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Discriminatie op de Brusselse arbeidsmarkt: sectorale analyse o.b.v. een correspondentie-experiment

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1. Introductie

Discriminatie blijft een prangend probleem in hedendaagse arbeidsmarkten. Ondanks de toenemende diversiteit van de wereldwijde beroepsbevolking en talrijke beleidsinterventies, ervaren veel individuen uit verschillende minderheidsgroepen, waaronder oudere personen en personen met een buitenlandse etniciteit, nog steeds aanzienlijke discriminatie op de arbeidsmarkt. Met betrekking tot geslacht, suggereren studies verschillende effecten, afhankelijk van factoren zoals de organisatie en de genderverhouding binnen het beroep. Niettemin zouden mannen in vergelijking met vrouwen gemiddeld gezien minder kans hebben om aangenomen te worden. Ondanks veel onderzoek naar discriminatie op de arbeidsmarkt, is het relatieve belang van de voorgenoemde persoonskenmerken slechts beperkt onderzocht. Niettemin, is dit beleidsmatig een belangrijk onderwerp.

Bovendien worden individuen vaak geconfronteerd met discriminatie op basis van meerdere kenmerken, zoals oudere leeftijd en buitenlandse etniciteit of leeftijd en geslacht, en wordt de eventuele discriminatie die zij ervaren beïnvloed door omgevings- en werkgeverskenmerken, zoals de grootstedelijke context en het type sector waarin een bedrijf opereert. Deze elementen kunnen discriminatie versterken of juist compenseren. Echter blijven ook de interactie-effecten tussen meerdere factoren en de modererende rol van omgevings- en werkgeverskenmerken onvoldoende onderzocht. Dit benadrukt de complexiteit van het probleem en benadrukt de noodzaak van verder onderzoek.

2. Brussels Hoofdstedelijk Gewest

Het Brussels Hoofdstedelijk Gewest, een van de drie regio's België, is gelegen in het centrum van het land en bestaat uit 19 gemeenten, waaronder de hoofdstad van België, Brussel. De regio maakt deel uit van zowel de Vlaamse als de Franse gemeenschap van België, waardoor zowel het Nederlands als het Frans officiële talen zijn in de regio, ook in het onderwijs. Hoewel de regio geografisch gezien relatief klein is (162 vierkante kilometer), is het veruit de dichtstbevolkte regio met ongeveer 7 500 personen per vierkante kilometer.

De bevolking van Brussel is hyperdivers, met 36% van de inwoners die een niet-Belgische nationaliteit heeft uit 183 verschillende landen. Meer dan 55% van de inwoners met een buitenlandse nationaliteit heeft een nationaliteit van buiten de EU-27. Bovendien heeft ongeveer 40% van de Brusselse inwoners met een Belgische nationaliteit, ook een buitenlandse nationaliteit en/of minstens één ouder met een eerst geregistreerde buitenlandse nationaliteit. Van de mensen met een buitenlandse nationaliteit die in het Brussels Hoofdstedelijk Gewest verblijven, is 75% tussen 18 en 64 jaar oud, vergeleken met 59% van degenen met de Belgische nationaliteit. Bovendien wordt het Brussels Hoofdstedelijk Gewest gekenmerkt door een relatief jonge bevolking, waarbij slechts 13% van de bevolking 65 jaar of ouder is, vergeleken met respectievelijk 21% en 20% in de Vlaamse en Waalse regio's. Een groot aandeel (62%) van de inwoners van het gewest valt binnen

de leeftijdsgroep van 20 tot 64 jaar, wat de respectieve cijfers in de Vlaamse (57%) en Waalse (58%) regio's overtreft. Wat betreft de genderverdeling in de regio, vertegenwoordigen mannen en vrouwen elk ongeveer 50% van de Brusselse bevolking.

Bovendien, pendelen elke dag veel personen naar het Brussels Hoofdstedelijk Gewest voor werk, met in 2022 meer dan 400 000 pendelaars en bijna de helft (49,5%) van alle jobs die worden ingevuld door Vlamingen of Walen. Dit biedt extra mogelijkheden en uitdagingen voor het Gewest, aangezien werknemers uit het Vlaams en Waals gewest een divers spectrum van perspectieven en culturen met zich meebrengen die verbonden zijn met hun woonplaats.

Economisch gezien heeft de regio het hoogste aantal actieve btw-plichtige organisaties per vierkante kilometer in België. Bovendien heeft het Brussels Gewest een interessante mix van private en publieke organisaties (uit alle drie de regio's). Desondanks kampt de regio in vergelijking met het Vlaams en Waals Gewest met een relatief hoog werkloosheidspercentage, vooral onder jongeren en mensen met een niet-EU-nationaliteit, alsook een lage activiteitsgraad voornamelijk onder jongeren en vrouwen.

3. Onderzoeksopzet

Deze studie onderzoekt de prevalentie van etnische, leeftijds- en geslachtsdiscriminatie op de arbeidsmarkt binnen het Brussels Hoofdstedelijk Gewest. Daarnaast heeft de studie tot doel het relatieve belang van deze discriminatoire factoren te onderzoeken, evenals hun eventuele interactie-effecten. Bijkomend focussen we in dit onderzoek op drie prominente sectoren in de Brussels economie, binnen zowel publieke als private sectoren, om verschillen in discriminerende praktijken tussen sectoren te onderzoeken. Concreet focust dit onderzoek op de sectoren 'Groot- en detailhandel; reparatie van auto's en motorfietsen' (nace G), 'Administratieve en ondersteunende diensten' (nace N), en de publieke sector 'Openbaar bestuur en defensie; verplichte sociale verzekeringen' (nace O). Deze drie sectoren werden geselecteerd omwille van hun belangrijk aandeel binnen de totale tewerkstelling in het Brussels Hoofdstedelijk Gewest. In 2022 vertegenwoordigden de groot- en detailhandel (nace G), de administratieve en ondersteunende diensten (nace N) en de publieke sector (nace O) respectievelijk 8,2%, 10,5% en 16,5% van alle werknemers met een job in het Brussels Hoofdstedelijk Gewest.

Het onderzoek maakt gebruik van een correspondentie-experiment (praktijktest). Het experimentele design omvatte het versturen van gestandaardiseerde cv's en sollicitatiebrieven naar werkgevers met een openstaande vacature in het gewest, waarbij variaties zijn aangebracht in de etniciteit, leeftijd en geslacht van de fictieve sollicitanten. De cv's en sollicitatiebrieven zijn zorgvuldig ontworpen om vergelijkbaar (met uitzondering van de manipulaties van de relevante variabelen) en realistisch te zijn.

Tijdens het opzet van het experiment werd rekening gehouden met de hyperdiverse bevolking van het Brussels Hoofdstedelijk Gewest. Concreet werd etniciteit gedifferentieerd op basis van Belgische en buitenlandse achtergrond, met verdere onderverdeling in Poolse (EU-27) en Marokkaanse (niet-

EU) etniciteit. Deze twee specifieke buitenlandse etniciteiten werden gekozen omdat werkzoekenden van Oost-Europese als van Maghrebijnse afkomst relatief gezien meer voorkomen in cijfers voor respectievelijk zeer korte periodes van inactiviteit (minder dan zes maanden) en lange periodes van inactiviteit (meer dan twaalf maanden) in vergelijking met werkzoekenden van Belgische origine in het Brussels Hoofdstedelijk Gewest. Bovendien vertegenwoordigen Maghrebijnen bijna een vijfde van de Brusselse bevolking op beroepsactieve leeftijd. De etniciteit van een sollicitant werd enkel gesignaleerd door hun naam. Zo zijn alle fictieve sollicitanten geboren in Brussel (België), studeerden ze in het Gewest en bouwden ze daar hun professionele carrière uit. Gegeven de tweetalige context in het Brussels Hoofdstedelijk Gewest, selecteerden we zowel Franse (Waalse) als Nederlandse (Vlaamse) gangbare namen voor de sollicitanten met de Belgische etniciteit. Het geslacht van de sollicitanten (man of vrouw) werd eveneens enkel gesignaleerd via de namen van sollicitanten. De factor leeftijd varieerde in het onderzoek tussen 38 en 56 jaar, met een verschil van zes of twaalf jaar tussen de twee sollicitanten binnen een paar. Deze leeftijdsgrenzen zijn gebaseerd op twee belangrijke argumenten. Ten eerste is het voor (vrouwelijke) kandidaten onder de 38 moeilijk om discriminatie op basis van geslacht en vruchtbaarheid uit elkaar te houden.[*] Ten tweede kunnen werkgevers extra subsidies ontvangen voor het aannemen van oudere kandidaten (leeftijd 57-65), wat mogelijk leidt tot een onderschatting van leeftijdsdiscriminatie. In het cv van de oudere sollicitant binnen elk paar werd extra irrelevante ervaring toegevoegd om ervoor te zorgen dat ze niet verschillen in relevante ervaring.

De reacties van werkgevers op de sollicitaties via telefoonvoicemail en e-mail zijn zorgvuldig opgevolgd. Hierbij werd telkens een onderscheid gemaakt tussen een positieve reactie in de strikte zin (een uitnodiging voor een sollicitatiegesprek) en een positieve reactie in de brede zin (elke positieve reactie, bijvoorbeeld uitnodiging voor een sollicitatiegesprek, een verzoek om verdere informatie of om contact op te nemen, een alternatief aanbod voor een baan). Belangrijk is dat we de betrokken werkgevers zo snel mogelijk na ontvangst van een positieve reactie op de hoogte stelden van de vrijwillige terugtrekking van de sollicitant uit het selectieproces per e-mail, om zo de kosten voor werkgevers zo veel mogelijk te beperken.

4. Dataverzameling

Tussen april 2023 en februari 2024 zijn er 432 paren sollicitaties (wat overeenkomt met 864 individuele sollicitaties) verzonden naar vacatures voor jobs in het Brussels Hoofdstedelijk Gewest. Deze vacatures werden allemaal uitgegeven door bedrijven binnen de drie geselecteerde sectoren: 'Groot- en detailhandel; reparatie van auto's en motorfietsen' (nace G), 'Administratieve en

[*] Op basis van dit onderzoek kunnen we geen conclusies trekken over mogelijke discriminatie van individuen jonger dan 38 jaar. Evenmin valt de mogelijke interactie tussen geslacht en jonge leeftijd binnen de reikwijdte van dit onderzoek, zoals bijvoorbeeld discriminatie op basis van vruchtbaarheid en gezinsverantwoordelijkheden.

ondersteunende diensten' (nace N), en de publieke sector 'Openbaar bestuur en defensie; verplichte sociale verzekeringen' (nace O).

Vacatures werden geput uit de belangrijkste kanalen voor het zoeken naar werk in België, namelijk de openbare diensten voor arbeidsbemiddeling van het Vlaams Gewest (VDAB), het Waals Gewest (Le FOREM), het Brussels Hoofdstedelijk Gewest (Actiris) en de Duitse Gemeenschap (ADG). Deze websites werden aangevuld met andere bronnen, zoals websites van organisaties in de publieke sector.

Bij het selecteren van vacatures werd bijzondere aandacht besteed aan de plaats van tewerkstelling en de vereiste ervaring. Hierbij werden enkel vacatures met plaats van tewerkstelling in het Brussels Hoofdstedelijk Gewest en vacatures waarvoor enige ervaring vereist was weerhouden. Vacatures voor juniorfuncties (≤5 jaar ervaring) werden niet weerhouden omdat alle fictieve sollicitanten in het experiment 38 jaar of ouder zijn met relevante ervaring in het beroep waarvoor ze solliciteerden. De fictieve kandidaten zijn bijgevolg overgekwalificeerd voor juniorfuncties. Bovendien konden vacatures waarvoor aanvullende informatie vereist was tijdens de initiële sollicitatiefase, zoals een (bewijs van) diploma, rijbewijs, goed gedrag en zeden, niet worden meegenomen in het experiment. Dergelijke documentatie is typisch niet beschikbaar in correspondentie-onderzoek vanwege ethische overwegingen en, belangrijker nog, vanwege het verbod op het vervalsen van deze documenten. In ons experiment kwam de toegangsbarrière voornamelijk tot uiting in vacatures binnen de publieke sector, waar vaak een nationaal registratienummer en/of verdere bewijzen van diploma's vereist zijn.

Ten slotte solliciteerden we maximaal voor één vacature per werkgever in de privésector en twee vacatures per werkgever in de publieke sector, om de kosten voor de werkgevers te beperken en de kans dat het experiment ontdekt zou worden te minimaliseren. De sollicitaties werden per e-mail of via online tools verstuurd, met 12 tot 24 uur tussen de sollicitaties.

5. Resultaten

5.1. Beschrijvende statistieken

Onze steekproef bestaat grotendeels uit kleinere organisaties met maximum 250 werknemers (80%) en organisaties actief binnen de private sector (86.1%). Van alle fictieve sollicitanten ontving 14% een uitnodiging voor een sollicitatiegesprek (positieve reactie in de strikte zin), 36% een positieve reactie (positieve reactie in brede zin, zoals een uitnodiging voor een sollicitatiegesprek en een verzoek om verdere informatie), en 9% een formele afwijzing. De overige 55% van de fictieve sollicitanten ontving geen reactie op hun sollicitatie (binnen 30 dagen na hun sollicitatie).

De statistieken tonen vergelijkbare cijfers in de drie sectoren, maar met enkele opmerkelijke verschillen. Ten eerste hebben fictieve sollicitanten vaker een bachelordiploma wanneer ze solliciteren in de publieke sector dan in de privésector, respectievelijk 92% versus 58%. Vooral de particuliere sector groothandel en detailhandel (nace G) rapporteert een relatief laag aandeel fictieve sollicitanten met een bachelordiploma (43%). Ten tweede is er een verschil in de taal waarin

kandidaten solliciteerden, waarbij de meerderheid van de fictieve sollicitanten Nederlands gebruikt in de publieke sector (60%) en Frans in de private sector groothandel en detailhandel (nace G) (72%). In de private sector administratieve en ondersteunende diensten (nace N) solliciteerden de fictieve sollicitanten bijna even vaak in het Nederlands (54%) als in het Frans (47%). Ten derde stellen overheidsorganisaties gemiddeld meer werknemers te werk dan private organisaties. Ten slotte worden bij overheidsorganisaties meer sollicitanten uitgenodigd voor een sollicitatiegesprek: 23% van de sollicitanten wordt uitgenodigd, tegenover 13% in de privésector. Bovendien sturen werkgevers in de publieke sector vaker een formele afwijzing. Meer specifiek ontving 17% van de sollicitanten in de publieke sector en 8% van de sollicitanten in de private sector een formeel bericht van afwijzing via e-mail of voicemail. De sector groot- en detailhandel (nace G) heeft het hoogste aandeel (65%) kandidaten die binnen 30 dagen na sollicitatie geen reactie ontving, vergeleken met 48% in de publieke sector (nace O) en 46% in administratieve en ondersteunende diensten (nace N).

5.2. Bivariate en multivariate analyses

Onze onderzoeksresultaten onthullen dat vrouwelijke sollicitanten consequent meer kans maken om uitgenodigd te worden voor een sollicitatiegesprek of om een positieve reactie te ontvangen in vergelijking met mannelijke sollicitanten. Met betrekking tot etniciteit blijkt uit onze bevindingen dat alleen sollicitanten met een Marokkaanse (niet-EU) etniciteit aanwervingsdiscriminatie ervaren in vergelijking met sollicitanten met een Belgische etniciteit. Dit uit zich zowel in een lagere kans om uitgenodigd te worden voor een sollicitatiegesprek als in een verminderde kans op een positieve reactie in het algemeen. Voor sollicitanten met een Poolse (EU) etniciteit werd geen aanwervingsdiscriminatie vastgesteld in vergelijking met sollicitanten met een Belgisch klinkende naam. Wat betreft leeftijd benadrukt onze analyse dat alleen sollicitanten die 50 jaar of ouder zijn (leeftijdsverschil van 12 jaar met de jongere sollicitanten) nadelige gevolgen ervaren op de Brusselse arbeidsmarkt. Wanneer we de effecten geassocieerd met een Marokkaanse etniciteit, een leeftijdsverschil van 12 jaar en het mannelijk geslacht vergelijken, vinden we geen statistisch significante verschillen. Verschillende robuustheidsanalyses werden uitgevoerd. Deze resultaten bevestigden eerdere bevindingen.

In de analyses voor deelsteekproeven met organisaties uit de publieke sector (nace O) en de private sectoren groot- en detailhandel (nace G) en administratieve en ondersteunende diensten (nace N), observeerden we enkel significante (discriminerende) effecten bij organisaties uit de private sectoren. Dit suggereert dat er statistisch significante ongelijke behandeling plaatsvindt binnen de private sectoren. In beide sectoren zien we dat het hebben van een Marokkaanse etniciteit, een leeftijd van ouder dan 50 jaar en man zijn, nadelige effecten voor de initiële kansen op de arbeidsmarkt. In de publieke sector observeren we geen significante effecten. Nader onderzoek wijst echter uit dat deze effecten statistisch niet verschillen van de effecten in de private sector(en). Het gebrek aan significantie in de deelsteekproef voor de publieke sector lijkt verband te houden met het beperkte aantal observaties. Hoewel we enkel evidentie vinden voor

aanwervingsdiscriminatie in de private sectoren groot- en detailhandel (nace G) en administratieve en ondersteunende diensten (nace N), kunnen we dus niet met zekerheid stellen dat er geen aanwervingsdiscriminatie is in de publieke sector (nace O).

Verder vinden we in ons onderzoek geen robuust bewijs voor intersectionaliteit tussen etniciteit, leeftijd en geslacht overheen de verschillende uitkomstvariabelen en sectoren. Hoewel enkel suggestief, suggereren de resultaten zwakke interactie-effecten voor bepaalde uitkomsten. Voor de uitkomst 'uitnodiging voor een sollicitatiegesprek' zien we een zwak interactie-effect tussen etniciteit en geslacht (significantie op 10%-niveau), wat erop wijst dat het negatieve effect van een buitenlandse etniciteit kleiner is (mogelijk volledig weg gebalanceerd) voor mannen. Voor de uitkomst 'elke positieve reactie' vinden we een zwak interactie-effect tussen etniciteit en leeftijd (op 10% significantieniveau), wat aangeeft dat het negatieve effect van een buitenlandse etniciteit kleiner is voor oudere sollicitanten. Deze bevinding kan worden toegeschreven aan het feit dat alle fictieve sollicitanten in ons experiment geboren waren, studeerden en werkten in het Brussels Hoofdstedelijk Gewest. Bijgevolg zouden oudere kandidaten met een buitenlandse achtergrond een voordeel kunnen hebben ten opzichte van hun jongere collega's met een buitenlandse naam. In de analyses voor de deelsteekproeven, vinden we opnieuw geen sluitend bewijs dat de discriminerende effecten van etniciteit, leeftijd en geslacht elkaar versterken of verzwakken.

