the challenges with the current data and postal price elasticity estimation more generally in Belgium.

In addition to the previous annual aggregate data, we were provided with a more disaggregated dataset by BIPT using monthly data from 2014-2019.

The figure below shows the time series graphs of selected products. Firstly, national residential priority letters show a significant downward trend, [CONFIDENTIAL]. It also should be noted that this product was split into priority and non-priority at the beginning of 2019. Even with this small number of periods (for the split priority/non-priority residential letter), we see non-priority is a greater volume than priority, perhaps indicating a price sensitivity for residential letter senders. Interestingly perhaps the holidays peak appears much small in the last year available, 2018. Registered mail and parcels are on the right-hand axis. On the other hand, registered mail appears to have a downward trend and seasonality but the seasonality may or may not be monthly, and the trend overall is harder to discern.

Figure 3.1: Residential Mail by Volume (000s) (2014 - 2019)

-[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

Finally, parcels are a much smaller volume but show a clear small upward trend. Because of the scale, discerning seasonality is more difficult to see.

Figure 3.2: National Letters by Volume (000s) and Speed within Professional Mail (via Normal Collection) (2014 - 2019)

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

The dataset is divided further by customer types, as described previously, residential, professional, and bulk/mass. The figure above shows professional customers letter mail which is franked mail. The volumes show a very significant downward trend. There is also very little difference between the volumes for differences in speed, suggesting these products are strong substitutes. Finally, there is casual evidence of seasonality, but not an obvious pattern, and thus further econometric analysis will be needed. There is also a curious divergence of the two quantities from early 2019.

Parcel volume's trend was shown in the first of the previous figures, and a closer look is instructive. Below shows volumes by weight, divided into 0-2kg and 2-10kgs. Both show clear positive time trends, and at least some potential for seasonality.

Figure 3.3: Parcels by Volume and Weight within Professional Mail (via Normal Collection) (000s) (2014 - 2019)

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

A key conclusion from our preliminary analysis is that positive time trends for parcels and larger items are combined with negative time trends for letters and related letter products. Seasonality for letters and other items may also be important and mask trends or elasticity.

The figure below breaks down the categories and volume trends for bulk or mass professional mail. Letters are divided into priority and non-priority. There are the additional products magazines and newspapers, non-addressed, and direct mail. All these products are priced differently.

Non-addressed mail is by far the largest category, but the graph would not indicate any clear downward trend. [CONFIDENTIAL]. Direct mail and magazines appear to have a downward trend.

Figure 3.4: Professional Mail (via Mass Collection) by Volume (000s) (2014 - 2019)

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

National non-priority bulk letters are a very small portion of the total volumes, and as these will also be one of the lowest priced items, will have a smaller portion of bulk revenue. Further discussions with the project team at BIPT indicated that bulk non-priority is effectively franked non-priority, and that these two categories would be better to be aggregated in the subsequent econometric analysis.

Figure 3.5: Parcels by Volume and Weight within Professional Mail (via Mass Collection) (2014 - 2019)

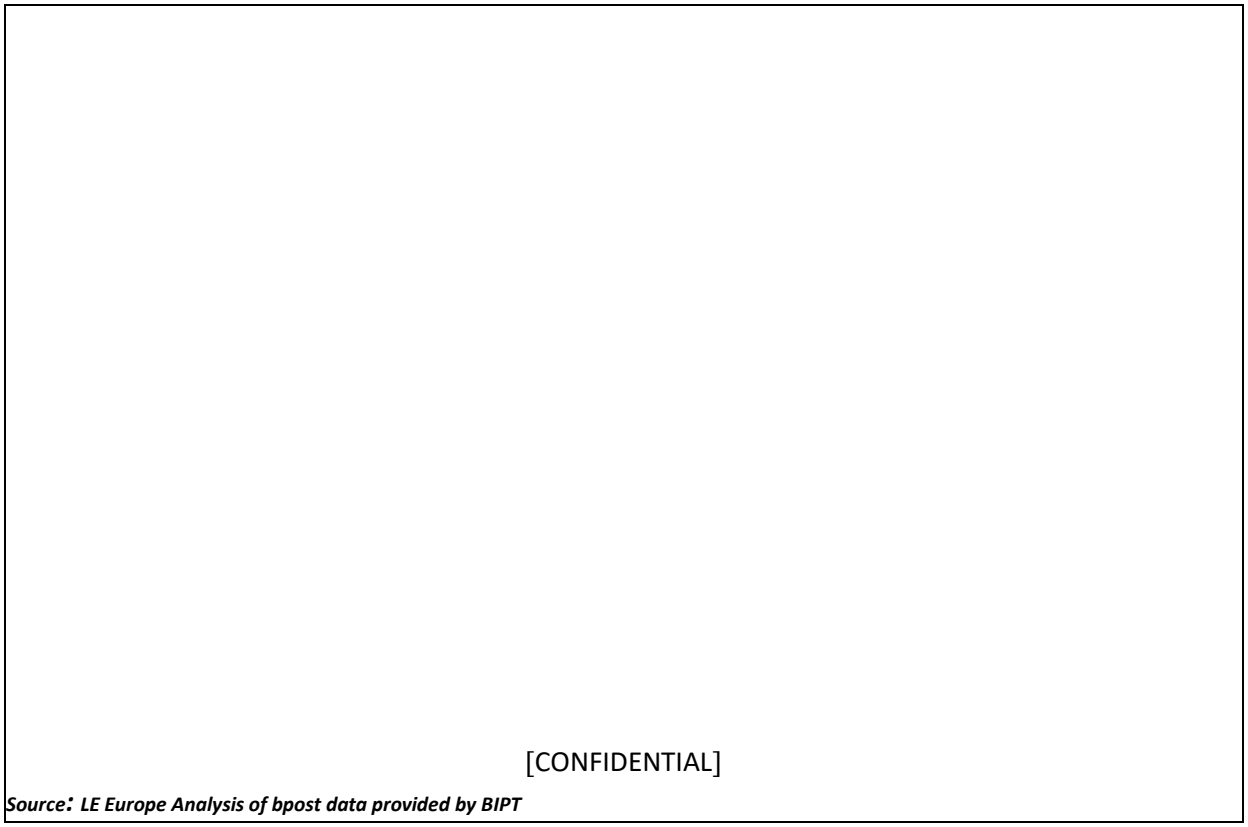
[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

Within the category of bulk parcels, it is useful to consider the breakdown by weight. [CONFIDENTIAL].

