



# Toolkit Business Advice Incubators

## What are they and what do they aim to do?

Accelerators and incubators are business support programmes that provide packages of support to young firms to help them grow. Widely used in the tech sector, they are now increasingly applied in other industries. We distinguish accelerators from incubators based on the definition provided by the Harvard Business Review (summarised in Table 1 of the Annex). This toolkit is concerned with incubators. A companion toolkit considers accelerators.

Accelerators use competitive entry and a range of intensive support, typically targeting start-ups aged 3-6 months for a period of up to a year, although often for much less time. Incubators typically use non-competitive entry and comparatively 'light-touch' support, typically targeting start-ups aged 1-5 years. Typically, incubators are either non-profit or run as managed workspaces where firms have rolling contracts and pay rent, usually staying for between one and five years. Incubators provide their firms with workspace and ad hoc training that is directly relevant to the business (e.g. in accounting). Mentorship is also provided, but is often minimal and tactical (i.e. advice as needed), as opposed to the more intense, scheduled, and consistent mentorship sessions provided by accelerators.

## How effective are they?

We found seven evaluations that met our evidence standards. This section summarises the findings from these studies. The Annex provides more detail.

There is some evidence that incubator support may increase participating **firm employment and sales**. Two studies look at employment, finding positive effects. Both studies consider support from accelerators and incubators and are unable to distinguish between the two. One of these two studies also looks at firm sales, finding a positive effect.

There is some evidence that incubators may decrease firm survival. One study looks at survival, focusing on five German programmes, finding a negative effect for three of the incubators and no effect for the remaining two incubators. Taken at face value, this suggests that incubators may be bad for firm survival. An alternative – and more plausible – explanation is that incubators help firms to more quickly gauge the quality of their business idea (e.g. through mentoring or demo days) and encourage them to drop bad ideas quickly, rather than continuing until the idea fails ‘naturally’.

We found no studies that looked at the overall impact of incubators on **firms receiving external funding** (e.g. from angel investors or venture capital firms).

Length of time spent in the incubator is, at best, weakly associated with improved firm outcomes. One study finds positive effects on revenues, no effect on survival and negative effects on the likelihood of graduating and getting funded. A second study also finds negative effects on graduating but a positive effect on survival – i.e. the longer firms stay in an incubator the more likely they are to continue to stay in the incubator. Finally, a third study reports a negative effect on survival and no effect on sales or employment.

The evidence on **different incubator business models** is inconclusive. Two studies consider the relative effectiveness of different incubator business models. One of these finds that, relative to for-profit incubators, non-profit incubators have no impact on revenue and employment, but are more likely to ensure firm survival. The other finds that firm survival is not related to the rent level charged by incubators.

**University / academic involvement** may help improve firm outcomes; affiliation seems more useful than involvement of individual academics. Four studies evaluate the impact of different kinds of academic roles on companies in incubators. Two studies compare university-affiliated incubators to non-affiliated incubators, with one finding university affiliation has no effect on revenue or employment, but a positive effect on survival, and another finding a positive effect on revenue and employment. Another finds that academic involvement in incubated firms has no effect on revenue, but suggests that using university research generally increases the likelihood of obtaining venture capital funding, and the amount of funding. The fourth study finds that academic involvement in the firm may increase the likelihood of firm survival, but may also have a negative impact on the firm's ability to graduate from the incubator.

**The type of incubator and accelerator support** may effect firm survival. The one study considering this finds that incubators and accelerators that only host firms from a specific sector are more conducive to firm survival. It also notes that incubators that facilitate networking events are associated with lower likelihood of survival, while training programmes have no effect on survival.

These effects vary across **locations**. In areas with more competition, one study finds that networking events and training are conducive to survival, while only hosting firms from certain sectors has a

negative impact on survival. Another study that looks at the effect of location finds that locating in areas with dense entrepreneurial networks has no impact on revenue or employment, but decreases the likelihood of firm survival. However, firms headed by a member of an ethnic minority group are more likely to survive in more competitive areas. In this case, incubator participants might be negatively selected overall, but participation might be helpful for firms that would face additional challenges (e.g. discrimination) in their business environment.

## Are incubators cost effective?

None of the studies provide information on policy costs or cost-effectiveness of the programmes.