6. Beleidsaanbevelingen

De bevindingen van het onderzoek hebben aanzienlijke implicaties voor beleidsvorming. In de eerste plaats tonen de resultaten aan dat zelfs bij gelijkaardige kenmerken, zoals geboorteplaats, opleiding en professionele ervaring binnen het Brussels Hoofdstedelijk Gewest, er nog steeds sprake is van aanwervingsdiscriminatie op basis van etniciteit, met name ten opzichte van individuen van niet-Europese afkomst. Ook vonden we dat mannen en oudere sollicitanten (twaalf jaar ouder), ondanks gelijke achtergrondkenmerken en competenties (inclusief digitale vaardigheden), lagere arbeidsmarktkansen hebben. Dit wijst op het bestaan van aanhoudende etnische, gender en leeftijdsvooroordelen die verder gaan dan louter o.a. compatibiliteit van kwalificaties en gepercipieerde vaardigheden.

Ten tweede vonden we dat de effecten geassocieerd met een Marokkaanse etniciteit, een leeftijdsverschil van 12 jaar en het mannelijk geslacht vergelijken niet significant verschillen van elkaar. Dit suggereert dat beleidsmakers niet slechts één van deze factoren afzonderlijk moeten aanpakken, maar eerder een holistisch beleid moeten voeren dat zich richt op een breed scala aan discriminerende praktijken tijdens het aanwervingsproces. Niettemin, is het tegelijkertijd belangrijk om hierbij in het bijzonder aandacht te geven aan personen die verschillende kenmerken combineren en daardoor negatieve effecten opstapelen (bv. een oudere man met een Marokkaanse etniciteit).

Dit kan verschillende aspecten omvatten, zoals het stimuleren van bewustwording en training over vooroordelen en stereotypen. In beoordelingsprocessen kunnen immers verschillende onbewuste vooroordelen sluipen. Verder kan beleid zich richten op het informeren van werkgevers over de wetgeving die discriminatie verbiedt, waaronder de antiracismewet, de wet op de gelijkheid van vrouwen en mannen en de antidiscriminatiewet. Deze elementen kunnen worden gerealiseerd door sensibiliseringsacties in de vorm van onder andere affichecampagnes en evenementen. Belangrijk hierbij is dat de meerwaarde van diversiteit binnen de onderneming in de verf wordt gezet.

Bovendien kan een regelgevend kader voor anonieme sollicitaties worden overwogen.† Bij anonieme sollicitaties worden persoonlijke kenmerken zoals geslacht, etniciteit of leeftijd (waarvoor discriminatie bij wet verboden is) verwijderd uit het cv voor deze wordt beoordeeld. Deze informatie kan worden weggelaten door de sollicitanten zelf of door de organisatie (tijdens de sollicitatie via een online sollicitatie platform waar persoonlijke kenmerken niet worden gevraagd of na de sollicitatie via een ICT-systeem of manueel door een persoon die niet betrokken is bij de evaluatie van kandidaten). In België introduceerde Accent, een talent placement bedrijf, anonieme cv's in februari 2023 (Trends, 2024). Het bedrijf rapporteert alvast een gunstig effect van deze maatregel (Accent, 2024). Niettemin, moet de impact van deze maatregel grondig worden onderzocht, omdat onderzoek suggereert dat hoewel anonieme cv's bepaalde vormen van discriminatie kunnen verminderen, ze mogelijk discriminatie naar een later stadium van het wervingsproces verschuiven.

Verder, kan beleid zich richten op het stimuleren van diversiteit en inclusie op de werkplek. Dit is vooral een effectieve strategie als blootstelling aan diverse groepen in de samenleving leidt tot minder vooroordelen en discriminatie (volgens de "contacttheorie"). Echter, als blootstelling aan diversiteit discriminatie verergert (de zogenaamde "zichtbaarheidsdiscriminatie"), is deze strategie niet effectief. Hoewel beperkt onderzoek de "zichtbaarheidsdiscriminatie"-theorie ondersteunt, is verder onderzoek van groot belang.

Bijkomend is het belangrijk om de evolutie van discriminerende praktijken bij aanwerving op de Brusselse arbeidsmarkt te monitoren. Dit kan onder meer door middel van praktijktesten bij een grote groep bedrijven actief op de Brusselse arbeidsmarkt, al dan niet binnen een bepaalde sector. Een belangrijke opmerking hierbij is dat het gebruik van praktijktesten om individuele bedrijven te testen, op te volgen en mogelijk te sanctioneren geen effectieve of eerlijke methode is. Dit komt voornamelijk door twee redenen: (1) een erg hoog aantal observaties is nodig om met voldoende zekerheid aanwervingsdiscriminatie te kunnen vaststellen, (2) de resultaten van deze praktijktesten zijn beperkt tot de specifieke kenmerken die worden getest en (3) bij herhaalde praktijktesten bij één organisatie verhoogt de kans op detectie van het experiment alsook de kosten voor de

† Let op, anonieme cv's mogen niet verward worden met praktijktesten (correspondentie-experimenten), zo is het gebruik van anonieme cv's een (beleids)maatregel om discriminatie tegen te gaan en vormen praktijktesten een onderzoeksmethode om discriminatie op te sporen.

betrokken werkgever substantieel. Bijkomend is het opzetten van praktijktesten een technische aangelegenheid die experten kennis vereist en worden academische onderzoekers aangemoedigd om ethische goedkeuring te verkrijgen van hun onderwijsinstelling voor deze experimenten, wat vaak een uitdaging is.

Tot slot observeerden we, op basis van analyses per sector, discriminerende praktijken in de private sectoren groot- en detailhandel (nace G) en administratieve en ondersteunende diensten (nace N). Het lijkt daarom belangrijk voor het beleid om deze sectoren verder op te volgen. Bovendien konden we op basis van deze studie niet uitsluiten dat er discriminatie plaatsvindt in de publieke sector, evenals in sectoren die niet zijn meegenomen in het experiment. Opnieuw benadrukken we het belang van een holistisch beleid.

7. Suggesties voor verder onderzoek

Ondanks de interessante en innovatieve resultaten, is het belangrijk dat vervolgonderzoek wordt uitgevoerd om sollicitanten, werkgevers en overheden te begeleiden bij het verminderen van discriminatie op de arbeidsmarkt. Dit onderzoek ging na hoe een niet-Belgische Europese etniciteit (Pools) of een niet-Europese etniciteit (Marokkaans) de arbeidsmarktkansen van sollicitanten beïnvloedt. Hoewel de waargenomen negatieve effecten voor sollicitanten met een Marokkaanse etniciteit mogelijk een signaal zijn voor niet-EU-landen in een vergelijkbare situatie met Marokko, is het belangrijk om de impact van verschillende etniciteiten op de arbeidsmarktkansen te onderzoeken. Mogelijk zijn er alsnog verschillen in arbeidsmarktkansen naar specifieke niet-EU etniciteit. Ook voor EU-etniciteiten vermoeden we verschillen in arbeidsmarktkansen naar specifieke EU-etniciteit. Verder onderzoek kan het debat voeden door een breder scala aan etnische groepen te onderzoeken.

Verder zijn alle fictieve sollicitanten in ons experiment geboren in het Brussels Hoofdstedelijk Gewest. Ook studeerden en werkten alle sollicitanten in het Gewest. Hierdoor werden eventuele verschillen in arbeidsmarktkansen gerelateerd aan o.a. compatibiliteit van diploma's en nationaliteit (en/of geboorteland) niet onderzocht. Toekomstig onderzoek gericht op het land van herkomst van de sollicitanten en/of waar ze hun diploma behaalden (in België, in Europa of buiten Europa) zou ons onderzoek kunnen aanvullen. Ook werd onze studie gekenmerkt door een laag aantal observaties in de publieke sector, waardoor diepgaande analyses per sector niet mogelijk waren. Verder onderzoek hiernaar wordt daarom noodzakelijk geacht.

Bijkomend, moedigen we toekomstig onderzoek aan naar de impact van anonieme sollicitaties op zowel de kans om aangenomen te worden (positieve reactie op een sollicitatie incl. een uitnodiging voor een gesprek) als effectieve jobaanbiedingen, om zo oplossingen gericht op het bestrijden van discriminatie op de arbeidsmarkt te verkennen.

Daarnaast is, gezien de grootstedelijke context van het Brussels Hoofdstedelijk Gewest, onderzoek naar contextfactoren van cruciaal belang. Hierbij moet specifiek worden gekeken naar de impact van blootstelling aan diverse groepen in de samenleving op discriminatie op de arbeidsmarkt. Het

onderzoeken van deze contextfactoren kan helpen bij het vormgeven van effectief beleid gericht op het bevorderen van diversiteit en inclusie op de werkvloer. Bijkomend is aanvullend onderzoek nodig naar de onderliggende mechanismen om meer inzicht te krijgen in de waargenomen discriminerende praktijken, alsook beleidsmakers te informeren. Mechanismen die hierbij zeker moeten worden onderzocht zijn de theorie van het menselijk kapitaal over de (gepercipieerde) aangeleerde kennis en competenties, en de signaleringstheorie over de (gepercipieerde) aangeboren kennis en competenties.

Verder, is het aangewezen om de evolutie van discriminatie op de Brusselse arbeidsmarkt op te volgen. Wel moet bij herhaling van experiment in het bijzonder rekening worden gehouden met de kosten voor de betrokken werkgevers en de toenemende kans op detectie. Het is daarom aangeraden een langere periode tussen twee metingen in te plannen en/of bedrijven die reeds eerder betrokken waren bij correspondentietesten uit te sluiten voor vervolgonderzoek.

Voorgaande suggesties voor verder onderzoek kunnen (onder andere) worden onderzocht aan de hand van keuze-experimenten. Meer specifiek, vormen zowel correspondentie-experimenten als vignettenonderzoek interessante pistes. Beide experimenten leggen respondenten - potentiële werkgevers - fictieve sollicitaties voor die (onder andere) variëren op de kenmerken van interesse (bijvoorbeeld etniciteit, nationaliteit, leeftijd en geslacht). Het voornaamste onderscheid tussen deze twee experimentele benaderingen is de geïnformeerde toestemming. Bij correspondentie-experimenten worden paren van gelijkaardige fictieve sollicitaties naar echte vacatures gestuurd, zonder dat de werkgevers op de hoogte zijn van hun deelname aan het experiment. De antwoorden van de werkgevers geven een onvertekend inzicht in hun voorkeuren. Bij vignettenonderzoek nemen werkgevers vrijwillig deel aan een vragenlijst waarin ze een hypothetische functiebeschrijving lezen en vervolgens fictieve kandidaten evalueren. Omdat de werkgevers instemmen met onderzoek, kent deze methode minder ethische overwegingen. Bovendien kunnen hierdoor aanvullende vragen worden gesteld om een dieper inzicht te krijgen in de onderliggende mechanismen. Niettemin kan niet worden uitgesloten dat de resultaten beïnvloed worden door sociaal wenselijk gedrag.‡ Beide soorten experimenten bieden waardevolle instrumenten voor onderzoekers om voorkeuren en besluitvorming op de arbeidsmarkt te begrijpen.

‡ Uit onderzoek blijkt dat de geobserveerde effecten van de eigenschappen van sollicitanten vergelijkbaar zijn tussen vignettenonderzoek en correspondentie-onderzoek.

Academic article (ENG)

The relative rates of ethnic, age and gender discrimination and their intersectionality: a factorial field experiment in the Brussels Capital Region§

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Abstract. This study investigates the relative rates of ethnic, age, and gender discrimination, as well as their intersectionality in three prominent sectors in the metropolitan context of the Brussels Capital Region. The research employs a correspondence experiment to estimate the causal impact of ethnicity (Polish or Moroccan versus Belgian), age (6- or 12-year age gap with younger applicants aged 38 or 44), and gender (male or female) on the likelihood of receiving a job interview invitation or any positive response. Our findings reveal female applicants are more likely to be invited to a job interview or receive a positive response compared to male applicants. Regarding ethnicity, evidence suggests that hiring discrimination is experienced only by individuals of Moroccan (non-EU) descent when compared to Belgian applicants, with no observed discrimination for those of Polish (EU) descent. For age, our results indicate that only a substantial age gap of 12 years is penalised in the Brussels labour market. Comparison of coefficients indicates no statistical significance between the effects of a Moroccan ethnic background, a 12-year age gap, and being male. Separate analyses by sector reveal significant discriminatory effects only among the private sector organisations 'Wholesale and retail trade; repair of motor vehicles and motorcycles' (nace G) and 'Administrative and support service activities' (nace N). In the public sector, we observe no significant effects. However, we note that the effects observed for the public sector are qualitatively similar and not significantly distinct from those of the private sectors. A noteworthy exception is a weak but significant difference in hiring discrimination against men which is substantially larger in wholesale and retail sector (nace G) as compared to the public sector (nace O). Last, exploring the intersectionality of ethnicity, age, and gender, we do not find robust evidence that these characteristics substitute (weaken) or complement (strengthen) one another both in the full sample analyses and the analyses for the subsamples by sector.

JEL classification. C93, J15, J20, J71

Keywords. Discrimination, Unequal treatment, Hiring discrimination, Labour market discrimination, Age, Ageing, Gender, Ethnicity, Design of experiments, Field experiments, Correspondence experiment, Brussel Capital Region, intersectionality, sector analysis

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1. Introduction

Hiring discrimination remains a pressing issue in contemporary labour markets. Despite the increasing diversity of the workforce worldwide and numerous policy interventions, many individuals from various minority groups, including older individuals and individuals with a foreign ethnicity, still experience significant discrimination in the labour market (Lippens, Vermeiren, et al., 2023; Zschirnt & Ruedin, 2016).[5] Interestingly, while some suggest discrimination against women to reduce over time (Schaerer et al., 2023), most studies indicate there to be limited or no change (increase or decrease) over time in hiring discrimination across various discrimination grounds, including race, ethnicity, nationality, gender, age, religion, disability and sexual orientation (Heath & Di Stasio, 2019; Quillian et al., 2017; Quillian & Lee, 2023).[6] Moreover, while certain meta-analyses indicate that hiring discrimination against minority groups exhibits minimal variation across different regions, encompassing the Americas, Africa, Asia, Europe, and Oceania (Lippens, Vermeiren, et al., 2023), contrasting perspectives posit that discrimination against specific ethnic minority groups may vary significantly at the national level, depending on the particular ethnic group being examined (Thijssen et al., 2022). Concerning age discrimination, older candidates seem to be discriminated against more in Europe than in the United States (Lippens, Vermeiren, et al., 2023). This could be linked to the stricter legal framework surrounding pensions and retirement in European countries. The existence of mandatory retirement ages, in particular, may convey to employers that older individuals are expected to withdraw from the labour market upon reaching a certain age, thereby fostering age discrimination in hiring. Importantly, research by Baert et al. (2016) in Belgium suggests age discrimination largely depends on older candidates' career patterns, with older age only affecting callback robustly if the older candidate was employed in an out-of-field job during their extra post-educational years. For gender, researchers have not yet reached a unanimous conclusion. While most correspondence experiments report null results, the remaining experiments report discrimination against both men and women, with men on average being less likely to be hired (Lippens, Vermeiren, et al., 2023). These results, however, largely depend on various factors, such as the organisation and gender composition of the occupation (Adamovic & Leibbrandt, 2023; Galos & Coppock, 2023; Kline et al., 2022; Lippens, Dalle, et al., 2023). Two recent studies, for example, find the effect of being a man is positive in male-dominated occupations, but negative in female-dominated ones (Adamovic & Leibbrandt, 2023; Galos & Coppock, 2023; Schaerer et al., 2023).[7]

[5] See Lippens et al. (2023) for a meta-analysis of recent correspondence experiments on discrimination (based on various grounds) in hiring decisions.

[6] Notwithstanding this overarching pattern, Quillian and Lee's (2023) meta-analysis uncovered distinct country-specific and ethnically dependent trends over time in hiring discrimination. The study noted an increase in discrimination against Middle Eastern and North African ethnic groups from the 1990s to the 2000s. France exhibited a decline in discrimination, although from very high to high levels, while the Netherlands experienced an overall increase in discrimination.

[7] Moreover, a comprehensive meta-analysis of field audits investigating gender gaps in application outcomes also reveals a nuanced evolution of discrimination trends over time in male-dominated and female-dominated professions.

Additionally, individuals often combine multiple characteristics (e.g. an older, ethnic minority job applicant), which can lead to supplementary discrimination. However, interactions between multiple factors remain largely under-researched in the field of experimental literature with the exception of gender and ethnicity (Dahl & Krog, 2018). Notwithstanding, for several reasons, we can expect heterogenous effects for ethnicity, age and gender depending on other applicant characteristics. First, when examining the interactions of ethnicity and gender in hiring processes, it can be anticipated that men may face a heightened risk of encountering discrimination. This expectation stems from the disproportionate representation of men in European immigration statistics. In 2021, men constituted 55% of all immigrants and comprised 71% of asylum applicants (Eurostat, 2023a, 2023b, 2023c), in contrast to the general EU27 population, where males make up 49% (Eurostat, 2023a, 2023b, 2023c).[8] For this reason, men with an ethnic minority background may be perceived to be particularly threatening by the majority population. Evidence from labour market field experiments is however mixed. Some research supports the hypothesis (Andriessen et al., 2012; Arai et al., 2016; Dahl & Krog, 2018; Liebkind et al., 2016; Midtbøen, 2016; Van Borm & Baert, 2022), where minority men consistently experience substantially higher levels of discrimination across different types of occupations compared to their minority female peers, while other studies find no or negligible differences in ethnic discrimination based on gender (Blommaert et al., 2014; Bursell, 2014; Derous et al., 2012).

