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Generating societal impact from collaborations between universities and arts and culture organisations (ACOs): Evidence from a survey of arts and culture professionals in the UK

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ABSTRACT

The art and cultural industries are known to generate not only important economic benefits, but also broader impacts on society. One of the ways in which they can amplify their societal impact is through their collaborations with universities, contributing to research and knowledge exchange activities that produce valuable outcomes for numerous societal stakeholders. Yet, the association between the characteristics of the collaboration and its impact is not clearly understood. Building on the framework of Collaborative Value Creation (CVC), we argue that the *nature* of the collaboration between university and ACO – whether it is transactional, integrative or transformational – will affect the *breadth* of impact generated – whether it benefits mainly the collaboration partners and/or external stakeholders. We rely on a unique, purpose-built survey of arts and culture professionals in the UK, co-designed by National Centre for Academic and Cultural Exchange (NCACE) and Arts Professional. The empirical findings confirm that different types of collaborations are associated with different breadth of impact: transactional collaborations mainly impact the ACO, integrative collaborations impact both partners, transformational collaborations impact external stakeholders. The impact on the ACO refers to direct benefit from the collaboration, rather than to the ACO's intention to engage in further collaborations; we find that the latter is negatively affected by the participation in transactional collaborations, and positively affected by the ACO's positive attitude towards collaborating. The study makes a theoretical contribution, by applying the CVC framework to a new context, and by identifying the mechanisms through which the nature of the collaboration influences the type of impact it produces. It also contributes to policy and practice by proposing a set of relevant implications.

1. Introduction

While universities have traditionally played an important civic role in society, the pressures for them to produce valuable economic, social and cultural impacts have increased in the last couple of decades (Dawson and Gilmore, 2009; Davies and Lyons, 2022; Olsson et al., 2021). Universities are seen as knowledge hubs (Lind et al., 2013), performing more action-oriented research as well as multi-disciplinary collaborations with partners from public, private and third sectors, to jointly produce and publicise research and to generate impact (Ankrah et al., 2013; Roncancio-Marin et al., 2022). Universities are also now expected to demonstrate evidence of impact generation, for example through research and knowledge exchange assessment exercises (Comunian et al., 2014a,b).

Although there is by now a large amount of research on universities' engagement with external stakeholders, research in innovation studies tends to focus disproportionately on collaborations involving academics in STEM fields (Levy et al., 2009; Segarra-Blasco and Arauzo-Carod, 2008) and companies in manufacturing, and particularly high-tech sectors (Abreu and Grinevich, 2013a,b; De Wit-de Vries et al., 2019). Instead, only paid limited attention is being paid to collaborations between universities and the arts and cultural industries, often (but not always) involving academics in the arts and humanities fields, and to the many ways in which such collaborations produce societal impacts.

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There is evidence that universities actively engage with the arts and cultural industries through collaborations around teaching, research, public engagement as well as by sharing cultural infrastructures such as space, museums, galleries and theatres (Chatterton and Goddard, 2000; Powell, 2007; Comunian and Faggian, 2014; Klofsten et al., 2019; Agasisti et al., 2019). The incentives for universities and the arts and cultural industries to collaborate with each other have increased over time (Moreton, 2016): on the one hand, universities need to increasingly demonstrate that they are generating societal impact; on the other hand, arts and culture organisations[1] (henceforth: ACOs) are encouraged to seek partnerships to increase their visibility, broaden their network and compensate for cuts in public funding to the sector (Kim, 2017; Nijzink et al., 2017; Ashton, 2023). University-ACO collaborations allow the parties to share and acquire resources (Hughes et al., 2011), gain efficiencies (Fisher, 2012) and, very importantly, to receive and co-produce knowledge, research outputs and create wider societal impacts, for example by improving education and cultural understanding (Gilmore and Comunian, 2014; Scullion and García, 2005; OECD, 2021).

Yet, there are very few attempts to think systematically about the modes of engagement between universities and organisations in the arts and cultural sector, and about the processes through which such collaborations generate impact (Wilson et al., 2021). The evidence on the impact of collaborations between universities and the arts and cultural sector is mostly anecdotal, building on small scale, descriptive analyses of individual cases (Bakhshi et al., 2008). Research is also fragmented, published across a wide array of journals and grey literature sources (blogs, reports, etc.) and undertaken from a variety of disciplinary perspectives (Sigal, 2021).

This study enriches our understanding of how universities and ACOs produce societal impact by investigating the relationship between the characteristics of university-ACO collaborations and the type of societal actors that most benefit from them. We develop an articulated conceptual framework and test it using original empirical evidence. We pose the research question: "*Does the nature of the university-ACO collaboration influence the breadth of impact of the collaboration, and the ACO's intention to collaborate again in the future?*"

Building on the theory of Collaborative Value Creation (CVC) proposed by Austin and Seitanidi (2012a,b), we identify three ways in which collaborations can create value: *transactional collaborations* generate value from the transfer of resources, whereby one partner is the recipient of a resource from the other partner; *integrative collaborations* create value from the process of working together; *transformative collaborations* produce value from synergies between the partners. We argue that the nature of the collaboration between university and ACO – whether it is transactional, integrative or transformational – by producing value through different processes, will affect the *breadth* of the impact of the collaboration – whether it mainly impacts the ACO, both partners, or wider society, and whether the ACO will continue to collaborate with universities in the future.

We rely on a unique, purpose-built survey of professionals working for arts and culture organisations in the UK about their collaborations with universities, co-designed by National Centre for Academic and Cultural Exchange (NCACE) and Arts Professional and carried out in 2021. We deploy both quantitative and qualitative information derived from the survey to investigate the nature of the collaboration and to distinguish between different types of impact, internal and external to the collaboration.

This study addresses a three-fold gap in research in relation to university-industry collaborations and their impact. First, most studies in this domain, pertaining to the field of innovation studies, concentrate on universities' collaboration with manufacturing industries (Levy et al., 2009; Segarra-Blasco and Arauzo-Carod, 2008) while the present work concentrates on the arts and culture sector. Second, most research is conducted predominantly from the universities' perspective and less so from the perspective of the organisations they collaborate with (Mascarenhas et al., 2018; Youtie and Shapira, 2008; Corsi et al., 2021; Sigal, 2021), while this study builds on a unique survey of professionals working in the arts and culture sector. Third, most studies investigate the factors underpinning or hampering the success of collaborations (e.g. Schofield, 2013; Ankrah and AL Tabbaa, 2015; Rybnicek and Königsgruber, 2019), whereas we focus specifically on the types of actors who benefit from the collaboration, in order to understand the breadth of the impact generated, including the potential of repeated collaboration in the future.

The study makes some theoretical and practical contributions. Theoretically, it extends the application of the CVC framework originally developed to study collaborations between universities and not-for-profit organisations to the context of ACOs and identifies the mechanisms through which the nature of the collaboration influences the type of societal actors that are impacted by it. This provides a new, in-depth understanding of how the nature of the collaboration (in terms of its objectives, importance for the organisation, nature of resources exchanged) affects the breadth of impact it can generate, and the ACO's likelihood to engage in future collaborations. Practically, we are able to derive a set of relevant policy and management implications from the findings. This analysis also opens up avenues for further research. The framework and argument could be tested in the context of other types of university-industry collaborations, and it might be possible to study the effects on the nature of the collaboration on other dimensions of impact (type of impact, duration of the impact, for example).

The paper is organised as follows: the theoretical background and conceptual framework underpinning our empirical analysis are presented in Section 2. Data and methodology are presented in Section 3, and the empirical findings in Section 4. Findings and their implications for university-industry collaboration and management are discussed in Section 5.

2. Theoretical background

2.1. Evidence about collaborations between universities and ACOs

The value of arts and culture to society has been acknowledged in academic and policy discourses (Santoro et al., 2020; Sanderson et al., 2023). Beyond their immediate intrinsic experience, arts and culture play key parts in advancing social and economic goals. For example, in the UK, the cultural industries provided an estimated Gross Value Added of £32.03bn in 2018 (DCMS, 2020). In addition, there is clear evidence showing that they benefit wider society by positively impacting health, well-being and education (Arts Council England, 2024). One of the ways in which the arts and culture amplify their impact on society is through their engagement with universities and other research organisations.

Yet while university-industry collaborations have been studied extensively in terms of their nature, barriers, drivers and impacts, studies of collaborations between universities and the public sector and not-for-profit organisations are less numerous (Abreu and Grinevich, 2013a,b), and so are studies of collaborations between universities and ACOs (Comunian, 2017; Hauge et al., 2018; Moreton, 2016). The literature is fragmented across different fields of research, including management and innovation studies, economic and human geography, social studies and policy. Despite the potential for university-ACO collaborations to generate significant societal impacts, the factors that underpin the generation of such impact, including the association

[1] *Arts organisation* means an organisation that provides programming across one or more of the following artistic fields: creative place-making, dance, design, folk and traditional arts, literary arts, multi-disciplinary arts, music, media arts, theatre, and visual arts. *Cultural organisation* means an organisation with culture, the sciences or humanities as its primary mission and purpose. The organisation must operate as a cultural organisation, including but not limited to a cultural centre, civic arts-presenting venue, botanical centre, science museum, children's museum, arboretum, or zoo.

between the characteristics of the collaboration and the impacts it produces, are not clearly understood.