## Things to consider

- ***If incubators ‘kill’ participating firms, is that a bad thing?*** The limited available evidence suggests incubators may be bad for survival. It’s plausible that this is down to programme managers helping founders identify weak ideas and kill them, allowing entrepreneurs to develop new ideas.
- ***What type of support should incubators provide?*** Targeting a specific sector produces better results for firm survival. On the other hand, networking events do not appear to be effective and providing training is only effective in areas with more competition. There is limited evidence here, however, so providers should experiment to see what configuration of these works best for them.
- ***Should incubators have a minimum or maximum tenancy?*** There is little indication of a positive relationship between tenancy length and firm performance, in terms of employment, sales or survival. There is some evidence that firms are less likely to get funded, become independent, or be acquired the longer they are incubated.
- ***Should incubators be left to the private sector?*** We found no strong evidence either way. Policymakers should consider whether there is any substantive market failure in incubator provision in their area.
- ***Which types of firms are more successful in incubators?*** Firms that have patents survive longer; firms with patents citing academic research are more likely to secure funding.
- ***Should incubators charge higher or lower rents?*** Results are inconclusive.
- ***What roles should universities play in incubators?*** Overall, affiliation and using university research seems to be more helpful than involving individual academics.
- ***Should different types of support be provided in different regions?*** Impacts of different types of support seem to differ based on how competitive the environment is in which they are operating. Think about your local economy when considering what model you adopt.
- ***What is the value added of accelerator vs. incubator business models?*** We didn’t find any studies that directly compare the two approaches.

## Annex: Evidence on incubators

Accelerators and incubators are business support programmes that provide packages of support to young firms to help them grow. Widely used in the tech sector, they are now increasingly applied in other industries. We distinguish accelerators from incubators based on the definition provided by the Harvard Business Review (summarised in Table 1). This toolkit is concerned with incubators. A companion toolkit considers accelerators.

Firms are typically admitted to incubators on a rolling and non-competitive basis. Although there is no defined time frame for firms to remain in incubators, they are typically housed for between one and five years. During this time, the incubator provides the firm with workspace and ad hoc training that is directly relevant to the business (e.g. in accounting). Mentorship is also provided, but is often minimal and tactical (i.e. advice as needed), as opposed to the more intense, scheduled, and consistent mentorship sessions provided by accelerators.

Table 1: Definition of accelerators and incubators

	Accelerators	Incubators
Duration	3 to 6 months	1 to 5 years
Cohorts	Yes	No
Business model	Investment; can also be non profit	Rent; non profit
Selection	Competitive; cyclical	Non-competitive
Venture stage	Early	Early or late
Education	Seminars	Ad hoc; human resources or legal support
Mentorship	Intense; by self and others	Minimal; tactical
Venture location	On-site	On-site

Source: Harvard Business Review <https://hbr.org/2016/03/what-startup-accelerators-really-do>

## How secure is the evidence?

This toolkit summarises the available evidence on the effect of incubator policies for firms that have spent time in an incubator (i.e. ex-post impact studies). This toolkit does not consider evidence based on qualitative or case study methods. Instead, we focus on evaluations that identify effects that can be attributed, with some degree of certainty, to the support provided.

We looked for evidence on the effect of incubators on a range of outcomes including survival, revenue, employment, and funding.

We focused on evidence from the OECD, in English. We considered any study that provided before-and-after or cross-sectional evidence controlling for differences between supported and unsupported areas or firms. We also included more robust studies that compared changes to areas or firms with a control group or that used a source of randomness in provision of support to estimate a causal effect.<sup>1</sup> Throughout the toolkit, we've placed greater emphasis on studies with stronger methods.

1 See the Maryland Scientific Methods Scale (SMS) <http://www.whatworksgrowth.org/resources/the-scientific-maryland-scale/>.

Using these criteria, we found seven studies that looked at the effects of incubators and that met our evidence standards. Only one of these studies (203) considered the overall impact of incubator support. A further two studies (202 and 235) consider the overall impact of support, but do not distinguish between accelerators and incubators. The four remaining studies (201, 204, 205, 206) do not consider the overall impact, but instead focus on which characteristics of incubator programmes are associated with improved firm performance. One of these studies (204) does not distinguish between accelerators and incubators.

All seven of these studies examine firm level effects. Six studies consider programmes in the US, while one considers a programme in Germany. Two of the seven studies examine before-and-after changes in outcomes for 'treated' firms against a control group (SMS 3), while the remaining five examine cross-sectional differences in outcomes for 'treated' firms against a control group (SMS 2).

No studies evaluating UK policies or support mechanisms met the evidence standards for inclusion in this toolkit.

Overall, the findings for incubators are less clear-cut and extensive than the findings for accelerators, even though the latter are a more recent phenomenon.