Second, the results are likely to be nuanced for the intersection of ethnicity and age. In line with the previous argument, it is conceivable that younger minority individuals may experience supplementary discrimination, as individuals under the age of 35 are largely overrepresented among asylum applicants (78%) in the EU27 (Eurostat, 2023a). A second argument, in line with the literature on acculturation and age, indicates those who immigrate at younger ages are likely to better acculturate into their new society compared to individuals who immigrate at older ages (Cheung et al., 2011),[9] which could lead to a reduced risk of encountering discrimination for minority individuals who immigrated at a younger age or later generation immigrants compared to their minority peers who immigrated at an older age. Furthermore, in light of the preceding two dynamics regarding ethnicity and age, we anticipate long-established older minority individuals who have i.e. participated in the country's educational and labour market system, will encounter reduced levels of discrimination in comparison to their younger minority peers.

Third, age and gender discrimination may interact. However, the sign of this interaction is difficult to predict (Levy, 1988). On the one hand, we anticipate women to experience heightened discrimination both at younger and older ages. At younger ages, women may experience

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The findings by Schaerer et al. (2023) indicate a decreasing trend in discrimination against women in male-dominated professions, whereas discrimination against men in female-dominated professions appears to remain relatively stable over time.

[8] A similar pattern manifests itself in Belgium (Eurostat, 2023a, 2023b, 2023c).

[9] Cheung et al. (2011) found that a longer duration of exposure is associated with stronger identification with the culture of the immigrant's 'new' country among young immigrants only.

additional discrimination based on their potential or realized fertility. Research suggests this to mainly be an issue in the private sector (Wang & Wong, 2021) and for part-time employment (S. O. Becker et al., 2019). At older ages, employers might prefer hiring men because women more often opt for earlier retirement (OECD, 2015). Results from a large-scale field experiment, suggest that callback rates indeed drop steeper for women than for men (Carlsson & Eriksson, 2019). On the other hand, men may experience heightened discrimination at older ages, as women, on average, have better health than men (OECD, 2013).

Beyond these individual characteristics, hiring discrimination can differ by specific employer aspects. One such aspect is the metropolitan context. In metropolitan cities, such as Brussels and surrounding municipalities, a multitude of disparities emerge including linguistic diversity, ethnic backgrounds and socioeconomic statuses.[10] This diversity presents both opportunities and challenges.

For several reasons, we can expect the effects of discrimination to differ in such a setting. First, exposure to a diverse range of individuals in a metropolitan area may exacerbate discrimination (Beggs et al., 1997; Blalock, 1967; Burr et al., 1991; Frisbie & Neidert, 1977), a phenomenon also referred to as "visibility-discrimination". In densely populated urban environments, people from various backgrounds often interact closely, leading to increased visibility of different demographic groups within society. As a result, individuals may develop discriminatory attitudes in response to perceived socioeconomic threats associated with the increasing presence of minority subgroups. In essence, the visibility of these groups accentuates differences and can exacerbate existing prejudices or stereotypes, thereby intensifying discriminatory behaviour. Second, metropolitan areas may also offer opportunities for reduced discrimination, aligning with the "Contact Theory" (Allport et al., 1954; Paolini et al., 2021; Pettigrew, 2021). This theory suggests that, under certain circumstances, increased exposure to individuals from diverse backgrounds can lead to reduced prejudice and discrimination, primarily because it challenges and breaks down stereotypes. Similarly, in metropolitan areas, organisations are more likely to be owned by a more diverse population. This presence of a diverse group of decision-makers might again benefit minority job seekers, as employers may either consciously or unconsciously seek to hire individuals who share similarities with them or the existing workforce (Sibert, 2014). Notwithstanding, while empirical evidence about discrimination in a metropolitan context is limited, studies mainly suggest a positive correlation between the concentration of ethnic minorities and various indicators of socioeconomic inequality, including hiring discrimination and earnings, providing support for the "visibility-discrimination" thesis (Beggs et al., 1997; Johnson et al., 2012; Mai, 2022; Tomaskovic-Devey & Roscigno, 1996). Some researchers find this to be the case only for certain ethnic groups (Mai, 2022).

[10] For a more elaborate description of the metropolitan contact in the Brussels Capital Region, we refer to the section 'Institutional setting'.

Another interesting aspect is the (type of) sector in which an organisation operates. Although any discrimination based on any ground such as age, sex, sexual orientation, race, colour, ethnic or social origin, or membership of a national minority is prohibited in Europe (European Union, 2007), multiple factors lead us to believe that the sector and especially the distinction between public and private sectors is of significant interest. In contrast to the private sectors, the government plays a pivotal role in terms of labour market integration, serves as a crucial exemplar, and must remain neutral towards its citizens. Notwithstanding, the experimental literature on this topic is focused only on ethnic discrimination. While some studies indicate employers in the public sector discriminate significantly less compared to those in the private sector (Hou & Coulombe, 2010; Jankowski et al., 2020; Lahey et al., 2023; Wang & Wong, 2021; Wood et al., 2009), others find little to no overall evidence for differences in hiring discrimination between both types of sectors (Cahuc et al., 2019; Jankowski et al., 2020; Leysen et al., 2023; Villadsen & Wulff, 2018).[11] The results, furthermore, suggest research outcomes largely depend on the considered ethnic minority group (Zwysen et al., 2021).

There have been a number of correspondence studies on discrimination in cities in Belgium. Recent experiments carried out in Ghent and Antwerp help shed light on ethnic, age and gender discrimination in hiring practices in Belgian cities (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021). In both cities, evidence was found of ethnic discrimination (although only weakly significant in Ghent) and age discrimination in hiring. The latter was driven by applicants who filled in their additional years of life with inactivity. More specifically, in terms of callback rates, the researchers found evidence of a 5.5 percentage point and 5 percentage point difference in positive reactions based on ethnicity, and a 3.8 percentage point and 11.7 percentage point difference by age in Antwerp and Ghent respectively. For gender, which was only alternated between pairs as opposed to within pairs in the experiments, no evidence was found of hiring discrimination.

In this study, we conduct a novel randomised factorial field experiment in the Brussels Capital Region in Belgium (a large metropolitan area), where we simultaneously vary three applicant characteristics (ethnicity, age and gender). In this experiment, we send pairs of fictitious job applications, where the applicants differ only by the tested characteristics, to real job openings in both the public and private sectors. Doing so, we investigate hiring discrimination based on ethnical background, age and gender, including the intersectionality between these characteristics. Interestingly, the method allows us to compare the relative importance of the applicant's characteristics. Last, targeting a broad sample of employers, we also assess heterogeneous effects related to employer characteristics.

2. Institutional setting

[11] Related, a recent study for Flanders Belgium also found not-for-profit and larger organisations exhibit lower levels of discrimination against candidates from ethnic minority groups when compared to their for-profit counterparts or organisations with smaller workforces.

The Brussels Capital Region is one of the three regions in Belgium. The region is located in the centre of the country and is part of both the Flemish and French communities of Belgium. Consequently, both Dutch and French are official languages in the region.[12] Also, education[13] in Brussels is organised by both the Flemish and French Communities. Hence, students in Brussels have the option to enrol in either Dutch or French study programmes. In the school year 2020-2021, 82% of the secondary education population and 63% of the higher education population were enrolled in French education (BISA.Brussels, 2023b). Of the Brussels population ages 25 and older around 50% obtained a higher education diploma (ISCED 2011 level 5-8) (Statbel, 2023a).

The region comprises 19 municipalities, including the capital (Brussels) of Belgium (Brussels Hoofdstedelijk Gewest, 2023). While the region is geographically relatively small (162 km^2) compared to the other two regions of Belgium,[14] it is by far the most densely populated region with around 7 500 persons per square kilometre (Statbel, 2022e).

The population of Brussels is hyper-diverse, with 36% of the population having a non-Belgian nationality from 183 different countries (BISA.Brussels, 2023a; Statbel, 2022b). Additionally, of those with a non-Belgian nationality, over 55% have a nationality from outside the EU-27 (BISA.Brussels, 2023a; Statbel, 2022b). Of those with a foreign nationality residing in the Brussels Capital Region, 75% are between 18 and 64 years old, compared to 59% of those with a Belgian nationality (Statbel, 2023d). Additionally, 40% of the Brussels population has foreign roots whilst having the Belgian nationality (Statbel, 2022b).[15] Consequently, Brussels stands out as one of the most cosmopolitan cities globally, with sources indicating the city has the second-largest proportion of foreign-born residents among major cities worldwide (International Organization for Migration, 2015). Looking at the gender distribution in the region, men and women each represent about 50% of the Brussels population (Statbel, 2023d).[16] Furthermore, the Brussels Capital Region is characterised by a relatively young population with only 13% of the population being 65 years or older, compared to 21% and 20% in the Flemish and Walloon Region respectively in 2023 (Statbel, 2023c). The vast majority (62%) of Brussels residents fall within the age range of 20 to 64 years, surpassing the respective figures in the Flemish (57%) and Walloon (58%) regions (Statbel, 2023c).[17] In light of this hyper-diverse context, the region is characterised by many initiatives to reduce discrimination, e.g. action plan against racism (2023-2026), for gender mainstreaming(2022-2025), for inclusion of

[12] The Brussels Capital Region is the only bilingual region in Belgium.

[13] This is a community matter in Belgium.

[14] The Flemish region and Walloon Region cover 13,626 and 16,901 km^2 respectively.

[15] This category comprises individuals who possess a foreign nationality as their first registered nationality, alongside holding the Belgian nationality, or individuals who have at least one parent with a first registered foreign nationality.

[16] While these indicators for the Brussels population reflect the hyper-diverse nature of the Brussels population, it's essential to note that these statistics may not accurately represent the entire workforce in the Brussels Capital Region. This is because more than half (56%) of the jobs in the region are occupied by individuals who reside outside the region (Heylen & De Maesschalck, 2018).

[17] Interestingly, 32% of Brussels residents fall within the age range of 20 to 39 years, exceeding the corresponding percentages in both the Flemish (24%) and Walloon (25%) regions (Statbel, 2023c).

LGBTQIA+ individuals (2022-2025) and for the integration of individuals with a handicap(2022-2025) (https://equal.brussels/).

In addition to the hyper-diverse population, each day many commuters travel to the Brussels Capital Region for work. In 2022 over 400 000 individuals commuted to the Region for work, with nearly half (49.5%) of all jobs being occupied by residents from Flanders or the Walloon Region (Actiris, 2022). This adds an additional layer of opportunities and challenges for the Region, as workers from Flanders and the Walloon Region bring with them a diverse spectrum of perspectives and cultures tied to their region of residence.

Economically, the Brussels Capital Region has the highest number of active VAT-registered organisations per square kilometre in Belgium (Statbel, 2022a, 2022e). The Brussels region, in addition, has an interesting mix of private and public (from all three regions) organisations. Notwithstanding, the Region is confronted with a relatively high unemployment rate compared to the Flemish and Walloon Region in Belgium, respectively 11.5% versus 3.2% and 8.4% in 2022 (Statbel, 2024). Furthermore, while all regions experience higher unemployment rates among individuals with a non-EU nationality of origin, the Brussels Capital Region bears the highest unemployment rate for this demographic (Statbel, 2023b). This trend extends to age demographics as well, with all regions experiencing higher unemployment rates among young individuals (ages 15-24), where again, the Brussels Capital Region exhibits the highest rate (Statbel, 2024). Notably, while the unemployment rates are lower for older age groups (25 to 49 and 50 to 64 years old), also for these groups Brussels reports the highest rates relative to the Flemish and Walloon Regions. Furthermore for men and women, unemployment rates are quite similar within each region (Statbel, 2024).

When examining the proportion of the active population (employed and unemployed) within the total population, slightly different trends emerge. The Brussels Capital Region has an overall activity rate of 68%, placing the region just below the Flemish Region with 74%, and slightly above the Walloon Region, which holds a rate of 66% (Statbel, 2024). Interestingly, while all regions witness lower activity rates among individuals with a non-EU nationality, the gap between Belgian nationals and those of other origins appears smaller in the Brussels Capital Region (Statbel, 2023b). However, within the 15-24 age group, Brussels reports the lowest activity rate at 20% of all regions, compared to 36% in the Flemish Region and 26% in the Walloon Region (Statbel, 2024). For older age brackets, 25 to 49 and 50 to 64 years old, the Brussels Capital Region reports a lower activity rate compared to Flanders but higher compared to the Walloon region (Statbel, 2024). Last, across all three regions, activity rates are consistently higher among men compared to women (Statbel, 2024).

3. Factorial field experiment

To study hiring discrimination in the Brussels labour market, we conduct a randomised factorial field experiment, which builds on both the revealed preferences correspondence experimentation framework of Bertrand and Mullainathan (2004) and the stated preferences factorial experimentation framework of Auspurg and Hinz (2015). Specifically, and in line with

correspondence experiments, we send pairs of fictitious job applications to real job openings where the applicants differ only by the tested characteristics. These characteristics are varied according to the design of factorial experiments, meaning that in our experiment three characteristics with each two levels are simultaneously varied. All other factors are kept constant for all the fictitious applications.

This experimental approach has five distinct advantages. First, by monitoring the responses to fictitious job applications, we can study unequal treatment in the labour market based on these three characteristics, compare the relative rates of hiring discrimination, as well as study the interaction effects among these characteristics. Importantly, any observed effects cannot be due to selection based on unobservable factors, as all information provided is controlled by the researchers (Pager, 2007; Riach & Rich, 2002). The method, therefore, allows for a causal interpretation of the effects related to the investigated candidate characteristics and assures high internal validity of the study. Second, the assessment of hiring discrimination occurs in the real-world context, where employers face tangible consequences of their hiring decisions. The design, therefore, ensures high external validity. Third, in alignment with the second advantage, correspondence experiments directly measure discriminatory behaviour in the labour market, albeit in the initial stages of the hiring process, rather than relying on intentions or attitudes towards candidate characteristics. This allows for the identification of patterns that may be subconscious to the employers in the selection process, thereby enhancing external validity. Fourth, as employers are unaware of the experiment, the study is not affected by social desirability bias, a concern often present in traditional surveys. Last, the method enables us to isolate discriminatory practices by employers from supply-side determinants of labour market outcomes such as diploma and experience (Pager, 2007; Riach & Rich, 2002). Given these advantages, correspondence experiments are often referred to as the "golden standard" to measure discrimination (Heath & Di Stasio, 2019).

3.1. Characteristics

Related to the hyper-diverse population of Brussels, we include three characteristics: **ethnical background, age and gender.** The characteristics and their levels are described below as well as visualised in Table 1.

First, we differentiate between applicants with a Belgian **ethnical background** and those with a foreign ethnic background. Studying the ethnic composition of the Brussels population and the bilingual context, we select both French and Dutch (Flemish) Belgian common names and further divide the foreign ethnicity into European and non-European ethnicities. The latter is operationalized by selecting Polish (EU-27) and Moroccan (non-EU) names, as both job seekers of

Eastern European[18] and of Maghreb[19] origin are more prevalent in figures for very short periods of inactivity (less than six months) and long periods of inactivity (more than twelve months), respectively, compared to job seekers of Belgian origin (view.Brussels, 2019). In addition, those of Maghreb origin represent nearly one-fifth of the working-age population in Brussels (view.Brussels, 2019).

The selected ethnicities are signalled only through the applicants' names for two main reasons. First, (also) signalling the applicants' ethnicity through their nationality might cause employers to avoid foreign applicants in fear of additional paperwork. As this study focuses on the unequal treatment of applicants purely based on their ethnical background, including foreign nationalities could bias our results through perceived administrative costs. Therefore, all applicants have the Belgian nationality and are born in Brussels. While these characteristics imply that we can only study hiring discrimination for a subgroup of second- and later-generation immigrants of Brussels' diverse minority population, research indicates that individuals from ethnic minority backgrounds who are domestically born also experience differential treatment compared to their majority, domestically born, counterparts (Veit & Thijsen, 2021). Second, we could also signal foreign roots whilst having the Belgian nationality through the applicants' language skills. The inclusion of a foreign mother tongue (apart from English), however, is rather unlikely in the Belgian context when the language isn't specifically mentioned in the vacancy.[20] Similarly, the inclusion of other potential ethnic signals such as religion, physical appearance (photo) or types of free time activities, are either unlikely to be included in a CV or could bias our results through perceived credibility, likability, intelligence or flexibility. For similar reasons, gender is only signalled through the applicants' names.

Given that the names are the only aspect signalling ethnicity and **gender**, it is important that the names effectively signal the targeted ethnic origin and gender. To ensure this, we rely on an extensive validation study (the only one in Belgium) in which researchers tested the perception of different (Flemish, Polish, Congolese, Turkish and Moroccan) names among a sample of 990 Belgian individuals (Martiniello & Verhaeghe, 2022).[21] More specifically, we draw the best-matched names from a set of 20 ethnically homogenous names for the Flemish, Polish and Moroccan ethnical groups. The study unfortunately did not cover Walloon (French) names. For these names, we consulted the official statistics on most common names in the Walloon region and selected two top-10 last names (in 2022), as well as one male and one female first name among the 10 most popular first names for girls and boys born in 1995 (Statbel, 2022d, 2022c).[22]

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[18] This includes the following countries: Poland, Hungary, Slovakia, Slovenia, Czech Republic, Bulgaria, Romania, Estonia, Latvia, Lithuania, Cyprus, Malta and Croatia.

[19] This includes the following countries: Morocco, Algeria, Tunisia, Libya and Mauritania.

[20] This was confirmed through informal conversations with both recruiters and individuals with foreign roots.

[21] See also the recent discussion paper of Baert et al. (2022) on for an extended discussion on the importance of name with respect to the validity of experiments in the United States, and the study of Martiniello and Verhaeghe (2023) for more insights into the role of (ethnic) names in discrimination in Belgium.

[22] While the fictitious applicants are born between 1967 and 1985 (see later), the database is only available from 1995 onwards.