The graphic overleaf shows the breakdown of revenue by priority and non-priority letters, and by customer. It shows that the vast majority of revenue is from priority bulk, with the next highest category non-priority residential. This is only for 2019 as this was the first year for non-priority residential stamped mail. Professional non-priority franked mail is the next largest. This might be an indicator that residential stamped mail is more price sensitive but less time sensitive.

Figure 3.6: Revenue of National Letters by Speed and Customer Type in 2019



Source: LE Europe Analysis of bpost data provided by BIPT

[CONFIDENTIAL]

Figure 3.7: Revenue of Parcels by Weight and Customer Type in 2019

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

Figure 3.8: Revenue of Other Mail by Customer Type in 2019

[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

[CONFIDENTIAL]

4 Model

In this section we discuss the modelling strategy and models used. Our modelling takes three primary approaches. The first is to use the aggregate annual time series data from the second dataset provided to estimate an overall or more aggregated long-run elasticity.

The second and more detailed approach, is to combine the monthly-product disaggregated data to create a type of stacked or panel dataset by product and time and then explore estimation of the elasticity by interacting the slope and constant parameter estimates with combinations of the categorical dummies which define the products, along with other variable such as year/time trend, and seasonal dummy variables, as motivate in the preliminary analysis section before.

Finally, as there are a great number of actual total parameters to be potentially estimated, and the econometric approach may not be capable of estimating all the parameters together consistently or with sufficient degrees of freedom. Therefore, we also employ the PCAIDs method which allows us to calculate own and cross-price elasticities of related products once we have an overall 'industry' elasticity and a single own-price elasticity of one product, plus the revenue shares of the products in question across the sub-system under investigation.

In the case of the modelling strategy, the basic starting model can be written as:

1) $$lnv = \alpha + \beta lnp + \gamma year + \varepsilon$$

Where:

- ln is the natural logarithm
- v is volume
- p is price
- year is year
- The Greek letters are parameters or values to be estimated
    - α is the intercept
    - β is the slope coefficient – which
    - γ is the time trend or annual rate of growth
    - ε is a random error term

Very generally, we can allow the time to vary by month and year, and subscript the variables by this time step. We also can index categorical variables by the categories that form the products.

From our previous description of the data, consider the following to indicate the indexation of the products and types:

1. Customers (3 types): residential, professional, bulk/mass;

    i=1, 2, 3

2. Speed (2 types); priority, non-priority (where applicable)

j = 1, 2

3. Product (3 types); letters, parcels, other-mail/mags

   k = 1,2,3

4. Weight (2 types); 0-2kg, 2-10kgs (where applicable)

   l= 1,2

5. other_mail_indicator (5 types); registered, direct, unaddressed, news/mags, other

   m= 1….5

We present the model below and illustrate the concept allowing just the first two indices to illustrate the concept of the model where the intercepts and slopes are indexed in equation form:

2) $lnv_{ijt} = \sum_{i=1}^{3}\sum_{j=1}^{2}\alpha_{ij} + \sum_{i=1}^{3}\sum_{j=1}^{2}\beta_{ij}lnp_{ijt} + \gamma t + \varepsilon_{ijt}$

In the above, we show the data subscripted by i, j, and t, and the intercept and slope parameters indexed by i, and j, thus in theory we would be estimating for example six different parameters for each. It is possible, to envisage different combinations, for example, to interact the time trend with some of the indices, as:

3) $lnv_{ijkt} = \sum_{i=1}^{3}\sum_{k=1}^{3}\alpha_{ik} + \sum_{i=1}^{3}\beta_{ik}lnp_{ijkt} + \sum_{k=1}^{3}\gamma_{k}t + \varepsilon_{ijkt}$

In this case, we're allowing the intercept to vary by customer types, i= 1…3, and by product type, k= 1…3, and the slope or elasticity to vary only by customer type. Alternatively, we have now allowed the time trend to vary by product type, k=1..3, so we are allowing the trend to be different for letters, parcels, and other mail, in this case. For the actual estimation, different combinations of the above were tried and tested and we selected models in terms of significance, fit, priors on sign and magnitude, and inspection of the residuals. Details of the model specifications and regression outputs are in the annexes. In the analysis that follows, we use a variety of different combinations of dummy variables and then also further rely on the PCAIDs method to further estimate own-price and cross-price elasticities of certain products.

PCAIDS model

The PCAIDS model is an extension of the typical AIDS model. AIDS stands for Almost Ideal Demand system, and is a system of equations approach to econometric modelling of price-quantity demand relationships.

A linear approximation or LA AIDS model is often estimated. The LA AIDS model can be estimated using the following equations:

Equation 1

$$\ln x = a + \sum_i \alpha_i \ln p_i + \tfrac{1}{2} \sum_j \sum_i \gamma_{ij} \ln p_i \ln p_j + b \prod_i p_i^{\beta_i}$$

$$s_i = \alpha_i + \sum_j \gamma_{ij} \ln p_i \ln p_j + \beta_i \ln\left(\frac{x}{P^*}\right)$$

Source: Deaton and Muellbauer 1980.

In the equation above; ln is the natural log; the p_i are the prices of the services, (stamp, meter, bulk), the s_i is the share in revenue, x is total revenue, P* is a general price index, and the lowercase Greek letters are the parameters to be estimated.

