

**Communication du Conseil de l'IBPT
du 20 avril 2021
concernant
les études d'élasticité des produits postaux**

Version non-confidentielle

TABLE DES MATIÈRES

Introduction	3
1. Élasticités considérées	3
2. Rétroactes.....	4
Méthodologie	5
3. Enquête auprès des utilisateurs postaux (annexe 1).....	5
4. Étude de littérature (annexe 1).....	5
5. Interview des opérateurs postaux (annexe 1)	6
6. Analyse économétrique (annexe 2).....	6
Résultats.....	6
7. Enquête auprès des utilisateurs postaux, interview des opérateurs et étude de la littérature (annexe 1) 6	
8. Analyse économétrique (annexe 2).....	12
Publications.....	13

Introduction

1. Élasticités considérées

1. L'élasticité est une notion importante en économie parce qu'elle reflète un degré de sensibilité aux changements (par exemple, la sensibilité au prix dans le cas de l'élasticité des prix). L'élasticité-prix de la demande indique par exemple dans quelle mesure la quantité demandée pour certains biens ou services réagira à une évolution du prix de ces biens ou services.
2. En général, l'on constate une corrélation négative entre le prix et la quantité demandée. En effet, pour la plupart des produits ou services, le fait est que lorsque le prix est plus élevé, les produits ou services sont moins demandés. À l'inverse, lorsqu'un prix est plus bas, une demande plus élevée est d'habitude constatée.
3. Le niveau de variation de la quantité demandée à une modification des prix est mesuré par le niveau d'élasticité-prix. Si l'élasticité-prix est inférieure en valeur absolue à 1, il est question d'une demande inélastique : l'évolution de la quantité demandée sera relativement moins forte que celle du prix. À l'inverse, l'on parle de demande élastique si l'élasticité des prix est supérieure à 1, ce qui implique que le degré d'évolution de la demande sera relativement plus important que celui du prix.
4. Une élasticité-prix de la demande compare donc ce qui suit (Abraham, Buyst, De Bruyne, et al., 2000) :

Élasticité-prix :

$$E_p^V = \frac{\text{évolution relative de la quantité demandée}}{\text{évolution relative du prix}}$$

Soit :

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

5. L'analyse économétrique effectuée aborde également quelques élasticités croisées. L'élasticité croisée renvoie au degré auquel la demande pour un produit réagira au changement de prix d'un autre produit. Une élasticité croisée négative indique des biens qui se complètent, ce que l'on appelle les biens complémentaires. Une élasticité croisée positive renvoie par contre à des biens qui peuvent (dans une certaine mesure) être considérés comme des alternatives, il s'agit alors de biens substituables.
6. Nous avons donné ci-dessus l'exemple de l'élasticité-prix, mais toutes sortes d'élasticités peuvent naturellement être calculées. Dans cette étude, nous examinons également l'élasticité de la fréquence de distribution. Cette élasticité indique le degré auquel le volume de la quantité demandée en matière de services postaux évoluera suite à une modification du nombre de distributions par semaine, tenant compte d'un certain prix fixe. En l'occurrence, elle est déterminée par l'équation suivante :

Élasticité de la fréquence de distribution :

$$E_b^V = \frac{\text{évolution relative de la quantité demandée}}{\text{évolution relative de la fréquence de distribution}}$$

Soit :

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

2. Rétroactes

7. L'IBPT a déjà publié en 2016 la synthèse d'une étude d'élasticités effectuée par M.A.S. (Market Analysis & Synthesis) pour le compte de l'IBPT¹. Il s'agissait alors d'une étude d'élasticités réalisée à l'aide d'une enquête en ligne auprès de particuliers, d'indépendants et de PME, et d'une enquête écrite auprès de grandes entreprises et de services publics.
8. Une mise à jour des coefficients d'élasticité s'imposait après quelques années d'évolutions sur le marché postal. Il y avait également le souhait d'étendre la portée de l'étude. Une diversification du nombre d'approches permettait d'étendre et d'évaluer les connaissances. En effet, chaque méthodologie présente ses avantages, ses limitations et ses inconvénients. Pour cette édition, l'IBPT a ainsi souhaité prévoir, en plus d'une enquête, une étude de littérature, un entretien avec des opérateurs postaux et qu'une analyse économétrique.
9. L'étude de la littérature, la consultation des opérateurs postaux ainsi que la rédaction et l'analyse des enquêtes auprès des particuliers et des professionnels ont été effectuées par WIK Consult. M.A.S. a réalisé ces enquêtes. Enfin, London Economics a effectué l'analyse économétrique sur la base de séries chronologiques fournies par bpost. Le questionnaire pour l'enquête a été rédigé pendant les mois d'avril et de mai 2019. Ensuite, l'enquête a été réalisée entre mai et juillet 2019. Pendant cette période, des entretiens ont également eu lieu avec trois opérateurs. Une analyse a ensuite été effectuée et le rapport a été rédigé. L'analyse économétrique de London Economics y a enfin été ajoutée. Sur la base des données fournies par bpost en décembre 2019 et en mars 2020, ce rapport a également vu le jour.
10. Depuis le 24 juin 2020, les opérateurs concernés ont eu l'opportunité de formuler des remarques et d'en préciser le niveau de confidentialité. Cela a donné lieu à quelques reformulations et à la création d'une version non confidentielle. Compte tenu des remarques et questions spécifiques soulevées par bpost le 12 août 2020 à propos de la méthodologie utilisée dans l'analyse économétrique, une réunion a s'est tenue le 16 septembre 2020 entre bpost, London Economics et l'IBPT. À la suite de cette réunion, London Economics a davantage affiné le modèle pour répondre aux préoccupations de bpost. Cet affinage du modèle n'a toutefois pas eu d'incidence (significative) sur les résultats obtenus. Une version adaptée du rapport a été transmise le 30 septembre 2020 à bpost. Laquelle a ensuite fait savoir le 5 février 2021 qu'elle n'avait aucune remarque complémentaire, bien qu'elle soit encore quelque peu surprise par certains résultats.

¹ Communication du Conseil de l'IBPT du 24 octobre 2016 concernant les résultats de l'étude des élasticités des produits postaux sur le marché postal belge

Méthodologie

3. Enquête auprès des utilisateurs postaux (annexe 1)

11. En ce qui concerne l'approche, lors de la rédaction du questionnaire des utilisateurs postaux, l'on a opté pour le « test monadique doux »². Des questions individuelles pour les attentes concernant la demande pour une diminution/augmentation de prix donnée sont ce faisant séparées et leur ordre est randomisé pour minimiser les réponses stratégiques. Étant donné que l'approche monadique douce diminue les réponses stratégiques et maintient tout de même une taille d'échantillon raisonnable, cette approche a été choisie. Les répondants ont été exclus lorsqu'ils étaient employés d'un opérateur postal pour éviter un biais dans les réponses. En outre, les répondants n'utilisant pas de services postaux ont également été écartés. Une fois ces cas exclus, la taille de l'échantillon obtenue était de 2.072 pour l'enquête relative aux utilisateurs particuliers et de 2.019 pour l'enquête relative aux utilisateurs professionnels.
12. Afin d'assurer une évaluation représentative des utilisateurs résidentiels, les cas ont été pondérés selon l'occurrence naturelle de l'âge, du genre et de la région dans les populations de plus de 18 ans. Étant donné que l'analyse initiale a révélé que certains répondants indiquaient qu'ils enverraient des quantités déraisonnablement élevées de lettres et de colis, une vérification supplémentaire a été effectuée spécifiquement pour ce groupe de l'enquête. Étant donné que les distributions des volumes d'envois annuels renseignés par les utilisateurs résidentiels pour chaque prix et date individuels ne s'approchaient pas d'une distribution normale selon le test de Kolmogorov-Smirnov appliqué, c'est la méthode développée par Tukey (1977)³ qui a été appliquée pour détecter et supprimer les valeurs aberrantes.

4. Étude de littérature (annexe 1)

13. Les recherches concernant l'élasticité- prix de la demande pour les courriers ont été abordées en détail dans la littérature par le passé, alors que d'autres facteurs importants déterminants de la demande pour les courriers ont été traités dans une bien moindre mesure. Notamment, l'élasticité de la demande en fonction de la qualité générale du service est uniquement traitée dans quelques études et l'élasticité de la demande concernant des aspects qualitatifs seuls, comme les jours de distribution par semaine, est à peine analysée dans la littérature. Les recherches récentes (par exemple, Rodriguez et al. 2018, Cazals et al. 2018) se concentrent de plus en plus sur l'e-substitution plutôt que sur le prix comme principal facteur déterminant de la demande de services postaux (outre l'activité économique).

² Pour son questionnaire de 2016, M.A.S. a appliqué la technique dite de l'échelonnement (« laddering »), qui est en fait l'une des méthodes les plus utilisées pour obtenir l'élasticité-prix. Cette technique a l'avantage de fournir une comparaison intra-individuelle. Les personnes sondées peuvent comparer directement toutes les options possibles et exprimer ensuite des attentes concernant leur comportement. Le désavantage de cette technique est toutefois qu'elle a tendance à recueillir des réactions stratégiques et suivant un modèle (« pattern »).

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

5. Interview des opérateurs postaux (annexe 1)

14. Dans le contexte de l'étude, trois opérateurs postaux actifs en Belgique ont été interrogés : l'opérateur historique et fournisseur du service universel, bpost, le concurrent principal sur le segment du courrier, TBC Post⁴, et un concurrent sur le segment des colis, à savoir Post NL. Les entretiens ont eu lieu entre mai et juin 2019. Sur la base des entretiens, des notes détaillées ont été rédigées et revues par les entreprises interrogées pour s'assurer qu'elles garantissaient l'exactitude des positions exprimées.

6. Analyse économétrique (annexe 2)

15. bpost a fourni deux bases de données utilisées pour l'analyse économétrique. Tout d'abord, la base de données fournie en décembre 2019, contenant des données mensuelles concernant les volumes et les prix de janvier 2014 à juin 2019. Celle-ci concernait aussi bien les principaux produits pour les clients résidentiels (courrier national prioritaire ou non, courrier recommandé national et colis prépayés achetés au guichet) que ceux pour les clients non résidentiels (courrier national prioritaire ou non, courrier recommandé national, colis prépayés, publicité non adressée, publipostage (Direct Mail), périodiques et journaux). Pour les clients professionnels, un prix moyen, sur base du chiffre d'affaires et du volume, a été utilisé et une distinction a également été faite entre la levée normale (comme pour les particuliers dans une boîte postale, un point postal ou un distributeur de colis) et le dépôt de volumes d'envois plus importants directement dans des centres Masspost. En mars 2020, bpost a ensuite également fourni sa série chronologique la plus longue possible pour le courrier adressé résidentiel et non résidentiel, avec des chiffres annuels concernant les volumes et les prix de 2010 à 2019.
16. La modélisation s'est basée sur trois approches primaires. La première approche comprend l'utilisation des données de séries chronologiques annuelles agrégées du deuxième ensemble de données fourni pour estimer une élasticité générale ou plus agrégée sur le long terme. La deuxième approche plus détaillée est la combinaison des données mensuelles désagrégées par produits pour créer une sorte d'ensemble de données par produit et par période. L'estimation de l'élasticité a ensuite été examinée en évaluant l'interaction de la pente et des estimations de paramètres constantes avec des combinaisons des simulations catégoriques qui définissent les produits, et d'autres variables comme la tendance année/temps et les variables indicatrices liées aux saisons. Enfin, une troisième approche est la méthode PCAIDS⁵, qui permet de calculer l'élasticité-prix propre et croisée de produits analogues.

Résultats

7. Enquête auprès des utilisateurs postaux, interview des opérateurs et étude de la littérature (annexe 1)

17. Ce chapitre examine les résultats de l'enquête (de 2019) auprès des utilisateurs postaux et compare ceux-ci aux résultats de l'enquête de 2016 et aux informations de l'étude de littérature. En outre, les contributions des opérateurs sont aussi expliquées textuellement.
18. Pour l'élasticité-prix de la demande pour les utilisateurs résidentiels (tableau 1), les éléments principaux suivants ont été observés :

⁴ Mosaïc SPRL (TBC Post) a fait faillite à la fin de l'année 2019, voir L'Echo 14 décembre 2019 : « TBC Post, le seul rival de bpost dans l'activité de courrier, dépose le bilan ».