It is acknowledged that establishing collaborations between universities and ACOs is challenging (Comunian et al., 2014a,b). The art and cultural sector includes many small to micro start-ups, working in rapid manner to produce art and cultural products, services or cultural experiences, which are intangible in nature. In contrast, universities are big and complex entities, with hierarchical workflows and bureaucratic systems. This makes it challenging for small ACOs to initiate collaborations with universities (Bakhshi et al., 2013), or to capitalise on the relationships afterwards (Hughes et al., 2011). There is evidence of growing interest among different parties, such as policy makers and cultural and development bodies (e.g. Creative England or Arts Council England in the UK) and the university sector itself, in finding ways to understand and overcome this disparity. The key challenges to sustaining and growing engagement and collaboration between academics and art and culture professionals include developing dialogue, appropriate methods, and a suitable collaborative environment (Gilmore and Comunian, 2016).

For instance, Louis and Vormittag (2017) show that successful collaborations entail clear and continuous communication between universities and ACOs, including careful expectations management in process and output, and considered attempts to reconcile their cultures (Wilson and Lasebikan, 2017). Sedgman (2019) notes that challenges in collaborations between universities and ACOs arise due to unclear or inconsistent communications and lack of clear expectations management. Hughes et al. (2011) explore how the advantages of each field can be amplified, and underline that the complexities of different fields have to be taken into account, such as the distinction between arts and humanities academics and arts practitioners.

Additionally, a few studies look at collaboration models. Jacobson et al. (2016) describe an interdisciplinary collaboration between ACOs and natural resources science departments to tackle climate change and science communication. Moreton (2016) analyses “the hub” as a space where collaborative works are being redesigned to avoid a transactional view of collaborations, which is prevalent in dominant knowledge exchange/transfer practices. Building on the Triple Helix framework, several authors have engaged with the concept of the ‘third space’ in order to frame the nature of collaboration between universities and ACOs, as spaces where knowledge production is stimulated. For instance, Gilmore and Comunian (2014) map the dynamics and drivers of the relationships between universities, ACOs and communities, exploring how collaborations are shaped by the motivations and rationales of the various parties. Comunian et al. (2015) employ the third spaces concept to investigate the importance of local community management. They outline clear practices in order to sustain the relationships and enhance their impact towards communities. Ellis et al. (2020) argue that universities should consider collaborations as reflexive processes in which the knowledge coming from both parties is valued equally and equitably.

The *impact* of collaborations between universities and ACOs is underresearched in the literature (Sigal, 2021). Some studies provide very broad descriptions of impact (Dawson and Gilmore, 2009; Sedgman, 2019). Other studies engage with specific types of impacts of collaborations, such as: the aesthetic impact and value for academics and artists (Lee et al., 2018); impacts on communities and students (Villeneuve et al., 2006; Ellis et al., 2020); impacts on the regional creative economy (Comunian et al., 2014a,b). Gilmore and Comunian (2016) remark that university-ACO collaborations make significant contributions to local/regional/national economies and societies, but recognise that it is difficult to facilitate and evaluate them, due to the casual and informal nature of the collaborations. As noted by Sigal (2021), the impact of the collaboration needs to be paid more attention to, and it needs to be better articulated, as most impacts are not well recorded and reported. Furthermore, the majority of these studies take the perspective of universities and individual academics; there are few studies of university-ACO collaborations from the perspective of ACOs. In the next section, we will present a conceptual framework, building on the Collaborative Value Creation (CVC) framework proposed by Austin and Seitanidi (2012a,b), which links the role of the ACOs in the collaboration to the impact of the collaboration.

2.2. *A Collaborative Value Creation (CVC) framework to analyse how the type of collaboration affects the breadth of societal impact of the collaboration*

Building on the literature on collaborative innovation, we develop a conceptual framework that articulates the different types of collaborations between ACOs and universities – from the perspective of how the collaboration is perceived by the ACO – and associates each type to the societal impact of the collaboration, distinguishing between impact that primarily accrues to the ACO itself, to both the ACO and the university, and to stakeholders outside the collaboration (external impact). There have been many attempts at developing typologies of collaborations, in different fields of study such as, among others, relationship marketing (Day, 2000), supply chain management, strategic alliances management (Clements et al., 2007), inter-firm relationships, and finally university-industry collaborations. Such typologies distinguish between collaboration types based on elements such as the frequency of the collaboration (from one-off to repeated), its duration (short and long term), the governance and coordination of the relationship (from arms-length market exchange to co-dependent investments). Many approaches to classifying types of collaborations, however, focus on the problem of understanding which collaboration type is more appropriate given a set of conditions (the typical question posed in firm theory is whether a firm should engage in a market transaction or in a closer form of collaboration in order to maximise profits given certain conditions). In the present study we focus on the relationship between the type of collaboration and the impact it generates.

We build on the approach proposed by Austin and Seitanidi (2012a, b), who have developed a Collaborative Value Creation (CVC) framework for analysing social partnerships between businesses and non-profits, with particular emphasis on the framework’s value creation spectrum, which is the central idea for cross-sector collaboration (Austin, 2013). This approach is appropriate for our study due to two advantages. First, it focuses on collaborations between entities operating in different domains, similarly to our case, where one side of the collaboration (non-profits) is composed of organisations that are very heterogeneous, but often small and with limited resources, as in the case of ACOs (which are often themselves non-profits). Second, the framework is specifically designed to link the type of collaboration to the value created by the collaboration, which is close to our objective to analyse the association between role in the collaboration and the collaboration’s impact. Building on the CVC framework, we develop several hypotheses which we test using an original dataset derived from a survey of professionals working for arts and culture organisations.

Austin and Seitanidi (2012) distinguish three types of approaches to the collaboration between businesses and non-profits, which sit along a continuum. At one end of the spectrum, transactional collaborations are characterised by low engagement of the partners, peripheral importance of the collaboration to the organisation’s mission, narrow scope of activities and each organisation creating value individually. These collaborations do not require a high level of trust between the partners, they seldom lead to innovation, and they rarely lead to an external system change. At the opposite end of the spectrum, transformational collaborations are characterised by high engagement of the partners, central importance of the collaboration to the organisation’s mission, broad scope of activities, and both organisations creating value jointly. These collaborations require high degree of trust between the partners, they often lead to innovation, and very frequently lead to an external system change. In between, there are integrative relationships, which have intermediate characteristics.

Each of these types of collaborations, according to the CVC framework, generates value in different ways. There are, in particular, three ways in which collaborations can generate value.

2.2.1. Transactional collaborations

Transactional collaborations generate value from a largely one-sided transfer of resources. The collaboration is not focused on achieving a joint objective but on the transfer of resources itself (Austin and Seitanidi, 2012a,b). "Transferred resource value" is the benefit derived by a partner from the receipt of a resource from the other partner (Watson et al., 2020). The significance of the value will depend on the nature of the assets transferred and how they are used. After the resource has been transferred, for the continuation of value proposition or collaborative longevity, the transfer of more or equally valuable assets needs to be repeated. These collaborations often involve a comparatively low degree of interpersonal engagement, usually characterised by circumstances that do not demand a sustained personal-based relationship between partners (D'Este et al., 2019). Hence, relational trust, which is based on social interactions among partners, can be low (Bellini et al., 2019). Typically, the main benefit of the collaboration accrues to one of the partners (usually, the one who receives the resources): the partner organisation that receives the resources benefits directly from the collaboration, and the value created is usually somewhat quantifiable for that organisation (Austin, 2010; Hausdorf and Timm, 2024). The issue of the extent to which these transactional collaborations create societal benefits outside the collaboration remains unclear (Austin and Seitanidi, 2012a,b). From the discussion, it can be hypothesised that.

H1. Collaborations that are transactional are associated with impact primarily affecting one of the partners.

2.2.2. Integrative collaborations

Integrative collaborations generate value from the process of working together. "Interaction value" is the set of intangible assets that derive from the processes of partners working together - for example, reputation, trust, relational capital, learning, knowledge, joint problem solving, communication, coordination, transparency, accountability, and conflict resolution (Le Pennec and Raufflet, 2018). Integrative collaborations are much more intricate and organically developed than transactional collaborations. Instead of using their assets or resources in an isolated manner in carrying out an activity to create value, partners progressively combine their key resources and competencies (Austin and Seitanidi, 2012a,b). Hence, the flow of resources is conjoined. In addition, the missions or goals of the partners are more aligned and fit well together (Murphy et al., 2015). This is due to the high level of involvement of both parties, leading to the development of a deeper relationship, social capital and greater trust (D'Este et al., 2019). Bowen et al. (2010) argue that, with integrative collaborations, value tends to be generated through relational engagement, closer and richer relationships between partners as opposed to transactional. The intangible resources produced from working collaboratively between partners, such as, learning, knowledge or communication, act as enablers of value co-creation (De Silva and Wright, 2019). Generating societal value from integrative collaborations is observed to take on greater importance in comparison to transactional collaborations (Austin and Seitanidi, 2012a,b; Fisher, 2014), but the main benefits accrue to both partners in the collaboration. Hence, it can be postulated that.