The system is made more tractable (reducing the number of free parameters to be estimated) by imposing restrictions within and across equations, including symmetry, homogeneity, and adding up (budget shares must sum to one). The restrictions imply:

Equation 2

$$\sum_j \gamma_{ij} = 0, \ \sum_i \beta_i = 0, \ \sum_i \gamma_{ij} = 0, \ \gamma_{ij} = \gamma_{ji}, \ \sum_i \alpha_i = 1$$

Source: Deaton and Muellbauer 1980.

From the above system of equations and parameter estimates, the own and cross-price elasticity estimates can be derived. In these equations, ε_{ii} refers to the own-price elasticity for the various products and ε_{ij} refers to the cross-price elasticity between product i and product j.

Equation 3

$$\varepsilon_{ii} = \frac{1}{\bar{s}_i}\left(\gamma_{ij} + s_i^b \beta_i\right) - 1$$

$$\varepsilon_{ij} = \frac{1}{\bar{s}_i}\left(\gamma_{ij} + s_j^b \beta_i\right)$$

Source: Deaton and Muellbauer 1980.

There are three key assumptions that are imposed in a PCAIDS model. These additional constraints are proportionality, adding-up and homogeneity. The most important of these restrictions in terms of its impact on various elasticity estimates is the assumption of proportionality. Under proportionality, we assume that sales are diverted away from a product according to the relative market share of other products in the defined market.

As the PCAIDS model is a variant of the standard AIDS model, it may be expressed as a system of equations as in Equation 4. Thus, the share equations below refer to the share of the product whose elasticity is known and a share for all other products in the market. The market shares in this model will be the average of the revenue shares at the end of the sample period.

Equation 4

$$S_1 = a_1 + b_{11}\ln(p_1) + b_{12}\ln(p_2) + \ldots + b_{1,N-1}\ln(p_{N-1})$$

$$S_{N-1} = a_{N-1} + b_{N-1,1}\ln(p_1) + b_{N-1,2}\ln(p_2) + \ldots + b_{N-1,N-1}\ln(p_{N-1})$$

Source: Epstein and Rubinfeld 2004[14]

In Equation 4, ln(p_1) refers to the natural log of the price of product 1. As part of the PCAIDS model, a price elasticity for this one product in the market must be estimated. In this equation, the coefficient on b11 must be converted into an elasticity using Equation 5.

By imposing the adding-up and homogeneity constraints, we derive the various elasticities with reference to the estimated coefficients. These are shown in Equation 5**.** The coefficient b_{jj} refers to the coefficient on the price variable in the share equation that is estimated in the two product LA/AIDS model.

Equation 5

$$\varepsilon_{j} = b_{jj} - 1 + s_j(1+\varepsilon)$$

$$\varepsilon_{jk} = b_{jk/s_j} + s_k(1+\varepsilon)$$

Source: Epstein and Rubinfeld 2004

The value in this approach is that once the own-price elasticity is estimated for any product within the market, then this estimate can be used to estimate all other own-price elasticities in the market once the revenue shares are known for all products. These can be derived by applying the equations shown in Equation 6 where ε_i is the price elasticity of one product in the market. ε refers to the price elasticity of the overall market.

Equation 6

$$\varepsilon_{j} = [(1-S_j)\varepsilon_1 + (s_j - S_1)\varepsilon]/(1-S_1)$$

$$\varepsilon_{jk} = s_k(\varepsilon - \varepsilon_1)/(1-s_1)$$

Source: Epstein and Rubinfeld 2004

A more detailed derivation of PCAIDS models than is presented in this report is given in Coloma (2006).[15]

[14] Epstein and Rubinfeld, 2004. "Effects of Mergers Involving Differentiated Products" Technical report for the European Commission, COMP/B1/2003/07

[15] Coloma, German. 2006. "Econometric Estimation of PCAIDS Models" *Empirical Economics, vol. 31 No.3 pp. 587-599*

The application and usefulness of the PCAIDS model to postal pricing was published in the peer-reviewed publication by Swinand and Hennessy (2014).[16] More generally, the PCAIDs and related methods were applied more widely in post by Swinand, Hennessy, and O'Meara (2015).[17]

[16] Gregory Swinand & Hugh Hennessy, 2014. "Estimating postal demand elasticities using the PCAIDS method," Chapters, in: The Role of the Postal and Delivery Sector in a Digital Age, chapter 5, pages 65-74 Edward Elgar Publishing.

[17] Gregory Swinand, Hugh Hennessy, Graeme O'Meara, Chapter, Postal and Delivery Innovation in the Digital Economy, Volume 50 of the series Topics in Regulatory Economics and Policy pp 115-129, Date: 28 November 2015, A Demand System Approach to Affordability

5 Econometric Analysis and Results

In this section we present the econometric results of our analysis of the Belgian postal market. This section will also provide an analysis of cross-price effects of some of the key postal products, estimated using the PCAIDS model.

We start our analysis by computing an aggregate price elasticity which takes into account longer trends of volumes and prices using our longer time series dataset. This provides an insight of the relationship between aggregated volumes and tariffs within the overall postal market. The aggregate industry price elasticity (or industry price elasticity in the table below) is inelastic since it is estimated to be at -0.27 (see Table 5.1 below) (see annexes for details).

The final model for the main letter elasticity was as follows:

$$lnv_{ijkt} = \sum_{i=1}^{3}\sum_{k=1}^{3} \alpha_{ik} + \sum_{i=1}^{3} \beta_i lnp_{ijkt} + \sum_{k=1}^{3} \gamma_k t + \varepsilon_{ijkt}$$

Details of model output, further details of model selection and diagnostics are contained in the Annexes. Overall, the model selection process was conducted by first studying the graphics of the simple regressions and simple disaggregated regressions as shown previously in Chapter 3. We then conducted both statistical and sense checks of the models as well as of typical model outputs such as residuals.

We further then received feedback and suggestions from bpost on the models which included valuable insights into aspects such their informed market-based opinions about priors for parameters within the models and estimates. We duly took account of this and considered further modelling, and although the overall conclusions and indeed values were not sensitive to some of these concerns, their inputs are noted in that further refinement of the models was possible.

