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The environmental cost of the international job market for economists

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Abstract
We provide an estimate of the environmental impact of the recruitment system in the economics profession, known as the "international job market for economists". Each year, most graduating PhDs seeking jobs in academia, government, or companies participate in this job market. The market follows a standardized process, where candidates are pre-screened in a short interview which takes place at an annual meeting in Europe or in the United States. Most interviews are arranged via a non-profit online platform, econjobmarket.org, which kindly agreed to share its anonymized data with us. Using this dataset, we estimate the individual environmental impact of 1,057 candidates and one hundred recruitment committees who attended the EEA and AEA meetings in December 2019 and January 2020. We calculate that this pre-screening system generated the equivalent of about 4,000 tons of avoidable CO2-eq and a comprehensive economic cost over e3.5 million. We contrast this overall assessment against three counterfactual scenarios: a more efficient in-person system, a hybrid system (where videoconference is used for some candidates) and a fully online system (as it happened in 2020-21 due to the COVID-19 pandemic). Overall, the study can offer useful information to shape future recruitment standards in a more sustainable way.

Key words: job market for economists; international job market; carbon footprint; environmental impact; comprehensive economic cost
JEL: A11; J44; Q51; Q56

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1 Introduction

Two years ago, many graduating PhD in Economics from European institutions who were applying for a job in Europe were interviewed in San Diego, California. To be sure, the reason is not related to San Diego in particular, but to the current recruitment system in the economics profession. This system follows a standardized process, where most graduating PhDs seeking jobs in academia, government, or companies are initially pre-screened in a short interview (25-35 minutes), and subsequently invited to give a seminar at the recruiting institution for the decisive set of interviews (known as "fly-out"). Pre-screening is centralized and takes place either at the Annual Meeting of the American Economic Association (AEA) or at the Annual Congress of the European Economic Association (EEA). In January 2020, the AEA Meeting took place in San Diego, and its European counterpart took place in Rotterdam a few weeks earlier. The result was a global movement of people which produced an imprecise but momentous amount of CO_2-eq emissions and other pollutants, mainly through air transportation. The system has raised ecological concerns among some candidates and recruiters.

Even though individual responsibility plays an essential role in the ecological transition, market institutions can contribute a great deal to reducing emissions. The case of the job market for economists is paradigmatic. The use of video platforms, although technically possible, is rare. On the one hand, candidates are discouraged asking for online interviews, because, in doing so, they could introduce a comparative disadvantage to their competitors (recruiters tend to prefer face-to-face) and they would send a mixed signal about the number of interviews to which they have been invited at the annual meeting. On the other hand, recruiters have similar incentives to favor face-to-face interactions and to showcase their name among the list of recruiters. Each recruiter has a limited number of available interviews slots at each annual meeting, thus recruiters that are interested in next-door candidates might end up interviewing them on the other continent. Overall, neither the candidates nor the

recruiters have an incentive to deviate from the *status quo*: this is what economists would designate as an equilibrium. An ecologically unsustainable one.

The COVID-19 pandemic brought an unexpected disruption to this system. Last academic year, the international job market for economists was held entirely online. This event drew attention to the possibility of organizing the future recruitment standards in a more sustainable way in a post-pandemic world.

Herein, we present an original analysis and map out some potential solutions. Using a new high-quality dataset, our study estimates the environmental cost of in-person pre-screening for the 2019-20 edition of the international job market for economists. Previous research has estimated the environmental impact of academic activities. The main stream focuses primarily on the carbon footprint of conference participation (Spinellis and Louridas, 2013; Astudillo and AzariJafari, 2018; Jäckle, 2019; Burtscher et al., 2020; Klöwer et al., 2020; van Ewijk and Hoekman, 2021), sometimes adding energy consumption (Ørngreen et al., 2019), time lost (Ong et al., 2014) or local pollutant effects (Nevrlỳ et al., 2020) An alternative approach uses the ecological footprint by considering the land surfaces needed to provide the goods and services necessary for the conference and to absorb the resulting waste (Rickard, 2006). The overall impact of an event (i.e., all the stages from the *ex ante* organisation to the subsequent impacts) is sometimes approached thanks to life cycle assessments (Toniolo et al., 2017; Neugebauer et al., 2020) or the ecological footprint (Stiel and Teuteberg, 2015). Another strand of the literature considers the environmental impact of a research centre / a university / a research project as a whole and over a given period, generally through the prism of the carbon footprint (Arsenault et al., 2019; Jahnke et al., 2020; Ahonen et al., 2021; Aujoux et al., 2021). Finally, an article details the carbon footprint of all the stages of a scientific publication, from the early research stage to publication, with a life-cycle assessment approach (Song et al., 2016).