## The evidence

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**There is some evidence that incubator support may increase participating firm employment and sales. Two studies look at employment, finding positive effects. Both studies consider support from accelerators and incubators and are unable to distinguish between the two.**

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Study 202 (SMS 2 – firm) evaluates the relationship between incubators and accelerators and employment in the United States. The study uses the National Business Incubator Association's list, which also includes accelerators according to our definition. For this reason, it is not possible to disentangle the effects of incubators specifically. The study considers 2,043 supported firms, as well as a control group of observably similar firms. The study finds that incubated or accelerated firms have five more employees than non-incubated or accelerated firms.

Study 235 (SMS 2 - firm) evaluates the relationship between incubators and accelerators and employment in the United States. The study also uses the National Business Incubator Association's list so includes accelerators according to our definition. Again, for this reason, it is not possible to disentangle the effects of incubators. The study considers firms that participated in university-sponsored incubators or accelerators from 1989 to 2012. The comparison group is comprised of firms that are observably similar to those that were incubated or accelerated. The study finds that incubated or accelerated firms have four more employees than non-incubated or accelerated firms.

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**One of these two studies also looks at firm sales, finding a positive effect.**

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Study 235 (SMS 2 - firm) also evaluates the relationship between incubators or accelerators and firm revenue in the United States. Again, the study is unable to disentangle the effects of accelerators or incubators. The study looks at the difference between sales revenue two years after graduation and before incubator or accelerator participation. The study finds that incubated or accelerated firms have £350,110 more sales revenue than non-incubated or accelerated firms.



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**There is some evidence that incubators may decrease firm survival. One study looks at survival, focusing on five German programmes, finding a negative effect for three of the incubators and no effect for the remaining two incubators. Taken at face value, this suggests that incubators may be bad for firm survival. An alternative – and more plausible – explanation is that incubators help firms to more quickly gauge the quality of their business idea (e.g. through mentoring or demo days) and encourage them to drop bad ideas quickly, rather than continuing until the idea fails ‘naturally’.**

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Study 203 (SMS 2 - firm) evaluates the relationship between incubators and firm survival in Germany. The study considers all firms that enrolled between 1983 and 2006 in one of five incubators. It constructs a control group of observably similar firms that did not participate in an incubator. The study uses a hazard regression to analyse whether incubator firms are more likely to survive an additional period than non-incubator firms. It concludes that for three of the five incubators, incubated firms are less likely to survive. For instance, one to two years after starting, incubator firms are 24 per cent less likely to survive an additional year. However, this difference tends to decrease with firm age - nine to ten years after starting, incubator firms are 5 per cent less likely to survive an additional year. For two of the five incubators, incubation has no impact on firm survival.

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**Length of time spent in the incubator is, at best, weakly associated with improved firm outcomes. One study finds positive effects on revenues, no effect on survival and negative effects on the likelihood of graduating and getting funded. A second study also finds negative effects on graduating but a positive effect on survival – i.e. the longer firms stay in an incubator the more likely they are to continue to stay in the incubator. Finally, a third study reports a negative effect on survival and no effect on sales or employment.**

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Study 201 (SMS 3 – firm) considers whether length of time spent in an incubator impacts firm survival, revenues, and employment in the United States. The study features a panel dataset of incubated firms from 1990 to 2008, which allows it to control for time-invariant factors. The study concludes that firms that are incubated for a longer period are less likely to survive, but are no different with respect to (growth in) revenues and employment.

Study 205 (SMS 2 – firm) evaluates whether length of time spent in a university-affiliated incubator has an impact on firm survival in the United States. The study considers firms that participated in the Georgia Institute of Technology incubator from 1998 to 2003. Firm survival is considered in two different ways: (1) whether the firm has “graduated” – i.e. if the startup leaves the incubator and operates as a normal business or is acquired; (2) whether the firm “fails” – i.e. ceases to exist. Here, the reference category is remaining in the incubator. The study finds that the longer a firm spends in an incubator, the less likely it is to both graduate and fail, vis-à-vis remaining in the incubator.