Regarding **age**, we vary across ages 38, 44, 50 and 56 which is in line with previous research in Belgium (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021). Doing so, we construct the age difference between applicants within a pair of applications to be six or twelve years. The adopted age range is based on two main arguments. First, for (female) candidates under 38, it is hard to disentangle gender-based and fertility-based discrimination (S. O. Becker et al., 2019; Wang & Wong, 2021). Second, employers may receive additional subsidies for hiring older candidates (ages 57-65) (Rijksdienst voor Sociale Zekerheid, 2023a), potentially leading to an underestimation of age-based discrimination.

We further ensure that the candidates only differ in age and not on relevant experience by assigning the older applicant additional irrelevant experience on their CV.[23] Assigning the older candidate additional relevant experience or a period of inactivity could result in unequal (perceived) qualifications between candidates. The irrelevant experiences are identified using the ISCO codes of the different jobs as registered on the website of the Public Employment Agency of Flanders (one of the main job search channels in Belgium) (VDAB, 2023). Irrelevant experiences are those experiences which have as little matching ISCO codes as possible with the relevant experience.

Table 1. Characteristics and corresponding levels

Characteristics	Number of main levels	Main levels	Sublevels (if present)
Ethnical background	2	1. Belgian	/
		2. Foreign	2.1. Polish 2.2. Moroccan
Age	2	1. Young	1.1. 38 years old 1.2. 44 years old
		2. Old	2.1. 'Young' + 6 years 2.2. 'Young' + 12 years
Gender	2	1. Male	/
		2. Female	/

The selected characteristics and their levels (Table 1) result in eight possible combinations (i.e. 2×2×2; the factorial product of all main levels). These eight combinations are then divided into four groups (sets) of two fictitious applicants using the SAS macro %mktblock[24] (Table 2). Taking into account all sublevels of the three characteristics, the design in Table 2 is repeated eight times (Appendix Table A1). The sets were randomly assigned to the participants. Furthermore, to prevent order effects, the two fictitious applicants are sent in an alternating order to the recruiters. This design has the maximum possible efficiency (D-efficiency 100), meaning that all characteristics and their two-way interactions are orthogonal and all main levels are balanced (Auspurg & Hinz, 2015),

[23] The older applicants are assigned irrelevant experience for a period equal to the age difference (6 or 12 years) with the younger person applying to the same vacancy. Doing so, we make sure both the younger and older candidates have relevant experience immediately after graduation as well as before embarking on the new journey, with the older candidate having irrelevant experience in between both relevant experiences.

[24] This macro facilitates the allocation of the design to different sets, while aiming to achieve maximum orthogonality and level balance within each individual set.

which allows us to identify the causal effects of the parameters of interest. Post-experiment correlations indeed confirm the factors exhibit a high degree of orthogonality, implying that these factors are essentially uncorrelated (Appendix Table A2). Additionally, (post-experiment) descriptive statistics affirm that the levels within each factor are nearly balanced (Table 3).[25]

Table 2. Design: factorial field experiment

Set	Applicant 1			Applicant 2		
	Ethnic background	**Age**	**Gender**	**Ethnic background**	**Age**	**Gender**
1	Belgian	Young	Male	Foreign	Old	Female
2	Belgian	Young	Female	Foreign	Old	Male
3	Belgian	Old	Male	Foreign	Young	Female
4	Belgian	Old	Female	Foreign	Young	Male

3.2. Resume pair templates

Along with the characteristics altered within the experiment, we also add additional attributes to the CVs to make them believable. First, regarding personal information, all fictitious applicants live in Brussels as signalled through a fictitious postal address (an existing street name in a middle-class neighbourhood, but a non-existing house number was indicated) and mention their telephone number and email address (from major providers) as well as having the Belgian nationality. Also, none of the applicants disclosed their relationship status. Second, regarding skills and competencies, each candidate mentions a relevant educational degree, comparable language (Dutch, French, and English) and computer skills. Third, all applicants report similar relevant experiences at two fictitious companies (an existing, but general and widely used (part of a) company name or abbreviation was indicated).[26,27] Fourth, all applicants indicate having a driving licence and participating in a team sport. Fifth, the motivation letters mentioned that the job applicant (i) had found the vacancy online (mentioning the website), (ii) was looking forward to or would like to further discuss their application in a job interview and (iii) mentioned the applicants' name (and thus ethnic background and gender).[28]

Last, to avoid detection of the experiment, we created two CV and motivation letter templates, Type A and Type B (example in Appendix B). Both templates are equivalent concerning all crucial characteristics but include a variety of common terminology, as well as have a different layout. In addition, each template was assigned a specific postal address, educational institution, hobby and list of fictitious companies. While this background information and the template layout are highly comparable between both templates, we assigned the templates in alternating order to the two

[25] Also, with respect to the interactions, we also find exceptional post-experiment level balances (Appendix Table A3).
[26] This way employers cannot identify one specific company, and thus cannot (1) evaluate the candidate based on the (good or bad) corporate reputation and (2) burden the (fictitious) previous employers with questions about a job applicant.
[27] The familiarity of the company names was checked through the database of Bel-first (Bureau Van Dijk, 2023).
[28] The applicants' age was not signalled in the motivation letter.

applicants within each pair. The layout and the background information can therefore not impact our results. For the technical aspects and considerations when conducting a correspondence experiment, we refer to the study of Lahey and Beasley (2018).

3.3. Data collection

Between April 2023 and February 2024, 432 pairs of applications (equalling 864 individual applications) were sent out to vacancies for jobs (with the place of work) in the Brussels Capital Region.[29] These vacancies were all issued by companies with nace codes in either the private sectors of 'Wholesale and retail trade; repair of motor vehicles and motorcycles' (nace G) and 'Administrative and support service activities' (nace N), or the public sector 'Public administration and defence; compulsory social security' (nace O).[30] These three sectors were selected due to their significant contribution to overall employment in the Brussels Capital Region, encompassing both public and private sectors. In 2022, the wholesale and retail sector (nace G), the administrative and support service activities (nace N) and the public sector (nace O) represented respectively 8.2%, 10.5% and 16.5% of all employees working in the Brussels Capital Region (place of work) (Rijksdienst voor Sociale Zekerheid, 2022).[31] Focussing on these sectors allows us to study (potential differences in) discriminatory hiring practices in the public and private sectors. Within these sectors, we selected the 46 most requested jobs in Brussels (as defined by the Flemish Public Employment Agency) to which we could apply (overview of all jobs in Appendix Table A4).

Vacancies were drawn from the major job search channels in Belgium, namely public employment services of Flanders (VDAB), the Walloon Region (Le FOREM), the Brussels Capital Region (Actiris) and the German Community (ADG). These websites were supplemented by other sources, such as homepages of public organisations.[32]

Moreover, we filtered out vacancies for junior jobs where no or very limited (5 years or less) experience was required, as all fictitious applicants in our experiment are 38 years old or over. Last, we applied to no more than one vacancy from each employer in the private sector and two vacancies from each employer in the public sector,[33] to limit the burden on the employers and to

[29] This implies that the place of employment as mentioned in the vacancy is situated in the Brussels Capital Region, regardless of the location of the organisation's headquarter.

[30] The organisation's sector is checked through the database of the Crossroads Bank for Enterprises (CBE, 2023). Organisations are categorized into sectors based on their primary nace code for the NSSO activities 2008. If their primary activity falls outside the three predefined sectors, we allocate them to the sector corresponding to their secondary activity. 101 organisations are subject to this criterion. Furthermore, within our sample, eight organisations have a primary code that does not correspond with the predefined sectors and are involved in activities spanning two of these sectors. In such cases, we assign them to the sector deemed most relevant.

[31] Notably, the education sector (NACE P) also emerged as a substantial contributor to Brussels employment, mirroring a comparable share of 11.08% of all employees within the region (Rijksdienst voor Sociale Zekerheid, 2022). However, this sector is not included in this experiment, largely due to job vacancies often requiring documentation such as diplomas and a statement of convictions during the initial application phase.

[32] Though the homepages often referred back to the website of a public employment service, this approach did lead to some additional observations (especially for the public sector).

[33] For a discussion on the differing number of vacancies per organisation depending on the type of sector, we refer to Appendix C.

further minimize the chances of the experiment being discovered. The applications were sent via email or through online tools, with 12 to 24 hours in between submissions.

3.4. Outcome variables

For each selected vacancy, we monitor all responses from the employer via telephone voicemail and email.[34] Doing so, we differentiate between four response types, namely (1) an invitation to a job interview,[35] (2) any other positive reaction (e.g. a request for further information or to be contacted, an alternative job offer), (3) a rejection and (4) no reaction within 30 days after applying.[36] Importantly, to minimise the cost to employers, we emailed them as soon as possible after receiving a positive response (types 1 or 2) notifying them of the applicant's voluntary withdrawal from the selection process.[37]

For the analyses, we recode these responses into two dummy variables ('interview invitation' and 'any positive reaction') equal to one if the candidate received a positive response in the strict sense (job interview - response type 1) or broad sense (any positive reaction - response type 1 and 2), and zero otherwise.

3.5. Limitations of the experimental design

We end this section with a discussion of the limitations of correspondence experiments. While these experiments allow researchers to examine causal effects on labour market success, they are surrounded by some concerns regarding generalisability. This is linked to two main factors.

First, we only observe the initial hiring decisions of employers outside the candidates' networks and therefore cannot make any claims about wages and long-term labour market outcomes. While this is an important general weakness of correspondence experiments, the initial employer response (first job interview) crucially impacts the chances of being hired (Cédiey et al., 2008). Moreover, should we identify a bias favouring certain applicants, the absence of information beyond the callback is a concern only if, conditional on the callback, the probability of hiring changes based on the investigated characteristics of the applicant (Baert, Neyt, et al., 2021). Furthermore, to accommodate concerns of generalisability, we examine both general callback and strict callback (invitations for a job interview), where the latter serves as the strongest signal of employers' preferences (Deming et al., 2016). Audit studies, where actors partake in job interviews, could overcome this limitation and provide causal measures on labour market outcomes. However, audit tests are costly and have drawn criticism on various grounds, including concerns about efficacy and resource consumption (Heckman & Siegelman, 1993; Riach & Rich, 2002). Notwithstanding, the

[34] Additionally, these responses did not suggest any discovery of the experiment.
[35] This specifically concerns an invitation to an interview for the job mentioned in vacancy.
[36] All reactions, also exceptional positive ones, beyond 30 days after applying are censored and assumed to be negative.
[37] For a deeper exploration of the ethical dimensions surrounding the correspondence experiments, we refer to Riach and Rich (2004).

meta-study of Quillian et al. (2020) which includes those studies that investigate actual job offers (beyond callback), suggests that any observed effect for the initial outcome likely is amplified at later stages in the hiring process, with considerable additional observed discrimination of minority applicants in hiring after the callback.

Second, it is important to recognize that our findings only apply to the specific factors and levels included in our experiment, as well as the context to which are experiment applies. Consequently, these results cannot be extrapolated to encompass the entire population at large. More specifically, while we include various levels for the factors of ethnicity and age, these levels do not represent all ethnic minorities and age groups in the Brussels Capital Region. Furthermore, though we include a broad set of study programmes within fields of study in both secondary and higher education in the Brussels Capital Region, full representation of all fields of study cannot be achieved. Also, individuals who studied and/or reside outside the Brussels Capital Region are not represented in this study. More specifically, we only focus on applicants living in the Brussels Capital Region with a technical or vocational secondary education or a bachelor's degree obtained in the region and only apply for vacancies in the region.

Third, conducting correspondence experiments for positions and in sectors that demand documentation such as diplomas, licenses, or citizenship during the initial application phase poses significant challenges. Usually, such documentation is unavailable for these experiments due to ethical considerations and, notably, the legal prohibition against fabricating evidence. Consequently, vacancies requiring such credentials are omitted from our study, as fictional applicants are unable to apply or would be rejected due to insufficient documentation in their applications. Within our experiment, the barrier of access predominantly arises in vacancies within the public sector, where frequently a national registration number and/or further evidence of diplomas and licenses are required.

Despite these shortcomings, balancing the inherent generalisability problem inherent to the experimental framework and the benefit of obtaining causal estimates for labour market success, correspondence experiments remain the most prominent and favoured method for investigating this labour market discrimination. This is demonstrated through the ever-increasing occurrence of correspondence experiments in academic literature (see updated register of correspondence experiments on hiring discrimination of Baert, 2018).

4. Results

4.1. Data description

In this section, we provide descriptive statistics (mean values) for (i) treatment variables, (ii) other applicant characteristics, (iii) vacancy and organisation characteristics, and (iv) outcome measures (Table 3). The mean values for the treatment variables (ethnicity, age and gender) confirm that our experiment randomisation effectively worked, with all levels within each factor being balanced, both in our full sample and the various subsamples by sector.

Additionally, when considering the applicants' educational background and the specific characteristics of the vacancies and organisations, the sample showcases a diverse cross-section.[38] In terms of educational qualifications, 63% of the fictitious applicants hold a bachelor's degree, while 37% possess a vocational or technical secondary education degree. Furthermore, an analysis of the vacancies included in the experiment reveals that 86% of them were posted by private organisations,[39] with the majority falling under administrative and support service activities (nace N), while 14% were from the public sector. Consistent with the prevalence of small and medium enterprises (SMEs) in Belgium, nearly 80% (the sum of 61.3% and 18.2% in Table 3) of the organisations in our sample have 250 employees or less.[40] Moreover, considering the nature of contracts and work schedules, the sample has a high proportion of indefinite-duration contracts and full-time work schedules.

Studying the employers' response, we find that in our experiment of all applicants, 14% received an invitation to a job interview (response in the strict sense), 36% received a positive response (response in the broad sense, including an interview invite and a request for further information), and 9% were formally rejected. The remaining 55% of applicants did not receive any reaction to their application within 30 days after applying. These callback rates (in strict and broad sense) are in line with, or slightly higher compared to, earlier correspondence experiments in Belgium on ethnicity, age and gender (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021; Baert et al., 2016; Baert & Vujić, 2016).

Exploring the descriptive statistics across the public and private (nace G and N) sectors similar trends emerge. For all four subsamples (Table 3, columns 2, 3, 3a and 3b), there is a commendable balance across all levels within each experimental factor. Notwithstanding, there are noteworthy differences between the sectors. First, fictitious applicants more frequently hold bachelor's degrees when applying to the public sector compared to the private sector, respectively 92% versus 58%. The private sector wholesale and retail trade (nace G), especially, reports a relatively low share of fictitious applicants holding a bachelor's degree (43%). Second, there is a linguistic contrast, with a majority of applicants using Dutch in the public sector (60%) and French in the private sector wholesale and retail trade (nace G) (72%). In the private sector administrative and support service activities (nace N), the fictitious applicants almost equally often applied in Dutch (54%) and French (47%). Third, public organisations tend to be larger on average than their private counterparts. Last, public sector organisations demonstrate a higher share of applicants invited for a job interview, with 23% of applicants receiving invitations compared to 13% in the private sector. Additionally, public employers tend to send more formal rejections, with 17% and 8% of applicants in the public and

[38] Please note that these characteristics are beyond our control within the experiment and instead depend on the available relevant vacancies.

[39] When utilizing the terms 'private sector' or 'private organisations' we are referring to the outcomes derived from the combined sectors 'Wholesale and retail trade; repair of motor vehicles and motorcycles' (nace G) and 'Administrative and support service activities' (nace N).

[40] These statistics are derived from a subsample that excludes observations where the company size was unknown, (Table 3 column 1b).

private sectors respectively receiving formal decline notifications via email or voicemail. The wholesale and retail sector (nace G) has the highest share of non-response, with 65% of the candidates not receiving any response within 30 days after applying compared to 48% in the public sector (nace O) and 46% in administrative and support service activities (nace N).