⁵ Une extension du modèle AIDS, ou « Almost Ideal Demand System ».

- Les consommateurs ont estimé que 61 % des services postaux traditionnels basés sur le papier sont déjà remplacés par des services électroniques. Une nouvelle substitution de 5 points de pourcentage est attendue pour 2020. Lors des entretiens, les opérateurs postaux ont confirmé qu'une première phase de l'e-substitution avait déjà eu lieu, mais qu'ils s'attendaient à ce que celle-ci se poursuive.
- Les élasticités-prix observées lors de l'enquête de 2019 pour tous les services fournis dans le cadre du régime du service universel (non prioritaire, prioritaire, courrier recommandé et colis) sont hautement élastiques (entre -1,69 et -2,9) comme le montre le tableau ci-dessous. Dans l'ensemble, les élasticités-prix observées en 2019 semblent de prime abord supérieures aux valeurs observées en 2016 et aux séries historiques issues de la littérature. Toutefois, les résultats de l'enquête de 2019 concernent uniquement les utilisateurs résidentiels, alors que l'enquête de 2016 et la littérature fournissent (principalement) des résultats pour les deux groupes d'utilisateurs combinés, résidentiels et non résidentiels. Pour procéder à une comparaison correcte, une moyenne a donc été calculée pour les valeurs observées en 2019 pour les utilisateurs résidentiels et non résidentiels.
- Une comparaison des moyennes de 2019 montre que les élasticités-prix observées pour les lettres non prioritaires et prioritaires sont légèrement inférieures à celles de 2016, mais toujours plus élevées que les séries historiques observées dans la littérature. Toutefois, les valeurs observées dans la littérature sont pour la plupart obtenues via une méthode différente (souvent sur la base d'une analyse économétrique), ce qui pourrait expliquer les valeurs inférieures.
- Les résultats de la littérature indiquent également des élasticités-prix élevées pour les colis, même au-delà des valeurs observées dans l'enquête de 2019.
- Lors des entretiens avec les opérateurs belges, il a été noté que les envois recommandés figuraient parmi les services les plus susceptibles d'être remplacés par des services électroniques, ce qui pourrait expliquer l'élasticité-prix élevée observée⁶.
- Les opérateurs ont également indiqué lors des entretiens que le moteur de la demande pour les envois recommandés était principalement la garantie de livraison avec un accusé de réception juridiquement accepté plutôt que le prix. En ce qui concerne les colis, les opérateurs ont noté lors des entretiens qu'à cause de la concurrence, l'élasticité-prix était assez élevée.
- Le fait que les clients résidentiels affichent des élasticités supérieures pour des niveaux de prix supérieurs peut confirmer le biais inhérent aux méthodes d'enquête visant à évaluer les élasticités, à savoir la tendance de ces derniers à éviter des niveaux de dépense élevés sans pour autant se rendre compte de leur capacité ou non à substituer le produit par un autre⁷.

Tableau 1 : Élasticité-prix de la demande - Clients résidentiels

Catégories de produits	Enquête WIK/MAS 2019/20 (résidentiels)	Enquête WIK/MAS 2019/20 (résidentiels et non résidentiels)	Enquête MAS 2016 (résidentiels et non résidentiels)	Fourchette historique issue de la littérature (résidentiels et non résidentiels)
Courrier non prioritaire (0-50 grammes)	-1,69	-1,35	-1,51	-0,2 à -0,9

⁶ Le niveau tarifaire d'un envoi recommandé est en outre plusieurs fois supérieur à celui d'un envoi régulier, ce qui pourrait entraîner une sensibilité au prix supérieure.

⁷ Dans le rapport ci-joint, WIK-Consult discute plus en détail de ce problème de biais dans les méthodes d'enquête et de la manière dont cela a été contré au maximum dans cette étude.

Courrier prioritaire (0-50 grammes)	-1,77	-1,46	-1,51	-0,1 à -0,8
Courrier recommandé (0-50 grammes)	-1,91	-1,34	-0,28	-0,1 à -0,8
Colis (0-2 kg)	-2,90	-2,04	-1,45	-0,8 à -3,5

Source : WIK-Consult

19. Pour l'élasticité de la fréquence de distribution de la demande pour les utilisateurs résidentiels (tableau 2), les éléments principaux suivants ont été observés :

- La valeur moyenne observée (deuxième colonne) pour le courrier non prioritaire standard se situe dans la marge attendue sur la base de la littérature⁸. Sur la base des entretiens, on note que la fréquence de distribution actuelle des courriers convient aux utilisateurs résidentiels (3 jours ouvrables à compter de l'envoi pour le courrier non prioritaire et 1 pour le courrier prioritaire), même si l'on s'attendait à ce que les courriers prioritaires soient plus sensibles à la fréquence de distribution.
- Pour les courriers recommandés et les colis, l'on a observé une sensibilité à la fréquence de distribution bien plus élevée que celle de l'enquête de 2016. Les entretiens ont révélé qu'il y avait une tendance sur le marché à une distribution quotidienne et que cela pourrait même devenir la norme sur le marché (établie par de grands détaillants en ligne).

Tableau 2 : Élasticité de la la fréquence de distribution de la demande - Clients résidentiels

Catégories de produits	Enquête WIK/MAS 2019/20 (résidentiels)	Enquête WIK/MAS 2019/20 (résidentiels et non résidentiels)	Enquête MAS 2016 (résidentiels et non résidentiels)
Courrier non prioritaire (0-50 grammes)	0,40	0,22	-0,46
Courrier prioritaire (0-50 grammes)	-0,38	-0,25	-0,46
Courrier recommandé (0-50 grammes)	2,52	1,40	0,36
Colis (0-2 kg)	1,60	0,90	0,28

Source : WIK-Consult

20. Pour le segment non résidentiel (tableaux 3 et 4), les éléments principaux suivants ont été observés :

⁸ L'analyse de littérature ne comprenait que quelques études du Royaume-Uni où l'amélioration du délai d'acheminement du courrier avait un effet faiblement positif sur la demande postale, généralement entre 0,2 et 0,5.

- Dans l'ensemble, l'élasticité-prix est clairement moins élevée pour les utilisateurs non résidentiels que pour les utilisateurs résidentiels ; la valeur la plus élevée observée pour les utilisateurs non résidentiels dans l'enquête de 2019 est de -1,17 contre -2,90 pour les utilisateurs résidentiels (colis). Cela a également été confirmé dans les entretiens, lors desquels les opérateurs ont indiqué que la sensibilité au prix était faible pour le courrier restant utilisé par les entreprises et qu'une poursuite de l'e-substitution dépendrait de la capacité des entreprises à investir dans une structure IT et non des prix et/ou de la qualité.
- Sur la base de l'analyse de littérature, il s'est avéré que la demande de services postaux, notamment pour les utilisateurs non résidentiels, était déterminée dans une large mesure par d'autres paramètres que le prix, comme le développement macro-économique.
- En général, nous avons observé dans l'enquête de 2019 que plus le volume d'envois d'une entreprise est élevé, moins sa réaction aux changements de prix sera prononcée. D'autres facteurs semblent plus importants. En d'autres termes, l'on observe une plus grande élasticité-prix de la demande pour les petites et moyennes entreprises par rapport aux grandes entreprises utilisant des envois en nombre⁹. Autrement dit, il semble y avoir une différence dans la capacité de changer de méthode de selon la taille des entreprises. Cela pourrait s'expliquer par un prix moyen par lettre inférieur et des coûts de changement élevés dus aux systèmes intégrés et aux procédures des grandes entreprises et de leurs fournisseurs de distribution d'envois en nombre. D'autre part, la capacité d'estimation de plus grandes entreprises pourrait aussi être plus précise, les entreprises plus modestes, tout comme les particuliers, pouvant surestimer leur possibilité de diminuer le volume ou de le transférer vers des services alternatifs.
- L'élasticité-prix observée est plus élevée pour les courriers prioritaires que pour les courriers non prioritaires, ce qui semble intuitivement correct, vu qu'il existe un ensemble d'alternatives aux messages pour lesquels le délai d'acheminement est critique, comme les e-mails et les envois express, et que les courriers non prioritaires peuvent servir de substituts également. C'est également ce qui est ressorti de l'analyse de littérature. L'enquête de 2019 a montré une élasticité-prix pour les courriers prioritaires comparable à l'élasticité spécifique en 2016 pour les envois en nombre des utilisateurs non résidentiels (-1,15 contre -0,95).
- Les entreprises interrogées ont également confirmé que la demande pour les colis sur le marché non résidentiel étaient plutôt sensibles au prix en raison d'une concurrence supérieure et de l'apparition de rabais de quantité. L'élasticité-prix de -1,17 observée est la valeur la plus élevée pour le segment non résidentiel, mais reste moins élevée que celle observée dans la littérature (jusqu'à -3,5).
- Pour le courrier non adressé, le publipostage et les périodiques, la taille des échantillons était très petite ; toutefois, les résultats correspondent à ceux de l'enquête de 2016 et l'intervalle de confiance ne comprend pas de valeur nulle. Par conséquent, nous avons proposé d'utiliser ces valeurs. Les valeurs indiquent une demande inélastique (respectivement -0,81, -0,86 et -1) et sont légèrement inférieures ou quasiment identiques à celles de l'enquête de 2016. Selon les entreprises interrogées, pour ces services, l'accent est moins mis sur le prix que sur l'alignement par rapport à la stratégie de marketing (autrement dit, la question de savoir si le courrier arrive chez les clients finals pour une certaine date lorsque la campagne de marketing commence). Les entreprises interrogées ont noté que pour les périodiques comme les magazines et les journaux, l'élasticité-prix variait, et ce, davantage pour les quotidiens et moins pour les mensuels. Les mensuels ne sont toutefois pas livrés tous les jours et ont généralement un prix supérieur à celui des quotidiens, de sorte que les frais d'envoi sont relativement moins importants.

⁹ Les expéditeurs de grandes quantités de courrier (envoi en nombre) amènent généralement leurs volumes directement aux centres Masspost de bpost, plutôt que d'utiliser le réseau normal de boîtes postales, de bureaux de poste ou de points poste.

- L'effet de la fréquence de distribution sur la demande a diminué dans l'enquête de 2019 par rapport à celle de 2016 et, de manière générale, les clients non résidentiels ne semblent pas préoccupés par une fréquence de distribution supérieure ou inférieure. Ce qui importe, c'est que le courrier arrive, que le publipostage soit aligné sur la stratégie de marketing et que les périodiques soient distribués un certain jour/une certaine semaine dans toute la Belgique. C'est ce qu'ont confirmé les entreprises interrogées. En ce qui concerne les périodiques, elles ont noté que seule bpost pouvait assurer la distribution dans toute la Belgique un certain jour/une certaine semaine.
- Pour le courrier non adressé, le publipostage et les magazines, la petite taille de l'échantillon empêche une interprétation claire des résultats. Toutefois, les élasticités-prix observées correspondent à celles de l'enquête de 2016 et tombent dans l'intervalle de confiance.
- Pour les colis, les entreprises interrogées ont indiqué qu'il y avait une tendance aux livraisons le jour même (comme sur le marché résidentiel) sous l'effet d'acteurs importants, ce qui pousse l'ensemble du marché à suivre.

Tableau 3 : Élasticité-prix de la demande - Clients non résidentiels

Catégories de produits	Enquête WIK/MAS 2019/20 (non résidentiels)	Enquête WIK/MAS 2019/20 (résidentiels et non résidentiels)	MAS 2016 (résidentiels et non résidentiels)	Intervalle historique issue de la littérature (résidentiels et non résidentiels)
Courrier ordinaire (0-50 grammes)	-1	-1,35	-1,51 levée normale – résidentiels et non résidentiels -0,95 envois en nombre – utilisateurs non résidentiels	-0,2 à -0,9 (courrier non prioritaire) -0,2 à -1,17 (envois en nombre)
Courrier prioritaire (0-50 grammes)	-1,15	-1,46	-1,51 levée normale – résidentiels et non résidentiels -0,95 envois en nombre – utilisateurs non résidentiels	-0,1 à -0,8 (courrier prioritaire)
Courrier recommandé (0-50 grammes)	-0,76	-1,34	-0,28 levée normale – résidentiels et non résidentiels -0,81 envois en nombre – utilisateurs non résidentiels	-0,1 à -0,8 (courrier prioritaire)
Colis (2-10 kg)	-1,17	-2,04	-1,45 levée normale – résidentiels et non résidentiels -1,12 envois en nombre (2-10 kg) – utilisateurs non résidentiels	-0,8 à -3,5 (paquets postaux et colis)

Courrier non adressé	-0,81*	N/A	-0,98 (envois adressés) non	-0,2 à -1,17 (envois en nombre) en
Publipostage	-0,86*	N/A	-0,95 (envois en nombre - utilisateurs non résidentiels)	-0,2 à -1,4 (publipostage)
Périodiques	-1*	N/A	-0,97 (périodiques)	-0,1 à -0,9 (périodiques)

Source : WIK-Consult.