Table 5.1 further reports the price elasticities of some of the headline products that compose the postal market, differentiated by customer type or weight (where applicable). As we can see, most of postal products are inelastic, therefore in line with the overall aggregate price elasticity, except for bulk national letters and parcel pre-paid (2-10 kg) which are the most elastic.

Table 5.1: Price Elasticities*

	National Letters	Parcel Pre-paid	Direct Mail and Non-Addressed Mail	Industry
Residential	-[CONFIDENTIAL]	-[CONFIDENTIAL]	n.a.	-[CONFIDENTIAL]
Professional (via Normal Collection)	-[CONFIDENTIAL]	-[CONFIDENTIAL]	n.a.	
Professional (via Mass Collection)	-[CONFIDENTIAL]	-[CONFIDENTIAL]	-[CONFIDENTIAL]	

0-2 kg	n.a.	-[CONFIDENTIAL]	n.a.
2-10 kg	n.a.	-[CONFIDENTIAL]	n.a.

*Estimated via OLS regression
Source: LE Europe Analysis of bpost data provided by BIPT

It is illustrative to further estimate cross-price elasticities using the PCAIDS model, in order to see the degree of substitution across the different segments of the postal market. In order to do so, we first measure cross-sectional market shares (denoted by the revenue of the postal product) within market segments of interest (such as customers or weight). Then we compute the cross-price elasticities via PCAIDS model by using the market shares, own products' price elasticity as well as the aggregate price elasticity presented before.

National Letters

In this section we consider the postal market of national letters. This postal product is differentiated by customers and speed (priority and non-priority).

Market shares are measured using the most recent data available since the introduction of national letters without priority within residential customers in 2019. For instance, we observe that since such introduction took place, [CONFIDENTIAL].

Table 5.2 below reports own and cross-price elasticities for national letters differentiated by speed and calibrated on residential customers. We previously estimated that the price elasticity for national letters for residential customers was -[CONFIDENTIAL] (Table 5.1), therefore inelastic. Non-priority letters in the table below seem to be close substitutes when compared to letters with priority, while both products are inelastic.

Table 5.2: Own and Cross-Price Elasticities for National Letters by Speed, calibrated on Residential Customers

National Letters	Priority	Non-Priority
Priority	-[CONFIDENTIAL]	[CONFIDENTIAL]
Non-Priority	[CONFIDENTIAL]	-[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

We conduct the same exercise except this time Table 5.3 is calibrated on the professional customers (via normal collection) segment. [CONFIDENTIAL] The price elasticity for national letters within the Professional segment was lower (in absolute value) than the residential customers' price elasticity, and inelastic (-[CONFIDENTIAL]). The table below is consistent with the results presented before (Table 5.2) since both products remained inelastic, except for the cross-price effects which are close to zero.

Table 5.3: Own and Cross-Price Elasticities for National Letters by Speed, calibrated on Professional Customers via Normal Collection		
National Letters	Priority	Non-Priority*
Priority	-[CONFIDENTIAL]	-[CONFIDENTIAL]
Non-Priority	-[CONFIDENTIAL]	-[CONFIDENTIAL]
*National Letters (without priority) includes both professional customers via normal and mass collection, since the two can be classified as one postage product and therefore priced the same.		
Source: LE Europe Analysis of bpost data provided by BIPT		

Pre-paid Parcels

Next, we consider the postal market of pre-paid parcels. This postal product is differentiated by customers and weight (0-2 kg and 2-10 kg), with data on the higher weight option not available for residential customers (our understanding is this data was not provided).

We presented before, in Table 5.1, the direct estimates of the price elasticities for parcel by weight, where the higher weight option was the more elastic product.

Table 5.4 below reports cross-price effects for pre-paid parcels differentiated by customers and calibrated on Professional Customers (via Normal Collection). We therefore use the own-price elasticity for parcels for professional customers which is -[CONFIDENTIAL]. The cross-price elasticity effects are positive, suggesting that there is positive substitution among parcels between the two professional customers' segments as well as with residential. The PCAIDS model further estimates that the three postage products are inelastic, but broadly the same as professional parcels; these figures are also in line with the direct estimates of the own-price elasticities presented in Table 5.1.

Table 5.4: Own and Cross-Price Elasticities for Pre-paid Parcels, calibrated on Professional Customers via Normal collection			
Pre-paid Parcels	Professional Customers (via Normal Collection)	Residential	Professional Customers (via Mass Collection)
Professional Customers (via Normal Collection)	-[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]
Residential	[CONFIDENTIAL]	-[CONFIDENTIAL]	[CONFIDENTIAL]
Professional Customers (via Mass Collection)	[CONFIDENTIAL]	[CONFIDENTIAL]	-[CONFIDENTIAL]
Source: LE Europe Analysis of bpost data provided by BIPT			

Non-addressed and Direct Mail

In this next subsection we consider the postal market of other types of mail: non-addressed and direct mail. These postal products are available for professional customers (via normal or mass

collection). [CONFIDENTIAL], we decide to aggregate the two and create one additional postal product. Thus, in this section we consider a postal market that includes direct and non-addressed mail for bulk customers as well as the aggregate of the two for professional customers.

In line with the overall industry, the three postage products are inelastic, as shown in Table 5.5 below which is calibrated on the own-price elasticity for non-addressed and direct mail for bulk customers (-[CONFIDENTIAL]). Cross-price effects are further reported to be all positive, meaning that direct mail is a close substitute for non-addressed mail. Similarly, non-addressed and direct mail for professional customers seem to be closer substitutes for direct and non-addressed mail for bulk customers.