Table 3. Descriptive statistics

Variable		Description	Mean					
			Full sample (1a)	Full sample, excluding category 'unknown' (1b)	Public sector, nace O (2)	Private sector, nace G and N (3)	Private sector, nace G (3a)	Private sector, nace N (3b)
Treatment variables								
Ethnical background								
• Belgian		1 if the candidate reveals a Belgian-sounding name in their application, 0 otherwise	.500		.500	.500	.500	.500
• Foreign	Total	1 if the candidate reveals a foreign-sounding name in their application, 0 otherwise	.500		.500	.500	.500	.500
	Polish	1 if the candidate reveals a Polish-sounding name in their application, 0 otherwise	.250		.250	.250	.233	.268
	Moroccan	1 if the candidate reveals a Moroccan-sounding name in their application, 0 otherwise	.250		.250	.250	.267	.232
Age								
• Young	Total	1 if the candidate is the younger applicant of the pair of applicants, 0 otherwise	.500		.500	.500	.500	.500
	38 years old	1 if the candidate is the younger applicant of the pair of applicants and 38 years old, 0 otherwise	.259		.225	.265	.267	.262
	44 years old	1 if the candidate is the younger applicant of the pair of applicants and 44 years old, 0 otherwise	.241		.275	.235	.233	.238
• Old	Total	1 if the candidate is the older applicant of the pair of applicants, 0 otherwise	.500		.500	.500	.500	.500
	'Young' + 6 years	1 if the candidate is the older applicant of the pair of applicants and 6 years older than the younger applicant, 0 otherwise	.250		.292	.243	.227	.259
	'Young' + 12 years	1 if the candidate is the older applicant of the pair of applicants and 12 years older than the younger applicant, 0 otherwise	.250		.208	.257	.273	.241
Gender								
• Male		1 if the candidate is male, 0 otherwise	.500		.500	.500	.500	.500
• Female		1 if the candidate is female, 0 otherwise	.500		.500	.500	.500	.500
Other applicant characteristics								
Diploma	Secondary education	1 if the candidate holds a vocational or technical secondary education degree, 0 otherwise	.370		.083	.417	.567	.265
	Tertiary education	1 if the candidate holds a bachelor's degree, 0 otherwise	.630		.917	.583	.433	.735
Language of the application	Dutch	1 if the candidate applied in Dutch, 0 otherwise	.433		.600	.406	.278	.535
	French	1 if the candidate applied in French, 0 otherwise	.567		.400	.594	.722	.465
Vacancy and organisation characteristics								
Sector								
• Public	Total - Public administration and defence; compulsory social security (Nace O)	1 if the organisation has a 'nace code for the NSSO£ activities 2008' in the public sector, 0 otherwise	.139		1.000	.000	.000	.000
• Private	Total	1 if the organisation has a 'nace code for the NSSO£ activities 2008' in the private sector, 0 otherwise	.861		.000	1.000	1.000	1.000
	Wholesale and retail trade; repair of motor vehicles and motorcycles (Nace G)	1 if the organisation has a 'nace code for the NSSO£ activities 2008' in the private sector Nace G, 0 otherwise	.461		.000	.503	1.000	.000
	Administrative and support service activities (Nace N)	1 if the organisation has a 'nace code for the NSSO£ activities 2008' in the private sector Nace N, 0 otherwise	.447		.000	.497	.000	1.000

(Table 3 continued)

Company size	Small	1 if the organisation has 50 employees or less, 0 otherwise	.569	.613	.183	.632	.754	.508
	Medium	1 if the organisation has between 51 and 250 employees, 0 otherwise	.169	.182	.300	.148	.118	.178
	Large	1 if the organisation has more than 250 employees, 0 otherwise	.190	.204	.500	.140	.080	.200
	Unknown	1 if the number of employees is unknown, 0 otherwise	.072		.017	.081	.048	.114
Contract duration	Indefinite contract	1 if the vacancy mentions an indefinite (open-ended) contract, 0 otherwise	.563	.698	.550	.565	.492	.638
	Temporary contract	1 if the vacancy mentions a temporary contract, 0 otherwise	.243	.302	.350	.226	.219	.232
	Unknown	1 if the contract duration is unknown, 0 otherwise	.194		.100	.210	.289	.130
Work schedule	Fulltime	1 if the work schedule is fulltime, 0 otherwise	.833	.853	.917	.820	.759	.881
	Part-time	1 if the work schedule is part-time, 0 otherwise	.144	.147	.067	.156	.209	.103
	Unknown	1 if the work schedule is unknown, 0 otherwise	.023		.017	.024	.032	.016
Outcome								
Interview invitation (strict sense)		1 if the candidate receives an interview invitation, 0 otherwise	.140		.233	.125	.115	.135
(Any) positive response (broad sense)		1 if the candidate receives any positive reaction, 0 otherwise	.363		.358	.364	.262	.468
Decline		1 if the candidate receives a negative response, 0 otherwise	.091		.167	.079	.088	.070
No response		1 if the candidate receives no response within 30 days after applying, 0 otherwise	.545		.475	.556	.650	.462
The number of observations (job applications)			864		120	744	374	370

Note. Standard deviations are not reported as all variables are binary. The data presented in this table is unweighted. Column 1b reports the mean values for a subsample that excludes observations where the respective variable (company size, contract duration or work schedule) was unknown. Company size is derived from the number of employees at the company as registered in Bel-first (Bureau Van Dijk, 2023), supplemented with Trends Top (Roularta Media Group, 2024). The definition of company size is based on the European definition of small and medium enterprises (European Commission, 2003). £ NSSO stands for 'National Social Security Office'.

4.2. Bivariate analyses

In this section, we describe the bivariate results, where we report the number of tested vacancies and the callback rates per experimental characteristic (Table 4). Overall, we find the callback rate to be higher for Belgian applicants, younger applicants and female applicants compared to their ethnic minority, older and male peers. For ethnicity and age, this difference is observed mainly when studying the response in the broad sense (any positive reaction). However, it is important to note that while our results suggest potential biases against foreign ethnicity and older age groups in employer responses, the differences in callback rates are only weakly significant (at the 5% and 10% level) when relying on the McNemar statistics.[41]

For gender, in contrast, we observe a significant preference for women both in the strict and broad sense. Overall, we find that female applicants get an invitation to a job interview in 16.2% of their applications, in contrast to 11.8% for their male peers. Female applicants thus have a 4.4 percentage points higher invitation probability. The ratio of the invitation rates is 1.373, indicating that female applicants get as much as 37.3% more invitations than their male counterparts for a given number of applications.

The bivariate analyses for the private and public sectors, confirm that the overall results are mainly driven by organisations operating in the private sector (as they make up the majority of our sample). Delving into the specific private sectors, we only observe significant hiring discrimination against men in the wholesale and retail sector (nace G), with women on average receiving more positive responses as well as more interview requests. In the administrative and support service activities (nace N), on the other hand, we only observe a significant difference in callback (albeit only at the 10% significance level) in the broad sense for ethnicity with applicants with a foreign sounding name receiving fewer positive reactions as compared to their peers with a Belgian sounding name. In the public sector, the differences in callback rates are all insignificant. This is likely linked to the low number of observations. Notwithstanding, also for the public sector, results seem to point towards similar trends with the callback rate being higher for Belgian applicants, younger applicants and female applicants compared to their ethnic minority, older and male peers.

Last, it is essential to note that while bivariate results allow us to assess whether we observe unequal treatment between the applicants of Belgian and foreign ethnicity, younger and older applicants, and men and women, the bivariate analyses are less suited for the analysis of more detailed sublevels of these applicant characteristics, e.g. do callback rates differ depending on the specific foreign ethnic group or magnitude of the age gap. Additionally, the analyses do not allow us to compare the relative importance of the applicant's characteristics or to assess whether the outcomes are significantly different across subsamples (private versus public sectors). Therefore, in

[41] While the significance levels vary somewhat depending on the test used (t-test or McNemar test), results overall point towards the same conclusion.

the next section, we estimate multivariate regressions with the individual application as the observation unit and the employer response as the outcome variable.

Table 4. Bivariate analyses of the positive responses in strict and broad sense

Applicant characteristic		N	Interview invitation						Any positive response					
			Callback group 1	Callback group 2	Ratio	Difference in callback	*T-value*	*McNemar's* χ^2 value	Callback group 1	Callback group 2	Ratio	Difference in callback	*T-value*	*McNemar's* χ^2 value
Full sample														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	432	.155	.125	1.241	.030 (.024)	*1.274*	*3.45**	.387	.340	1.136	.046 (.033)	*1.415*	*4.35***
Age	Group 1 Young, Group 2 Old$	432	.139	.141	.984	-.002 (.024)	*-.098*	*.02*	.384	.343	1.122	. 042 (.033)	*1.273*	*3.52**
Gender	Group 1 Female, Group 2 Male	432	.162	.118	1.373	.044 (.024)	*1.864**	*7.37****	.394	.333	1.181	.060 (.033)	*1.841**	*7.35****
Public sector, nace O														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	60	.250	.217	1.154	.033 (.078)	*.428*	*.40*	.367	.350	1.048	.017 (.088)	*.189*	*.07*
Age	Group 1 Young, Group 2 Old$	60	.250	.217	1.154	.033 (.078)	*.428*	*.40*	.383	.333	1.150	.050 (.088)	*.567*	*.60*
Gender	Group 1 Female, Group 2 Male	60	.250	.217	1.154	.033 (.078)	*.428*	*.40*	.350	.367	.955	-.017 (.088)	*-.189*	*.07*
Private sectors (nace G and N)														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	372	.140	.110	1.268	.030 (.024)	*1.219*	*3.10*	.390	.339	1.151	.051 (.035)	*1.448*	*4.69***
Age	Group 1 Young, Group 2 Old$	372	.121	.129	.937	-.008 (.024)	*-.332*	*.23*	.384	.344	1.117	.040 (.035)	*1.142*	*2.92*
Gender	Group 1 Female, Group 2 Male	372	.148	.102	1.447	.046 (.024)	*1.887**	*7.41****	.401	.328	1.221	.073 (.035)	*2.060***	*9.47****
Private sector, wholesale and retail trade (nace G)														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	187	.139	.091	1.529	.048 (.033)	*1.459*	*3.24*	*.283*	*.241*	*1.178*	*.043 (.046)*	*.939*	*1.52*
Age	Group 1 Young, Group 2 Old$	187	.102	.128	.792	-.027 (.033)	*-0.809*	*1.00*	*.278*	*.246*	*1.130*	*.032 (.046)*	*.704*	*.86*
Gender	Group 1 Female, Group 2 Male	187	.144	.086	1.687	.059 (.033)	*1.786**	*4.84***	*.316*	*.209*	*1.513*	*.107 (.045)*	*2.363***	*9.52****
Private sector, administrative and support service activities (nace N)														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	185	.141	.130	1.083	.011 (.036)	*.303*	*.29*	*.497*	*.438*	*1.136*	*.059 (.052)*	*1.145*	*3.46**
Age	Group 1 Young, Group 2 Old$	185	.141	.130	1.083	.011 (.036)	*.303*	*.29*	*.492*	*.443*	*1.110*	*.049 (.052)*	*.936*	*2.31*
Gender	Group 1 Female, Group 2 Male	185	.151	.119	1.273	.032 (.036)	*.911*	*2.57*	*.486*	*.449*	*1.084*	*.038 (.052)*	*.728*	*1.40*

Note. N equals the number of vacancies. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Significance levels for McNemar's Chi2 test are based on the exact McNemar significance probability. Standard errors are in parentheses. The data presented in this table is unweighted. £ indicates the candidate has a foreign (Moroccan or Polish) sounding name. $ indicated the applicant is 6 or 12 years older than the younger applicant. In Appendix Table A5, we provide an overview of the number of negative and positive responses by group.

4.3. Multivariate analyses

In this section, we run a linear probability model with the individual application as the observation unit and the employer response as the outcome variable.[42] Doing so, we study both the interview invitations (1 if the candidate receives an interview invitation, 0 otherwise) and the dummy for any positive response (1 if the candidate receives any positive reaction, 0 otherwise). For all analyses, we cluster the standard errors at the organisation level.[43]

First, we estimate a model (Model a, Table 5) including only the main candidate characteristics. The results of this analysis confirm our findings of the bivariate analysis.[44] Specifically, we observe a positive effect of being female for both the strict and broad employer responses, with women having a 4.4 percentage points higher probability of getting an interview request and a 6.0 percentage points higher probability of getting a positive reaction compared to men. For ethnicity and age, the effects are less evident. While there is no real impact on the strict outcome (interview invitations), our analysis of the response in broad sense reveals that both older applicants and those with names suggesting a foreign origin experience a significantly (at the 5% and 10% level) lower probability (respectively -4.2 percentage points and -4.6 percentage points) of receiving a positive response compared to their younger counterparts and those of Belgian descent.

Second, we estimate a linear probability model (Model b, Table 5) including the more detailed candidate characteristics for ethnicity and age. Interestingly, we find the effect for both ethnicity and age to be driven by one of their sublevels. Specifically, we find applicants with a Moroccan ethnic background to have a significantly lower probability of getting an interview request (-5.8 percentage points) and a positive response (-9.5 percentage points) compared to those of Belgian descent. For age, the negative effect is largely driven by applicants who are 12 years older than their younger peers (50 versus 38 years old and 56 versus 44 years old). We find applicants over 50 years old to have a significantly lower probability of getting an interview request (-5.1 percentage points) as well as any positive response (-9.3 percentage points) compared to younger applicants. For 6 years older applicants, the analysis in the strict sense (Model 1b) seems to suggest a positive effect of being 6 years older, this effect does not persist in the broad-sense analyses. The observation could be linked to employers valuing additional, yet irrelevant, experience over an age gap of 6 years.

Next, it is noteworthy that (for both models a and b) the impact of (Moroccan) ethnicity, (12-year older) age and male gender on hiring chances appears to be more pronounced when considering responses in a broad sense as compared to the strict sense. However, additional analyses indicate

[42] Results, reported in Appendix Table A6, based on logistic regression models yield similar results.

[43] Additional analyses, reported in Appendix Table A7, with standard errors clustered at the vacancy level yield almost identical results.

[44] Note that, given the D-efficient design of our experiment where all three applicant characteristics are orthogonal and all main levels are balanced, the reported percentage point differences for Model a in Table 5 are equal to the difference in callback rates as reported in Table 4.

the coefficients not to be statistically different from one another, and therefore we cannot rule out the effects are similar. Interestingly, comparing the coefficients for ethnicity, age and gender, we find the effects of a Moroccan ethnic background, a 12-year age gap and being male, not to be statistically significant from one another.

Table 5. Linear probability models of employer response

			Interview invitation; strict sense		**(Any) positive response;** broad sense		χ^2 statistic	
			(1a)	(1b)	(2a)	(2b)	(1a)=(2a)	(1b)=(2b)
Ethnicity (ref. Belgian)	Foreign	*(e)*	-.030* (.016)		-.046** (.022)		.72	
	Polish			-.002 (.024)		.002 (.032)		.03
	Moroccan	*(e_m)*		-.058*** (.022)		-.095*** (.031)		1.81
Age (ref. young)	Old (6-12 years older)	*(a)*	.002 (.016)		-.042* (.022)		5.32**	
	Old – 6 years older			.056** (.024)		.009 (.032)		2.75*
	Old – 12 years older	*(a_12)*		-.051** (.023)		-.093*** (.032)		2.43
Gender (ref. female)	Male	*(g)*	-.044*** (.016)	-.044*** (.016)	-.060*** (.022)	-.060*** (.022)	.72	.72
Constant			.176*** (.022)	.176*** (.022)	.438*** (.028)	.437*** (.028)		
F-statistic	*(e)=(a)*		1.97		.02			
	(e)=(g)		.43		.22			
	(a)=(g)		4.21**		.32			
	(e_m)= (a_12)			.05		.00		
	(e_m)=(g)			.28		.88		
	(a_12)=(g)			.05		.64		

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Table 6 examines disparities in hiring discrimination across different sectors. Much like the bivariate analyses, we find significant discriminatory effects only among the private sector organisations (both nace G and N). Notwithstanding, the analyses for the more detailed levels of ethnicity and age surface additional insights. In both the wholesale and retail sector (nace G) and the administrative and support service activities (nace N), we observe adverse effects of having a Moroccan ethnicity as compared to a Belgian ethnicity, with no significant effect of a Polish ethnicity and a negative effect of being over 50 years old with no (negative) effect for older workers under 50. In both sectors, women appear to have an advantage with respect to their initial labour market chances.

In the public sector, we observe no significant effects, likely due to the limited sample size for the sector. However, we note that the discriminatory effects observed for the public sector are qualitatively similar to those of the private sector, except for the absence of hiring discrimination against men in any positive reaction. Further examination reveals that the observed effects in both public and private sectors are not significantly distinct from each other, with the exception of a weak but significant difference in hiring discrimination against men which is substantially larger in wholesale and retail sector (nace G) as compared to the public sector (nace O).

Table 6. Linear probability models of employer response; detailed effects by sector

			Public sector (1)	**Private sector, nace G and N** (2)	**Private sector, nace G** (2a)	**Private sector, nace N** (2b)	χ^2 statistic (1)=(2)	(1)=(2a)	(1)=(2b)	(2a)=(2b)
Interview invitation; strict sense										
Ethnicity (ref. Belgian)	Polish		-.027 (.083)	.000 (.025)	-.027 (.037)	.024 (.033)	.11	.00	.35	1.06
	Moroccan	*(e_m)*	-.040 (.069)	-.061*** (.023)	-.070** (.032)	-.049 (.032)	.09	.16	.01	.21
Age (ref. young)	Old – 6 years older		-.002 (.068)	.063** (.026)	.070* (.038)	.053 (.035)	.83	.88	.54	.11
	Old – 12 years older	*(a_12)*	-.095 (.089)	-.043* (.023)	-.018 (.035)	-.071** (.030)	.34	.70	.07	1.37
Gender (ref. female)	Male	*(g)*	-.037 (.053)	-.047*** (.017)	-.058** (.027)	-.035* (.020)	.03	.14	.00	.51
Constant			.289*** (.080)	.159*** (.023)	.158*** (.034)	.161*** (.031)	2.56	2.39	2.33	.00
(Any) positive response; broad sense										
Ethnicity (ref. Belgian)	Polish		.025 (.100)	-.001 (.034)	.001 (.050)	-.019 (.046)	.06	.05	.17	.08
	Moroccan	*(e_m)*	-.067 (.085)	-.102*** (.034)	-.090** (.044)	-.100* (.051)	.15	.06	.12	.02
Age (ref. young)	Old – 6 years older		-.039 (.076)	.021 (.035)	.031 (.048)	-.004 (.050)	.54	.63	.16	.25
	Old – 12 years older	*(a_12)*	-.048 (.111)	-.097*** (.033)	-.099** (.045)	-.082* (.048)	.19	.19	.08	.06
Gender (ref. female)	Male	*(g)*	.013 (.066)	-.073*** (.023)	-.107*** (.034)	-.036 (.032)	1.59	2.77*	.47	2.35
Constant			.384*** (.081)	.446*** (.030)	.359*** (.044)	.535*** (.042)	.55	.07	2.92*	8.58***
Number of observations (job applications)			120	744	374	370				
Number of clusters (organisations)			46	368	185	183				

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted. In Appendix Table A8, we provide an overview of the linear probability models of employer response; main effects by sector.

Next, we concentrate on assessing callback variations within distinct subgroups based on applicants' ethnicity, gender, and age (Table 7). Doing so, we include interaction effects between the main candidate characteristics (foreign ethnicity, older and male). As a robustness check, we also compare regression results for all subsamples regarding ethnicity, age and gender (Appendix Table A9). Overall, we do not find any strong interaction effects. However, it's worth noting that the results hint at interaction effects for certain outcomes, albeit weakly. For the response in the strict sense, we observe a weak interaction-effect between ethnicity and gender (significance at the 10%-level) indicating the negative effect of a foreign ethnicity to be smaller (potentially fully mitigated) for men. Further analyses for all subsamples, however, indicated this to be true only when comparing those of Polish descent to applicants of Belgian ethnicity (Appendix Table A9). For the response in the broad sense, we find a weak interaction-effect between ethnicity and age (at the 10% significance level), which indicates the negative effect of a foreign ethnicity to be smaller for older applicants. This finding may be attributed to the fact that all fictitious applicants in our experiment were born, studied and worked in the Brussels Capital Region. Consequently, older applicants from a foreign background might have an advantage compared to their younger counterparts with foreign-sounding names. Further analyses for all subsamples (Appendix Table A9) indicate this to be true, especially for 12 years older applicants of both Polish and Moroccan descent.