H2. *Collaborations that are integrative are associated with impact primarily affecting both of the collaboration's partners.*

2.2.3. Transformative collaborations

Transformative collaborations generate value by achieving synergies between the partners that have external benefits. "Synergistic value" arises from the underlying premise that combining partners' resources enables them to accomplish more together than they could have separately (Le Pennec and Raufflet, 2018). Transformative collaborations progress beyond integrative collaborations to a greater degree of confluence. The primary focus is to co-create transformative change at the societal level. There is an agreed societal issue (Le Ber and Branzei, 2010a,b); knowledge, learning, resources and roles are shared between partners in addressing and fulfilling social needs (Selsky and Parker, 2005). The common goal incentivises partners to collaborate more closely, combining their distinctive resources and co-creating greater value (De Silva and Rossi, 2018). The synergistic value is leveraged by innovation, which denotes the creation of completely new forms of change, or significant organisational and systemic transformation. Interdependence and collective action are observed as the modus operandi; a more active role in the transformation process of the beneficiaries is also noted (Le Ber and Branzei, 2010a,b). This gives rise to collaborative networks or multisector collaborations (Blockson, 2003; Gray and Purdy, 2018). Typically, these synergies will spill out of the collaboration and generate external benefits in the form of large-scale change, such as social or environmental value (Shumate et al., 2018). Transformational benefit will accrue either to a significant segment of society or to society as a whole (Austin and Seitanidi, 2012a,b). This allows us to formulate the following hypothesis.

H3. *Collaborations that are transformative are associated with impact primarily affecting external stakeholders.*

The following table, building on Austin (2000) and Austin and Seitanidi (2012a,b), summarises the relationships between type of collaboration (and their key characteristics) and impact.

Based on this approach, we expect therefore that the societal benefits generated by university-ACO collaborations will be influenced by the nature of the collaboration.

2.2.4. Repeated collaborations

Collaborations can generate not only immediate impacts but also foster future changes; for example, they can encourage the partners to collaborate more in the future. Extant studies have shown that repeated interactions between partners within the collaboration help them to improve trust, lower transaction costs and develop both social relationships and cognitively close knowledge (Tidd, 2001). This contributes to a path-dependent process by which prior collaboration increases the possibility of future collaboration (Belderbos et al., 2015; Østergaard and Drejer, 2022). Particularly, the relational experience acquired during the collaboration with universities is expected to encourage firms or organisations to engage in further collaborations (Hemmert et al., 2014). When investigating how the nature of the collaboration affects its impact, it is therefore relevant to ask whether it also affects the partners' intention to engage in further collaborations.

From our framework, we know that transactional collaborations tend to produce their main effects through the transfer of resources, which exhausts the impact of the collaboration (Austin and Seitanidi, 2012a,b). Therefore, each collaboration is a 'self contained' process: only if a new need for resources emerges will new collaborations be set up. Moreover, transactional collaborations do not foster the development of relational trust and social interactions among partners, which are crucial for the development of further collaborations (Bellini et al., 2019). Hence, we can expect transactional collaborations to be unlikely to foster repeated collaborations.

Instead, integrative and transformative collaborations generate interaction value through relational engagement, closer and richer relationships (Bowen et al., 2010). For transformative collaborations, moreover, synergistic value is created, meaning that the shared goals between partners motivate them to collaborate more closely by integrating their specific assets or resources and co-create value and benefits beyond the project degree to achieve the synergy (Feldman and Hernandez, 2022) allowing an increase in co-operation, and relationship stability improvement, which make further collaborations possible (Rossi et al., 2022). Therefore, we can formulate the following hypothesis.

H4. *Collaborations that are integrative and transformative are associated with greater intention to collaborate again in the future on the part of the ACO.*

3. Data and methodology

3.1. Data

This study builds on a unique, purpose-built survey of professionals working for arts and culture organisations in the UK, regarding their engagement with universities (Davies et al., 2012; Nijzink et al., 2017). The survey was launched on March 1st, 2021, and was open for three weeks until it was closed for responses on March 21st, 2021.

The survey was co-designed by NCACE (in particular, two of the study's authors participated in the survey design) in collaboration with Arts Professional and hosted by Arts Professional.[2] An initial draft of the survey was pre-tested with five professional contacts, and was revised following feedback from this pre-test stage. The final version of the survey included a total of 26 questions, with a mixture of closed-ended and open-ended questions. The survey aimed to discover if, how and why professionals working in the arts and cultural sector had entered collaborative projects with a university. It was also concerned with gaining an understanding of the first-hand experiences of cultural knowledge exchange partnerships from the perspective of practitioners/organisations, with ample opportunities to provide supporting narratives about the value of their experience.

For those practitioners/organisations who had no experience with a university collaboration, a set of alternative questions aimed to understand what were the factors that had stopped them from collaborating, and to explore whether they had any intention of pursuing future collaborations.

For those practitioners/organisations that had entered into a collaboration with a university, the survey asked respondents to provide more detailed information about a specific collaboration that they considered to be their most significant or impactful experience. This included information on.

- how this collaboration was initiated;
- the aspects of the collaborative process that did or did not work well;
- the role of the cultural practitioner/organisation within the collaboration;
- how the collaboration had been funded;
- how the collaborative experience had been evaluated and by whom.

The survey also asked respondents about the extent to which they felt knowledge exchange had taken place throughout the collaboration, and the extent to which this exchange was mutually beneficial. For all respondents, there were questions regarding: the name, geographical location and cultural sub sector of the practitioner/organisation; the size of the organisation team; and an option to be contacted in the future if they so wished.

The survey was sent to the mailing list of Arts Professional magazine, which includes approximately 46,000 addresses, and gathered 546 responses. It was also promoted via National Centre for Academic and Cultural Exchange (NCACE) and The Culture Capital Exchange, through Bulletins to their mailing list subscribers as well as social media posts (mostly Twitter and LinkedIn channels). The survey was shared by the NCACE regional partner universities and by NCACE team members to relevant networks within the wider cultural sector.

[2] Arts Professional is one of the largest networks of arts practitioners, organisations and institutions across the UK, sharing relevant content of professional interest across the arts and cultural sector. Alongside an editorial partnership, the survey was promoted to a community of approximately 46,000 network members.

The number of responses that were received is in line with those achieved by the other surveys that Arts Professional ran over the past 10 years. This is the largest survey to have been conducted in the UK on how the arts view their relationships with universities.

Of the 546 respondents, 153 dropped out of the survey almost immediately without providing any useable responses. Of the remaining 393 respondents, 286 stated that they had experience of at least one collaboration with a university. Of the 107 professionals who stated that they did not have any collaborations with universities, 80 provided some information about their reasons for not collaborating, while the remaining 27 did not provide any details about their reasons for not collaborating.

Focusing on the 286 respondents who claimed to have had some experience with collaborations with universities, we have a full set of useable responses for 200 respondents only; the remaining 86 did not respond to at least some of the questions which we used as a basis to build the variables that we use in our empirical analysis.

Table 2 compares the distribution according to geographical location, sector (arts and culture sub-sector) and size, for, the 107 respondents who state that they did not collaborations with universities (1); the 286 respondents who stated that they had collaborations with universities (2); the subset of 200 respondents (comprised in the prior group) who provided sufficient information for us to be able to construct the main dependent, independent and control variables for the analysis (3). The latter group constitutes the final sample we have used for our empirical analysis.

If we compare those that did not state any collaborations with universities (1) with those that stated collaborations with universities (2) we note some differences. The geographical and sector distributions are similar although there is a significantly greater share of London-based ACOs and of ACOs active in the sector of literature, libraries and museums that did not state any university collaborations. Greater shares of social enterprises and arts organisations stated university collaborations. Finally, greater shares of large firms (and smaller shares of individual firms) stated that they had university collaborations.

Instead, the distributions of the set of respondents that stated that they collaborated with universities (2) and the sub-group of those that

Table 1
Types of collaborations and impact according to CVC framework.

Type of collaboration	Transactional	Integrative	Transformative
Engagement between partners	Low engagement	Medium engagement	High engagement
Centrality to mission	Peripheral	Intermediate	Central
Scope of activities	Narrow	Intermediate	Broad
Degree of trust between partners	Low	Medium	High
Who creates value	Each partner individually	Both partners mutually	Both partners synergistically
Source of value	Transferred resource value	Interaction value	Synergistic value
Breadth of societal impact	Collaboration impacts mainly one of the partners	Collaboration impacts both partners	Collaboration impacts external stakeholders

Source: Austin (2000); Austin and Seitanidi (2012a,b).

Table 2
Comparisons across respondent sub-groups.

	(1) Did not state university collaborations	(2) Stated university collaborations	P-value of *t*-test on the means of (1) vs (2)	(3) Final sample
Number of respondents	107	286		200
Location:				
London	41.2%	27.6%	0.0434	26.9%
South East	8.8%	10.4%	0.7117	10.8%
South West	5.9%	6.7%	0.8086	6.0%
East Midlands	4.4%	6.1%	0.6063	6.0%
West Midlands	5.9%	10.4%	0.2752	10.2%
East of England	5.9%	3.7%	0.4559	5.4%
North East	4.4%	5.5%	0.7304	5.4%
North West	4.4%	10.4%	0.1395	10.2%
Yorkshire	2.9%	7.4%	0.2010	7.8%
Scotland	1.5%	4.3%	0.2867	4.2%
Northern Ireland	1.5%	0.6%	0.5237	0.6%
Wales	4.4%	3.1%	0.6124	3.0%
Elsewhere in Europe	4.4%	2.5%	0.4311	2.4%
Outside Europe	4.4%	1.2%	0.1307	1.2%
Arts and culture sub-sector:				
Multiple arts forms (including cross-disciplinary)	22.4%	19.6%	0.5335	28.5%
Literature, libraries and museums	6.5%	2.8%	0.0850	4.5%
Dance, performance and theatre	15.0%	14.3%	0.8774	21.5%
Visual Arts and Crafts	10.3%	8.0%	0.4835	11.5%
Film and music	7.5%	9.4%	0.5441	13.5%
Type of arts and culture organisation:				
Social enterprise	2.8%	7.7%	0.0775	11.0%
Cultural institution	2.8%	4.5%	0.4380	7.0%
Arts organisation	12.1%	23.4%	0.0134	33.0%
Size:				
Individual	25.2%	13.6%	0.0061	21.0%
2-9 staff (micro firm)	25.2%	21.3%	0.4098	31.0%
10-249 staff (small and medium sized firm)	11.2%	15.4%	0.2937	22.0%
250+ (large firm)	0.9%	4.9%	0.0684	7.0%

are part of our final sample (3) are very similar.[3]

Our final sample of 200 respondents that have stated that they collaborated with universities and that are included in our analysis, is quite reflective of the organisation of the arts and culture sector in the UK. In fact, the geographical distribution and sector of our sample is broadly similar to that of the population of National Portfolio Organisations in the UK (the 985 arts and culture organisations that receive funding from Arts Council England).[4] Table A1 in the Appendix compares the geographical and sectoral distribution of our sample and of UK NPOs.