Here, we contribute to the literature in two directions. We propose the first evaluation of an institutionalized professional job market, and we offer a comprehensive perspective by

including many external costs (related to CO_2-eq and local pollutant emissions, and covering climate change, accidents, air pollution, noise, congestion, well-to-tank, habitat), as well as private costs and time lost. We contrast this overall assessment against three quickly implementable counterfactual scenarios: a more efficient in-person system, a hybrid system (where videoconference is used for some candidates) and a fully online system (as it happened in 2020-21 due to the COVID-19 pandemic). To clarify, our estimates refer to the pre-screening phase only: the environmental impact of the entire recruitment process (including the fly-out phase) is inevitably larger.

2 Methodology and Data

Most pre-screening interviews are organized via www.econjobmarket.org, a non-profit online platform which kindly agreed to share its anonymized data with us. The dataset includes 3,001 interviews arranged by a hundred institutions with 1,057 candidates, both at the EEA Congress in Rotterdam and the AEA Meeting in San Diego. For each annual meeting, we know the place of departure of the candidates (inferred from their IP address), the recruiters (from their institutional affiliation) and the place of arrival (conference venue). We complement the dataset with the official list of recruiters at the meetings, and we prudently assume each recruiting committee to be composed of only two people. Although not all interviews are arranged via econjobmarket.com, we estimate that the database covers over 95% of candidates at each meeting (see Supplementary Information).

The CO_2-eq emissions cover transport (from air or rail depending on the duration of the journey, Jäckle, 2019; Neugebauer et al., 2020) and electricity consumption (Kamiya, 2020). We consider that only a fraction of the time spent in transportation is not productive (waiting, transit, transfers and boarding procedures). We compute the overall economic impact from several sources. For the external costs, a distinction is made between carbon footprint-related (climate change) and other external effects (accidents, air pollution, noise, congestion, well-to-tank, habitat). They are expressed in euro per passenger-kilometer for (electric) train and

aircraft (European Commission, 2019), and in euro per kWh^{-1} for electricity consumption (European Commission, 2020). Time lost in transportation is valued at the median after-tax wage rate, with different country-specific wages for recruiters and candidates (European Commission 2007; www.datacommons.org; www.uk.indeed.com; www.payscale.com). For private costs, we consider an average ticket price per travelled kilometer for train (European Commission, 2016) and plane (www.rome2rio.com), and an average expense per night for accommodations (www.whereandwhen.net). Estimation details are in the Supplementary Information.

3 Results and Alternative Scenarios

To attend pre-screening interviews at the 2019-20 AEA and EEA meetings, participants covered over 17 million kilometers, equivalent to more than 430 times the circumference of the earth. We find that the meetings generated 3,963 tons CO_2-eq. The total CO_2-eq emissions associated with these few days of interviews conducted in Rotterdam and San Diego slightly exceeds the typical total emissions of these cities during the same period (Moran et al., 2018). The average individual CO_2-eq emissions of the participants were about 3.2 tons CO_2-eq per person, equivalent to 50% of the average annual carbon footprint of a European and 20% of an American (World Bank, 2021). When adding up economic costs to the monetary value of environmental externalities, we estimate the economic impact of the 2019-20 AEA and EEA meetings at €3.65 million. This is almost seven times more than if we accounted for the carbon footprint only (see Figure 1). The location of the meetings matters for the impact of transportation and the peripheral position of San Diego certainly did not help. For instance, if the AEA meeting took place in New York or Chicago rather than San Diego, overall emissions and costs would have been reduced by about 25%. Below, we contrast the 2019-20 situation with three alternative ways to organize the job market pre-screening phase.

Scenario 1. Efficient in-person. If all recruiters conduct interviews at both annual meetings while candidates only go to the closest meeting, the associated emissions would be cut by one-third.