Study 206 (SMS 2 – firm) analyses whether length of time spent in a university-affiliated incubator influences firm revenue, ability to attract funding, and survival. The study considers firms that participated in the Georgia Institute of Technology (GIT) incubator from 1998 to 2003. Ability to attract funding is considered in two different ways: (1) funds raised - the dollar amount of cumulative capital raised; (2) VC funding – whether the firm received any funding from venture capitalists. For survival the study distinguishes between firm failure, graduation, or remaining in the incubator. Here, graduation means that the firm became a stand-alone going concern or was acquired, while failure implies that the firm ceases to operate. The study finds that the number of years spent in an incubator has a positive

effect on (cumulated) revenue, but a negative effect on the total funds raised, as well as the likelihood of securing VC funding. Furthermore, years in an incubator has no effect on the likelihood of failure vis-à-vis remaining in the incubator, but is associated with a lower likelihood of graduating, vis-à-vis remaining in the incubator.

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**The evidence on different incubator business models is inconclusive. Two studies consider the relative effectiveness of different incubator business models. One of these finds that, relative to for-profit incubators, non-profit incubators have no impact on revenue and employment, but are more likely to ensure firm survival. The other finds that firm survival is not related to the rent level charged by incubators.**

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Study 201 (SMS 3 – firm) evaluates whether for-profit or non-profit incubators are more effective for ensuring firm survival, revenue, and employment in the United States. The study finds that for-profit and non-profit incubators are no different with respect to revenue or employment growth, but non-profit incubators are associated with higher likelihood of survival.

Study 203 (SMS 2 - firm) evaluates the relationship between incubator rent levels and firm survival in Germany. As noted above, the study considers all firms that enrolled between 1983 and 2006 in one of five publicly funded non-profit incubators. The study compares the survival rates of firms in incubators with differing rents. Results are inconclusive. One of the two incubators that had no effect on survival charged high rents, while the other charged medium rents. On the other hand, the three incubators for which a negative effect was found all charged different rents (high, medium, and low).

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**University / academic involvement may help improve firm outcomes; affiliation seems more useful than involvement of individual academics. Four studies evaluate the impact of different kinds of academic roles on companies in incubators. Two studies compare university-affiliated incubators to non-affiliated incubators, with one finding university affiliation has no effect on revenue or employment, but a positive effect on survival, and another finding a positive effect on revenue and employment. Another finds that academic involvement in incubated firms has no effect on revenue, but suggests that using university research generally increases the likelihood of obtaining venture capital funding, and the amount of funding. The fourth study finds that academic involvement in the firm may increase the likelihood of firm survival, but may also have a negative impact on the firm's ability to graduate from the incubator.**

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Study 201 (SMS 3 – firm) evaluates whether incubator affiliation with universities or community college is associated with firm survival, revenue, and employment in the United States. The study finds that university affiliation is associated with a higher likelihood of survival, but has no effect on employment or revenue growth. However, for firms owned by members of a minority ethnic group, university affiliation is associated with a lower likelihood of survival.

Study 205 (SMS 2 – firm) evaluates the relationship between university affiliation and incubated firm survival in the United States. The study analyses the extent to which university professor involvement in incubated firms is conducive to firm survival. University professor involvement is considered in several different ways: (1) whether a university professor works for the firm; (2) whether a professor who invented the product works in senior management; (3) whether a professor works in senior management. For survival the study distinguishes between firm failure, graduation, or remaining in the incubator. Here, graduation means that the firm became a stand-alone going concern or was acquired, while failure

implies that the firm ceases to operate. The study finds that having a professor in senior management is not correlated with firm survival. However, having a professor who invented the product on the team is associated with a decreased likelihood of both failure and graduation, vis-à-vis remaining in the incubator. On the other hand, having a professor in senior management is associated with a decreased likelihood of graduating, vis-à-vis remaining in the incubator.

Study 206 (SMS 2 – firm) evaluates the relationship between university affiliation and incubated firms' revenue, ability to attract funding, and survival. The study analyses the extent to which university knowledge transfers are associated with higher firm revenue. Knowledge transfers are captured in six different ways: (1) firm has ties to a university other than Georgia Institute of Technology (GIT); (2) firm commercialises a product invented by GIT; (3)-(6) the type of research that is cited in firm patents, namely: the proportion of university citations (3), the proportion of academic journal citations (4), the proportion of GIT citations (5), and the proportion of non-GIT citations (6). Ability to attract funding is considered in two different ways: (1) funds raised - the dollar amount of cumulative capital raised; (2) VC funding – whether the firm received any funding from venture capitalists. For survival the study distinguishes between firm failure, graduation, or remaining in the incubator. Here, graduation means that the firm became a stand-alone going concern or was acquired, while failure implies that the firm ceases to operate. The study finds that links to a university other than GIT has no impact on revenue, likelihood of securing VC funding, or failure. However, it is associated with less funding and lower likelihood of graduating (vis-à-vis remaining in the incubator). Commercialising a product invented by GIT has no effect on any of the outcomes. Citing university research has no effect on (cumulated) revenue or likelihood of graduating, but a negative effect on likelihood of failure (vis-à-vis remaining in the incubator), and a positive effect on likelihood of obtaining VC funding and total amount raised. Citing academic journals has a negative effect on failure (vis-à-vis remaining in the incubator), no effect on graduating (vis-à-vis remaining in the incubator), or (cumulated) revenue, but a positive effect on likelihood of obtaining VC funding and total amount raised. Citing GIT research has no effect on (cumulated) revenue, likelihood of obtaining VC funding, funding amount, and likelihood of graduating (vis-à-vis remaining in the incubator), but has a negative effect on the likelihood of failure (vis-à-vis remaining in the incubator). Finally, citing non-GIT research has no effect on (cumulated) revenue, the likelihood of failure or graduation (vis-à-vis remaining in the incubator), but has a positive impact on likelihood of obtaining VC funding and the amount raised.