3.2. Variables creation

Our dependent variables measure the benefits of the collaboration and who they accrue to. In particular, using information present in the questionnaire, we are able to distinguish whether the collaboration impacted different stakeholders: (i) the ACO; (ii) the university; (iii) both ACO and university; (iv) broader society and economy.

We also considered another measure of impact - the extent to which the collaboration encouraged the ACO to engage in further collaborations. This additional dependent variable was considered to check whether the type of collaboration also generated some lasting impact on the ACO's collaborative behaviour, besides affecting the breadth of the impact. Table 3 shows how the dependent variables were constructed.

In order to identify the type of collaboration following the CVC framework presented in Table 1, we used the following question from the questionnaire: "What role does/did your organisation play in this collaboration?", which had six possible responses[5].

- Providing data/information for an HEI-led research project
- Co-design and production/delivery of an arts/creative project
- Leading the project
- Using university resources/expertise to develop your work
- University using your space/resources (e.g to showcase work)

Table 3
Variables construction for the analysis.

Questionnaire questions	Options	Variable used for the analysis
Who do you think is having/has had the most benefit from the collaboration? (Tick one only).	Options: 1 = My organisation; 2 = The university; 3 = There is a strong sense of mutual benefit	*Impact_organisation*: dummy taking value 1 if the main beneficiary is the ACO *Impact_mutual*: dummy taking value 1 if there is a strong sense of mutual benefit
Knowledge exchange is broadly defined as "collaborative, creative endeavour that translates knowledge and research into impact in society and the economy". To what extent do you feel your collaboration supported knowledge exchange and sharing?	Options: 5 = A great deal, 4 = A lot, 3 = To some extent, 2 = A little, 1 = Not at all	*Impact_external:* Ordinal variable taking values from 1 to 5 as per options listed.
Following your collaboration, did you/ do you feel inclined to work together in future with the Higher Education sector?	Options: 4 = Definitely would, 3 = Probably would, 2 = Probably would not, 1 = Definitely would not	*Collaborate_again*: Ordinal variable taking values from 1 to 4 as per options listed.

[3] The lower shares for group (2) compared to group (3) for some of the variables are due to the fact that some of the respondents in group (2) did not provide information relating to sector, type of arts and culture organisation and size.

[4] The list of NPOs and information about some of their characteristics can be found here: https://www.artscouncil.org.uk/how-we-invest-public-money/2023-26-Investment-Programme/2023-26-investment-programme-data.

[5] The questionnaire presented an additional option: "teaching or leading workshops with students and/or university staff". However, in this study we focus on university-ACO collaborations which involve some form of research and knowledge creation between the partners, rather than the arts and culture professional performing some teaching activities for the university. Therefore we do not consider this option in our analysis. Additionally, there was also an option 'other (specify)' with a free text box which allowed respondents to specify a different role. We were able to reclassify all the 'other' free text responses into the existing categories.

We constructed six binary variables taking value one if the ACO played the role in the collaboration, and zero otherwise.

Then, to better characterise the role of the ACO in the context of the collaboration, we extract the main dimensions of variance across these five variables using a principal component analysis (PCA). Table 4 shows the principal components' loading factors after imposing a varimax rotation. The analysis returns three highly significant components with eigenvalues greater than 1, and satisfactory reliability measures (the Kayser-Meyer-Olkin Measure of Sampling Adequacy is 0.67, Bartlett's Test of Sphericity is highly significant, Chi-square 69.055, p-value 0.000)

The first three components explain 72% of the variance. The first component strongly aligns with the variables "Providing data/information for an HEI-led research project"; "University using your space/resources (e.g to showcase work)"; "Using university resources/expertise to develop your work". Since all three variables are aggregated into the same component, this component captures a dimension of the data associated with a mutual exchange of resources, where both partners contribute something to the collaboration (data, information, space, resources, expertise), with some element of working together. This suggests that the ACO describes the collaboration as being closer to the concept of integrative collaborations (Austin and Seitanidi, 2012a,b). For example, the following quotes illustrate collaborations that scored high on the 'integrative' factor:

> "This is a project that would only work through partnership because of what both partners bring. It is firmly rooted in [organisation X] community engagement programme, and the venue's networks and links in [local community], but also relies on the expertise and specialisms of the university department."

> "Fulfils [organisation X]'s mission of supporting scholarship. Joint delivery of public events - talks, exhibitions. Joint delivery of online training for the wider public (MOOC). Supported Trust's mission to educate at all levels, including students. Adding scholarly validation for exhibition displays. Funding for our work and projects. Added reputation. Ongoing scholarly support for our work in every area."

The second component strongly aligns with the variable "Co-design and production/delivery of an arts/creative project". This component captures a dimension of the data associated with collaborative relationships where both parties have a high degree of mutual engagement throughout the project (from design to delivery). This suggests that the ACO describes the collaboration as being closer to the concept of transformational collaborations as proposed by Austin and Seitanidi (2012a,b). For example, the following quotes illustrate collaborations that scored high on the 'transformational' factor:

> "The partnership enables a highly productive two-way flow of knowledge, enabling co-produced University research to reach a wider non-academic audience via the outcomes that the artists have delivered, such as exhibitions, films, and publications."

> "Long-term development of the relationship. Mutual recognition of complementary skills and expertise, joint development of theory and experiments in practice. Openness and honesty and high level of trust."

The third component is associated with the variable "Leading the project". In this case, the ACO describes its role as being the core partner in the project, with the other partners playing a peripheral role as resource providers. This could be seen as being closer to the concept of transactional collaborations proposed by Austin and Seitanidi (2012a, b). Although the project may be important for the ACO, the role played by the other partners is peripheral and narrowly defined so that the relationship can be seen as transactional. For example, the following quotes illustrate collaborations that scored high on the 'transactional' factor:

> "Ideally, we gain the immeasurable benefit of using the expertise of and sometimes featuring world experts on camera. In the future we would like to do broader collaborations, where we work on a programme that features work of [a university], and we hope to raise money in our programme budgets to fund research and collaboration."

> "Activities include general advice and information website, and our own projects: research residencies, internships, data and insights, publications, one to one advice, peer mentoring groups support, career development grants, mentoring. These are run as action research projects generating insight and intelligence about the sector as well."

We derived factor scores for the three components, deriving three variables that we named, respectively *Integrative*, *Transformational* and *Transactional*.

We then present several models associating the impact of the collaboration to the type of collaboration, controlling for several organisational factors. In particular, we control for some characteristics of the ACO and some of the characteristics of the collaboration.

- The size of organisation, since it captures the ACO's level of resources, which can make it easier for the ACO to achieve impact from its collaborations (for example, larger ACOs may find it easier to exploit the outcomes of the collaboration to achieve impact for itself and/or externally). We include the ACO's size in terms of number of staff (*Individual* = an organisation employing just one person; *Micro* = an organisation employing between 2 and 9 employees; *Small-medium* = an organisation employing between 10 and 249 employees);
- The ACO's experience in collaborating with universities (how many universities it has collaborated with in the past). As noted by Zollo et al. (2002), organisation-specific experience has a positive influence on collaboration performance; we expect that the experience of having collaborated with universities in the past should help ACOs to generate impact. We include *University collaboration experience*, an ordinal variable which takes values 1 if the ACO has collaborated with one university, 2 if it has collaborated with between two and four, and 3 if it has collaborated with five or more).;
- The importance that the ACO attributes to collaborations with universities, as collaboration intent enables organisation to increase their capability in collaboration activity, such as attaining research synergies or sharing R&D costs with university partner (Lin, 2019), and can therefore increase the impact of the collaboration particularly for themselves. We include an ordinal variable based on the question: "How important are research collaborations within the work of the organisation?"; the variable *Importance of collaborations* takes values 4 = The most important priority, 3 = A priority, but not the most important, 2 = Not very important, 1 = Not at all important;
- Finally, we control for type of organisation and sector as these dimensions may influence the ease with which the collaborations achieve impact. We include the type of organisation (*Social enterprise*; *Cultural institution*; *Arts organisation*; *Other*) and the ACO's

Table 4
Rotated components.

Variable	Comp1	Comp2	Comp3
Providing data/information for an HEI-led research project	**0.6122**	−0.1076	−0.1018
Co-design and production/delivery of an arts/creative project	−0.0131	**0.9778**	−0.0220
Leading the project	−0.0139	−0.0221	**0.9781**
Using university resources/expertise to develop your work	**0.5278**	0.1766	0.1776
University using your space/resources (e.g to showcase work)	**0.5885**	−0.0253	−0.0308

sector (*Multiple*; *Dance, performance and theatre*; *Literature, Libraries and Museums*; *Film and music*; *Visual Arts and Crafts*).