* Malgré la petite taille de l'échantillon, les résultats correspondent à ceux de l'étude M.A.S. de 2016 et se situent dans l'intervalle de confiance.

Tableau 4 : Élasticité de la fréquence de distribution de la demande - Clients non résidentiels

Catégories de produits	Enquête WIK/MAS 2019/20 (non résidentiels)	Enquête WIK/MAS 2019/20 (résidentiels et non résidentiels)	Enquête MAS 2016 (résidentiels et non résidentiels)
Courrier ordinaire (0-50 grammes)	0,03	0,22	-0,27
Courrier prioritaire (0-50 grammes)	-0,12	-0,25	-0,27
Courrier recommandé (0-50 grammes)	0,27	1,40	0,21
Colis (2-10 kg)	0,20	0,90	0,28 normal 0,45 en nombre
Courrier non adressé	0,21*	N/A	0,32
Publipostage	0,20*	N/A	0,27
Périodiques	-0,09*	N/A	0,27

Source : WIK-Consult.

* Malgré la petite taille de l'échantillon, les résultats correspondent à ceux de l'étude M.A.S. de 2016 et se situent dans l'intervalle de confiance.

8. Analyse économétrique (annexe 2)

21. Ce chapitre examine les résultats de l'analyse économétrique sur la base des deux ensembles de données fournis par bpost. Alors que pour les résultats de l'enquête, il existe un risque de surévaluation de la sensibilité au prix, du fait que les répondants (notamment particuliers) ont tendance à éviter des niveaux de dépense élevés sans se rendre compte pour autant qu'ils seraient en effet en mesure de remplacer le produit par un autre, le risque que l'on court potentiellement ici est d'observer le phénomène inverse. Dans le cadre de cette analyse économétrique, la période la plus longue possible pour laquelle des données étaient disponibles n'était que de 10 ans (2010-2019) ; la précision augmenterait toutefois avec une série chronologique plus longue. En outre, l'effet des augmentations tarifaires plus élevées depuis 2018 est probablement sous-évalué parce que l'impact à plus long terme n'a pas encore été pris en compte. Seule l'évolution des volumes en 2018 et 2019 est déjà (partiellement) reprise dans cette analyse.
22. De par l'analyse économétrique¹⁰, les éléments principaux suivants ont été constatés (tableau 5) concernant l'élasticité-prix de la demande :
- Le tableau 5 illustre les principales estimations économétriques de l'élasticité. Toutes les estimations présentées sont statistiquement significatives. Les estimations varient d'environ -[CONFIDENTIEL] à -[CONFIDENTIEL], ce qui correspond plutôt à la littérature. Les envois en nombre s'avèrent plus élastiques, bien que cela soit quelque peu sensible à la spécification choisie. Les grands colis semblent être les plus élastiques, ce qui pourrait indiquer qu'il existe une forte concurrence pour ces services.
 - Pour les courriers nationaux, résidentiels comme non résidentiels, via la levée normale ou les envois en nombre, l'élasticité moyenne pondérée s'élève à -[CONFIDENTIEL]. Pour les colis prépayés, celle-ci est de -[CONFIDENTIEL].

Tableau 5 : Élasticité-prix de la demande

	Courrier national	Colis prépayé	Publipostage et courrier non adressé
Particulier	- [CONFIDENTIEL]	-[CONFIDENTIEL]	n.a.
Non résidentiel (levée normale)	- [CONFIDENTIEL]	-[CONFIDENTIEL]	n.a.
Non résidentiel (envois en nombre)	- [CONFIDENTIEL]	-[CONFIDENTIEL]	-[CONFIDENTIEL]
0-2 kg	n.a.	-[CONFIDENTIEL]	n.a.
2-10 kg	n.a.	-[CONFIDENTIEL]	n.a.
Moyenne pondérée	- [CONFIDENTIEL]	-[CONFIDENTIEL]	-[CONFIDENTIEL]

*Estimation via régression OLS
 Source : London Economics Europe

¹⁰ Pour plus d'informations concernant le modèle utilisé, nous renvoyons au rapport complet de London Economics en annexe.

23. De par l'analyse économétrique (tableau 6), les points principaux suivants ont été constatés concernant l'élasticité-prix croisée entre courrier prioritaire et non prioritaire :

- Une nouvelle estimation de l'élasticité et de l'élasticité-prix croisée a été réalisée avec l'aide du modèle PCAIDS. Le modèle PCAIDS permet de calibrer un système d'élasticités-prix propres et croisées en imposant des contraintes aux données. Un élément important pour l'évaluation de la politique tarifaire est la rapidité de la livraison. Nous notons que l'estimation économétrique directe des élasticités distinctes pour la vitesse par produit n'a pas donné de résultats significatifs ou plausibles et que cela était vraisemblablement dû en partie au fait que l'envoi de courriers non prioritaires n'ont été introduits que récemment (janvier 2019) pour les utilisateurs résidentiels (donc via timbre poste).
- Le tableau ci-dessous reprend les élasticités-prix croisées pour les courriers nationaux, selon la vitesse (priorité) et calibrées sur les utilisateurs résidentiels. Les données à ce sujet n'étaient disponibles que de manière limitée : le timbre non prior a été introduit en janvier 2019 alors que l'ensemble de données avec des données mensuelles n'allait que jusqu'au mois de juin 2019. L'élasticité-prix des courriers nationaux a précédemment été estimée à - [CONFIDENTIEL] pour les clients résidentiels (voir plus haut, tableau 5). Les courriers non prioritaires apparaissent comme de faibles substituts par rapport aux courriers prioritaires et ne sont qu'un peu plus inélastiques que les courriers prioritaires, bien qu'une étude plus poussée soit nécessaire vu la relative nouveauté de cette catégorie.

Tableau 6 : Élasticité-prix propre et élasticité-prix croisée pour les utilisateurs résidentiels sur la base de la priorité (lettres prioritaires contre non prioritaires)

Courrier national	Prioritaire	Non prioritaire
Prioritaire	-[CONFIDENTIEL]	[CONFIDENTIEL]
Non prioritaire	[CONFIDENTIEL]	-[CONFIDENTIEL]

Source : London Economics Europe

Publications

24. Vous trouverez en annexe les versions complètes du rapport WIK-Consult ainsi que de l'étude économétrique de London Economics. Ces rapports fournissent davantage de détails concernant les méthodologies utilisées et l'examen des résultats obtenus. Il s'agit toutefois de versions non confidentielles des deux études, c'est-à-dire excluant les données et les sections que les opérateurs concernés ont classées comme confidentielles.

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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

Imprint

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VAT-ID	DE 123 383 795

Contents

1	Figures	III
2	Tables	IV
3	Executive Summary	V
4	Introduction	1
4.1	Scope and structure of the study	1
4.2	Definition of elasticity	1
5	Market survey 2019 on price elasticity and impact of delivery frequency on demand	3
5.1	Methodology market survey 2019	3
5.2	Calculation of price elasticity and the elasticity of delivery frequency on demand	7
5.3	Outcome market survey 2019 - residential users	9
5.3.1	Non-priority letters	11
5.3.2	Priority letters	11
5.3.3	Registered mail	12
5.3.4	Parcels	12
5.4	Outcome market survey 2019 – business users	12
5.4.1	Normal letters	14
5.4.2	Priority letters	16
5.4.3	Registered mail	16
5.4.4	Parcels	17
5.4.5	Unaddressed mails	18
5.4.6	Direct mail	19
5.4.7	Periodicals	20
6	Interviews with postal operators	21
6.1	Summarised opinions of postal operators	21
7	Review literature studies on the elasticity of demand	22
7.1	Introduction	22
7.2	Detailed results of reviewed econometric studies	23
7.3	Summarised findings of the literature review	33
8	Conclusions	35
8.1	Conclusions for residential users	35
8.2	Conclusions for business users	37
9	Annexes	40
10	Annex 1 Empty questionnaire for residential customers	41

11 Annex 2 Empty questionnaire for business customers	49
12 Annex 3 Interview notes from bpost	69
13 Annex 4 Interview notes from TBC-Post	70
14 Annex 5 Interview notes from PostNL	76
15 Annex 6 Boxplots with results per surveyed product category – residential users	79
16 Annex 7 Impact of price changes per surveyed product category – business users	84
17 Literature	88

Figures

Figure 1	Share of residential users using different postal services	10
Figure 2	Average/maximal mailing volume for residential users	10
Figure 3	Share of business users using different postal services	13
Figure 4	Average mailing volume of business users by way of normal collection	14
Figure 5	Average mailing volume of business users via bulk mail	14
Figure 6	Distribution of mailing volume for non-priority letters by prices	79
Figure 7	Distribution of mailing volume for non-priority letters by delivery frequencies	80
Figure 8	Distribution of mailing volume for priority letters by prices	80
Figure 9	Distribution of mailing volume for priority letters by delivery frequencies	81
Figure 10	Distribution of mailing volume for registered mail by prices	81
Figure 11	Distribution of mailing volume for registered mail by delivery frequencies	82
Figure 12	Distribution of mailing volume for parcels by prices	82
Figure 13	Distribution of mailing volume for postal packages by delivery frequencies	83
Figure 14	Impact of price changes – normal letters	84
Figure 15	Impact of price changes – priority letters	84
Figure 16	Impact of price changes – registered mail	85
Figure 17	Impact of price changes – parcels	85
Figure 18	Impact of price changes – unaddressed mails	86
Figure 19	Impact of price changes – direct mails	86
Figure 20	Impact of price changes – periodicals	87

Tables

Table 1	Comparison M.A.S. 2016 and WIK-Consult 2019	3
Table 2	Structure of the questionnaire for residential and business users	5
Table 3	Population details of business customers in Belgium	7
Table 4	Realised sample details of business customers in Belgium	7
Table 5	Scenarios	8
Table 6	Price elasticities for normal letters	15
Table 7	Elasticity of delivery frequency of normal letters	15
Table 8	Price elasticities of priority letters	16
Table 9	Elasticity of delivery frequency for priority letters	16
Table 10	Price elasticities for registered mail	17
Table 11	Elasticity of delivery frequency for registered mail	17
Table 12	Price elasticities for parcels	18
Table 13	Elasticity of delivery frequency for parcels	18
Table 14	Price elasticities for unaddressed mails	19
Table 15	Elasticity of delivery frequency for unaddressed mails	19
Table 16	Price elasticities for direct mail	19
Table 17	Elasticity of delivery frequency for direct mail	20
Table 18	Price elasticities for periodicals	20
Table 19	Elasticity of delivery frequency for periodicals	20
Table 20	Main interview statements regarding elasticities for the residential market	21
Table 21	Main interview statements regarding elasticities for the business market	22
Table 25	Indication of historic ranges for price elasticities from the literature	33
Table 26	Overview elasticities of demand by price – residential	35
Table 27	Overview elasticities of demand by delivery frequency – residential	36
Table 28	Overview elasticities of demand by price – business	37
Table 29	Overview elasticities of demand by delivery frequency – business	39

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 elasticity 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 combined – 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 that residential customers show higher elasticities for higher price levels may confirm the bias 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 substitute 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 elasticity 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 literature¹. 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 and 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 price elasticity 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 indicate 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 responds 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 limited³ 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 (q_1) is the 25th percentile, and the upper quartile (q_3) is the 75th percentile of the data. The inter-quartile range (IQR) is defined as the interval between q_1 and q_3 . Tukey (1997) defined $q_1 - (1.5 \cdot \text{IQR})$ and $q_3 + (1.5 \cdot \text{IQR})$ as "inner fences", $q_1 - (3 \cdot \text{IQR})$ and $q_3 + (3 \cdot \text{IQR})$ 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 taken 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.