Table 5.6: Own and Cross-Price Elasticities for Non-Addressed and Direct Mail, calibrated on Professional Customers via Mass collection

Non-Addressed and Direct Mail	Non-Addressed Mail	Direct Mail	Non-Addressed Mail and Direct Mail (Professional Customers)
Non-Addressed Mail	-[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]
Direct Mail	[CONFIDENTIAL]	-[CONFIDENTIAL]	[CONFIDENTIAL]
Non-Addressed Mail and Direct Mail (Professional Customers)	[CONFIDENTIAL]	[CONFIDENTIAL]	-[CONFIDENTIAL]

Source: LE Europe Analysis of bpost data provided by BIPT

6 Conclusions

We have estimated elasticities for bpost products across a wide variety of postal products using two different data sets, annual, and monthly from bpost. Particular challenges exist in elasticity estimation as contemporaneous price rises, and exogenous trends, have driven mail volumes down. Some products, such as parcels, have had positive trends. Data challenges are particular in this case as data were limited, and our experience is more disaggregated data (such as by weight, if there are other parameters to bulk, such as size discounts, etc.), longer time series, and more operational detail/accuracy would likely improve estimation.

Despite these challenges, we estimated a number of the main elasticities using OLS regression and some detailed specifications, combining the data in many cases, and then allowing the elasticities to vary by the product types defined by customer type, speed, product, mail type, and weight as applicable. The headline residential letter elasticity estimated was -[CONFIDENTIAL], while the bulk/mass letter was estimated to more elastic at -[CONFIDENTIAL]. This is in line with previous research and our own research and expectations.

Our estimates compare broadly with previous research conducted for the BIPT, such as by WIK, which found residential priority letter elasticities to be -1.77, and business priority letters to be -1.0 for business customers in total but lower for mass collections at -0.71. It is noteworthy that while these estimates are not too dissimilar (without a more formal analysis, it can be seen the estimates' confidence intervals tend to overlap, but a formal analysis would need to test statistical differences), the overall relative sizes are different, that is to say, our results suggest residential users are less prices sensitive, while business users are more price sensitive.

We further investigate elasticities and cross-price elasticities where the regression models did not yield good results using the PCAIDS model. Here, using a headline industry elasticity of -[CONFIDENTIAL]f, we estimated that there is little difference between priority and non-priority residential letter elasticities (using the most recent shares after the product introduction). The PCAIDS model further provided some suggestive evidence that mass direct mail is less elastic than non-addressed mail, and that franked professional mail is a weak substitute for mass mail.

Overall, we stress that the postal market at the current time is very dynamic. Besides data limitations already listed, other factors such as changing technology, structure, but also factors such as USO (at National or EU level), quality of service (e.g., frequency of delivery) all may be changing in the near future and this would be expected to potentially impact the results, and therefore the BIPT may wish to consider this is developing their ongoing research programme.

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ANNEXES

Annex 1 Additional information

A1.1 Derivation of industry elasticity

The PCAIDs model requires an overall industry elasticity as a primary input to the model. In the past, for postal pricing, it was possible to estimate this from aggregate postal demand over a long run aggregate time series. However, this was from a time when USPs were monopolies in their respective businesses, and so the own firm overall elasticity was in fact the industry elasticity (or very close to it). Overtime and with market opening this has changed as firms and other technologies have entered the market. Thus, an aggregate long run elasticity estimate for a USP would not be a good representative for the industry elasticity of demand. In general, the industry elasticity is lower than the single firm own-price elasticity as consumers might switch to a competitive rival firm or form of communications when faced with a price rise. On the other hand, we have only obtained data for Bpost for this project and trying to estimate an industry overall demand elasticity using aggregated data across firms would not be feasible or within scope, time or budget. Further, an initial search of existing research did not indicate any clear candidates for such an elasticity, and further as the industry is fairly dynamic, using up-to-date data might also be considered important.

We therefore use the following method to convert our long run aggregate Bpost elasticity into an industry elasticity. We make use of the standard Cournot model assumptions.
The main results of this are general, and the method's theoretical underpinnings can be found in Pindyck (2010)[18].

For the Cournot profit maximising firm, the firm's first order conditions can be written as follows:

$$\frac{\partial \pi_i}{\partial q_i} = 0 = P(Q) - c + q_i \frac{\partial P}{\partial Q}\frac{\partial Q}{\partial q_i}$$

Where P(Q) is the inverse industry demand function (price), Q is industry demand and q_i is firm-level output for the ith firm. All firms charge the same price in the Cournot symmetric equilibrium, so the market price P() is the same as the firm-level price. Marginal cost is c and is common to all firms.

Or

$$c = P(Q) + q_i \frac{\partial P}{\partial Q}\frac{\partial Q}{\partial q_i}$$

Since there are n symmetric firms in the industry, $q_i = Q/n$; rearranging gives:

[18] https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwjj-PPvwtboAhXTqHEKHRj3BzUQFjAAegQIBhAB&url=http%3A%2F%2Fwww.mit.edu%2F~rpindyck%2FCourses%2FPricing_10.pdf&usg=AOvVaw0hxDvingMqMYOtNWya4g5c.

$$\frac{P(Q)-c}{P} = -\frac{1}{n}\frac{Q}{P}\frac{\partial P}{\partial Q}\frac{\partial Q}{\partial q_i}$$

The middle term is the inverse of the industry elasticity, $1/\varepsilon$:

$$-\frac{Q}{P}\frac{\partial P}{\partial Q} = 1/\varepsilon$$

And in the Cournot equilibrium, the assumption is firms match each others' variations in quantity, and a change in firm level quantity increases industry quantity 1:1; $\frac{\partial Q}{\partial q_i} = 1$, so:

$$\varepsilon = \frac{1}{n}\varepsilon_i$$

In other words, the industry elasticity is 1/n times the own firm elasticity, where n is the number of firms operating in the industry.

While if firms are equal size, the above holds, this is rarely the case. But an adjustment for unequal size firms can be made; the above formula can be adjusted to account for unequal size firms (see Pindyck 2010*, op cit*).

$$\varepsilon = \frac{1}{n^*}\varepsilon_i$$

Where 1/n* is now the HHI, or Herfindahl index.[19] A monopoly would give an HHI of 1; a duopoly with equal sized firms 0.5; a duopoly with one firm 2x the size of the second firm; 0.56; and finally, a three-firm market with firms roughly 2x the size of the smaller, 0.29, and so on.