3.3. Empirical strategy

We test the effect of the role of the ACO in the collaboration on the collaboration's impact considering different types of impacts. First, we run two separate logit regressions on the binary variables *Impact_organisation* (which takes values 1 if the ACO believes that the main beneficiary of the collaboration is the ACO itself[6]), and *Impact_mutual* (which takes value 1 if the ACO believes that there is mutual benefit). Then we run an ordered logit regression on the variable *Impact_external* (an ordinal variable taking values 5 = A great deal, 4 = A lot, 3 = To some extent, 2 = A little, 1 = Not at all), and, finally, an ordered logit regression on the variable *Collaborate again* (an ordinal variables taking values 4 = Definitely would, 3 = Probably would, 2 = Probably would not, 1 = Definitely would not). Subsequently, we provided some robustness checks by running the same models with sample selection and with instrumental variables.

Table 5 provides some basic statistical information about the dependent, independent and control variables.

4. Findings

The next table shows the results of several regression models linking the type of university-ACO collaboration to the impact of the collaboration. Columns (1) and (2) report the logit regressions on the variables *Impact_organisation,* and *Impact_mutual*, while column (3) reports the ordered logit on the variable *Impact_external*. Column (4) reports the ordered logit on the variable *Collaborate_again*.

First, we consider the logit regressions on the variables *Impact_organisation,* and *Impact_mutual*. Transactional collaborations are strongly positively associated with greater impact on the ACO itself, and integrative collaborations are strongly positively associated with mutual benefit. This is in line with the expectations of our conceptual framework and particularly with hypotheses H1 and H2. Second, we consider the ordered logit on the variable *Impact _external.* Here we find that transformational collaborations have a positive association with impact outside the collaboration, as we expected, and in line with the CVC framework, and particularly with hypothesis H3. We interpret the coefficients in the model as follows.

Table 5
Descriptive statistics of dependent, independent and control variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
Impact_organisation	200	0.07	0.25	0.00	1.00
Impact_mutual	200	0.68	0.47	0.00	1.00
Impact_external	180	4.08	1.06	1.00	5.00
Collaborate_again	180	3.63	0.69	1.00	4.00
Independent variables					
Transactional	200	0.00	1.02	−1.21	1.37
Integrative	200	0.00	1.23	−1.27	2.47
Transformative	200	0.00	1.02	−1.70	1.00
Control variables					
University collaboration experience	200	1.93	0.68	1.00	3.00
Importance of collaborations	200	2.51	0.88	1.00	4.00
Individual	200	0.21	0.41	0.00	1.00
Micro	200	0.31	0.46	0.00	1.00
Small_medium	200	0.22	0.42	0.00	1.00
Social enterprise	200	0.11	0.31	0.00	1.00
Cultural institution	200	0.07	0.26	0.00	1.00
Arts organisation	200	0.33	0.47	0.00	1.00
Other	200	0.07	0.25	0.00	1.00
Multiple	200	0.29	0.45	0.00	1.00
Dance, performance and theatre	200	0.22	0.41	0.00	1.00
Literature, libraries and museums	200	0.05	0.21	0.00	1.00
Film and music	200	0.14	0.34	0.00	1.00
Visual arts and crafts	200	0.12	0.32	0.00	1.00

When the ACO has responded to the question about their role in the collaboration with universities by ticking the variable that indicates that it is acquiring resources for a project it leads, rather than the other variables considered, we identify this as a collaboration that scores highly on the 'transactional' collaboration factor. The higher this score, the greater the likelihood that the collaboration will primarily impact the ACO. This is because it is a narrow type of collaboration where the partner is directly benefiting from the exchange of resources, and the benefits do not extend to wider society. When the ACO responded to the question about their role in the collaboration with universities by ticking several variables that indicates that resources have been exchanged, rather than the other variables considered, we identify this as a collaboration that scores highly on the 'integrative' collaboration factor. The higher this score, the greater the likelihood that the collaboration will impact both collaboration partners. This is because it is a collaboration where there is a more equal exchange of resources and both partners collaborate in order to achieve some outcome. When the ACO responded by ticking the variables that indicates that the partners co-designed and co-produced/delivered an arts/creative project, rather than the other variables considered, we identify this as a collaboration that scores highly on the 'transformational' collaboration factor. The higher this score, the greater the likelihood that the collaboration will impact external stakeholder. These are more radical, innovative partnerships which generate synergies whose outcomes spill over outside of the collaboration to generate broader impact.

In terms of controls, we find that ACOs that attribute greater importance to collaborating with universities tend to have greater mutual benefit and greater impact outside the collaboration. This is also aligned with the CVC framework to the extent that integrative and transformational collaborations are more likely to be central to the organisation's mission, so organisations that perceive their collaborations as important are more likely to engage in integrative and transformational approaches, which in turn are associated with mutual benefits and external benefits. There is perhaps also a direct effect to the extent that ACOs that perceive their collaborations with universities as important are more likely to be able to collaborate, put effort into ensuring that both partners benefit from the collaboration and that the collaboration has external impact. Very small (individual) ACOs are more likely to be the main beneficiaries from the collaboration. This might be because they do not have the capabilities and resources needed to engage in integrative and transformational collaborations (mutually exchanging resources and co-designing projects with universities), therefore they are more likely to invest effort in acquiring resource in the context of transactions from which they benefit directly. ACOs that are individual or micro firms are significantly less likely to generate mutual benefits, probably because they are less likely to engage in mutual exchange of resources and co-design of activities. It is interesting that the signs of the size coefficients support the view that mutual benefits associated with integrative collaborations are more likely the larger the ACO and vice versa unilateral benefits associated with transactional collaborations are more likely the smaller the ACO.

Considering the regression on the variable *Collaborate again*, we find that transactional collaborations are less likely to lead to repeated collaborations, which is consistent with the view that these collaborations are less engaged, more peripheral and shorter term. Integrative and transformational collaborations have positive but not significant association with the likelihood to collaborate again. In terms of control variables, the importance attributed by the ACO to collaborations is, as could be expected, positively associated with the likelihood to collaborate again.

[6] We do not consider the cases where ACOs believe that the main beneficiary of the collaboration was the university, as these were only a few cases (16).

4.1. Robustness checks

We perform two types of robustness checks. First, when estimating the main equations there may be a risk of selection bias. In fact, some of the factors influencing the breadth of impact of a university-ACO collaboration, and the ACO's intention to collaborate again in the future, may also influence the probability of collaborating in general. For example, larger organisations may be more likely to collaborate in the first place, and they may be more likely to participate in collaborations that generate broader impacts and to continue to engage with universities over time. To avoid underestimation of these variables, for each of the main equations that measure the effect of different variables on the breadth of impact of the collaboration, we estimate a selection equation (always the same equation) that indicates whether the ACO collaborated with universities at all.

The selection equation will be as follows:

$$SEL_i = \begin{cases} 1 & if \quad sel_i^* = z_i'\gamma + e_i > c \\ 0 & if \quad sel_i^* = z_i'\gamma + e_i \leq c \end{cases} \tag{1}$$

where SEL is a binary variable that equals 1 if the ACO has responded to the questions about the specific collaboration that they considered to be their most significant or impactful experience, and *sel** is a latent variable that measures the general ability of an ACO to collaborate with universities, influenced by a set of variables *z*. If such ability exceeds a certain threshold level *c* then the ACO will claim that they have participated in an impactful collaboration with a university. The impact of the collaboration with a university *y*, which depends on a set of variables *x*, will be observed only if SEL_i is equal to 1:

$$y_i = \begin{cases} y_i^* & if \quad SEL_i = 1 \\ 0 & if \quad SEL_i = 0 \end{cases} \leftrightarrow \quad y_i = \begin{cases} y_i^* = x_i'\beta + \varepsilon_i & if \quad SEL_i = 1 \\ 0 & if \quad SEL_i = 0 \end{cases} \tag{2}$$

Table 6
Logit and ordered logit regressions.