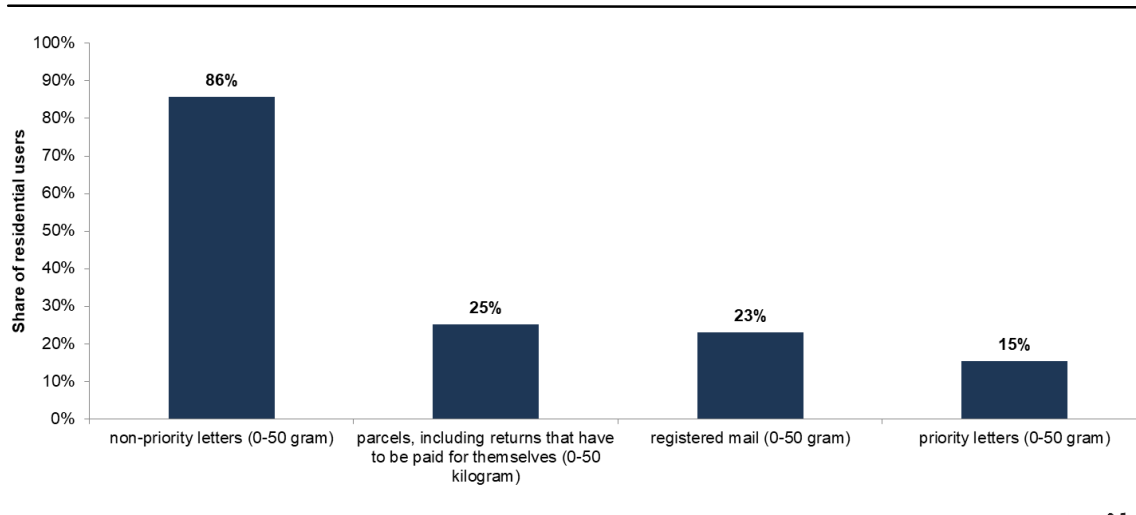
In general, this data indicates that some substitution has already taken place in recent years and is no longer as pronounced today. This is confirmed by the estimations of the respondents. In the survey, they stated that in 2019 they were already substituting 61% of the postal services

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. Throughout the entire report both terms 'bulk mail' and 'masspost' will be used interchangeably.

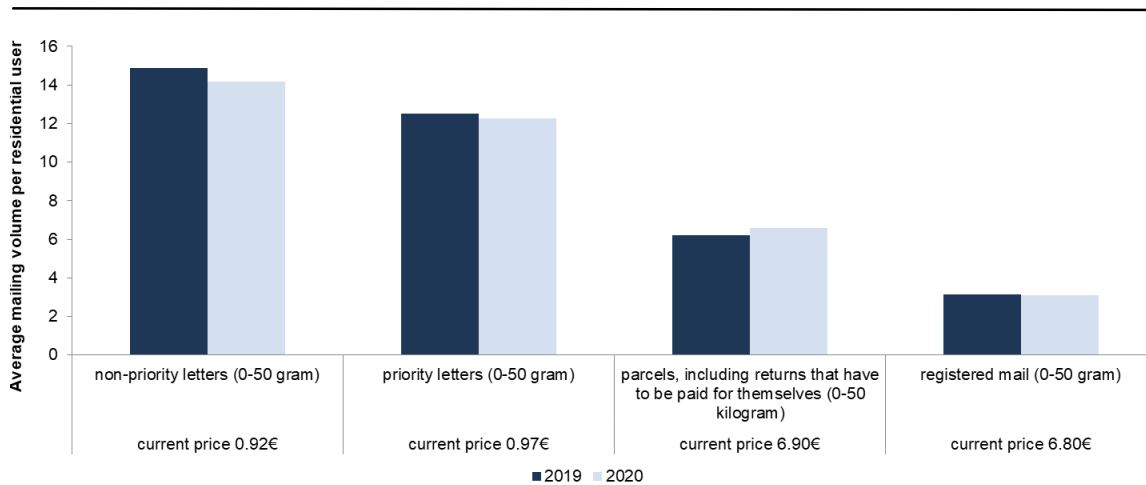
they had previously used with other services. For 2020 they expect the substitution rate to rise to about 66% (+5%-points).

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 volume¹¹ and sales channel¹² 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.

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

¹¹ Only a small 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 signals 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

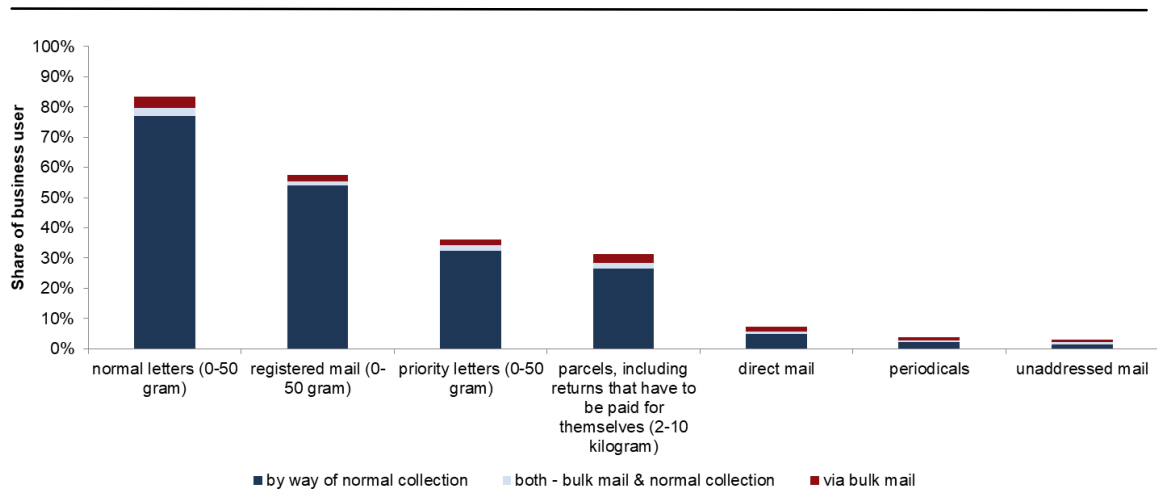
The demand for parcel services is particularly price-elastic in the considered interval from -10 to 40% from the current status quo. A slight rise in prices would immediately cause demand to fall sharply. Overall, demand fell by nearly 3% with a price increase of only 1% (95%-CI [-3.21;-2.60]). From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

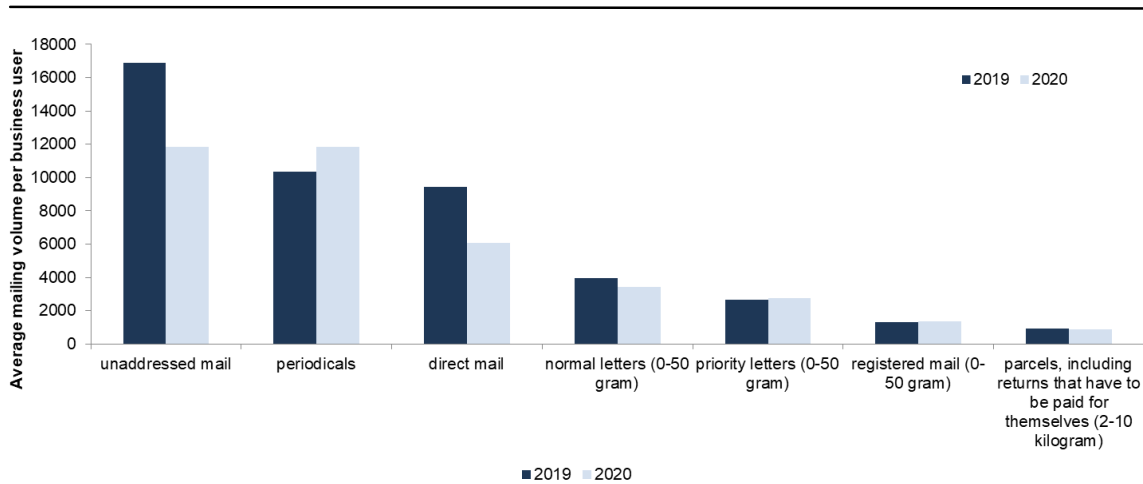


Source: WIK-Consult. N=2019.

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).

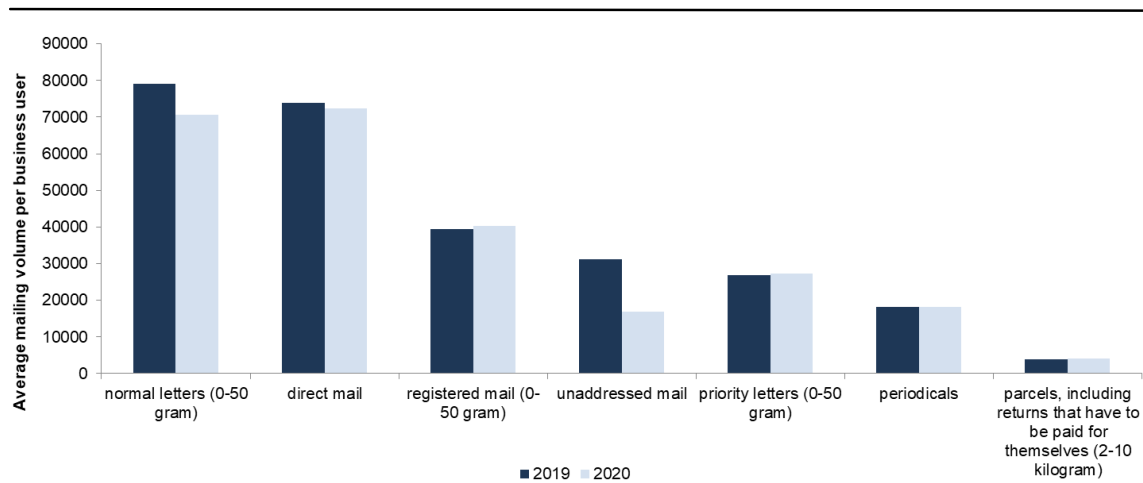
¹⁴ Also called masspost.

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 post, 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 [-1.36;-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-Post¹⁶¹⁷ 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)	<p>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.</p> <p>For priority letters, the sensitivity to delivery frequency will logically be high (D+1) and low for non-priority letters and registered items.</p> <p>Non priority letters are substitutes for priority letters. [CONFIDENTIAL].</p>
Letter (50 gram - 2 Kg)	<p>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.</p>
Registered shipments	<p>For registered shipments the sensitivity for delivery frequency depends on the content (B2B high, B2C less high) and the applicable legal conditions.</p>
Parcels	<p>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.</p> <p>Demand sensitivity for delivery frequency is higher as there is a market trend towards 'same-day-delivery'. Delivery at least D+1.</p> <p>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.</p>
Periodicals, magazines and newspapers	<p>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 2016-2020¹⁸).</p> <p>[CONFIDENTIAL]</p> <p>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</p>
Direct Mail	<p>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.</p>
Unaddressed	<p>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.).</p> <p>Like with DM, important is the aligning of the delivery with a marketing campaign, so delivery by a specific date.</p>

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. 2018¹⁹, Cazals et al. 2018²⁰) 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.

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 adjustment²⁹:

	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 Quantity	% Change in Price								
	LA-AIDS			PC-AIDS (calibrated for stamped postage)			PC-AIDS (calibrated for metered postage)		
	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 summarizes 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 -0.26) 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 Belgium 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 combined – residential and business. Hence for a proper

comparison, we have calculated an average⁴⁵ 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

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	OF	Per maand	OF	Per jaar
Briefpost zonder prioriteit (0 – 50g)		OF		OF	
<hr style="border: 1px solid #4a86e8;"/>					
Briefpost met prioriteit (0 – 50g)		OF		OF	
<hr style="border: 1px solid #4a86e8;"/>					
Aangetekende zendingen (0 – 50g)		OF		OF	
<hr style="border: 1px solid #4a86e8;"/>					
Postpakketten (inclusief terugzendingen, die men zelf dient te betalen) (0 – 2kg)		OF		OF	
<hr style="border: 1px solid #4a86e8;"/>					

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 market trends. 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	OF	Per maand	OF	Per jaar
Briefpost zonder prioriteit (0 – 50g)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Briefpost met prioriteit (0 – 50g)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Aangetekende zendingen (0 – 50g)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Postpakketten (inclusief terugzendingen, die men zelf dient te betalen) (0 – 2kg)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>

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 bedeed.