Many candidates attended both the American and European meetings, while many recruiters attended only the closest event. Given the unbalance between the higher number of candidates than recruiters, the market should instead encourage the geographical displacement of the latter. Therefore, candidates could attend only the closest meeting. Importantly, recruiters should interview only candidates which are in close geographical proximity: hence, the paradoxical case of a European institution interviewing a European candidate in the US (or the reverse) would be avoided, by a formal or informal rule. A criticism could be that the annual meetings host not only the job market interviews, but also international conferences where economists share their latest research. However, recruiters and candidates rarely benefit from the academic presentations at the meetings and even more rarely they participate as speakers.

Scenario 2. Hybrid. If recruiters and candidates attend only the closest annual meeting in-person, the associated emissions would be halved.

Candidates would be allowed to attend only the closest job meeting in person, while they would be able to be interviewed online at the other meeting. Intercontinental air transportation represents the largest ecological and financial cost of this job market. Therefore, shrinking this entry would generate important benefits at the expense of minor adaptations of the current system. Criticisms might address the fact that a hybrid format introduces an asymmetry between next-door candidates (interviewed in person) and remote candidates (interviewed online). Yet, this asymmetry is already present, in the form of pre-interview effort to join the meeting, like jet lag. Time differences could be easily accommodated, since interviews usually take place over the course of the entire day.

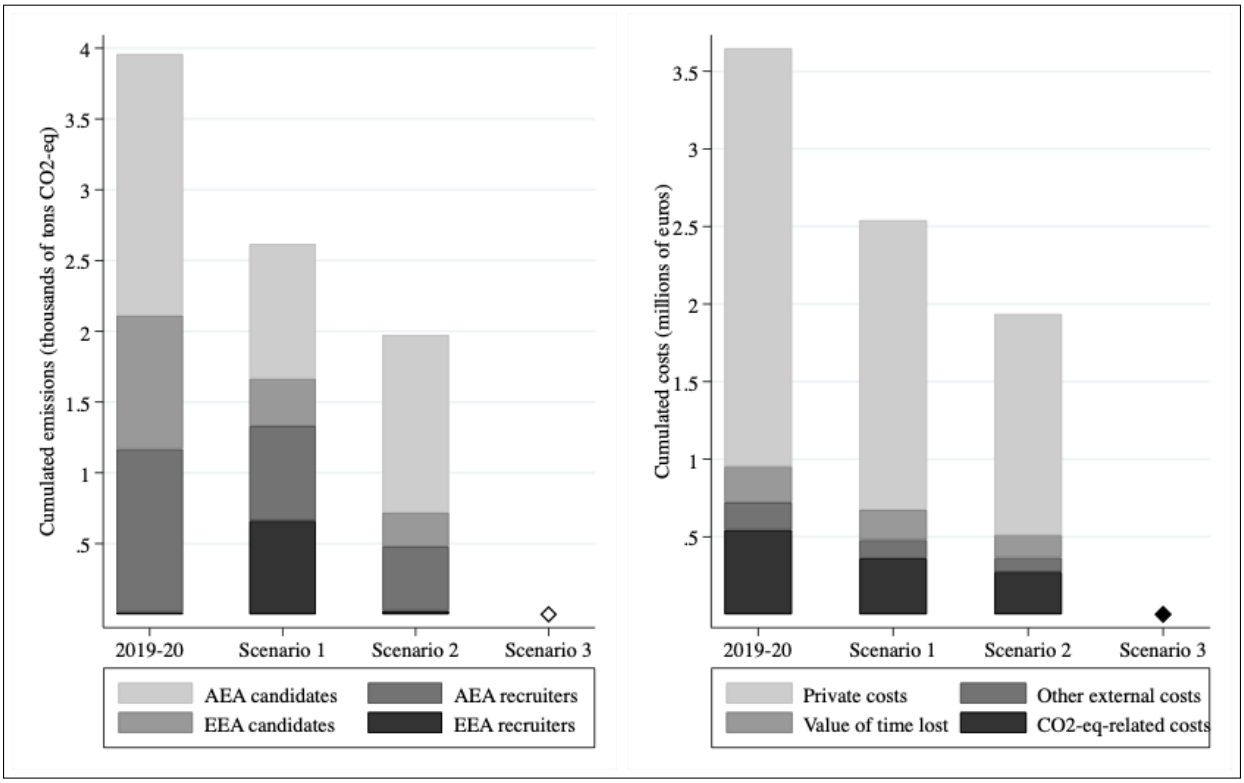
Scenario 3. Fully virtual (as in 2020-21). If the entire screening process takes place online, the associated emissions would nearly be eliminated.