Table 7. Linear probability models of employer response; interaction effects

		Interview invitation; strict sense	**(Any) positive response;** broad sense
Ethnicity (ref. Belgian)	Polish	-.035 (.045)	-.081 (.066)
	Moroccan	-.090** (.045)	-.178*** (.068)
Age (ref. young)	Old – 6 years older	.093* (.054)	-.042 (.066)
	Old – 12 years older	-.014 (.050)	-.144** (.065)
Gender (ref. female)	Male	-.081* (.044)	-.046 (.064)
Interaction-effects	**Foreign ethnicity x Older**	**-.042 (.057)**	**.148* (.080)**
	Foreign ethnicity x Male	**.106* (.055)**	**.019 (.081)**
	Older x Male	**-.032 (.059)**	**-.046 (.081)**
Constant		.184*** (.036)	.468*** (.047)

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Separate analyses by sector, yield significant interaction-effects only for the private sectors (Table 8, columns 1 and 2). These interaction-effects are in line with earlier findings for the full sample. Further analyses for subsamples by detailed private sector (Table 8, columns 2a and 2b) reveal, only for the response in the strict sense and in the wholesale and retail sector (nace G), a positive interaction effect between a foreign ethnicity and being male, suggesting the negative effect of a foreign ethnicity to be smaller for men. For the response in the broad sense, we observe a weak interaction effect in both private sectors, albeit for different interaction-effects. In wholesale and retail sector (nace G), results suggest a weak negative interaction-effect (at the 10% significance level) between being older and male. This suggests the negative effect of being older to be larger for men. In the administrative and support service activities (nace N), we observe a weak positive

interaction-effect (at the 10% significance level) between a foreign ethnicity and being older. This suggests that for those applying to jobs, the negative effect of having a foreign ethnicity is smaller for older individuals. Importantly, the observed interaction-effects are not statistically different over all subsamples.[45]

[45] It is probable that the subset consisting of public organisations continues to be hindered by a scarcity of observations.

Table 8. Linear probability models of employer response; interaction effects by sector

		Public sector, nace O (1)	**Private sector, nace G and N** (2)	**Private sector, nace G** (2a)	**Private sector, nace N** (2b)	χ^2 statistic (1)=(2)	(1)=(2a)	(1)=(2b)	(2a)=(2b)
Interview invitation; strict sense									
Ethnicity (ref. Belgian)	Polish	.001 (.169)	-.044 (.045)	-.087 (.064)	.001 (.064)				
	Moroccan	.004 (.162)	-.105** (.046)	-.136** (.063)	-.072 (.068)				
Age (ref. young)	Old – 6 years older	.006 (.163)	.098* (.058)	.142* (.082)	.044 (.084)				
	Old – 12 years older	-.083 (.190)	-.008 (.050)	.055 (.075)	-.080 (.066)				
Gender (ref. female)	Male	-.152 (.158)	-.075* (.045)	-.113* (.059)	-.033 (.069)				
Interaction-effects	**Foreign ethnicity x Older**	**-.162 (.198)**	**-.019 (.058)**	**-.065 (.076)**	**.034 (.088)**	.52	.23	.89	.39
	Foreign ethnicity x Male	**.089 (.178)**	**.107* (.058)**	**.191** (.075)**	**.012 (.089)**	.01	.30	.16	2.42
	Older x Male	**.140 (.201)**	**-.050 (.061)**	**-.081 (.075)**	**-.016 (.097)**	.89	1.15	.52	.29
Constant		.307** (.140)	.169*** (.037)	.170*** (.055)	.168*** (.050)				
(Any) positive response; broad sense									
Ethnicity (ref. Belgian)	Polish	-.013 (.214)	-.094 (.069)	-.073 (.093)	-.094 (.100)				
	Moroccan	-.096 (.228)	-.191*** (.072)	-.165* (.089)	-.179* (.108)				
Age (ref. young)	Old – 6 years older	-.094 (.183)	-.031 (.071)	.070 (.096)	-.117 (.105)				
	Old – 12 years older	-.100 (.195)	-.148** (.070)	-.056 (.091)	-.195* (.103)				
Gender (ref. female)	Male	-.136 (.201)	-.034 (.068)	-.040 (.091)	.006 (.097)				
Interaction-effects	**Foreign ethnicity x Older**	**-.063 (.229)**	**.182** (.087)**	**.101 (.108)**	**.233* (.132)**	1.08	.45	1.34	.61
	Foreign ethnicity x Male	**.129 (.248)**	**.001 (.086)**	**.049 (.108)**	**-.079 (.130)**	.26	.10	.60	.58
	Older x Male	**.169 (.229)**	**-.078 (.087)**	**-.183* (.107)**	**-.006 (.133)**	1.10	2.10	.47	1.10
Constant		.446*** (.155)	.472*** (.050)	.351*** (.069)	.569*** (.068)				
Number of observations (job applications)		120	744	374	370				
Number of clusters (organisations)		46	368	185	183				

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted.

5. Robustness analyses

In this section, we evaluate the reliability and stability of our main results under various conditions. First, we run a multivariate ordered logistic regression with the individual application as the observation unit and the employer response as the outcome variable. Doing so, we define the outcome variable as a categorical variable equal to 0 if the applicant received a negative or no response, 1 if they received a positive reaction and 2 if they were invited for a job interview.

First, we estimate three ordered logistic models (Models a, Table 9); Model 1a includes only the main candidate characteristics, Model 2a includes gender as well as the more detailed levels for ethnicity and age, and Model 3a also includes interaction effects between the main candidate characteristics (foreign ethnicity, older and male). The results of this analysis confirm our findings of the bivariate analysis and those of the linear probability models. We find the odds of a positive response to be lower for men compared to their female peers. For ethnicity and age, we find weak evidence that applicants with a Belgian-sounding name and younger applicants have a higher probability of a positive response. However, these overall effects again are driven by one of their sublevels. Specifically, we find applicants with a Moroccan ethnic background to have significantly lower odds of a positive response than applicants with a Belgian ethnic background, while we do not observe a significant effect for those of Polish ethnicity. Concerning age, we only find 12-year older applicants to have significantly lower odds of a positive response. For a 6-year age gap, we do not observe any significant effect. The latter finding is somewhat in contrast to the earlier findings, where we observed a weak positive effect of being 6 years older for securing a job interview (only). We do not observe any significant two-way interaction effects between ethnicity, age and gender. This aligns with our expectations, as the observed interaction effects in our benchmark analyses were only weakly significant and were not consistent across both outcomes (strict sense and broad sense).

Second, we re-run these three regressions, this time incorporating controls for both applicant and employer characteristics (Models b, Table 9). Notably, the inclusion of these controls does not sway our conclusions.[46] This is particularly reassuring, given that applicants are randomly assigned to vacancies, rendering employer characteristics unlikely to exert any substantial influence on the outcome.

Third, we interact the three main candidate characteristics with the applicant and employer characteristics (Model c, Table 9). While most interaction effects are insignificant, we find the odds of a positive response for candidates of non-Belgian ethnicity (versus candidates of Belgian descent) increases when they apply to larger organisations (>50 employees). Furthermore, we find hiring discrimination against men to be less severe if the applicant has a bachelor's degree or applied to a vacancy for a temporary position. Last, the results hint towards increased age

[46] Results based on linear probability models controlling for both applicant and employer characteristics (Appendix Table A10) also yield similar results to our benchmark analyses.

discrimination for applicants with a bachelor's degree. These effects, however, are all only weakly significant.

Table 9. Ordered logistic regression of employer response

		(1a)	(2a)	(3a)	(1b)	(2b)	(3b)	(c)
Ethnicity (ref. Belgian)	Foreign	-.213** (.094)			-.227** (.105)			
	Polish		.000 (.135)	-.336 (.269)		-.022 (.148)	-.385 (.296)	-.509 (.591)
	Moroccan		-.446*** (.145)	-.781*** (.288)		-.457*** (.154)	-.824*** (.302)	-.945 (.601)
Age (ref. young)	Old (6-12 years older)	-.138 (.093)			-.149 (.104)			
	Old – 6 years older		.127 (.133)	.027 (.290)		.159 (.145)	.105 (.308)	.883 (.569)
	Old – 12 years older		-.420*** (.150)	-.525* (.281)		-.472*** (.162)	-.534* (.297)	.223 (.598)
Gender (ref. female)	Male	-.285*** (.093)	-.289*** (.095)	-.288 (.243)	-.322*** (.103)	-.331*** (.106)	-.398 (.263)	-.592 (.579)
Interaction-effects	Foreign ethnicity x Older			.455 (.349)			.368 (.367)	
	Foreign ethnicity x Male			.244 (.344)			.389 (.360)	
	Older x Male			-.248 (.352)			-.252 (.361)	
Control variables								
Diploma	Tertiary education (bachelor)				.056 (.221)	.078 (.226)	.062 (.233)	-.042 (.297)
(ref. secondary education)	Foreign ethnicity x Tertiary education							.240 (.296)
	Old x Tertiary education							-.538* (.307)
	Male x Tertiary education							.537* (.286)
Language of application	French				-1.386*** (.211)	-1.388*** (.215)	-1.392*** (.218)	-1.151*** (.290)
(ref. Dutch)	Foreign ethnicity x French							-.005 (.252)
	Old x French							-.241 (.253)
	Male x French							-.323 (.249)
Sector (ref. Nace O)	Nace G				-.146 (.362)	-.058 (.371)	-.046 (.376)	-.134 (.535)
	Nace N				.241 (.319)	.280 (.328)	.286 (.334)	.214 (.504)
	Foreign ethnicity x Nace N or G							.115 (.409)
	Old x Nace N or G							.028 (.405)
	Male x Nace N or G							.002 (.406)
Company size (ref. small)	Medium				.158 (.239)	.160 (.238)	.133 (.243)	.029 (.312)
	Large				-.012 (.241)	.021 (.246)	.049 (.247)	-.112 (.330)
	Foreign ethnicity x Medium or large							.523** (.254)
	Old x Medium or large							-.189 (.253)
	Male x Medium or large							-.049 (.248)
	Unknown				.057 (.386)	.057 (.379)	.004 (.379)	.151 (.483)
	Foreign ethnicity x Unknown							.215 (.362)
	Old x Unknown							-.410 (.361)
	Male x Unknown							.056 (.373)
Contract duration	Temporary contract				-.013 (.207)	.000 (.209)	.003 (.216)	-.004 (.293)
(ref. indefinite contract)	Foreign ethnicity x Temporary contract							-.230 (.282)
	Old x Temporary contract							-.378 (.285)
	Male x Temporary contract							.618** (.279)
	Unknown				-.328 (.288)	-.348 (.289)	-.352 (.293)	.065 (.390)
	Foreign ethnicity x Unknown							-.334 (.389)
	Old x Unknown							-.348 (.386)
	Male x Unknown							-.334 (.380)

(Table 9 continued)

Work schedule	Part-time				.421 (.303)	.351 (.302)	.334 (.311)	.606 (.376)
(ref. fulltime)	Foreign ethnicity x Part-time							.209 (.382)
	Old x Part-time							-.137 (.398)
	Male x Part-time							-.662* (.377)
	Unknown				-.869 (.688)	-.973 (.692)	-.986 (.697)	-.025 (1.750)
	Foreign ethnicity x Unknown							-.500 (1.425)
	Old x Unknown							-.262 (1.429)
	Male x Unknown							-13.478*** (1.664)
Intercepts								
Rejection or no reaction | Other positive reaction		.247	.242	.140	-.387	-.332	-.458	-0.356
Other positive reaction | Interview invitation		1.510	1.517	1.420	1.014	1.085	.964	1.080

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Fourth, while the experiment was designed to study age gaps between younger and older applicants with an age difference of 6 to 12 years, we run a final robustness analysis where we include all ages (as indicated on the CVs through the year of birth) (Models a, Table 10) and the age gap relative to the younger applicant (aged either 38 or 44 years) within a pair of applications (Model b, Table 10). Doing so, we re-run our benchmark analysis. In Model a, our findings reveal that the oldest applicants aged 56 have a significantly lower probability of being invited to a job interview, as well as receiving a positive response. This pattern is also reflected in Model b, where we only observe a negative age effect for applicants who are 12 years older than their 44-year-old peers. However, additional analyses indicate that the negative effect for this group is not significantly different from the (insignificant) negative coefficient for applicants who are 12 years older than their 38-year-old peers.

Table 10. Linear probability models of employer response; detailed analysis for age

			Interview invitation; strict sense		**(Any) positive response;** broad sense	
			(1a)	**(1b)**	**(2a)**	**(2b)**
Ethnicity (ref. Belgian)	Polish		-.002 (.024)	-.002 (.024)	.002 (.032)	.002 (.032)
	Moroccan		-.058*** (.022)	-.058*** (.022)	-.095*** (.031)	-.095*** (.031)
Age (ref. 38 years old)	44 years old	*(a44)*	.004 (.026)		-.024 (.037)	
	50 years old	*(a50)*	-.008 (.031)		-.045 (.041)	
	56 years old	*(a56)*	-.094*** (.033)		-.152*** (.054)	
Age (ref. 38 years old)	6 years older	*(a38_6)*		.075** (.036)		.018 (.046)
	12 years older	*(a38_12)*		-.023 (.033)		-.054 (.046)
Age (ref. 44 years old)	6 years older	*(a44_6)*		.034 (.037)		.000 (.047)
	12 years older	*(a44_12)*		-.081*** (.027)		-.134*** (.043)
Gender (ref. female)	Male		-.044*** (.016)	-.044*** (.016)	-.060*** (.022)	-.060*** (.022)
Constant			.189*** (.029)	.176*** (.022)	.455*** (.036)	.438*** (.028)
F-statistic	*(a44)=(a50)*		.20		.34	
	(a50)=(a56)		6.35**		3.85*	
	(a38_6)=(a44_6)			.57		.06
	(a38_12)=(a44_12)			2.18		1.64

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Last, to assess differences in discriminatory practices in hiring between small and larger companies, we ran linear probability models for a subsample of organisations with 50 employees or less and more than 50 employees (Table 11). These additional analyses do not suggest significant variation in discrimination between small and medium to large firms, with the exception of a significant difference in ethnic discrimination for employer responses in the broad sense (any positive reaction). Specifically, applicants of Moroccan descent appear to face higher discriminatory effects in smaller companies.

Table 11. Linear probability models of employer response; detailed analysis by company size

Company size		**Interview invitation**; strict sense		**(Any) positive response**; broad sense		χ^2 statistic	
		Small (≤50 employees)	Medium or large (>50 employees)	Small (≤50 employees)	Medium or large (>50 employees)		
		(1a)	(1b)	(2a)	(2b)	(1a)=(1b)	(2a)=(2b)
Ethnicity	Polish	-.034 (.032)	.021 (.041)	-.011 (.042)	.006 (.057)	1.14	0.06
(ref. Belgian)	Moroccan	-.065** (.029)	-.031 (.035)	-.147*** (.039)	.004 (.054)	0.58	5.29**
Age	Old – 6 years older	.060* (.034)	.040 (.038)	.055 (.043)	-.034 (.051)	0.15	1.83
(ref. young)	Old – 12 years older	-.036 (.029)	-.056 (.040)	-.066 (.041)	-.109* (.058)	0.17	0.37
Gender (ref. female)	Male	-.035 (.021)	-.057** (.028)	-.089*** (.029)	-.032 (.037)	0.39	1.48
Constant		.175*** (.030)	.167*** (.036)	.399*** (.038)	.491*** (.046)	0.03	2.49
Number of observations (job applications)		492	310	492	310		
Number of clusters (organisations)		243	140	243	140		

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted.

Conclusion

This study contributes to the empirical literature on the relative rates of ethnic, age and gender discrimination and their intersectionality in three prominent sectors in the metropolitan context of the Brussels Capital Region. Specifically, we investigate the private sectors of 'Wholesale and retail trade; repair of motor vehicles and motorcycles' (nace G) and 'Administrative and support service activities' (nace N), and the public sector 'Public administration and defence; compulsory social security' (nace O). These sectors represent a substantial share of overall employment in the Brussels Capital Region.[47]

In this study, we causally estimate the relative rates of ethnic (Polish or Moroccan versus Belgian), age (6- or 12-year age gap) and gender (male, female) discrimination and their intersectionality on the likelihood of receiving a job interview invitation or a positive response through a correspondence experiment. We present findings for the entire sample and individual sectors separately.

Results indicate that despite similar background characteristics, such as birthplace, education, and professional experience within the Brussels-Capital Region, hiring discrimination based on ethnicity, age and gender persists. Particularly, our findings reveal female applicants are more likely to be invited to a job interview or receive a positive response compared to male applicants. Recent studies in Ghent and Antwerp (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021) did not find evidence of gender discrimination. These experiments however adopted a different approach where gender was constant within each pair of applications, whereas gender varied within each pair in our experiment. Notwithstanding, overrepresentation of women in human resource professions, the results are in line with our expectations.

Regarding ethnicity, evidence suggests that hiring discrimination is experienced only by individuals of Moroccan (non-EU) descent when compared to Belgian applicants, with no observed effects for those of Polish (EU) descent. These results are in line with correspondence research in Ghent and Antwerp where applicants of non-EU descent encountered discrimination (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021) and research in the Brussels Capital Region on the shared short-term rental market of Airbnb (Verhaeghe et al., 2023) and on the private rental market (Verhaeghe et al., 2017), where discrimination was observed only for individuals of Moroccan with no observed effects for those of Polish descent.

For age, our results indicate that only a substantial age gap of twelve years is penalised in the Brussels labour market (relative to the ages of 38 and 44 years). While the studies in Ghent and Antwerp (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021) do not differentiate between an age gap of six or twelve years, these results qualitatively point towards

[47] These three sectors combined represented 35.2% of all employees working in the Brussels Capital Region (place of work).

the same conclusion with older applicants with additional irrelevant experience having a lower likelihood of receiving a job interview invitation or any positive response.

The results suggest the presence of persistent ethnic, gender, and age biases that extend beyond mere compatibility of qualifications and perceived skills. Exploring the intersectionality of ethnicity, age, and gender, we find no robust evidence that these characteristics substitute or complement one another. When comparing the coefficients for ethnicity, age, and gender, we find the effects of Moroccan ethnic descent, a 12-year age gap, and being male are not statistically significant from one another.