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 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.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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** verstuurd brieven en pakketten.*

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 ?

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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	<input type="checkbox"/>	<input type="checkbox"/>
Briefpost met prioriteit	<input type="checkbox"/>	<input type="checkbox"/>
Aangetekende zendingen	<input type="checkbox"/>	<input type="checkbox"/>
Postpakketten	<input type="checkbox"/>	<input type="checkbox"/>
Niet-geadresseerde zendingen	<input type="checkbox"/>	<input type="checkbox"/>
Direct mail	<input type="checkbox"/>	<input type="checkbox"/>
Tijdschriften	<input type="checkbox"/>	<input type="checkbox"/>

* 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	OF	Per maand	OF	Per jaar
Normale briefpost (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Briefpost met prioriteit (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Aangetekende zendingen (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Postpakketten (inclusief zelf betaalde terugzendingen) (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Niet geadresseerde zendingen (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Direct mail (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Tijdschriften (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Briefpost (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>

Het betreft:	Per week	OF	Per maand	OF	Per jaar
Briefpost met prioriteit (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Aangetekende zendingen (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Postpakketten (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Niet-geadresseerde zendingen (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Direct mail (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Tijdschriften (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>

- 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	OF	Per maand	OF	Per jaar
Normale briefpost (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Briefpost met prioriteit (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Aangetekende zendingen (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Postpakketten (inclusief zelf betaalde terugzendingen) (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Niet geadresseerde zendingen (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Direct mail (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>

Het betreft:	Per week		Per maand		Per jaar
Tijdschriften (via normale ophaling)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Briefpost (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Briefpost met prioriteit (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Aangetekende zendingen (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Postpakketten (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Niet-geadresseerde zendingen (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Direct mail (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>
Tijdschriften (via masspost)	<input type="text"/>	OF	<input type="text"/>	OF	<input type="text"/>

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:

<input type="text"/>	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 bezorgfrequentie 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 bedield.

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 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 in 2020 met bpost als de post 3 dagen per week zou bezorgd worden 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 in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemming.

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 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 in 2020 met bpost als de post 3 dagen per week zou bezorgd worden 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 in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 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 in 2020 met bpost als de post 3 dagen per week zou bezorgd worden 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 in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemming.

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 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 in 2020 met bpost als de post 3 dagen per week zou bezorgd worden 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 in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemming.

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 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 in 2020 met bpost als de post 3 dagen per week zou bezorgd worden 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 in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 bestemming.

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 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 in 2020 met bpost als de post 3 dagen per week zou bezorgd worden 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 in 2020 met bpost als de post 2 dagen per week zou bezorgd worden bij uw bestemming.

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	<input type="text"/>	%
2020	<input type="text"/>	%

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 frequencies: 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:

<i>Delivery frequency sensitivity</i>	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)	Aangetekende / 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)	Aangetekende / waarde zendingen	Direct mail	Tijdschriften /Kranten	Niet geadresseerde 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)	Aangetekende / waarde zendingen	Direct mail	Tijdschriften /Kranten	Niet geadresseerde 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 geadresseerde 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:

<i>Price sensitivity</i>	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:

<i>Price sensitivity</i>	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:

<i>Delivery frequency sensitivity</i>	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:

<i>Delivery frequency sensitivity</i>	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).

<i>Demand shifting from:</i>	<i>To:</i>	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)	Aangetekende / 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.

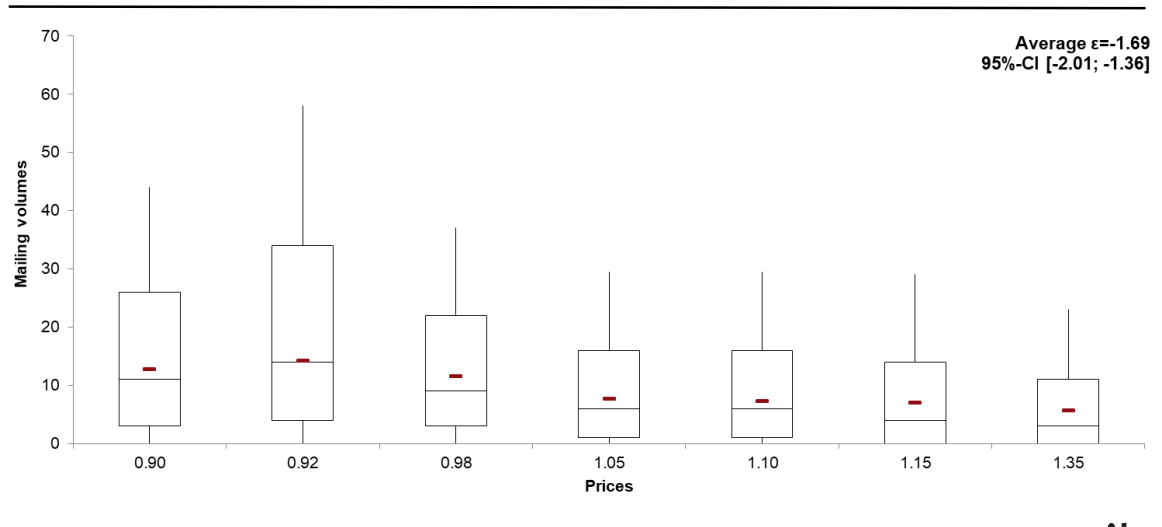
8) Are there any other relevant developments for the relevant services, which might impact the future demand in relation to price and the distribution frequency?

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 Boxplots⁴⁸ 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 priority 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 quartile, median, third quartile and maximum:

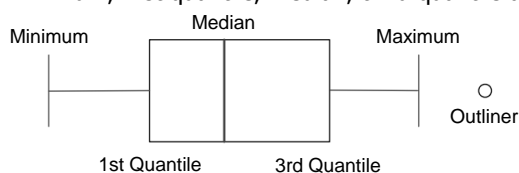
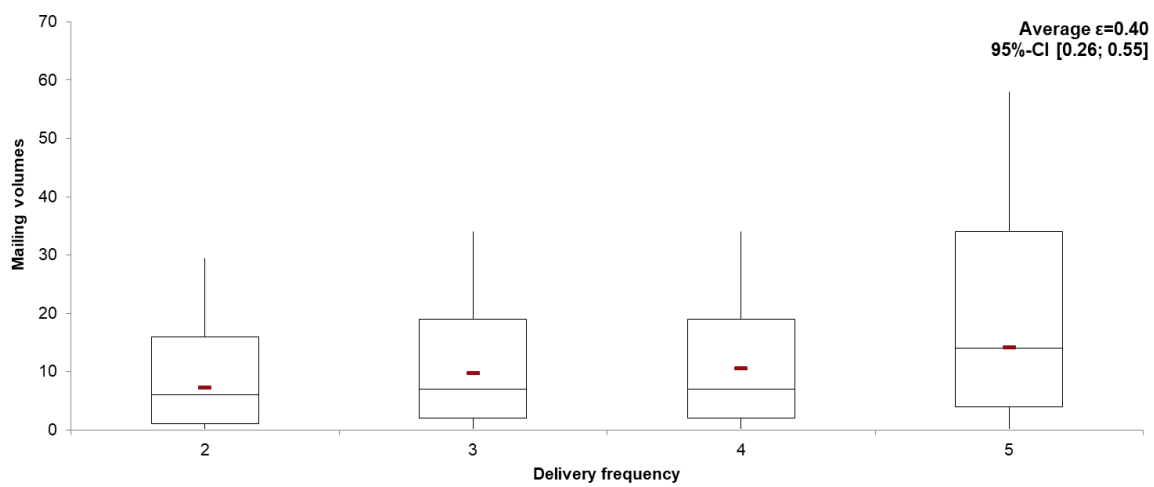
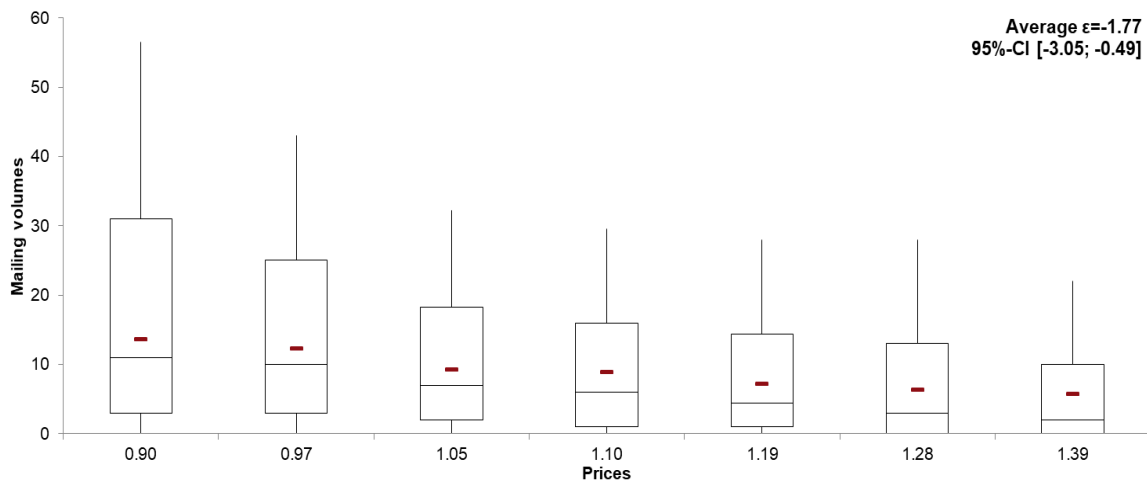


Figure 7 Distribution of mailing volume for non-priority letters by delivery frequencies



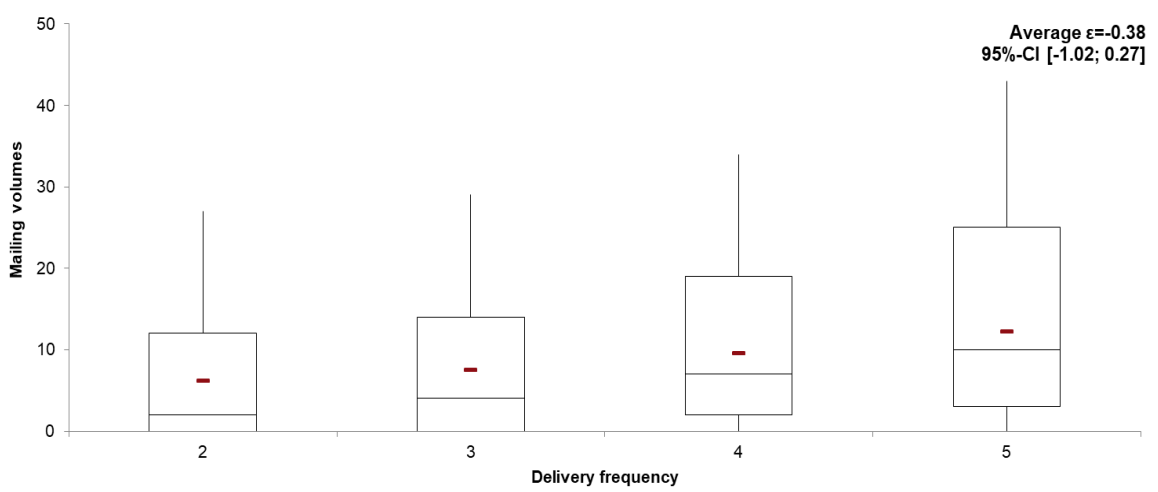
Source: WIK-Consult. N=1781. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

Figure 8 Distribution of mailing volume for priority letters by prices



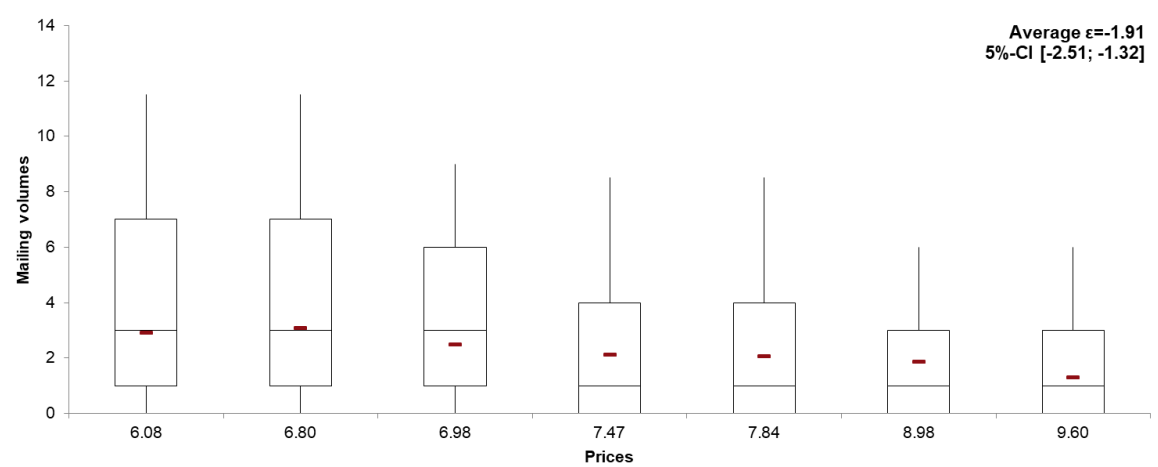
Source: WIK-Consult. N=320. Results after adjusting for extreme outliers.
Red rectangles depict the arithmetic mean.