VARIABLES	(1)	(2)	(3)	(4)
	Impact_organisation	Impact_mutual	Impact_external	Collaborate again
Transactional	0.804[b]	−0.204	−0.052[c]	−0.300
	(0.394)	(0.202)	(0.151)	(0.186)
Integrative	−0.160	0.412[b]	−0.121	0.215
	(0.297)	(0.175)	(0.129)	(0.163)
Transformational	−0.244	0.137	0.305[b]	0.055
	(0.351)	(0.190)	(0.156)	(0.185)
HEI collaboration experience	−0.917	−0.121	0.082	0.236
	(0.597)	(0.296)	(0.242)	(0.289)
Importance of collaborations	−0.329	0.974[a]	0.650[a]	0.528[b]
	(0.505)	(0.258)	(0.213)	(0.245)
Individual	2.994[b]	−1.497[c]	−0.082	−0.911
	(1.429)	(0.768)	(0.526)	(0.655)
Micro	2.033	−2.007[b]	−0.043	−0.630
	(1.619)	(0.838)	(0.537)	(0.700)
Small_medium		0.030	0.281	−0.219
		(0.879)	(0.549)	(0.717)
Social enterprise	2.020	0.985	0.004	0.448
	(1.238)	(0.759)	(0.548)	(0.722)
Cultural institution	2.055	−0.037	0.568	0.923
	(1.925)	(0.963)	(0.770)	(1.204)
Arts organisations	0.258	0.867	−0.149	−0.076
	(1.181)	(0.601)	(0.421)	(0.510)
Other	0.148	0.643	0.485	−0.353
	(1.382)	(0.805)	(0.690)	(0.749)
Multiple	−2.043	1.351[c]	−0.579	0.765
	(1.338)	(0.733)	(0.593)	(0.681)
Dance, performance and theatre	−3.135[c]	1.820[b]	−0.902	0.634
	(1.851)	(0.840)	(0.653)	(0.744)
Film and music	−2.340	2.398[b]	−0.719	1.184
	(1.823)	(1.002)	(0.678)	(0.851)
Visual arts and crafts	−0.931	1.477[c]	0.291	0.703
	(1.491)	(0.868)	(0.743)	(0.812)
Literature, libraries and museums		2.060[c]	−0.112	1.468
		(1.208)	(0.911)	(1.302)
Constant	−0.980	−1.977[a]		
	(1.366)	(0.763)		
Constant cut1			−2.584[a]	−1.895[b]
			(0.844)	(0.922)
Constant cut2			−1.330[c]	−0.534
			(0.740)	(0.828)
Constant cut3			0.564	1.033
			(0.717)	(0.817)
Constant cut4			1.534[b]	
			(0.724)	
Observations	200	200	180	180

Standard errors in parentheses
[a] $p < 0.01$.
[b] $p < 0.05$.
[c] $p < 0.1$

This selection equation includes the size of the ACO, since it captures the level of resources that can potentially influence the decision to collaborate with external partners (Eom and Lee, 2010). More resources in large organisation help them collaborate and establish the relationships with external partners more effectively (Tether, 2002). It also includes the type of organisation and sector, as differences among organisation types and sectors can influence the way in which the collaboration is initiated (Wilson et al., 2021). Finally, we include regional dummies, as the probability to collaborate with universities may be influenced by the presence and quality of universities in the region. The intensity (main) equations include the same variables as those included in the models presented in Table 6.

In order to estimate the intensity equation we use the following linear model:

$$y_i = c + \sum_j \beta_j \, Collaboration\ types_i + \sum_k \delta_k \, ACO\ characteristics_i + v_i$$

Where y_i measures the type of impact reported by ACO *i*, *Collaboration types* denotes the nature of the collaboration (transactional, integrative, transformational), *ACO characteristics* denotes a set of variables characterising the company (importance attributed to collaborations, past experience of collaboration with universities, size, type of organisation, sector) and v_i is an idiosyncratic error term.

The results, reported in Table 7, show that our hypotheses H1, H2 and H3 are confirmed also when we perform a Heckman selection model. In model (4) the negative impact of transactional collaborations on the intention to collaborate again is confirmed and significant.

Secondly, we are aware of the problem of endogeneity in relation to the dependent variables relating to the main beneficiary of the ACO, because the ACO might select the type of collaboration based on the benefit that they want to receive. For example, it is possible that ACOs participate in transactional collaborations because they want to benefit themselves, while they participate in transformative collaborations also for other reasons less directly linked to immediate benefits to themselves, such as benefiting to communities or wider society. Although we have not found supporting evidence that this was the case from the qualitative evidence available from the survey, the presence of endogeneity cannot be completely ruled out. To try to address this problem, we have run the regressions on the three variables relating to impact breadth using instrumental variable models.

Appropriate instrumental variables should be correlated with the

Table 7
Heckman selection models.

VARIABLES	(1)	(2)	(3)	(4)	First stage selection
	Impact_organisation	Impact_mutual	Impact_external	Collaborate again	
Transactional	0.039[b]	−0.024	−0.040	−0.090[c]	
	(0.017)	(0.029)	(0.076)	(0.050)	
Integrative	−0.007	0.056[b]	−0.031	0.053	
	(0.015)	(0.025)	(0.065)	(0.043)	
Transformational	−0.013	0.016	0.149[c]	0.038	
	(0.017)	(0.030)	(0.080)	(0.053)	
HEI collaboration experience	−0.029	−0.029	0.034	0.073	
	(0.026)	(0.045)	(0.120)	(0.079)	
Importance of collaborations	−0.023	0.179[a]	0.343[a]	0.159[b]	
	(0.023)	(0.040)	(0.106)	(0.070)	
Individual	0.151[b]	−0.213[b]	−0.044	−0.211	−0.855[b]
	(0.063)	(0.105)	(0.272)	(0.178)	(0.427)
Micro	0.100	−0.288[a]	−0.143	−0.224	−1.160[b]
	(0.067)	(0.111)	(0.285)	(0.186)	(0.453)
Small_medium	−0.008	−0.020	0.109	−0.051	−0.696
	(0.065)	(0.108)	(0.281)	(0.183)	(0.456)
Social enterprise	0.101	0.171	0.329	0.270	1.080[a]
	(0.077)	(0.128)	(0.324)	(0.212)	(0.399)
Cultural institution	0.004	0.007	0.547	0.212	1.215[b]
	(0.092)	(0.153)	(0.389)	(0.254)	(0.495)
Arts organisations	−0.015	0.123	0.125	0.061	0.718[a]
	(0.057)	(0.096)	(0.243)	(0.159)	(0.269)
Other	−0.010	0.100	0.240	−0.095	0.046
	(0.077)	(0.129)	(0.340)	(0.223)	(0.332)
Multiple	−0.136[c]	0.240[c]	0.113	0.355	0.521
	(0.079)	(0.131)	(0.350)	(0.229)	(0.484)
Dance, performance and theatre	−0.180[b]	0.327[b]	0.033	0.434[c]	0.640
	(0.089)	(0.147)	(0.392)	(0.256)	(0.518)
Film and music	−0.140	0.366[b]	0.163	0.555[b]	0.768
	(0.094)	(0.156)	(0.412)	(0.269)	(0.558)
Visual arts and crafts	−0.015	0.261[c]	0.418	0.354	0.312
	(0.088)	(0.146)	(0.388)	(0.254)	(0.525)
Literature, libraries and museums	−0.169	0.351[b]	0.194	0.459	−0.023
	(0.105)	(0.175)	(0.463)	(0.303)	(0.558)
Geographical controls					Significant
Constant			2.656[a]		
	0.273[b]	0.120		2.677[a]	−0.819[a]
	(0.114)	(0.193)		(0.343)	
			(0.523)		(0.112)
Observations	200	200	200	180	393

Standard errors in parentheses.
[a] $p < 0.01$.
[b] $p < 0.05$.
[c] $p < 0.1$

instrumented regressors but not with the independent variables (Wooldridge, 2009), hence, we sought to include variables which were likely to influence the collaborators' choice of collaboration type but not the impact of the collaboration. As instrumental variables, we chose.

- first, a binary variable (*Main_same_region*) equal to 1 if the ACO collaborated with a university in the same region. The rationale for this choice is that closer geographical proximity between the partners should facilitate the close interaction process (Massard and Mehier, 2009) that is required in order to engage in co-design and co-delivery of a project;
- second, a variable (*Evaluation_external*) equal to 1 if the collaboration was evaluated by an external body, often the partner university – this is indicative of the collaborating partner being also involved in the project given that they are interested in evaluating it;
- third, a variable (*Funding_Self*) equal to 1 if the collaboration was funded by the ACO, which indicates the ACO's objective to acquire resources for its own use through the collaboration.

These three variables have, as required, significantly positive correlations with one or more of the instrumented variables, but are not significantly correlated with the dependent variables. The Wald tests on the exogeneity of the instruments are not significant, suggesting that the null hypothesis of the exogeneity of the instruments can be accepted.

The Durbin-Wu-Hausman statistics are significant, rejecting the null hypothesis of exogeneity of the regressors, and indicating that an instrumental variables approach is appropriate. In the instrumental variables models (shown in Table 8) all of the signs and most of the significance of the key coefficients are maintained. In particular, the results are consistent with the findings of our main model. The only difference is that, in the case of impact on the organisation, there is a positive coefficient for transactional collaborations as expected, but it is not significant ($p = 0.296$) whereas there is a positive and significant effect for integrative collaborations.[7]

Table 8
Instrumental variables models.

VARIABLES	(1)	(2)	(3)
	Impact_organisation	Impact_mutual	Impact_external
Transactional	0.574	−0.759	−0.202
	(0.550)	(0.488)	(0.822)
Integrative	0.649[a]	0.674[b]	−0.478
	(0.117)	(0.330)	(0.314)
Transformational	−0.131[a]	−0.488	1.237[a]
	(0.034)	(0.511)	(0.218)
HEI collaboration experience	−0.257	−0.028	−0.177
	(0.344)	(0.329)	(0.348)
Importance of collaborations			−0.353
			(0.324)
Individual	0.589	−3.046[a]	−1.179
	(0.000)	(0.599)	(84.038)
Micro	0.048	−3.026[a]	−0.470
	(0.338)	(0.557)	(84.034)
Small_medium	–		−0.283
			(84.035)
Social enterprise	0.644	0.576	−0.080
	(0.422)	(0.587)	(0.499)
Cultural institution	0.581	−0.123	
	(0.000)	(0.482)	
Arts organisations	0.572	0.099	0.370
	(0.364)	(0.327)	(0.546)
Other	−0.043	0.266	0.947
	(0.435)	(0.562)	(0.751)
Multiple	−1.521[a]	−3.929[a]	0.195
	(0.495)	(0.468)	(34.115)
Dance, performance and theatre			−0.197
			(34.120)
Film and music	−1.574[c]	−3.722	
	(0.805)	(0.000)	
Visual arts and crafts	−1.863[a]	−3.737[a]	
	(0.510)	(0.482)	
Literature, libraries and museums			−0.414
			(34.166)
Constant	1.337	6.991[a]	1.924
	(0.000)	(1.295)	(90.757)
Observations	69	123	75

Standard errors in parentheses.
Note to table: in equations (1) and (2) the variable *Importance of collaborations* had to be removed due to multicollinearity. In equation (3) the dependent variable *Impact_external* is a dummy variable with value 1 if the value of the corresponding ordinal variable is 3 or greater.
[a] $p < 0.01$.
[b] $p < 0.05$.
[c] $p < 0.1$

5. Discussion

Our empirical findings support the arguments proposed by the CVC framework, that different types of collaborations are associated with different value creation processes and with different beneficiaries of the collaboration.