Analyses for subsamples with organisations from the public and the two private sectors (nace G and N) reveal significant discriminatory effects only among the private sector organisations. Observed discriminatory effects in the public sector are qualitatively similar to the private sector, but not statistically significant. Further examination reveals that the significant effects found in the private sector are not statistically different from the non-significant effects in the public sector. The lack of significance in the public sector subsample could be due to the limited number of observations. Evidence thus suggests hiring discrimination exists within private sector organisations in the wholesale and retail sector (nace G) or administrative and support service activities (nace N), but it would be premature to conclude the absence of discrimination within the public sector.

Several important implications can be drawn from these results. First, as hiring discrimination seems to be present for all three characteristics, governments should not prioritise addressing one of these characteristics but rather target all simultaneously. In adopting this comprehensive approach, particular attention should be directed towards individuals who combine multiple characteristics and therefore accumulate negative effects (e.g. an older man of Moroccan ethnicity).

Policy recommendations stemming from the research findings include raising awareness and providing training on biases and stereotypes, as various unconscious biases can creep into assessment processes. Furthermore, policies should focus on informing employers about legislation prohibiting discrimination, including the anti-racism law, the law on equality between women and men, and the anti-discrimination law. These awareness-raising initiatives can be implemented through various means, including poster campaigns and events. Throughout these initiatives, it is crucial to emphasize the benefits diversity can bring to a company. Additionally, a regulatory framework for anonymous job applications could be considered. Under this framework, sensitive personal attributes such as gender, ethnicity, or age, which are protected against discrimination by law, would be omitted from CVs prior to the evaluation of the job applicants. In Belgium, Accent, a talent placement organisation, introduce anonymous CVs in February 2023 (Trends, 2024). The organisation reports a favourable impact of this measure (Accent, 2024). However, the impact of such measure should be thoroughly investigated, as research suggests that while anonymous CVs may mitigate certain forms of discrimination, they may shift discrimination to a later stage of the recruitment process (Åslund & Skans, 2012; Krause et al., 2012).

Furthermore, policy efforts could aim to promote diversity and inclusion in the workplace, which can be an effective strategy if exposure to diverse groups in society leads to reduced biases and discrimination ("contact theory"). However, if exposure to diversity exacerbates discrimination ("visibility-discrimination"), this strategy may not be effective. Although limited research supports the "visibility-discrimination" theory, further investigation is crucial. Finally, to assess the impact of these policy measures, it is crucial to monitor the evolution in discriminatory practices in the labour market in future research, for example through follow-up correspondence experiments across a broad spectrum of companies. Based the analyses by sector, we observed discriminatory practices in the private sectors of wholesale and retail sector (nace G) or administrative and support service activities (nace N). It therefore seems important to further monitor these sectors. Notwithstanding, based on this study, we could not rule out discrimination in the public sector, as well as in sectors not included in the experiment. This underscores the need for a comprehensive policy framework that addresses various forms of discrimination across multiple sectors simultaneously. Notwithstanding, we warrant against using field tests to single out and penalize individual companies. This primarily because (1) these tests require a large number of observations to detect discrimination accurately, (2) the results are confined to the specific characteristics being tested and (3) in the case of repeated field tests at one organisation, the probability of detection of the experiment as well as the costs for the employer concerned increase substantially. Furthermore, setting up field tests necessitates technical expertise and, preferably, ethical approval.

To address the need for further research in guiding applicants, employers, and governments to mitigate discrimination in the labour market, we advance several avenues for future research. First, for gaining a comprehensive understanding of ethnic discrimination in the labour market, it is crucial that future research explores discrimination of applicants from other ethnic backgrounds. While the observed negative effect for applicants of Moroccan (non-EU) ethnicity may signal challenges faced by all individuals of non-EU descent, there may still be differences in job prospects based on specific non-EU ethnicities. Additionally, also for EU ethnicities, we suspect variations in job prospects based on specific EU ethnicities. Second, all fictional applicants in our experiment were born, studied, work and reside in the Brussels Capital Region. Consequently, potential differences in labour market opportunities related to factors such as diploma compatibility and nationality (and/or country of birth) were not investigated. Future research focusing on the applicant's country of birth and/or where they obtained their degree (in Belgium, in Europe, or outside Europe) could complement our study. Third, our study was characterised by a low number of public organisations, which prohibited in-depth analyses by type of organisation. Further research on this therefore is deemed necessary. Fourth, to explore solutions aimed at combating discrimination in the labour market, we encourage future research investigating the impact of anonymous job applications on both hiring chances (positive reaction to an application incl. an interview invitation) and actual job offers. Firth, follow-up studies investigating the evolution in discriminatory practices in the labour market, are deemed crucial. In case of repeated experimentation, particular consideration should be given to the costs for the employers involved and the increasing likelihood of detection. It is

therefore recommended to schedule a longer period between measurements and/or to exclude companies that have been involved in earlier correspondence testing from follow-up studies. Sixth, in light of the metropolitan context of the Brussels Capital Region, it is imperative to explore contextual factors to inform policymakers. This entails specifically assessing the influence of exposure to various societal groups on labour market discrimination, to see whether exposure increases ("visibility-discrimination") or decreases ("contact theory") the discriminatory response. Related, further investigation is required to explore underlying mechanisms to gain deeper insights into observed discriminatory responses. Mechanisms warranting further investigation encompass human capital theory related to (perceived) acquired knowledge and competencies (G. S. Becker, 1964; Mincer, 1958, 1989), and signalling and screening theory related to (perceived) pre-existing characteristics (Arrow, 1973; Spence, 1973; Stiglitz, 1975; Stiglitz & Weiss, 1990).

The aforementioned avenues for future research can be achieved, among other, through the use of correspondence experiments and/or stated choice (vignette) experiments. Both experiments present respondents - potential employers - with fictitious job applications that vary (among other things) on the characteristics of interest (e.g. ethnicity, nationality, age and gender). The main distinction between these two experimental approaches is informed consent. In correspondence experiments, pairs of similar fictitious applications are sent to real vacancies, without the employers' knowledge of their participation in the experiment. The employers' responses provide unbiased insights into their preferences. In vignette research, employers voluntarily participate in a questionnaire in which they read a hypothetical job description and then evaluate fictitious candidates. Because employers consent to participate in the study, this method has fewer ethical considerations. Additionally, the method allows researchers to explore the mechanisms underlying the decision to hire particular groups of applicants through the inclusion of additional statements about the mechanisms after each vignette. Furthermore, while research suggests the effects of the applicant attributes estimated from the vignette experiments and correspondence experiments to be remarkably similar (Hainmueller et al., 2015), it cannot be excluded that the results from vignette experiments are influenced by socially desirable behaviour. Both types of experiments provide valuable tools for researchers to understand preferences and decision-making in the labour market.

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Appendix

Appendix A

Table A1. Design: repetitions of the factorial field experiment based on the sublevels

Number of the repetition(s) of design	Adopted sublevel		
	Foreign ethnic background	Age: Young	Age: old
1	Moroccan	38	38+6
2	Moroccan	38	38+12
3	Polish	38	38+6
4	Polish	38	38+12
5	Moroccan	44	44+6
6	Moroccan	44	44+12
7	Polish	44	44+6
8	Polish	44	44+12

Note. See Table 1 for all characteristics and their (sub)levels and Table 2 for the factorial experimental design.

Table A2. Post-experiment correlations between factors

		1	2	3
Full sample (N=864)				
1	Ethnical background	1		
2	Age	.000	1	
3	Gender	.000	.000	1
Public sector, nace O (N=120)				
1	Ethnical background	1		
2	Age	.100	1	
3	Gender	.033	.133	1
Private sector, nace G and N (N=744)				
1	Ethnical background	1		
2	Age	.016	1	
3	Gender	.005	.022	1
Private sector, nace G (N=374)				
1	Ethnical background	1		
2	Age	.027	1	
3	Gender	.027	.027	1
Private sector, nace G (N=370)				
1	Ethnical background	1		
2	Age	.060	1	
3	Gender	.016	.070	1

Note. N represents the number of observations (job applications). (Absolute value of) Cramer's V is reported as all values are categorical. The data presented in this table is unweighted.

Table A3. Interaction post-experiment level balances

Interaction	Mean				
	Full sample	**Public sector, nace O**	**Private sector, nace G and N**	**Private sector, nace G**	**Private sector, nace N**
Ethnical background x Age					
Belgian x Young	.250	.225	.254	.243	.265
Foreign x Young	.250	.275	.246	.257	.235
Ethnical background x Gender					
Belgian x Male	.250	.242	.251	.257	.246
Foreign x Male	.250	.258	.249	.243	.254
Age x Gender					
Young x Male	.250	.283	.245	.257	.232
Old x Male	.250	.217	.255	.243	.268
Number of observations (job applications)	864	120	744	374	370

Note. Standard deviations are not reported as all variables are binary. The data presented in this table is unweighted.

Table A4. Overview of the jobs (in Dutch and French, and translated to English)

	ENG (translation)	Dutch job title	French job title (male and female)
	(Professional) bachelor's degree required		
1.	Accountant	Boekhouder	Comptable
2.	Administrative and financial officer	Administratief en financieel verantwoordelijke	Responsable administratif et financier Responsable administrative et financière
3.	Administrative assistant	Administratief medewerker	Assistant administratif Assistante administrative
4.	Cleaning officer	Schoonmaakverantwoordelijke	Responsable du nettoyage
5.	Commercial assistant	Commercieel medewerker	Employé commercial Employée commerciale
6.	Coordinator socio-cultural work	Coördinator socioculturee l werk	Coordinateur de travail socio-culturel Coordinatrice de travail socio-culturel
7.	Customs declarant	Douanedeclarant	Déclarant en douane Déclarante en douane
8.	Database manager	Databankbeheerder	Administrateur de base de données Administratice de base de données
9.	General staff member	Algemeen medewerker	Employé polyvalent Employée polyvalente
10.	HR employee	Personeelsmedewerker	Employé en ressources humaines Employée en ressources humaines
11.	ICT analyst	Analist ICT	Analyste TIC
12.	ICT analyst-programmer	Analist-programmeur ICT	Analyste-programmeur TIC Analyste programmeuse TIC
13.	ICT information manager	ICT-informatiemanager	Gestionnaire de projets TIC
14.	ICT integration and implementation assistant	Medewerker Integratie en Implementatie ICT	Employé en intégration et implémentation des TIC Employée en intégration et implémentation des TIC
15.	Insurance adviser	Verzekeringsadviseur	Conseiller en assurances Conseillère en assurances
16.	IT analyst	IT-analist	Analyste informatique
17.	Logistics manager	Verantwoordelijke logistiek	Responsable logistique
18.	Management assistant	Management assistent	Assistant de gestion Assistante de gestion
19.	Purchaser	Aankoper	Acheteur Acheteuse
20.	Responsible consumer service	Verantwoordelijke consumentendienst	Responsable du service consommateur
21.	Sales manager	Verkoopverantwoordelijke	Responsable des ventes
22.	Sales representative	Vertegenwoordiger	Représentant Représentante
23.	Social-cultural worker	Sociaal-cultureel werker	Animateur socio-culturel Animatrice socio- culturelle
24.	Technical-commercial representative	Technisch-commercieel gedelegeerde	Délégué technico-commercial Déléguée technico-commerciale
25.	Training and recruitment coordinator	Opleidings- en Wervingscoördinator	Manager de la formation et du recrutement
26.	Training manager	Opleidingsverantwoordelijke	Responsable de formation

(Table A4 continued)

	Technical secondary education required		
27.	Department manager	Departementsverantwoordelijke	Responsable de département
28.	Optimisation engineer	Optimalisatie-ingenieur	Ingénieur d'optimisation
29.	Packaging officer	Verpakkingsmedewerker	Ouvrier d'emballage Ouvrière d'emballage
30.	Packaging operator	Verpakkingsoperator	Opérateur de conditionnement Opératrice de conditionnement
31.	Production employee	Productiemedewerker	Opérateur de production Opératrice de production
32.	Production employee food processing	Productiemedewerker voeding	Ouvrier de production alimentaire Ouvrière de production alimentaire
33.	Production employee plastics processing	Productiemedewerker kunststofverwerking	Ouvrier de production dans le traitement des matières plastiques Ouvrière de production dans le traitement des matières plastiques
34.	Recycling sorter	Sorteerder recyclage	Trieur de recyclage/ Trieuse de recyclage
35.	Store manager	Winkelverantwoordelijke	Responsable du magasin
36.	Technical expert customer support	Technisch expert klantenondersteuning	Expert technique en soutien client Experte technique en soutien client
37.	Warehouse assistant	Medewerker opslagplaats	Employé de dépôt Employée de dépôt
38.	Warehouse manager	Magazijnverantwoordelijke	Responsable de magasin
	Vocational secondary education required		
39.	Call centre employee	Callcentermedewerker	Agent de centre d'appel
40.	Cleaner	Schoonmaker	Nettoyeur Nettoyeuse
41.	Hygiene and pest control assistant	Medewerker hygiëne en ongediertebestrijding	Employé en hygiène et lutte antiparasitaire Employée en hygiène et lutte antiparasitaire
42.	Kitchen assistant	Keukenmedewerker	Cuisinier Cuisinière
43.	Nurse	Verpleegkundige	Infirmier Infirmière
44.	Polyvalent employee	Polyvalent medewerker	Employé polyvalent Employée polyvalente
45.	Receptionist-telephonist	Receptionist-telefonist	Réceptionniste-téléphoniste
46.	Store assistant	Winkelmedewerker	Collaborateur en magasin Collaboratrice en magasin

Table A5. Number of negative and positive responses by group

Applicant characteristic		N	Interview invitation				Any positive response			
			Neither positive response	Both positive response	Only group 1 positive response	Only group 2 positive response	Neither positive response	Both positive response	Only group 1 positive response	Only group 2 positive response
Full sample										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	432	347	36	31	18	229	111	56	36
Age	Group 1 Young, Group 2 Old$	432	347	36	24	25	229	111	55	37
Gender	Group 1 Female, Group 2 Male	432	347	36	34	15	229	111	59	33
Public sector, nace O										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	60	41	9	6	4	31	14	8	7
Age	Group 1 Young, Group 2 Old$	60	41	9	6	4	31	14	9	6
Gender	Group 1 Female, Group 2 Male	60	41	9	6	4	31	14	7	8
Private sector, nace G and N										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	372	306	27	25	14	198	97	48	29
Age	Group 1 Young, Group 2 Old$	372	306	27	18	21	198	97	46	31
Gender	Group 1 Female, Group 2 Male	372	306	27	28	11	198	97	52	25
Private sector, nace G										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	187	153	9	17	8	117	28	25	17
Age	Group 1 Young, Group 2 Old$	187	153	9	10	15	117	28	24	18
Gender	Group 1 Female, Group 2 Male	187	153	9	18	7	117	28	31	11
Private sector, nace N										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	185	153	18	8	6	81	69	23	12
Age	Group 1 Young, Group 2 Old$	185	153	18	8	6	81	69	22	13
Gender	Group 1 Female, Group 2 Male	185	153	18	10	4	81	69	21	14

Note. N equals the number of vacancies. The data presented in this table is unweighted. £ indicates the candidate has a foreign (Moroccan or Polish) sounding name. $ indicated the applicant is 6 or 12 years older than the younger applicant.

Table A6. Logit models of employer response

		Interview invitation; strict sense		**(Any) positive response;** broad sense	
		(1a)	(1b)	(2a)	(2b)
Ethnicity (ref. Belgian)	Foreign	-.252* (.136)		-.201** (.096)	
	Polish		-.018 (.187)		.010 (.138)
	Moroccan		-.541** (.226)		-.430*** (.147)
Age (ref. young)	Old (6-12 years older)	.019 (.134)		-.181* (.095)	
	Old – 6 years older		.408** (.163)		.039 (.134)
	Old – 12 years older		-.518** (.258)		-.420*** (.151)
Gender (ref. female)	Male	-.369*** (.135)	-.374*** (.138)	-.262*** (.095)	-.265*** (.096)
Constant		-1.532*** (.162)	-1.529*** (.162)	-.243** (.115)	-.241** (.116)

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Table A7. Linear probability models of employer response; main effects with standard errors clustered at the vacancy level

			Interview invitation; strict sense		**(Any) positive response;** broad sense	
			(1a)	(1b)	(2a)	(2b)
Ethnicity (ref. Belgian)	Foreign	*(e)*	-.030* (.016)		-.046** (.022)	
	Polish			-.002 (.024)		.002 (.032)
	Moroccan	*(e_m)*		-.058*** (.022)		-.095*** (.031)
Age (ref. young)	Old (6-12 years older)	*(a)*	.002 (.016)		-.042* (.022)	
	Old – 6 years older			.056** (.024)		.009 (.031)
	Old – 12 years older	*(a_12)*		-.051** (.022)		-.093*** (.032)
Gender (ref. female)	Male	*(g)*	-.044*** (.016)	-.044*** (.016)	-.060*** (.022)	-.060*** (.022)
Constant			.176*** (.022)	.176*** (.022)	.438*** (.028)	.438*** (.028)

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (vacancies) is 432. The data presented in this table is unweighted.

Table A8. Linear probability models of employer response; main effects by sector

			Public sector, nace O (1)	**Private sector, nace G and N** (2)	**Private sector, nace G** (2a)	**Private sector, nace N** (2b)	χ^2 statistic (1)=(2)	(1)=(2a)	(1)=(2b)	(2a)=(2b)
Interview invitation; strict sense										
Ethnicity (ref. Belgian)	Foreign	*(e)*	-.036 (.053)	-.030* (.017)	-.049* (.026)	-.010 (.020)	.01	.05	.22	1.41
Age (ref. young)	Old (6-12 years older)	*(a)*	-.042 (.052)	.010 (.017)	.024 (.026)	-.008 (.020)	.93	1.33	.39	.95
Gender (ref. female)	Male	*(g)*	-.038 (.052)	-.046*** (.017)	-.059** (.026)	-.032 (.020)	.02	.14	.01	.72
Constant			.291*** (.079)	.158*** (.023)	.157*** (.034)	.160*** (.031)	2.72	2.52	2.48	.00
(Any) positive response; broad sense										
Ethnicity (ref. Belgian)	Foreign	*(e)*	-.022 (.066)	-.051** (.023)	-.047 (.034)	-.056* (.032)	.18	.11	.23	.04
Age (ref. young)	Old (6-12 years older)	*(a)*	-.051 (.064)	-.038* (.023)	-.036 (.034)	-.043 (.032)	.04	.04	.01	.02
Gender (ref. female)	Male	*(g)*	.011 (.064)	-.072*** (.023)	-.109*** (.034)	-.034 (.032)	1.52	2.82*	.40	2.65
Constant			.389*** (.078)	.445*** (.030)	.358*** (.044)	.534*** (.042)	.45	.13	2.79*	8.60***
Number of observations (job applications)			120	744	374	370				
Number of clusters (organisations)			46	368	185	183				

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted.