By far, the fully virtual scenario represents the more sustainable one, both financially and ecologically. Of course, face-to-face interaction is important and the priority of an institutionalized job market should be to generate a good match between the recruiter and the candidate. Yet, virtual pre-screening does not prevent subsequent face-to-face interaction of the shortlisted candidates at the recruiter's institution. It simply delays it to a later stage, when the probabilities of an actual match are higher. Two collateral advantages make virtual interviews fairer, too. First, the current recruitment system disadvantages candidates from remote areas and non-Western countries. Attendance at the annual meetings requires a considerable financial cost that only the richest sponsors can cover and that is disproportionately high for non-European and non-American candidates. Virtual interviews would remove these financial barriers. Second, virtual interviews could be recorded and archived, allowing the recruitment committee to review them asynchronously. Decades of research has shown that committees' fatigue and candidates' traits can bias the decision process, even when they should not. Recordings might prove useful for contrasting these biases.

In Figure 1, the left panel details CO_2-eq emissions associated with each scenario, while the right panel presents the environmental, private and opportunity costs. The figures show that alternative Scenarios 1, 2 and 3 would have generated 2,624t, 1,982t and 41.7kg CO_2-eq, respectively. In contrast to the €3.65 million comprehensive assessment of the 2019-20 meetings, alternative Scenarios 1, 2 and 3 would have reduced these values to €2.54 million, €1.94 million, and €20, respectively. The largest savings are associated with travel and accommodations expenditures, and with climate-related costs.

These results highlight a beneficial aspect of the COVID-19 pandemic for this professional job market. Switching from in-person to fully virtual interviewing saved thousands of tons of CO_2-eq emissions and millions of euros for universities. In the future, maintaining a fully virtual format would replicate this benefit annually and pave the way to a sustainable recruitment process.

Figure 1: Overall emissions and economic assessment (by scenario).



Notes: This graph shows overall emissions and economic assessment with the pre-screening phase of the international job market for economists, for the academic year 2019-20, and compares them with three alternative scenarios. The left panel breaks down emissions across recruiters and candidates at the EEA and AEA meetings. The right panel breaks down costs between CO_2-eq-related, other externality-related, private costs and value of time lost. In Scenario 1, recruiters go to both meetings while job market candidates only go to their closest meeting. In Scenario 2, both recruiters and candidates only go to their closest meeting. Interviews that cannot be conducted in-person are conducted online. In Scenario 3, job market interviews are conducted online. Emissions and associated costs take into account return trips. **Sources:** econjobmarket.org and personal computations.

4 Conclusion

Last January, the *Economist* underlined that at the last AEA Meeting, held virtually, many contributions rediscussed foundational in the economics profession: "Just as the global financial crisis of 2007-09 prompted a rethink of the profession's understanding of financial markets and macroeconomic policy, the pandemic may focus attention on other blind spots."[1] We

[1]https://www.economist.com/finance-and-economics/2021/01/06/could-the-pandemic-cause-economists-to-rethink-welfare [Accessed on 9 July 2021].

believe that the ecological impact of economists' recruitment system is one of these blind spots, and it is urgent to rediscuss it.

Urgency comes not only from the pressing challenge of climate change, but also from the role of the pandemic in disrupting institutional inertia. In some cases, the institutional arrangement is purely a matter of coordination based on a public announcer (see Gintis, 2014; Guala, 2016), rather than a matter of efficiency. The international job market seems to be one of these instances. Indeed, the mis-matching costs due to online pre-screening of candidates is likely to be from small to negative. This is not a claim about job interviews in general, but about the specific format of the international job market pre-screening phase, which is highly standardized, short (30') and preliminary. In this case, in-person meetings seem a focal point of coordination chosen for historical reasons, not for efficiency concerns, and the choice seems to be determined by the public announcers, which are the American Economic Association and the European Economic Association.

This year, pre-screening will be held again online, saving the equivalent of about 4,000 tons of CO_2-eq and over €3.5 million, according to our estimations. Yet, it is still unclear if the pre-screening will return to an in-person model in the post-pandemic world. In the coming months, the job market organizers will announce their official agenda for 2022-23. Here, we presented three solutions to shape future recruitment standards in a more sustainable way, implementable already in the next academic year.