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



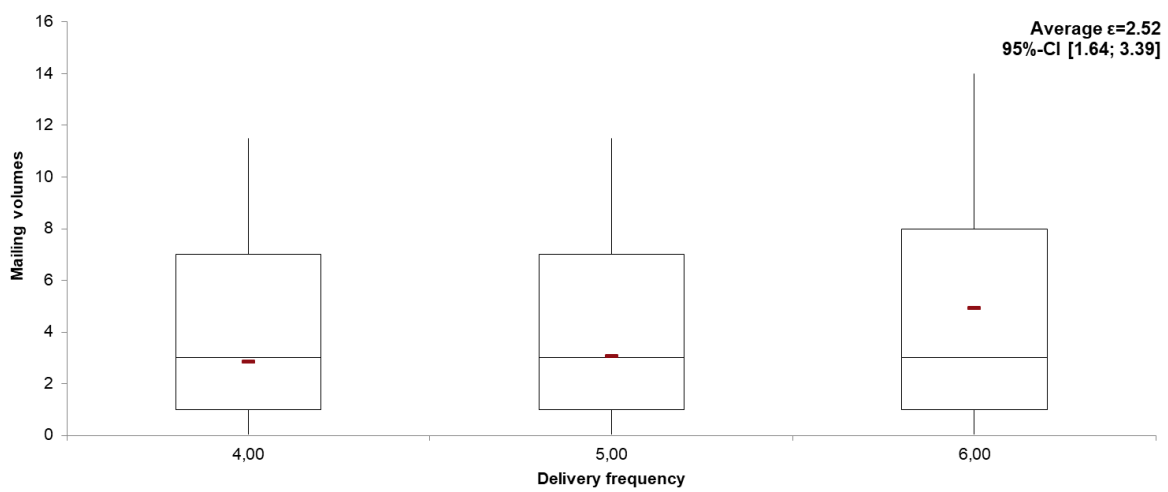
Source: WIK-Consult. N=320. Results after adjusting for extreme outliers. Red rectangles depict the arithmetic mean.

Figure 10 Distribution of mailing volume for registered mail by prices



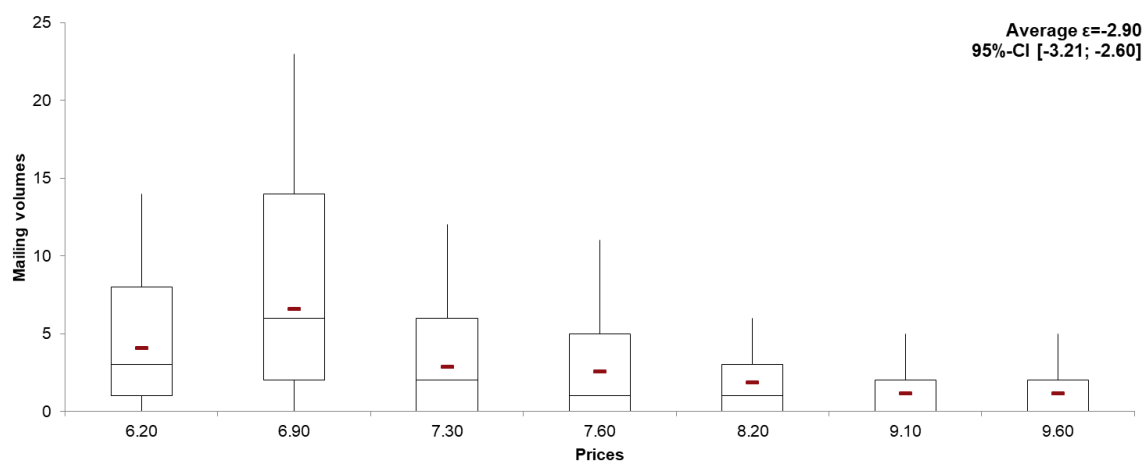
Source: WIK-Consult. N=465. Results after adjusting for extreme outliers. Red rectangles depict the arithmetic mean.

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



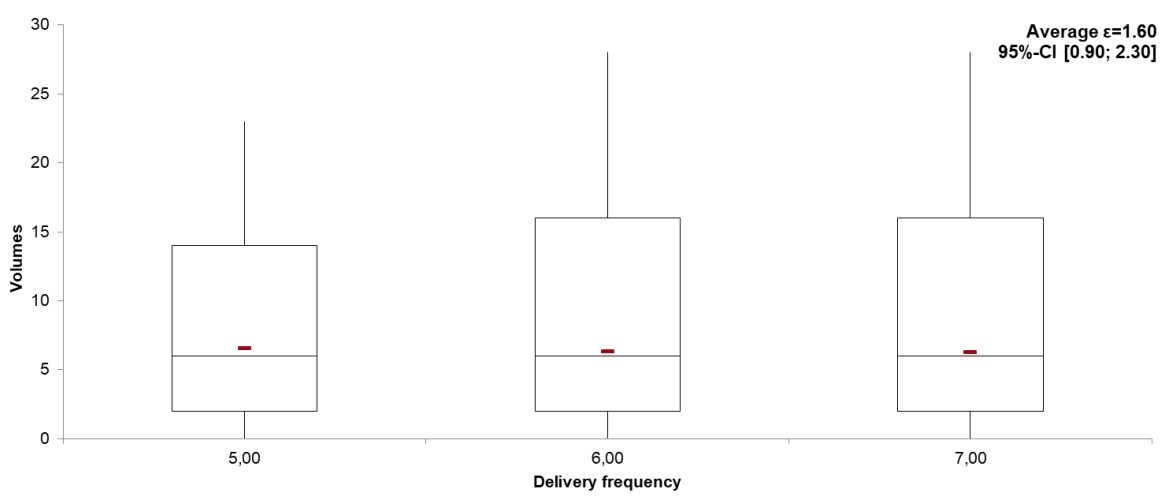
Source: WIK-Consult. N=465. Results after adjusting for extreme outliers. Red rectangles depict the arithmetic mean.

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.

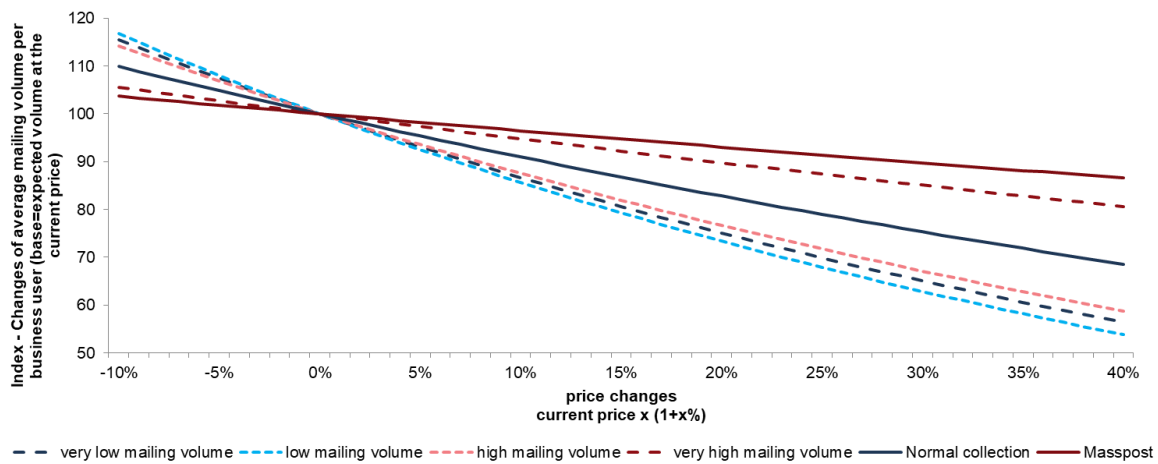
Figure 13 Distribution of mailing volume for postal packages by delivery frequencies



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

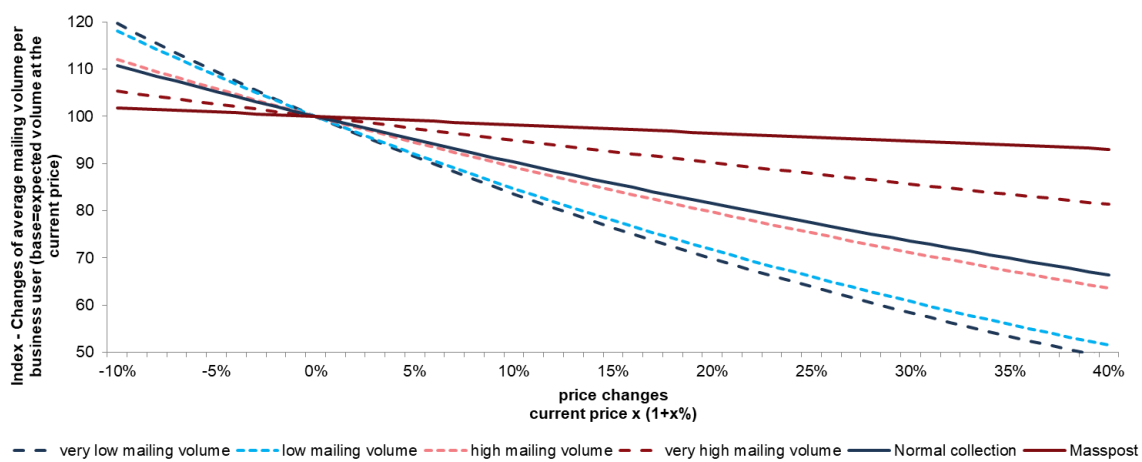
Annex 7 Impact of price changes per surveyed product category – business users⁴⁹

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.

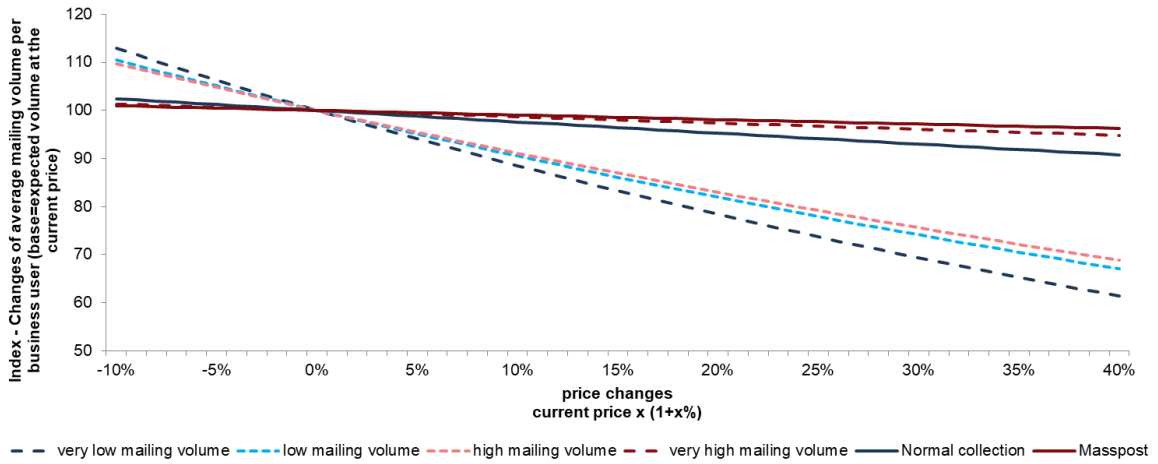
Figure 15 Impact of price changes – priority letters



⁴⁹ A curve adjustment was carried out.