Table A9. Linear probability models of employer response for subsamples by ethnicity, age and gender

		Interview invitation; strict sense				χ^2 statistic			**(Any) positive response**; broad sense				χ^2 statistic		
		(1)	(2)	(2a)	(2b)	(1)=(2)	(1)=(2a)	(1)=(2b)	(3)	(4)	(4a)	(4b)	(3)=(4)	(3)=(4a)	(3)=(4b)
Subgroup by ethnicity		**Belgian**	**Foreign**	**Polish**	**Moroccan**				**Belgian**	**Foreign**	**Polish**	**Moroccan**			
Age (ref. young)	Old – 6 years older	.088* (.048)	.023 (.042)	.000 (.064)	.046 (.057)	.74	.91	.27	-.037 (.059)	.056 (.057)	.028 (.083)	.083 (.078)	.91	.32	1.22
	Old – 12 years older	-.042 (.037)	-.060* (.034)	-.056 (.055)	-.065* (.039)	.12	.04	.16	-.194*** (.053)	.009 (.055)	.009 (.081)	.009 (.075)	5.45**	3.72*	4.13**
Gender (ref. female)	Male	-.097*** (.034)	.009 (.030)	.046 (.047)	-.028 (.040)	3.78*	4.66**	1.38	-.069 (.046)	-.051 (.045)	-.019 (.066)	-.083 (.062)	.05	.29	.02
	Constant	.192*** (.032)	.130*** (.026)	.144*** (.039)	.116*** (.037)				.479*** (.041)	.350*** (.039)	.389*** (.056)	.310*** (.055)			
Number of observations		432	432	216	216				432	432	216	216			
Number of clusters		414	414	211	212				414	414	211	212			
Subgroup by age		**Young**	**Old**	**Old – 6 years older**	**Old – 12 years older**				**Young**	**Old**	**Old – 6 years older**	**Old – 12 years older**			
Ethnicity (ref. Belgian)	Polish	.023 (.044)	-.028 (.042)	-.065 (.066)	.009 (.049)	.51	.90	.04	-.065 (.058)	.069 (.057)	.000 (.083)	.139* (.078)	2.01	.33	3.72*
	Moroccan	-.042 (.037)	-.074* (.038)	-.083 (.064)	-.065* (.039)	.29	.26	.16	-.176*** (.055)	-.014 (.055)	-.056 (.081)	.028 (.075)	3.27*	1.21	4.13**
Gender (ref. female)	Male	-.028 (.034)	-.060* (.033)	-.093* (.053)	-.028 (.040)	.30	.76	.00	-.037 (.047)	-.083* (.045)	-.102 (.066)	-.065 (.062)	.33	.47	.10
	Constant	.157*** (.032)	.197*** (.033)	.278*** (.053)	.116*** (.036)				.463*** (.041)	.370*** (.040)	.458*** (.059)	.282*** (.053)			
Number of observations		432	432	216	216				432	432	216	216			
Number of clusters		414	414	212	212				414	414	212	212			
Subgroup by gender		**Male**	**Female**						**Male**	**Female**					
Ethnicity (ref. Belgian)	Polish	.069* (.041)	-.074* (.041)			4.70**			.028 (.057)	-.023 (.058)			.29		
	Moroccan	-.023 (.034)	-.093** (.040)			1.38			-.102* (.053)	-.088 (.057)			.02		
Age (ref. young)	Old – 6 years older	.023 (.040)	.088* (.048)			.77			-.023 (.056)	.042 (.059)			.47		
	Old – 12 years older	-.051 (.036)	-.051 (.039)			.00			-.106* (.055)	-.079 (.056)			.09		
	Constant	.113*** (.025)	.194*** (.033)						.384*** (.041)	.431*** (.042)					
Number of observations		432	432						432	432					
Number of clusters		414	414						414	414					

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted. The number of observations reflects the number of job applications. The number of clusters reflects the number of organisations.

Table A10. Linear probability models of employer response, controlling for employment characteristics; detailed effects by sector

		Interview invitation; strict sense					**(Any) positive response**; broad sense				
		Full sample	Public sector, nace O	Private sector, nace G and N	Private sector, nace G	Private sector, nace N	Full sample	Public sector, nace O	Private sector, nace G and N	Private sector, nace G	Private sector, nace N
Ethnicity (ref. Belgian)	Polish	-.007 (.024)	-.052 (.085)	-.005 (.024)	-.018 (.037)	.011 (.031)	-.003 (.032)	-.024 (.108)	-.007 (.033)	.010 (.050)	-.040 (.043)
	Moroccan	-.053** (.021)	-.017 (.064)	-.056** (.022)	-.077** (.032)	-.034 (.032)	-.090*** (.030)	-.020 (.084)	-.096*** (.032)	-.097** (.041)	-.076 (.049)
Age (ref. young)	Old – 6 years older	.054** (.024)	-.015 (.067)	.063** (.025)	.069* (.038)	.046 (.034)	.009 (.031)	-.053 (.075)	.025 (.033)	.035 (.046)	.004 (.049)
	Old – 12 years older	-.050** (.023)	-.087 (.091)	-.042* (.023)	-.018 (.036)	-.065** (.028)	-.093*** (.031)	-.049 (.117)	-.100*** (.032)	-.103** (.046)	-.092** (.045)
Gender (ref. female)	Male	-.044*** (.016)	-.038 (.054)	-.047*** (.017)	-.058** (.027)	-.034* (.020)	-.060*** (.022)	.010 (.068)	-.073*** (.023)	-.107*** (.034)	-.036 (.033)
Control variables											
Diploma (ref. secondary education)	Tertiary education (bachelor)	.019 (.031)	-.075 (.119)	-.003 (.033)	.033 (.042)	-.031 (.059)	.010 (.043)	.021 (.173)	.001 (.046)	.023 (.062)	-.047 (.066)
Language of application (ref. Dutch)	French	-.154*** (.035)	-.184* (.103)	-.141*** (.037)	-.133** (.054)	-.165*** (.051)	-.317*** (.045)	-.114 (.110)	-.346*** (.051)	-.181** (.077)	-.454*** (.063)
Company size (ref. small)	Medium	-.040 (.038)	-.086 (.176)	-.066* (.037)	.023 (.062)	-.120** (.053)	.067 (.054)	-.101 (.146)	.095 (.060)	.070 (.085)	.080 (.087)
	Large	-.046 (.043)	-.177 (.164)	-.065 (.044)	.080 (.085)	-.134** (.056)	.033 (.055)	-.149 (.126)	.085 (.066)	.130 (.114)	.011 (.081)
	Unknown	.025 (.066)	-.371** (.156)	.045 (.068)	.056 (.098)	.038 (.093)	.013 (.074)	-.385*** (.127)	.023 (.074)	-.025 (.123)	.037 (.101)
Contract duration	Temporary contract	.003 (.035)	.089 (.095)	-.029 (.036)	.008 (.056)	-.035 (.048)	.011 (.047)	.288** (.113)	-.041 (.052)	-.147** (.068)	.021 (.077)
(ref. indefinite contract)	Unknown	-.028 (.039)	.365* (.183)	-.067** (.032)	-.025 (.045)	-.096* (.053)	-.067 (.050)	.292 (.197)	-.094* (.053)	-.091 (.071)	-.149 (.090)
Work schedule	Part-time	.065 (.044)	.192 (.244)	.061 (.044)	.009 (.046)	.144 (.100)	.031 (.052)	.132 (.182)	.032 (.055)	-.020 (.060)	.171* (.100)
(ref. fulltime)	Unknown	-.014 (.062)	-.338* (.189)	.004 (.065)	.033 (.085)	-.031 (.106)	-.098 (.064)	-.416* (.212)	-.085 (.069)	-.106 (.095)	-.079 (.085)
Constant		.261*** (.046)	.481*** (.172)	.271*** (.050)	.231*** (.063)	.311*** (.081)	.601*** (.058)	.396** (.192)	.649*** (.062)	.529*** (.090)	.758*** (.083)
Number of observations		864	120	744	374	370	864	120	744	374	370
Number of organisations		414	46	368	185	183	414	46	368	185	183

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the orginisation level, displayed in parentheses. The data presented in this table is unweighted.

Appendix B

Exemplary CV - Type A (English translation)

Thomas Goossens

Personal details

- **Address**

  Ongenastraat 63

  1090 Jette (Belgium)
- **Date of birth**

  18/4/1985, Brussels
- **Nationality**

  Belgian
- **Phonenumber**

  0032 491/62.18.94
- **email**

  Goossens_Thomas@yahoo.com
- **Driving license**

  B

Experience

- Warehouse manager, COOLS (2014-present)
- Warehouse manager, CAMARA (2003-2014)

Skills

Digital skills

- MSWord: Very good
- MSExcel: Very good
- MSPowerpoint: Very good

Languages

- Dutch: excellent
- French: excellent
- English: fluent

Education

- Diploma in Secondary Education: Commerce (TSO) (1997-2003)

  Atheneum Emanuel Hiel

  Charles Gilisquetlaan 34, 1030 Schaarbeek BE

Hobbies

- Sport: badminton

  Club: jet'plume

  Location: Jette

Exemplary motivation letter - Type A (English translation)

Dear Sir/Madam,

I would like to express my interest in the open position of [position], which I found through the database of [jobsite]. I have been looking for a new professional challenge for several months now. The content of the job you are offering looks very attractive and seems to match my skills and experience perfectly.

I would like to explain my drive, flexibility, capabilities and work experience during a personal interview. More information about my work experience and education can be found in the attached Curriculum Vitae.

Kind regards,

Thomas Goossens

Exemplary CV - Type B (English translation)

CURRICULUM VITAE

Personal information

First name and last name	Magda Piotrowska
Address	Sint-Martinusgaarde 70, 1083 Ganshoren
Date of birth	9 June 1973
Place of birth	Brussels
Nationality	Belgian
Phone	(0492) 15 10 33
Mailaddress	magda-piotrowska@outlook.com

Profession activities

1991/10 - 2007	Chief warehouse worker, Fsp
2007/11 - 2013	Assistant chef, Collard
2013/3 - …	Chief warehouse worker, Aerts

Education

1985 - 1991	Regina Pacisinstituut
	TSO Commerce
	Brussels

Language skills

	Speaking	Reading	Writing
Ducth	Perfect knowledge	Perfect knowledge	Perfect knowledge
French	Perfect knowledge	Perfect knowledge	Perfect knowledge
English	Good	Good	Good

ICT skills

Perfect knowledge of standard desktop software (Microsoft Office)

Varia

Volleybal - Smash Ganshoren

Mobility

Driving license B

Exemplary motivation letter - Type B (English translation)

Dear Madam

Dear Sir

I have noted with interest your advertisement on the [jobsite] website. I would like to be considered for the position of [position], for which I believe I have the right experience. It is with great enthusiasm that I apply.

You can read my professional experience in my CV. I am happy to further explain my profile in a personal interview.

Yours sincerely

Magda Piotrowska

Appendix C

A common hurdle in correspondence research in the public sector is the low number of observations, as this sector typically comprises a relatively small number of employers. Notwithstanding, these employers often employ a very large number of individuals. Since researchers typically apply to no more than one vacancy from each employer, to limit the burden on the employers and society and to further minimize the chances of the experiment being discovered, the number of observations in the public sector is often too small to make valuable statements about discrimination in this sector.

In our experiment, we bridged this problem through various channels. First, we collected data over an extended period (April 2023-January 2024). Second, we selected all vacancies for all (public) employers with job offers in the Brussels Capital Region (place of employment). The latter implies that we maximise the number of (public) firms we can contact in our experiment. For example, organisations with a head office in the Flemish Region and a branch unit in the Brussels Capital Region could be included in the experiment if the organisation published a vacancy for a job in the Brussels Capital Region (place of employment). Third, under certain conditions, we contacted public organisations for two different vacancies, as opposed to one vacancy in the private sector.

Contacting public employers for two vacancies, likely has little additional cost to public employers and society as a whole, as public organisations often have a much larger employee base than organisations in the private sector. As a result, public organisations typically have multiple HR units responsible for recruitment. Data from the Belgian Social Security Office (Rijksdienst voor Sociale Zekerheid, 2023b) affirms that, on average, public sector branch units employ a significantly higher workforce compared to their counterparts in the private sector and the overall economy, as illustrated in Table C1. Furthermore, besides the costs for individual employers, we also considered the effects on society at large as contacting employers twice increases the probability of detection and possible perverse effects of the experiment. By imposing several conditions, we minimise these potential costs. Specifically, we impose four conditions for applying for a second vacancy with a public employer. First, only public sector employers may be contacted for two vacancies. Second, there must be a minimum of four months between the two contacts. Third, the selected vacancies with the same employer must be for different professions. Fourth, the four applicants (two times two applicants) must have different names.

Table C1. Number of employees per branch unit in Belgium

NACE		Branch Units with … employees									
		<5	**5-9**	**10-19**	**20-49**	**50-99**	**100-199**	**200-499**	**500-999**	**>1000**	**Total**
A. Agriculture, forestry and fishing	N	3 943	706	412	268	66	18	2	-	-	5 415
	%	72.8	13.0	7.6	4.9	1.2	0.3	0.0	0.0	0.0	100
B. Mining and quarrying	N	38	32	24	16	2	5	1	-	-	118
	%	32.2	27.1	20.3	13.6	1.7	4.2	0.8	0.0	0.0	100
C. Manufacturing	N	8 456	3 100	2 245	2 056	774	536	277	92	35	17 571
	%	48.1	17.6	12.8	11.7	4.4	3.1	1.6	0.5	0.2	100
D. Electricity, gas, steam and air conditioning supply	N	96	36	33	34	28	19	20	6	2	274
	%	35.0	13.1	12.0	12.4	10.2	6.9	7.3	2.2	0.7	100
E. Water supply; sewerage; waste management and remediation activities	N	742	246	217	215	96	35	24	3	-	1 578
	%	47.0	15.6	13.8	13.6	6.1	2.2	1.5	0.2	0.0	100
F. Construction	N	22 252	4 502	2 501	1 288	351	145	76	7	2	31 124
	%	71.5	14.5	8.0	4.1	1.1	0.5	0.2	0.0	0.0	100
G. Wholesale and retail trade; repair of motor vehicles and motorcycles	**N**	**45 244**	**12 988**	**6 742**	**3 507**	**887**	**251**	**126**	**17**	**4**	**69 766**
	%	**64.9**	**18.6**	**9.7**	**5.0**	**1.3**	**0.4**	**0.2**	**0.0**	**0.0**	**100**
H. Transportation and storage	N	5 749	2 009	1 405	1 336	464	255	143	24	17	11 402
	%	50.4	17.6	12.3	11.7	4.1	2.2	1.3	0.2	0.1	100
I. Accommodation and food service activities	N	19 592	5 539	2 759	873	110	28	8	1	2	28 912
	%	67.8	19.2	9.5	3.0	0.4	0.1	0.0	0.0	0.0	100
J. Information and communication	N	4 863	1 194	886	658	212	117	59	16	7	8 012
	%	60.7	14.9	11.1	8.2	2.6	1.5	0.7	0.2	0.1	100
K. Financial and insurance activities	N	6 996	1 736	769	390	123	72	40	25	13	10 164
	%	68.8	17.1	7.6	3.8	1.2	0.7	0.4	0.2	0.1	100
L. Real estate activities	N	6 576	548	206	141	41	7	1	-	-	7 520
	%	87.4	7.3	2.7	1.9	0.5	0.1	0.0	0.0	0.0	100
M. Professional, scientific and technical activities	N	17 443	3 370	1 743	1 094	301	170	76	9	7	24 213
	%	72.0	13.9	7.2	4.5	1.2	0.7	0.3	0.0	0.0	100
N. Administrative and support service activities	**N**	**8 724**	**2 272**	**1 600**	**1 915**	**1 284**	**637**	**276**	**53**	**31**	**16 792**
	%	**52.0**	**13.5**	**9.5**	**11.4**	**7.6**	**3.8**	**1.6**	**0.3**	**0.2**	**100**
O. Public administration and defence; compulsory social security	**N**	**1 896**	**961**	**999**	**1 353**	**854**	**464**	**270**	**67**	**37**	**6 901**
	%	**27.5**	**13.9**	**14.5**	**19.6**	**12.4**	**6.7**	**3.9**	**1.0**	**0.5**	**100**
P. Education	N	5 223	2 231	2 441	4 608	1 175	674	120	29	17	16 518
	%	31.6	13.5	14.8	27.9	7.1	4.1	0.7	0.2	0.1	100
Q. Human health and social work activities	N	10 919	2 950	2 649	2 275	1 328	797	279	117	60	21 374
	%	51.1	13.8	12.4	10.6	6.2	3.7	1.3	0.5	0.3	100
R. Arts, entertainment and recreation	N	5 469	1 440	830	404	85	29	14	1	1	8 273
	%	66.1	17.4	10.0	4.9	1.0	0.4	0.2	0.0	0.0	100
S. Other service activities	N	12 540	2 086	906	441	104	37	13	-	-	16 127
	%	77.8	12.9	5.6	2.7	0.6	0.2	0.1	0.0	0.0	100
T. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	N	4 038	25	-	-	-	-	-	-	-	4 063
	%	99.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100
U. Activities of extraterritorial organisations and bodies	N	190	70	50	28	6	2	1	-	-	347
	%	54.8	20.2	14.4	8.1	1.7	0.6	0.3	0.0	0.0	100
Total	N	190 989	48 041	29 417	22 900	8 291	4 298	1 826	467	235	306 464
	%	62.3	15.7	9.6	7.5	2.7	1.4	0.6	0.2	0.1	100

Source. Rijksdienst voor Sociale Zekerheid (2023b).