While overall evidence on the HHI for the overall Belgian Postal industry is difficult to find, an estimate of postal mark-ups can be found of around 1.1. Information on the HHI is available from a variety of sources. The BIPT's own 2018 market observatory indicates and HHI of about 4000 (0.4 in decimals), for 2018 with a strong downward trend. See Figure 5 overleaf from the 2018 Observatory Report.[20] Other evidence include the European Regulators Group is consistent with this estimate but less up to date.[21]

Given this uncertainty we take a range of estimates for the HHI. The HHI might be of a range of 0.33 to 0.55. The industry overall elasticity thus is estimated to be about 1/2 to 1/3 the magnitude of the own-firm elasticity.

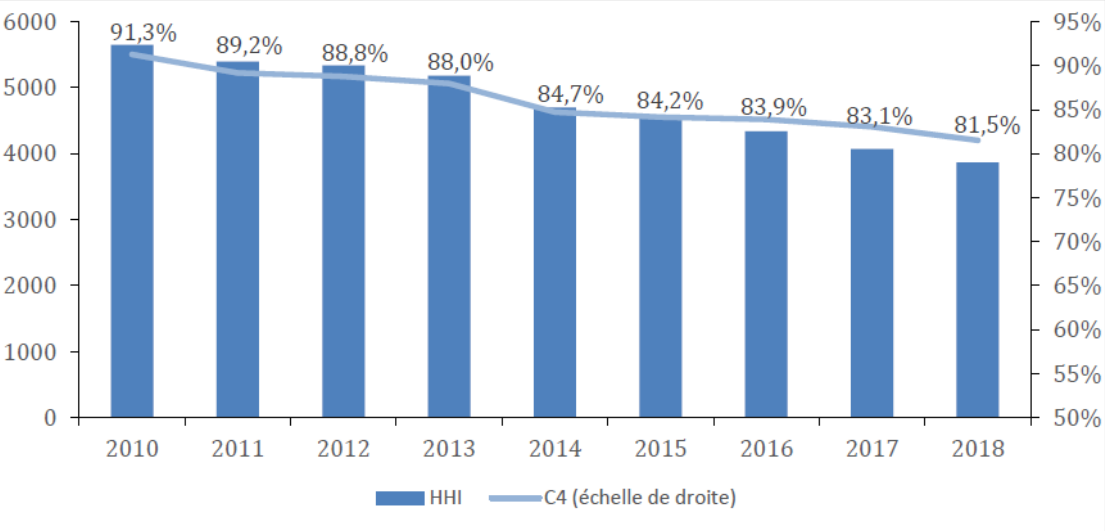
[19] This is defined as the sum of the market shares squared. The HHI is often presented in terms of % market shares, and we note in this case the shares should be in decimal fractions.

[20] https://www.ibpt.be/operateurs/publication/communication-du-27-novembre-2019-concernant-lobservatoire-du-marche-des-activites-postales-en-belgique-pour-2018.

[21] The range of elasticity estimates we use is consistent with the HHI measured by the European Regulators Group for Postal Services (ERGP). The HHI for the Belgian postal market was estimated at 0.45 (or 4500) for the year 2014 (ERGP Report on Core Indicators for Monitoring the European Postal Market (3 December 2015, ERGP)).

From that perspective, we take the aggregate longer time series elasticity estimate we estimated via OLS. Here we found an elasticity of, -0.829, and multiply it by 0.333 (for our base case), and 0.55 (as a sensitivity). This gives us a range of industry elasticity estimates of -0.46 to -0.27.

Figure 5 : Taux de concentration horizontale sur la base du chiffre d'affaires au moyen des indices HHI et C4



Source : IBPT

A1.2 Elasticity estimation output details

In this section we report the models used to estimate the price elasticities of some of the postage products reported in Table 5.1 of Section 5 (Econometric Analysis and Results). The results presented below are direct regression outputs and residual diagnostics from the statistical software used, Stata.

Residual diagnostics are presented in the form of: an histogram, from which we observe the distribution of residuals; a scatterplot of residuals over time.

National Letters

National letters can be differentiated by customer type and speed. However, national letters without priority for residential and mass customers were only recently introduced. For this reason, the direct estimation of separate elasticities for speed did not yield significant results. Instead, for the postal market of national letters we run the following model:

```
reg lnv c.lnp##i.cust i.prod##c.year d12 d_sum
```

Where:

- ln is the natural logarithm
- v is volume
- p is price
- cust is customer type
- year is year
- d12 is a dummy variable for December
- d_sum is a dummy variable for summer months (June, July and August)

Additional detailed diagnostics including AIC and BIC (information criterion statistics) were calculated and compared among models. Virtually identical results were obtained from the main models for national letters.

Other diagnostics included MA regressions of residuals and lagged residuals and prais-regression (an AR1 error correction) but all these indicated a) no sensitivity in the models and outcomes to the assumptions and b) no problems of violation of the linear assumptions.

We further used robust regression and robust errors and calculated standard errors of the residuals by month or other factors and compared the results which indicated heteroskedasticity was not a problem.

The first model below was chosen subsequent to first our extensive model selection and diagnostics, and then subsequent to our discussions and presentations to bpost, and then further model testing and checking. The model is virtually identical to other models but allows both the slopes and intercept parameters to interact with customer type and product to interact with both slope and intercept on the time index proxy year. While all the diagnostics, AIC and BIC, and tests indicated the models were virtually identical, and indeed the marginal predicted values, which are needed to estimate the elasticity with interaction effects were also virtually identical, the model below has the added and remarkable property of both significant and expected signs for every parameter save the December (12th month) dummy, d12. [CONFIDENTIAL].