Transactional collaborations generate value from the transfer of resources. "Transferred resource value" is the benefit derived by a partner from the receipt of a resource from the other partner. Typically, the benefit created by the collaboration accrues to one or the other partner (the one who receives the resources). Some qualitative statements provided by survey respondents highlight that *transactional collaborations*, where the ACO is very clear about the resources they require from the other partner, lead to benefits solely for themselves:

> "The drive and ambition from our part have made these collaborations work to the best of their ability because we know what we would like from our university partner and benefits we want to achieve from this collaboration project."

> "[…] This project allowed us as artists to focus on the art and creative contents, while being supported by the university partner on forms and questionnaires completion with participants. This benefits us very well".

> "We […] wanted to have a clear outline of the project and what we would like from our university partner. The brief and the contract drawn were very clear. As a result, the schedule for the timescale of the project was managed well and completed on time. There was a sense of triumph when the project was completed and launched."

Our findings also agree with the study by Whipple et al. (2010) that transactional relationships are often limited in value and impact generated and may lead to antagonistic behaviour between two parties. In addition, we found that transactional collaborations are associated with lower likelihood to collaborate again. Some qualitative statements emphasised reasons for not collaborating again, and these reasons are often associated to the inability to set up transactions in a satisfactory manner:

> "We would hesitate before working with universities again and if we did we would place more emphasis on clarifying what we are responsible for and what they are responsible for around marketing and admin. In the last project, one of the universities had unrealistic expectations."

> "We might not consider working with University again as we found the differences between our culture as a small social enterprise and the culture of a large prestigious university. As an SME we are nimble

[7] The signs and coefficients of this model are preserved also if we combine the model with instrumental variables with sample selection (results are available from the authors upon request).

and flexible, we often found it very difficult to fit research collaborations around our other commitments due to scheduling outside of our control, long delays followed by tight deadlines out of the blue etc. As a non-profit, we are minimally motivated by the notion that we might exploit outcomes of research financially. However, we find it a considerable barrier that our labour is often not paid."

"We are cautious in collaborating with universities again as we are often handed contracts, which explicitly rule out our being able to exploit research outcomes ourselves. We would need to own the IP related to our inputs whereas the standard contracts actually only allow us to retain 'background IP'."

"The bureaucratic nature of the university. Their silo and disconnected way of working. Their misunderstanding of the industry. Their ability to raise funds for inappropriate work: i.e., it is not effective and not invested into meaningful work. Their Access & Outreach teams being target led, rather than quality of work and legacy. Their lack of industry experience, management and production of the projects. These make us wary in collaborating with them again."

These statements suggest that collaborations where the partners, particularly the university, do not invest time and effort in the relationship (for example, to set the collaboration up in such a way that both parties feel that they are benefitting and are not being exploited; to get to know each other, develop mutual trust and find ways of communicating) are more likely to fail and to discourage further collaborations. Since transactional collaborations are characterised by low engagement and peripheral importance, the involved partners are less likely to invest time and effort into them, leading to greater probability of failure and discontinuation (or less likelihood of further engagement).

Integrative collaborations generate value from the process of working together. "Interaction value" consists of the intangible assets that derive from the processes of partners working together - for example, reputation, trust, relational capital, learning, knowledge, joint problem solving, communication, coordination, transparency, accountability, and conflict resolution. Typically, these benefits accrue to both partners in the collaboration. As it has also been noted by Grönroos (2011), interactive processes encourage value creation, since working collectively between partners (for example through the coordination of activities), offers more advantages than working individually (Sambasivan et al., 2011). During the interactions between partners, opportunities arise for two parties to co-create and share the unfolding value. Some statements provided by survey respondents describe examples of the mutual benefits accrued by the partners:

"In this project, we and university as partners have mutual aims for this collaborative project. They are high quality space, resources, and open access to facilities. So, young people can experience what HE training may look like."

"Mutual benefits of the project are countless, such as staff knowledge and expertise - complementary skills between a regional arts org and university staff as well as shared marketing, access to new audiences."

Survey respondents also shed further light on the relationship between having an integrative collaboration (based on trust, honesty, engagement) and the generation of mutual benefits:

" …. .mutual recognition of complementary skills and expertise, joint development of theory and experiments in arts and creative practice. Openness and honesty and high level of trust are required."

"All aspects work well due to a strong foundation of mutual respect, common ambition and goal. Particular strengths include a strong relationship at all level."

"When we co-create a brief with a university, outlining both the mutual benefit for each partner, us- the arts & cultural body and the university. The results have always been overwhelmingly positive and impactful."

"Our organisation and the University were very open to collaborative working. There were mutually beneficial aspects to the proposal and despite the distance between the University and the art project […] we developed a good relationship."

Transformative collaborations generate value by achieving synergies between the partners. "Synergistic value" arises from the underlying premise of all collaborations that combining partners' resources enables them to accomplish more together than they could have separately. This signifies simultaneous shared value creation for parties (Tantalo and Priem, 2016). Typically, these synergies will spill out of the collaboration and generate external impacts such as social or environmental value. We also found that this type of collaboration is akin to science-based co-creation. As highlighted by De Silva et al. (2021), combining different assets, knowledge, resources and networks of two parties is vital for generating dual values and impacts not limited to only both partners, but also towards society. This involves partners jointly defining goals, interacting and integrating their complementary assets. Some qualitative statements provided by survey respondents describe examples of the external benefits generated through highly engaged transformative collaborations:

"There is a compact in delivering collaborative heritage projects, that the community / wellbeing/ personal learning impacts are just as important as the research itself."

"The partnership enables a highly productive two-way flow of knowledge, enabling co-produced University research to reach a wider non-academic audience via the outcomes that the artists have delivered, such as exhibitions, films, and publications."

"This was a very successful collaboration demonstrating to us the exceptional benefits of collaborating with a HE partner in relation to offer genuine skill development opportunities and being able to bringing together artistic expertise and knowledge of deaf artists working in UK, with knowledge of activists and academics specialising in Deaf studies."

6. Conclusion

Extant literature highlights the limitation in our knowledge especially about the understanding of how the types of collaborations between universities and ACOs lead to impact. Building on the framework of Collaborative Value Creation (CVC) proposed by Austin and Seitanidi (2012a,b), this study has answered the research question: "*Does the nature of the university-ACO collaboration influence the breadth of impact of the collaboration, and the ACO's intention to collaborate again in the future?*" We investigated different types of university-ACO collaborations and their association with impact, particularly focusing on the nature of the societal actors that benefit from the collaboration, whether primarily the ACO itself, both partners, or external stakeholders.

The empirical findings confirm the notion that different types of collaborations are associated with different beneficiaries and value generated by the collaboration, leading to societal impact creation. Transactional collaborations mainly impact a single party, i.e., the ACO, as the ACO is the recipient of a resource from the partnered university. Therefore, societal impact generated from this kind of collaboration is narrow. Transactional collaborations are also less likely to lead to further collaborations of the ACO with universities. On the other hand, when universities and ACOs engage in integrative collaborations, both parties are working together to exchange mutually beneficial resources – so there is an impact on the main organisation (confirmed by the positive coefficient of integrative collaborations on *Impact_organisation* in the

instrumental variables model), but some impact on the partner as well. Hence, the impact generated from this type of collaboration accrues to both partners. When universities and ACOs are involved in transformative collaborations, increasing breadth of impact towards wider society is observed. Value is generated by achieving synergies between the parties, which create broader impact to external stakeholders.

This study makes valuable contributions about interactions between universities and ACOs. In particular, first, it provides empirical evidence to support the CVC framework by Austin and Seitanidi (2012a,b) by presenting different types of collaborations, and the impact of each collaboration type. Additionally, qualitative evidence demonstrates that integrative and transformative collaborations lead to societal impact generation. Secondly, this study provides some evidence associating the size of ACOs with the breadth of impact of the collaboration. Probably because of resource constraints, integrative and transformational collaborations with broader impacts are more likely to occur in the larger ACOs, while transactional collaborations leading to unilateral benefits for the ACO are more likely to happen in the smaller ACOs. Thirdly, the study expands the CVC framework by presenting an association of transactional collaborations with lower intention to collaborate in the future.