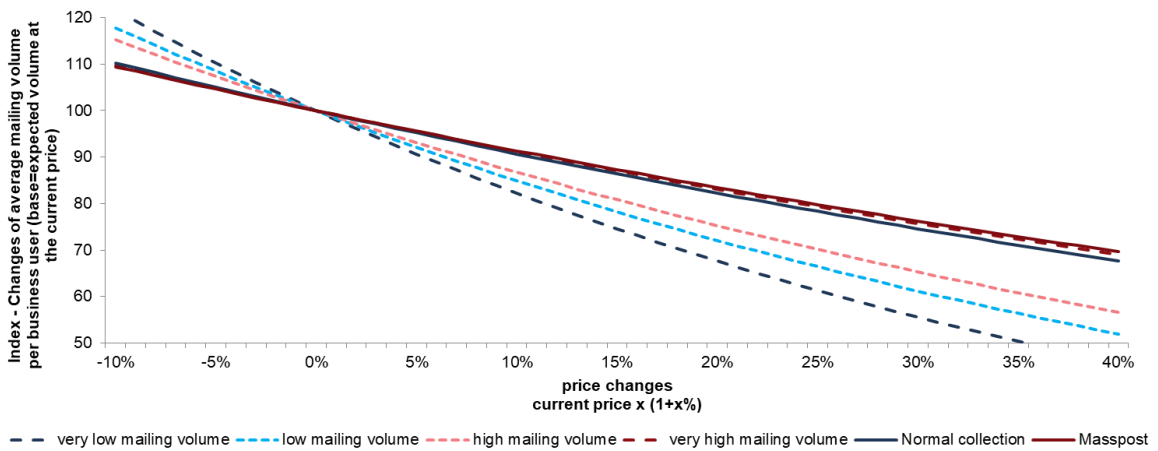
Source: WIK-Consult. Respondents: N=633; Responses: N=766. Mailing intensity classes:
 1-59 priority letters in 2019 = very low mailing volume; 60-299 priority letters in 2019 = low mailing volume; 300-1999 priority letter in 2019 = high mailing volume; more than 2000 priority letters in 2019 = very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

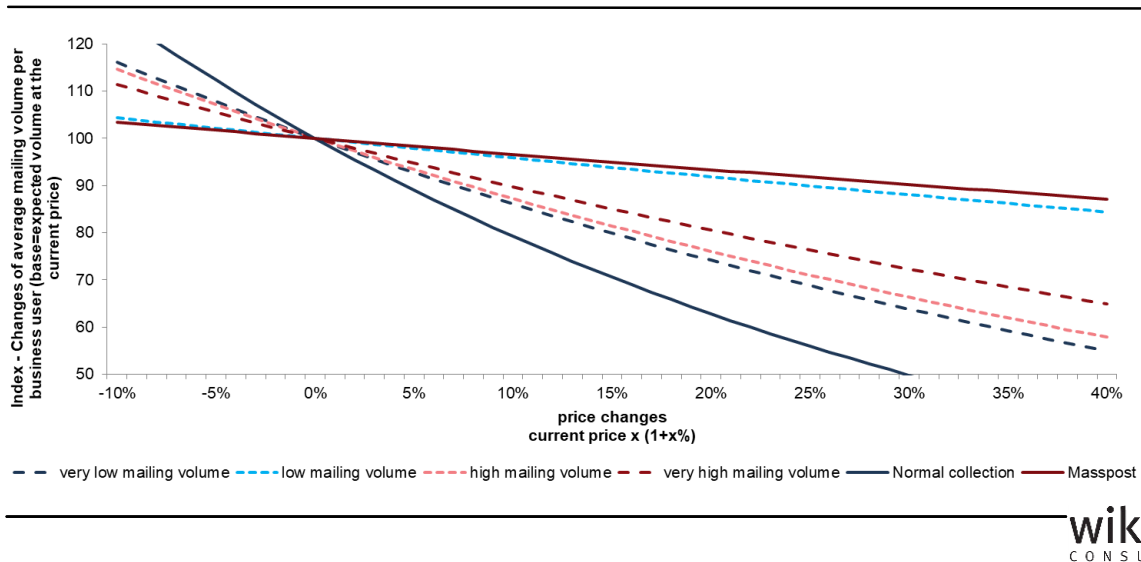
Figure 17 Impact of price changes – parcels



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

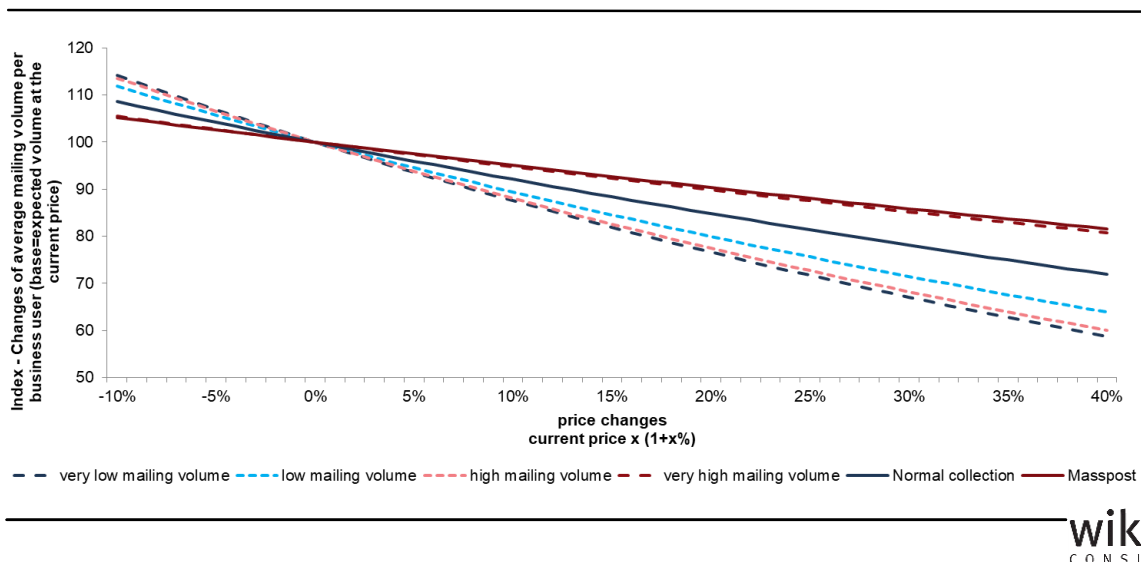
mailing volume; 40-249 postal packages in 2019 = high mailing volume; more than 250 postal packages in 2019 = very high mailing volume.

Figure 18 Impact of price changes – unaddressed mails



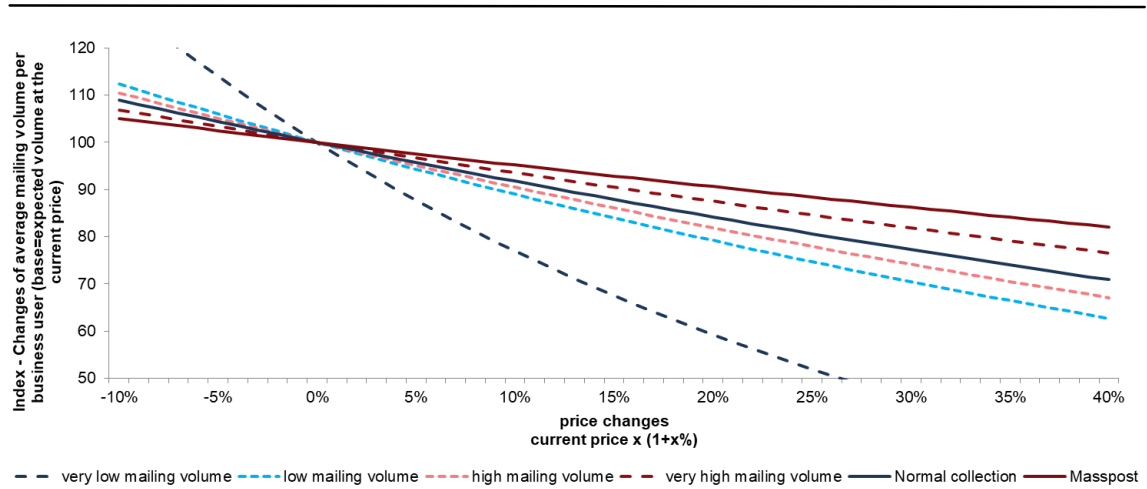
Source: WIK-Consult. Respondents: N=55; Responses: N=75. Mailing intensity classes: 1-99 unaddressed mails in 2019 = very low mailing volume; 100-999 unaddressed mails in 2019 = low mailing volume; 1000-4999 unaddressed mails in 2019 = high mailing volume; more than 5000 unaddressed mails in 2019 = very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



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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Table of Contents

Page

Executive summary	ii
1 Introduction	7
1.1 Overview	7
2 Review of previous research	8
2.1 Recent studies by bpost	10
2.2 Preliminary analysis and motivation of the challenges	11
2.3 Conclusions to this section	20
3 Data and trends	22
3.1 Section introduction	22
3.2 Data and descriptive statistics	23
3.3 Postal Product Trends for bpost	24
4 Model	33
5 Econometric Analysis and Results	38
6 Conclusions	42
References	43
Index of Tables, Figures and Boxes	45
ANNEXES	47
Annex 1 Additional information	48

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:

$$1) \quad \ln v = \alpha + \beta \ln p + \gamma \text{year} + \varepsilon$$

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 nesting³ 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 $D.\ln p$, and volume, $D.\ln v$, 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 $\ln v$ regressed on $\ln p$ 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 $\ln p$ 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 usually¹⁰ 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 $\ln p$ 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 $\ln v$ and $\ln p$ 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 $\ln(\text{price})$ 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 $-\text{[CONFIDENTIAL]}$ 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 $\ln p$ 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 sales¹² 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 Statistics 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 smaller 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)