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The environmental cost of the international job market for economists
Supplementary Appendices

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A Details of the computations

A.1 Data on participants

For each annual meeting, we know the place of departure of the candidates (inferred from their IP address), of the recruiters (from their institutional affiliation) and the place of arrival (conference venue). We complement our dataset with the official list of institutions that conducted interviews at the EEA Congress in Rotterdam, as reported by the European Economic Association. We also web-scrape job postings from the American Economic Association website and include all institutions that announced their presence at the AEA Meeting in San Diego. Although not all interviews are arranged via www.econjobmarket.com, we estimate that the database covers over 95% of candidates at each meeting (see Appendix B hereafter).

A.2 Data on distance

The figures include return trips between cities of residence and cities of meetings. We use data from Google Maps to compute the distance and travel duration between pairs of cities. For rail, we compute the shortest journey for the closest railway stations to the point of departure and the point of arrival. For plane, we compute the geodesic distance between the closest airports from residence cities and international airports of Rotterdam and San Diego, respectively. We make the conservative assumption that candidates and recruiters chose to travel by train when the travel duration is under six hours (as in Jäckle, 2019; 5 hours, or Neugebauer et al., 2020; 8 hours). We believe that this assumption is conservative in the sense that we probably under-estimate the number of plane passengers and the emissions associated with this type of transportation. We apply a factor of 1.2 to the distance covered by plane passengers to take into account the fact that aircrafts rarely follow the most direct route because of stacking, congested airspace or adverse weather conditions (Astudillo and

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AzariJafari, 2018; Jäckle, 2019; Klöwer et al., 2020). This also includes potential connecting flights. This factor of 1.2 also takes into account the distance between the airport (train station) and the conference centers of the job market meetings. However, they do not include the distance between the residence of travelers and airport (train station) at departure since we do not observe their exact address. Finally, we make another conservative assumption by assuming that recruitment committees only include two members.

A.3 Data on emissions (see also Table 1)

We consider an average CO_2-eq emissions per kilometer and passenger of 27 grams for train and 230 grams for plane. This is based on weighted averages from the values obtained from the three studies in Table 3 in Jäckle, 2019, with weight 1 for German Federal Environmental Agency and Government of the United Kingdom, and weight 2 for European Environment Agency. For accommodations, we consider that CO_2-eq emissions do not significantly differ from average emissions when participants are at home. We assume that an online instead of a face-to-face interview brings together one candidate with two recruiters for 30 minutes, and generates an extra consumption of 46.3 Watt per hour of connection with laptop, Wi-Fi and HD video (Kamiya, 2020). This leads to an average CO_2-eq emissions associated with one hour of videoconference of 9.26 grams per person (Kamiya, 2020). We do not factor in any other extra electricity consumption with respect to working from home, considering that the average energy mix of the participants in their places of residence does not significantly differ from the one in San Diego and Rotterdam.

A.4 Data on time lost

Time lost (i.e., opportunity cost of time) corresponds to the non-productive professional time related to mobility that could have been otherwise used to work. We adopt a conservative view by assuming that candidates and recruiters lose two hours of work per train trip and three hours per plane trip.

A.5 Data on economic values (see also Table 1)

Climate-related costs correspond to the costs associated with CO_2-eq emissions. Other external costs correspond to the other sources of environmental costs associated with transports (local air pollution, noise, congestion, well-to-tank, habitat). As above, we distinguish rail and air transports. For rail, we consider an average climate-related cost of €0.026 and other external cost of €0.026 per passenger kilometer (European Commission, 2019) based on electric train travel. Regarding plane, we distinguish the costs between short haul (<1,500 km), medium haul (1,500-5,000 km) and long haul (>5,000 km) because of differences in the type of aircraft, the number of passengers and the relative duration of take-off and landing phases with respect to steady flight phases. We consider average climate-related costs of €0.0426 for short haul, €0.0281 for medium haul and €0.0322 for long haul per passenger kilometer, and the average for other external costs of €0.0187 for short haul, €0.0096 for medium haul and €0.0098 for long haul per passenger kilometer (European Commission, 2019). With regard to electricity consumption associated with online interviews, we consider the weighted external costs for climate change and other external effects per kWh for the European Union and the

United States (European Commission, 2020).

For private costs directly related to participation in the job market pre-screening interviews, we assume that candidates and recruiters spend three nights at each meeting and consider an average conservative hotel price of €80 per night (www.whereandwhen.net). We do not account for the cost of meals taken during the conference as we assume it does not differ from the cost of meals taken at the workplace. For transport, fares depend on many country-specific parameters. However, we consider an average conservative price per passenger kilometer of €0.13 if travelers take a train (European Commission, 2016, Figure 4.12), €0.13 if they take a plane (www.rome2rio.com), a surprising similarity.