Table Annex 1.1a: National Letters elasticity regression with dummy variables, 2014-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

The next table shows the marginal effects by customer type. It should be noted that the elasticity and marginal effects are different by customer type and need to be calculated rather than merely observed from the table since the lnp term is interacted on both the slope and intercept with customer type. Interpretation of the above table is that -[CONFIDENTIAL] is the baseline elasticity (wrt customer=1, which is bulk) and then the elasticity with respect to each customer type is a functon of the baseline slope coefficient plus the cust#product interaction coefficient, as the marginal effect is the partial derivative given the customer type. As the elasticities are then a function of the volume, the elasticity of a given customer type must further take account of the mean value for the volume of that customer type. This can all be achieved algebraically or using the margins command in STATA (which is presented below).

We further present additional disaggregated models which show a much higher and significant elasticity when not accounting for the customer and price elasticity marginal effect (but disaggregating by customer and product).

Table Annex 1.2a_M: Marginal effects National Letters elasticity regression with dummy variables, 2014-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

The elasticity with respect to customer type (1=mass, 2=pro, and 3=resident) is shown. The effects are statistically significant as indicated by the *low* p-value.

Table Annex 1.3b: National Letters elasticity regression with dummy variables, 2014-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

Table Annex 1.4b_M: Marginal effects National Letters elasticity regression with dummy variables, 2014-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

```
*Additional Disaggregated models.
```

Table Annex 1.5: Additional Disaggregated models

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

Figure Annex 1.1: Residual Plots for National Letters

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

Pre-paid Parcels

We define the following model to estimate the elasticities involved with Bpost's parcel products (a):

(a) `reg lnv c.lnp#i.cust i.weight  c.year  d_sum if prod==4`

Where:

- ln is the natural logarithm
- v is volume
- p is price
- cust is customer type
- weight is parcels' weight
- year is year
- d_sum is a dummy variable for summer months (June, July and August)
- prod is parcels pre-paid (categorized as 4)

Table Annex 1.6: Pre-paid Parcels elasticity regression with dummy variables (model a), 2014-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

Figure Annex 1.2: Residual plots for Pre-paid Parcels (Model a)

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

We also run the following model (b) to directly estimate the separate elasticities for weight:

(b) `reg lnv c.lnp#i.weight year i.d_sum if prod==4`

Where:

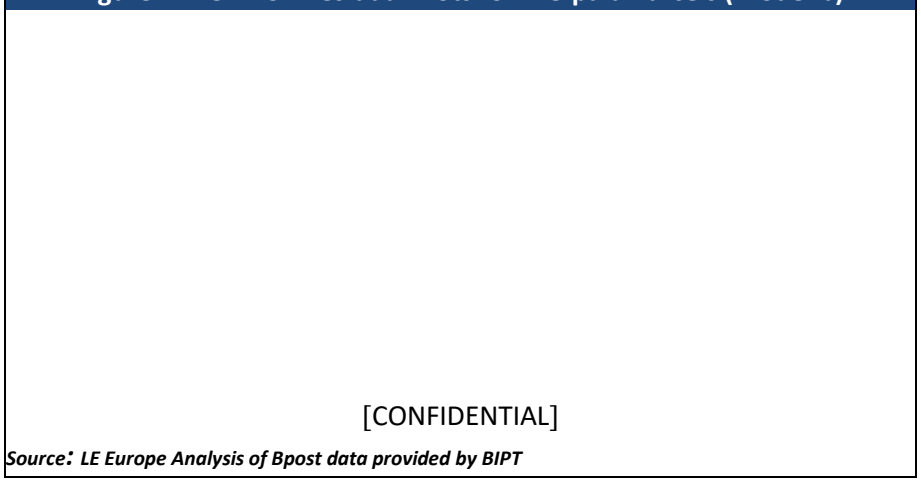
- ln is the natural logarithm
- v is volume
- p is price
- year is year
- weight is weight
- d_sum is a dummy variable for summer months (June, July and August)
- prod is parcels pre-paid (categorized as 4)

Table Annex 1.7: Pre-paid Parcels elasticity regression with dummy variables (model b), 2014-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

Figure Annex 1.3: Residual Plots for Pre-paid Parcels (Model b)



Source: LE Europe Analysis of Bpost data provided by BIPT

Direct and Non-Addressed Mail

We also define the following model to estimate the elasticities of other types of mail such as Direct and Non-Addressed Mail:

```
reg lnv c.lnp##i.cust  year i.d_sum if ifmail==772 | ifmail==773
```

Where:

- ln is the natural logarithm
- v is volume
- p is price
- cust is customer type
- year is year
- d_sum is a dummy variable for summer months (June, July and August)
- Ifmail is Non-Addressed Mail (categorized as 772) and Direct Mail (categorized as 773)

Table Annex 1.8: Direct and Non-Addressed Mail elasticity regression with dummy variables, 2014-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

Figure Annex 1.4: Residual Diagnostics for Direct and Non-Addressed Mail

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

We also decide to run the same model except this time instead of including a dummy variable for summer months, we include an election dummy since most of election literature comes via non-addressed mail. By controlling for election times, we expect an increase in volumes of Non-Addressed mail circa one month before an election takes place. We now define the following model:

```
reg lnv c.lnp##i.cust  year i.d_election if ifmail==772 | ifmail==773
```

Where:

- ln is the natural logarithm
- v is volume
- p is price
- cust is customer type
- year is year
- d_election is a dummy variable for the month before an election took place (April 2014, September 2018, April 2019)
- Ifmail is Non-Addressed Mail (categorized as 772) and Direct Mail (categorized as 773)

We find that the coefficient of the election dummy is insignificant and does not change the results presented before.

Table Annex 1.9: Direct and Non-Addressed Mail elasticity regression with election dummy variable, 2014-2019

[CONFIDENTIAL]

Source: LE Europe Analysis of Bpost data provided by BIPT

A1.3 Additional Sensitivities on Price Elasticities

In this section we run additional sensitivity checks on the price elasticities presented in Section 5 (Econometric Analysis and Results). The sensitivity checks consist on changing the calibration of the PCAIDS model within the postal market of pre-paid parcels; and using the highest (in absolute value) industry elasticity estimate (-[CONFIDENTIAL])[22] (see Annex A1.1) for the estimation of own and cross-price elasticities of the postage products.