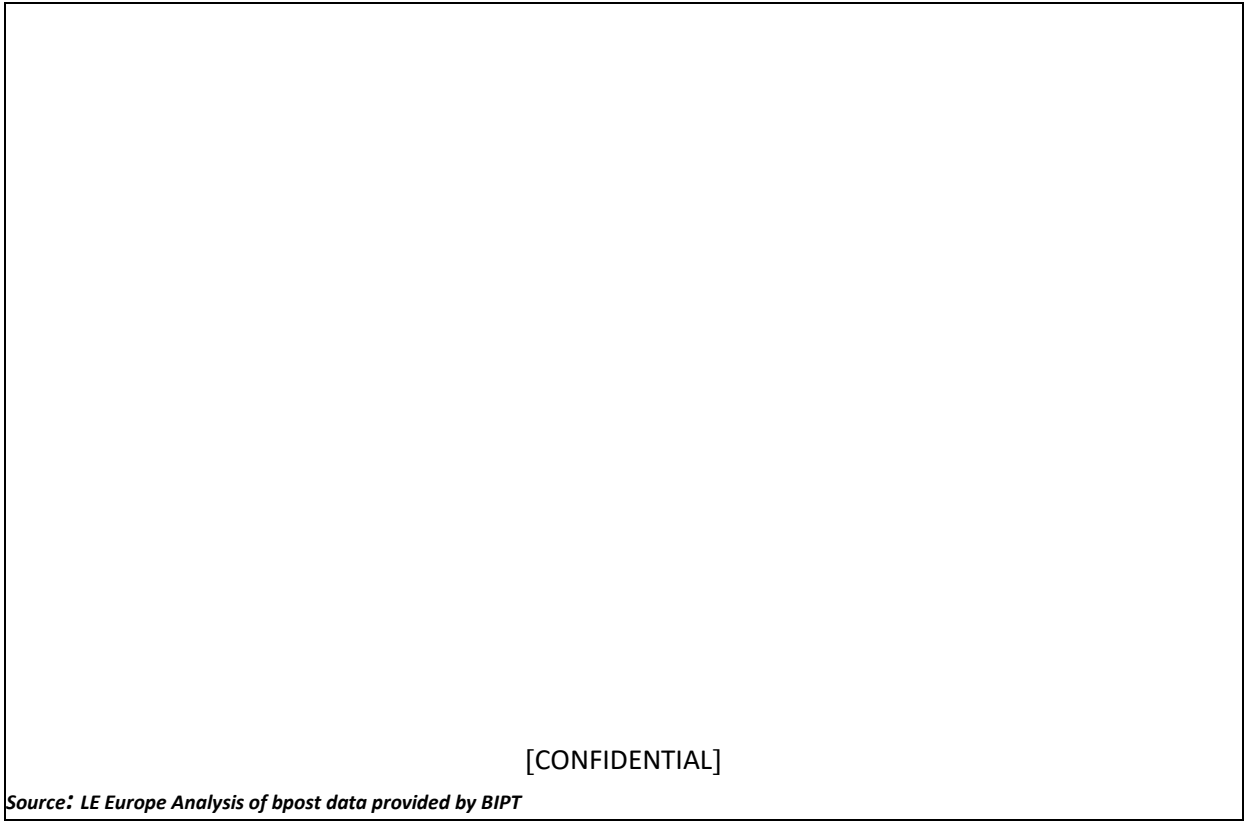
[CONFIDENTIAL]

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



[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:

$$1) \quad \ln v = \alpha + \beta \ln p + \gamma \text{year} + \varepsilon$$

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

$$m = 1 \dots 5$$

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:

$$2) \ln v_{ijt} = \sum_{i=1}^3 \sum_{j=1}^2 \alpha_{ij} + \sum_{i=1}^3 \sum_{j=1}^2 \beta_{ij} \ln p_{ijt} + \gamma t + \varepsilon_{ijt}$$

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:

$$3) \ln v_{ijkt} = \sum_{i=1}^3 \sum_{k=1}^3 \alpha_{ik} + \sum_{i=1}^3 \beta_{ik} \ln p_{ijkt} + \sum_{k=1}^3 \gamma_k t + \varepsilon_{ijkt}$$

In this case, we're allowing the intercept to vary by customer types, $i = 1 \dots 3$, and by product type, $k = 1 \dots 3$, and the slope or elasticity to vary only by customer type. Alternatively, we have now allowed the time trend to vary by product type, $k = 1 \dots 3$, 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

$$\ln x = a + \sum_i \alpha_i \ln p_i + \frac{1}{2} \sum_j \sum_i \gamma_{ij} \ln p_i \ln p_j + b \prod_i p_i^{\beta_i}$$

$$s_i = \alpha_i + \sum_j \gamma_{ij} \ln p_i \ln p_j + \beta_i \ln \left(\frac{x}{P^*} \right)$$

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

$$\varepsilon_{ii} = \frac{1}{s_i} (\gamma_{ij} + s_i^b \beta_i) - 1$$

$$\varepsilon_{ij} = \frac{1}{s_i} (\gamma_{ij} + s_j^b \beta_i)$$

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

$$S_1 = a_1 + b_{11} \ln(p_1) + b_{12} \ln(p_2) + \dots + b_{1,N-1} \ln(p_{N-1})$$

$$S_{N-1} = a_{N-1} + b_{N-1,1} \ln(p_1) + b_{N-1,2} \ln(p_2) + \dots + b_{N-1,N-1} \ln(p_{N-1})$$

Source: Epstein and Rubinfeld 2004¹⁴

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 b_{11} 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

$$\epsilon_j = b_{jj} - 1 + s_j (1 + \epsilon)$$

$$\epsilon_{jk} = b_{jk} / s_j + s_k (1 + \epsilon)$$

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

$$\epsilon_j = [(1 - s_j) \epsilon_1 + (s_j - s_1) \epsilon] / (1 - s_1)$$

$$\epsilon_{jk} = s_k (\epsilon - \epsilon_1) / (1 - s_1)$$

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:

$$\ln v_{ijkt} = \sum_{i=1}^3 \sum_{k=1}^3 \alpha_{ik} + \sum_{i=1}^3 \beta_i \ln p_{ijkt} + \sum_{k=1}^3 \gamma_k t + \varepsilon_{ijkt}$$

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 <i>Source: LE Europe Analysis of bpost data provided by BIPT</i>			

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]
<i>Source: LE Europe Analysis of bpost data provided by BIPT</i>		

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]
<i>Source: LE Europe Analysis of bpost data provided by BIPT</i>			

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 $-[\text{CONFIDENTIAL}]$, while the bulk/mass letter was estimated to more elastic at $-[\text{CONFIDENTIAL}]$. 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 price 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 $-[\text{CONFIDENTIAL}]$, 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.

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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Index of Tables, Figures and Boxes

Tables

Table 2.1: Summary of Previous Studies, by Bpost	10
Figure 2.2: Analysis of Headline Figures, by bpost	11
Table 3.1: Summary Statistics of Tariffs	23
Table 3.2: Summary Statistics of Volumes (000s)	23
Table 5.1: Price Elasticities*	38
Table 5.2: Own and Cross-Price Elasticities for National Letters by Speed,	39
Table 5.3: Own and Cross-Price Elasticities for National Letters by Speed,	40
Table 5.4: Own and Cross-Price Elasticities for Pre-paid Parcels,	40
Table 5.5: Own and Cross-Price Elasticities for Non-Addressed and Direct Mail,	41
Table Annex 1.1a: National Letters elasticity regression with dummy variables, 2014-2019	52
Table Annex 1.2a_M: Marginal effects National Letters elasticity regression with dummy variables, 2014-2019	52
Table Annex 1.3b: National Letters elasticity regression with dummy variables, 2014-2019	53
Table Annex 1.4b_M: Marginal effects National Letters elasticity regression with dummy variables, 2014-2019	54
Table Annex 1.5: Additional Disaggregated models	54
Table Annex 1.6: Pre-paid Parcels elasticity regression with dummy variables (model a),	56
Table Annex 1.7: Pre-paid Parcels elasticity regression with dummy variables (model b), 2014-2019	57
Table Annex 1.8: Direct and Non-Addressed Mail elasticity regression	58
Table Annex 1.9: Direct and Non-Addressed Mail elasticity regression	60
Table Annex 1.10: Own and Cross-Price Elasticities for Pre-paid Parcels,	61
Table Annex 1.11: Own and Cross-Price Elasticities for Pre-paid Parcels,	62
Table Annex 1.12: Own and Cross-Price Elasticities for National Letters by Speed,	63
Table Annex 1.13: Own and Cross-Price Elasticities for National Letters by Speed,	63
Table Annex 1.14: Own and Cross-Price Elasticities for Pre-paid Parcels,	63
Table Annex 1.15: Own and Cross-Price Elasticities for Pre-paid Parcels,	64
Table Annex 1.16: Own and Cross-Price Elasticities for Non-Addressed and Direct Mail,	64

Figures

Figure 2.1: Annual % change residential letters price and volume (2011 - 2019)	11
Figure 2.2: Residential Mail annual data OLS univariate regression results	12
Figure 2.3: Residential letter mail annual predicted vs actual values from OLS regression	13
Figure 2.4: Bulk mail OLS regression results annual data (2010 - 2019)	14
Figure 2.5: Bulk mail predicted vs actual, OLS annual 2010-2019	15
Figure 2.6: Bulk mail elasticity regression with dummy variables, annual 2010-19	15

Figure 2.7: Actual vs fitted values, residential and bulk by product, annual 2010-19	16
Figure 2.8: Disaggregated letter regression detailed outputs, residential priority letters	17
Figure 2.9: Disaggregated letter regression detailed outputs, professional priority letters	18
Figure 2.10: Disaggregated letter regression detailed outputs	19
Figure 3.1: Residential Mail by Volume (000s) (2014 - 2019)	25
Figure 3.2: National Letters by Volume (000s) and Speed within Professional Mail (via Normal Collection) (2014 - 2019)	26
Figure 3.3: Parcels by Volume and Weight within Professional Mail (via Normal Collection) (000s) (2014 - 2019)	27
Figure 3.4: Professional Mail (via Mass Collection) by Volume (000s) (2014 - 2019)	27
Figure 3.5: Parcels by Volume and Weight within Professional Mail (via Mass Collection) (2014 - 2019)	28
Figure 3.6: Revenue of National Letters by Speed and Customer Type in 2019	29
Figure 3.7: Revenue of Parcels by Weight and Customer Type in 2019	30
Figure 3.8: Revenue of Other Mail by Customer Type in 2019	31
Figure Annex 1.1: Residual Plots for National Letters	55
Figure Annex 1.2: Residual plots for Pre-paid Parcels (Model a)	56
Figure Annex 1.3: Residual Plots for Pre-paid Parcels (Model b)	58
Figure Annex 1.4: Residual Diagnostics for Direct and Non-Addressed Mail	59

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 i th 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&usq=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 an 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.

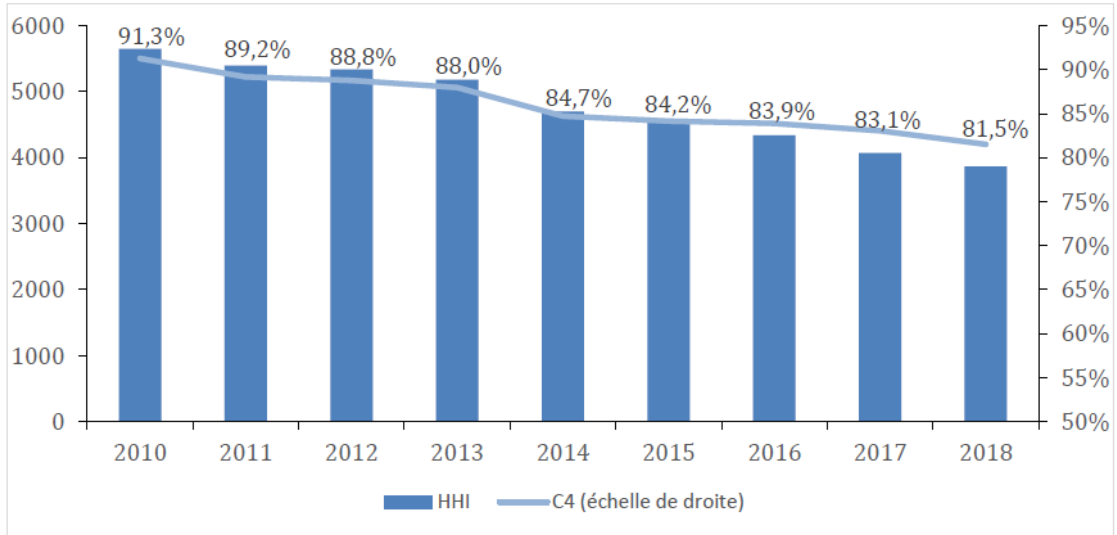
¹⁹ This is defined as the sum of the market shares squared. The HHI is often presented in terms of % market shares, and we note in this case the shares should be in decimal fractions.

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]	
<p><i>Source: LE Europe Analysis of Bpost data provided by BIPT</i></p>	

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 $\ln p$ term is interacted on both the slope and intercept with customer type. Interpretation of the above table is that $-\text{[CONFIDENTIAL]}$ is the baseline elasticity (wrt customer=1, which is bulk) and then the elasticity with respect to each customer type is a function of the baseline slope coefficient plus the $\text{cust}\#\text{product}$ 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 lnp#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)

[CONFIDENTIAL]

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]
<i>Source: LE Europe Analysis of Bpost data provided by BIPT</i>			

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]
<i>Source: LE Europe Analysis of Bpost data provided by BIPT</i>			

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 Analysis 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 Analysis 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 Analysis 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]
<i>Source: LE Europe Analysis of Bpost data provided by BIPT</i>			

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]
<i>Source: LE Europe Analysis of Bpost data provided by BIPT</i>			



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