Regarding the valuation of time lost, we obtain country-specific estimates of the average hourly wages of recruiters and candidates based on European Commission (2007). For the former, we consider average wages of researchers; for the latter, we consider average wages of researchers with less than four years of experience. Based on today's typical academic wages in the UK (drawn from www.indeed.com and www.payscale.com), we compute the growth rate since 2006 and apply this same linear trend to all countries. As for the few countries which were not reviewed in European Commission (2007), we assume a constant wage-to-GDP ratio across countries and compute average hourly wages from the following relationship at time t: $wage^{country_t}/wage^{UK_t} = GDP\ per\ capita^{country_t}/GDP\ per\ capita^{UK_t}$.

Table 2 compares total emissions and costs associated with the 2019-20 edition of the job market meetings with three alternative scenarios. In Scenario 1, we propose a more efficient in-person system where all recruiters conduct interviews at both EEA and AEA meetings while candidates only go to the closest meeting. In Scenario 2, we propose a hybrid system where both recruiters and candidates only go to their closest meeting. In this second scenario, interviews that cannot be conducted in-person are conducted online. In Scenario 3, we propose a fully virtual system where all interviews are conducted online.

The first row compares the total distance covered by candidates and all recruiters in 2019-20. The second row compares associated CO_2-eq emissions. In the first three columns, CO_2-eq emissions result from candidates' and recruiters' journeys between their residence and conference venues. In the last column, CO_2-eq emissions result from the energy used to conduct online interviews. The third and fourth rows detail the climate-related and other external costs for each scenario. The fifth row presents the private costs associated with each scenario, which include transport (train/plane tickets and public transportation between the train stations/airports and the conference venues) and accommodations costs. The sixth row represents the valuation of non-productive professional time.

B Estimation of the numbers of missing candidates and recruiters in the database

Table 3 describes the available data from the Econ Job Market (EJM) database, broken down by annual meeting. The database does not contain all interviews organized during the meetings, because some recruiters could arrange interviews by email or by other platforms

rather than on www.econjobmarket.org. Hence, the overall numbers of recruiters (r_{tot}) and candidates (c_{tot}) are unknown, but the former can be obtained from other sources and the latter can be estimated.

We denote as "non-observed recruiters" (r_{no}) and "non-observed candidates" (c_{no}), individuals that took part in an annual meeting, but that we do not observe in the database. We denote as "observed recruiters" and "observed candidates", the participants who are present in the EJM database. We obtain the number of non-observed recruiters from public information on job offers: 101 in Rotterdam, leading to r_{tot}=158, and 315 in San Diego, leading to r_{tot}=358.

For the estimation of the number of non-observed candidates, let's assume that the probability that a candidate is interviewed does not depend on the type of the recruiter (i.e., observed or non-observed in the database), and that the average numbers of interviews by recruiters (int_r) and by candidates (int_c) do not depend on their types either (i.e., observed or non-observed). The probability of not observing a candidate in the EJM database, denoted by π, corresponds to the probability that this candidate has only been interviewed by non-observed recruiters. For a candidate with x interviews, $\pi = [\Gamma(r_{no}+1)/\Gamma((r_{no}+1)-x)]/[\Gamma(r_{tot}+1)/\Gamma((r_{tot}+1)-x)]$, where $\Gamma(.)$ is the gamma function.

The average number of interviews of observed candidates by observed recruiters ($int_{c_{no}}$) is known (3,001), as well as the average number int_r of interviews by recruiters. We are then looking for the average numbers of interviews per candidate (int_c) such that $(c_o/(1-\pi)) \times int_c = r_{tot} \times int_r$, where π is defined as above with $x \equiv int_c$. By trial and error, we converge to π=3.75% in Rotterdam and π=4.15% in San Diego, meaning that the database contains 96.25% and 95.75% of candidates. The high estimated proportion of observed candidates is due to the fact that, typically, each candidate has several interviews at the meetings: as long as a candidate has one interview from an observed recruiter, s/he is observed in the database.

In our calculation, we assumed that π is computed on int_c, the average number of interviews by candidates. However, it should rely on the whole distribution of the numbers of interviews, which is unknown. When we relax this assumption by conducting sensitivity analyses on several bimodal distributions having int_c as mean value, we conclude that the EJM platform covers at least 90% of the candidates.