Below we report table Annex 1.6 and 1.7 for pre-paid parcels calibrated on residential and professional customers (via mass collection). The two tables are consistent with Table 5.4 (Section 5), meaning that a different model calibration yields the same results. Cross-price effects are positive, and the own-price elasticity of the three postage products is inelastic and in line with the direct estimate of the price elasticities (by customers) presented in Table 5.1 (Section 5).

Table Annex 1.10: Own and Cross-Price Elasticities for Pre-paid Parcels, calibrated on Residential Customers

Pre-paid Parcels	Residential	Professional Customers (via Normal Collection)	Professional Customers (via Mass Collection)
Residential	-[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]
Professional Customers (via Normal Collection)	-[CONFIDENTIAL]	-[CONFIDENTIAL]	[CONFIDENTIAL]

[22] The results presented in Section 5 (Econometric Analysis and Results) used an industry elasticity estimate of -[CONFIDENTIAL].

Professional Customers (via Mass Collection)	[CONFIDENTIAL]	[CONFIDENTIAL]	-[CONFIDENTIAL]
Source: LE Europe Anaysis of Bpost data provided by BIPT			

Table Annex 1.11: Own and Cross-Price Elasticities for Pre-paid Parcels, calibrated on Professional Customers (via Mass Collection)

Pre-paid Parcels	Professional Customers (via Mass Collection)	Professional Customers (via Normal Collection)	Residential
Professional Customers (via Mass Collection)	-[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]
Professional Customers (via Normal Collection)	[CONFIDENTIAL]	-[CONFIDENTIAL]	[CONFIDENTIAL]
Residential	[CONFIDENTIAL]	[CONFIDENTIAL]	-[CONFIDENTIAL]
Source: LE Europe Anaysis of Bpost data provided by BIPT			

The tables below report own and cross-price elasticities measured using the highest (in absolute value) industry elasticity estimate (-[CONFIDENTIAL]) within the postal market of the following postal products: national letters by speed (calibrated on residential and professional customers), pre-paid parcels by customers (calibrated on mass and professional customers), and direct and non-addressed mail by customers (calibrated on mass customers).

Due to the recent introduction of national letters without priority among residential and mass customers, we were not able to measure direct estimates for speed. For this reason, we use the PCAIDS model to estimate the own-price elasticities for national letters, and as we can see from the tables below (which differ by model calibration), changing the industry price elasticity yielded similar own-price elasticities, consistent with Tables 5.2 and 5.3 in Section 5 (Econometric Analysis and Results). Cross-price effects are now negative, although the magnitude of the change is small.

Table Annex 1.12: Own and Cross-Price Elasticities for National Letters by Speed, calibrated on Residential Customers		
National Letters	Priority	Non-Priority
Priority	-[CONFIDENTIAL]	-[CONFIDENTIAL]
Non-Priority	-[CONFIDENTIAL]	-[CONFIDENTIAL]
Source: LE Europe Anaysis of Bpost data provided by BIPT		

Table Annex 1.13: Own and Cross-Price Elasticities for National Letters by Speed, calibrated on Professional Customers (via Normal Collection)		
National Letters	Priority	Non-Priority
Priority	-[CONFIDENTIAL]	-[CONFIDENTIAL]
Non-Priority	-[CONFIDENTIAL]	-[CONFIDENTIAL]
Source: LE Europe Anaysis of Bpost data provided by BIPT		

The results for the postal market of pre-paid parcels are always consistent to different model calibrations and change in industry price elasticity. In fact, cross-price effects are always found to be positive, and own-price elasticities to be very similar to the direct estimates found in Table 5.1 (Section 5).

Table Annex 1.14: Own and Cross-Price Elasticities for Pre-paid Parcels, calibrated on Professional Customers (via Mass Collection)			
Pre-paid Parcels	Professional Customers (via Mass Collection)	Professional Customers (via Normal Collection)	Residential
Professional Customers (via Mass Collection)	-[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]
Professional Customers (via Normal Collection)	[CONFIDENTIAL]	-[CONFIDENTIAL]	[CONFIDENTIAL]
Residential	[CONFIDENTIAL]	[CONFIDENTIAL]	-[CONFIDENTIAL]
Source: LE Europe Anaysis of Bpost data provided by BIPT			

Table Annex 1.15: Own and Cross-Price Elasticities for Pre-paid Parcels, calibrated on Professional Customers (via Normal Collection)			
Pre-paid Parcels	Professional Customers (via Normal Collection)	Residential	Professional Customers (via Mass Collection)
Professional Customers (via Normal Collection)	-[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]
Residential	[CONFIDENTIAL]	-[CONFIDENTIAL]	[CONFIDENTIAL]
Professional Customers (via Mass Collection)	[CONFIDENTIAL]	[CONFIDENTIAL]	-[CONFIDENTIAL]
Source: LE Europe Anaysis of Bpost data provided by BIPT			

In conclusion, non-addressed and direct mail is also always consistent to different model calibrations and change in industry price elasticity. Positive cross-price effects mean that the three products are close substitutes, and own-price elasticities are in line with the direct estimate reported in Table 5.1 (Section 5).

Table Annex 1.16: Own and Cross-Price Elasticities for Non-Addressed and Direct Mail, calibrated on Professional Customers via Mass collection			
Non-Addressed and Direct Mail	Non-Addressed Mail	Direct Mail	Non-Addressed Mail and Direct Mail (Professional Customers)
Non-Addressed Mail	-[CONFIDENTIAL]	[CONFIDENTIAL]	[CONFIDENTIAL]
Direct Mail	[CONFIDENTIAL]	-[CONFIDENTIAL]	[CONFIDENTIAL]
Non-Addressed Mail and Direct Mail (Professional Customers)	[CONFIDENTIAL]	[CONFIDENTIAL]	-[CONFIDENTIAL]
Source: LE Europe Anaysis of Bpost data provided by BIPT			

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