There are some policy implications for organisations taking part in university-ACO collaborations. As noted in previous studies, universities and ACOs are under pressure from funders and policymakers to produce outputs (Moreton, 2018), while there is insufficient emphasis on relationship building (Munro, 2016). Policies should shift from focusing on collaboration outputs and reports to providing support and resources to facilitate integrative and transformational collaborations (Wilson et al., 2021), especially to very small ACOs, which have limited resources. In addition, the importance of collaborations should be recognised and understood between universities and ACOs to accelerate the potential to collaborate again. The form of shared governance by ACOs should be considered to promote and support an active engagement as well as to foster trust (Bstieler et al., 2015) for the best benefits and value, and in turn for repeated collaboration. The shared governance may entail features such as shared planning, project management and communications as well as joint responsibilities to prevail over problems, risks and obstacles.

The study also has several limitations. Even though the survey is considered the largest survey ever to have been conducted in the UK on how professionals in the arts and culture sector view their relationships with universities, it consists of a self-selecting group of ACOs that collaborate with universities. Our robustness checks included a model which attempts to account for selection bias (Table 7), which shows that our results hold even when controlling for the likelihood to collaborate with universities. Yet, the selection equation could only include a small number of demographic factors of the ACO due to the limited amount of variables available. A larger scale study would be appropriate to provide more statistically robust results. Future research should delve further into the factors that drive engagement in different types of collaborations between universities and ACOs - whether transactional, integrative or transformative – as well as considering their impact. It should also consider what are the factors that underpin the initiation of transactional, integrative and transformational collaborations between universities and ACOs, so as to help universities, ACOs and policymakers to create the conditions to favour such collaborations.

CRediT authorship contribution statement

Federica Rossi: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation. **Ning Baines:** Writing – review & editing, Writing – original draft, Conceptualization. **Evelyn Wilson:** Writing – review & editing, Project administration, Investigation, Data curation.

Appendix

Table A1
Comparison between geographical and sectoral distribution of final sample and of UK National Portfolio Organisations

	Final sample	NPOs
Number of organisations	200	985
Location:		
London	26.9%	28.5%
South East	10.8%	11.1%
South West	6.0%	8.8%
East Midlands	6.0%	7.3%
West Midlands	10.2%	9.4%
East of England	5.4%	5.8%
North East	5.4%	5.6%
North West	10.2%	12.2%
Yorkshire	7.8%	10.8%
Wales	3.0%	0.5%
Arts and culture sub-sector:		
Multiple arts forms (including cross-disciplinary)	28.5%	26.7%
Literature, libraries and museums	4.5%	15.9%
Dance, performance and theatre	21.5%	11.3%
Visual Arts and Crafts	11.5%	15.9%
Film and music	13.5%	14.1%

Note to Table A1: The information about National Portfolio Organisations was extracted from: https://www.artscouncil.org.uk/how-we-invest-public-money/2023-26-Investment-Programme/2023-26-investment-programme-data.

The lower share of respondents from the Literature, libraries and museums sector compared to the NPO population can be explained with the readership of Arts Professional being slightly lower for museum professionals, who have other professional magazines, with Arts Professional focusing on the arts.

Table A2
Heckman selection models

VARIABLES	(1)	(2)	(3)	(4)	First stage selection
	Impact_organisation	Impact_mutual	Impact_external	Collaborate again	
Transactional	0.039**	−0.024	−0.040	−0.090*	
	(0.017)	(0.029)	(0.076)	(0.050)	
Integrative	−0.007	0.056**	−0.031	0.053	
	(0.015)	(0.025)	(0.065)	(0.043)	
Transformational	−0.013	0.016	0.149*	0.038	
	(0.017)	(0.030)	(0.080)	(0.053)	
HEI collaboration experience	−0.029	−0.029	0.034	0.073	
	(0.026)	(0.045)	(0.120)	(0.079)	
Importance of collaborations	−0.023	0.179***	0.343***	0.159**	
	(0.023)	(0.040)	(0.106)	(0.070)	
Individual	0.151**	−0.213**	−0.044	−0.211	−0.855**
	(0.063)	(0.105)	(0.272)	(0.178)	(0.427)
Micro	0.100	−0.288***	−0.143	−0.224	−1.160**
	(0.067)	(0.111)	(0.285)	(0.186)	(0.453)
Small_medium	−0.008	−0.020	0.109	−0.051	−0.696
	(0.065)	(0.108)	(0.281)	(0.183)	(0.456)
Social enterprise	0.101	0.171	0.329	0.270	1.080***
	(0.077)	(0.128)	(0.324)	(0.212)	(0.399)
Cultural institution	0.004	0.007	0.547	0.212	1.215**
	(0.092)	(0.153)	(0.389)	(0.254)	(0.495)
Arts organisations	−0.015	0.123	0.125	0.061	0.718***
	(0.057)	(0.096)	(0.243)	(0.159)	(0.269)
Other	−0.010	0.100	0.240	−0.095	0.046
	(0.077)	(0.129)	(0.340)	(0.223)	(0.332)
Multiple	−0.136*	0.240*	0.113	0.355	0.521
	(0.079)	(0.131)	(0.350)	(0.229)	(0.484)
Dance, performance and theatre	−0.180**	0.327**	0.033	0.434*	0.640
	(0.089)	(0.147)	(0.392)	(0.256)	(0.518)
Film and music	−0.140	0.366**	0.163	0.555**	0.768
	(0.094)	(0.156)	(0.412)	(0.269)	(0.558)
Visual arts and crafts	−0.015	0.261*	0.418	0.354	0.312
	(0.088)	(0.146)	(0.388)	(0.254)	(0.525)
Literature, libraries and museums	−0.169	0.351**	0.194	0.459	−0.023
	(0.105)	(0.175)	(0.463)	(0.303)	(0.558)
Geographical controls					Significant
Constant			2.656***		−0.819***
	0.273**	0.120		2.677***	
	(0.114)	(0.193)		(0.343)	
			(0.523)		(0.112)
Observations	200	200	200	180	393

Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1

Table A3
Instrumental variables models

VARIABLES	(1)	(2)	(3)
	Impact_organisation	Impact_mutual	Impact_external
Transactional	0.574	−0.759	−0.202
	(0.550)	(0.488)	(0.822)
Integrative	0.649***	0.674**	−0.478
	(0.117)	(0.330)	(0.314)
Transformational	−0.131***	−0.488	1.237***
	(0.034)	(0.511)	(0.218)
HEI collaboration experience	−0.257	−0.028	−0.177
	(0.344)	(0.329)	(0.348)
Importance of collaborations			−0.353
			(0.324)
Individual	0.589	−3.046***	−1.179
	(0.000)	(0.599)	(84.038)
Micro	0.048	−3.026***	−0.470
	(0.338)	(0.557)	(84.034)
Small_medium	–		−0.283
			(84.035)
Social enterprise	0.644	0.576	−0.080
	(0.422)	(0.587)	(0.499)
Cultural institution	0.581	−0.123	

(*continued on next page*)

Table A3 (*continued*)

VARIABLES	(1)	(2)	(3)
	Impact_organisation	Impact_mutual	Impact_external
	(0.000)	(0.482)	
Arts organisations	0.572	0.099	0.370
	(0.364)	(0.327)	(0.546)
Other	−0.043	0.266	0.947
	(0.435)	(0.562)	(0.751)
Multiple	−1.521***	−3.929***	0.195
	(0.495)	(0.468)	(34.115)
Dance, performance and theatre			−0.197
			(34.120)
Film and music	−1.574*	−3.722	
	(0.805)	(0.000)	
Visual arts and crafts	−1.863***	−3.737***	
	(0.510)	(0.482)	
Literature, libraries and museums			−0.414
			(34.166)
Constant	1.337	6.991***	1.924
	(0.000)	(1.295)	(90.757)
Observations	69	123	75

Standard errors in parentheses.
***p < 0.01, **p < 0.05, *p < 0.1
Note to table: in equations (1) and (2) the variable *Importance of collaborations* had to be removed due to multicollinearity. In equation (3) the dependent variable *Impact_external* is a dummy variable with value 1 if the value of the corresponding ordinal variable is 3 or greater.

Appropriate instrumental variables should be correlated with the instrumented regressors but not with the independent variables, hence, we sought to include variables which were likely to influence the collaborators' choice of collaboration type but not the impact of the collaboration. As instrumental variables, we chose.

- first, a binary variable (*Main_same_region*) equal to 1 if the ACO collaborated with a university in the same region. The rationale for this choice is that closer geographical proximity between the partners should facilitate the close interaction process that is required in order to engage in co-design and co-delivery of a project;
- second, a variable (*Evaluation_external*) equal to 1 if the collaboration was evaluated by an external body, often the partner university – this is indicative of the collaborating partner being also involved in the project given that they are interested in evaluating it;
- third, a variable (*Funding_Self*) equal to 1 if the collaboration was funded by the ACO, which indicates the ACO's objective to acquire resources for its own use through the collaboration.

These three variables have, as required, significantly positive correlations with one or more of the instrumented variables, but are not significantly correlated with the dependent variables. The Wald tests on the exogeneity of the instruments are not significant, suggesting that the null hypothesis of the exogeneity of the instruments can be accepted.

The Durbin-Wu-Hausman statistics are significant, rejecting the null hypothesis of exogeneity of the regressors, and indicating that an instrumental variables approach is appropriate.

The results are consistent with the findings of our main model presented in section 4. The only difference is that, in the case of impact on the organisation, there is a positive coefficient for transactional collaborations as expected, but it is not significant ($p = 0.296$) whereas there is a positive and significant effect for integrative collaborations.[8]

Data availability

Data will be made available on request.

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[8] The signs and coefficients of this model are preserved also if we combine the model with instrumental variables with sample selection (results are available from the authors upon request).

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