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Table 1: Parameters used in computations

Parameter	Value	Unit	Source
Emissions:			
Plane	0.23	kg CO_2-eq/km	Jäckle (2019)[a]
Train	0.027	kg CO_2-eq/km	Jäckle (2019)[a]
Online	0.00926	kg CO_2-eq/hour	Kamiya (2020)[b]
CO_2-related costs:			
Plane (short haul)	0.0239	€/passenger kilometer	European Commission (2019)[c]
Plane (medium haul)	0.0185	€/passenger kilometer	European Commission (2019)[c]
Plane (long haul)	0.0224	€/passenger kilometer	European Commission (2019)[c]
Train	0	€/passenger kilometer	European Commission (2019)[c]
Online	0.00218	€/hour	European Commission (2020)[d]
Other external costs:			
Plane (short haul)	0.0187	€/passenger kilometer	European Commission (2019)[c]
Plane (medium haul)	0.0096	€/passenger kilometer	European Commission (2019)[c]
Plane (long haul)	0.0098	€/passenger kilometer	European Commission (2019)[c]
Train	0.026	€/passenger kilometer	European Commission (2019)[c]
Online	0.00225	€/hour	European Commission (2020)[d]
Private costs:			
Plane	0.13	€/passenger kilometer	www.rome2rio.com[e]
Train	0.13	€/passenger kilometer	European Commission (2016)[f]
Accommodation	80	€/night	www.rome2rio.com
Value of time lost:			
Average hourly wages	See sources	€/participant	European Commission (2007)[g]

Notes: This table details the values of the parameters used in our computations. [a] weighted averages from the values obtained from the three sources in Table 3. [b] Electricity use of streaming, scenario B, and International Energy Agency global average electricity mix. [c] Table 70 for bus and electric train, Table 72 for plane. [d]Weighted average EU and US of climate cost and other effects in Table 3.1. [e] https://www.rome2rio.com/labs/2018-global-flight-price-ranking/ [f] Average of international fares, month in advance and week in advance, Figure 4.12. [g] Complemented by www.indeed.com, www.payscale.com and own computations (see text).

Table 2: Overall emissions and economic assessment.

	Estimations	Counterfactual scenarios		
	2019-2020	Scenario 1	Scenario 2	Scenario 3
Distance (in km)	17,347,147	11,540,564	8,737,983	0
Emissions (in kg CO_2-eq)	3,963,476	2,623,731	1,982,108	41.7
CO2-eq-related costs (in €)	544,817	360,143	273,593	9.8
Other external costs (in €)	176,964	120,652	92,361	10.1
Private costs (euros)	2,694,085	1,866,029	1,424,833	0
Value of time lost (in €)	233,238	194,179	144,887	0
Overall economic assessment (in €)	3,649,105	2,541,005	1,935,677	19.9

Notes:This graph compares the estimated costs associated with the International job market for economists for the academic year 2019/2020 with 3 counterfactual scenarios. In Scenario 1, recruiters go to both meetings while European and non European job market candidates respectively go to the European/American meeting. In scenario 2, European (non-European) recruiters and candidates only go to the European (American) meetings. Interviews between European (non European) candidates and non European (European) recruiters are conducted online. In Scenario 3, job market meetings are conducted online. Emissions and associated costs take into account return trips. The overall economic assessment sums up private, opportunity, CO2-eq-related and other external costs. extbfSources: econjobmarket.org and authors' computations. **Source:** econjobmarket.org.

Table 3: Interviews, candidates and recruiters in EJM and complementary data

Job market meeting:	Rotterdam	San Diego
Number of interviews: observed in EJM database	1,720	1,281
Number of candidates: observed in EJM database	638	419
Number of recruiters: observed in EJM database	57	43
Number of recruiters (r_{no}): not observed in EJM database	101	315
Total number of recruiters (r_{tot}):	158	358

Notes: This table presents the number of interviews, candidates and recruiters observed in Econ Job Market (EJM) data. It also includes the number of recruiters who conducted interviews at Rotterdam (San Diego) but that are not included in the EJM database. For Rotterdam, we obtained this information from personal communication from the European Economic Association. For San Diego, we obtained this information from vacancies advertised on the website of the American Economic Association. **Sources:** econjobmarket.org, European Economic Association, American Economic Association.

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