Study 235 (SMS 2 - firm) evaluates the relationship between university-sponsored incubators and accelerators and firm employment and revenue in the United States. As noted above, the study uses the National Business Incubator Association's list of incubators, which also includes accelerators according to our definition. The study finds that university incubation is associated with faster sales and jobs growth than non-university incubation.

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**The type of incubator and accelerator support may effect firm survival. The one study considering this finds that incubators and accelerators that only host firms from a specific sector are more conducive to firm survival. It also notes that incubators that facilitate networking events are associated with lower likelihood of survival, while training programmes have no effect on survival. These effects vary across locations. In areas with more competition, one study finds that networking events and training are conducive to survival, while only hosting firms from certain sectors has a negative impact on survival. Another study that looks at the effect of location finds that locating in areas with dense entrepreneurial networks has no impact on revenue or employment, but decreases the likelihood of firm survival. However, firms headed by a member of an ethnic minority group are more likely to survive in more competitive areas. In this case, incubator participants**



**might be negatively selected overall, but participation might be helpful for firms that would face additional challenges (e.g. discrimination) in their business environment. There is some evidence that incubator support may increase participating firm employment. Two studies look at employment finding positive effects. Both studies consider support from accelerators and incubators and are unable to distinguish between the two.**

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Study 201 (SMS 3 – firm) evaluates whether an incubator's location (in particular the density of the location's entrepreneurial networks) impacts the likelihood of firm survival, revenue, or employment in the United States. The density of the local entrepreneurial network is captured by the number of economic development, business associations, professional associations, and other nonprofits found to be co-located with the business incubator on an annual basis. The study finds that firms hosted by an incubator within a denser entrepreneurial network are no different with respect to growth in revenue and employment, but are less likely to survive. However, for firms headed by members of an ethnic minority group, participating in an incubator located within a denser entrepreneurial network is actually conducive to firm survival. On its own the paper is unable to provide a particular convincing explanation, or further evidence, that would help explain why results differ for the minority group. However, study 180 in our accelerator review finds long run positive effects for minority, but not for non-minority, entrepreneurs, suggesting that the programme was effective at increasing entrepreneurship for those that would have otherwise found it difficult to enter the sector. It is possible that the same story is at work here too.

Study 204 (SMS 2 – firm) evaluates the relationship between different types of incubator and accelerator support and firm survival in the United States. As noted, the study considers incubators and accelerators simultaneously, so it is hard to disentangle specific incubator vs. accelerator effects. The study considers all firms that belonged to a university accelerator or incubator at any point between 1994 and 2007. Three different types of incubator and accelerator support are considered: (1) if the incubator hosted networking events and conferences; (2) if the incubator or accelerator only hosted firms in a particular sector; (3) if the incubator provided direct support in the form of educational training. The study finds that firms that participated in incubators or accelerators providing networking events were less likely to survive than firms in programmes without this form of support. On the other hand, firms that participated in incubators or accelerators that only hosted firms in a particular sector were more likely to survive than firms in non-specialised programmes. Direct support was found to have no effect. The study also considers whether these effects change according to the competitiveness of the incubator's location (as measured by the number of firms operating in the same industry within the firm's founding county). It finds that that networking events and training initiatives are associated with a positive effect on firm survival in competitive counties, while hosting only firms from certain sectors is associated with a negative impact on firm survival in competitive counties.

## Cost effectiveness

Five studies (201, 202, 203, 204, 235) consider firms from several incubators, so that it is not possible to infer their individual effectiveness and compare this to costs. Three studies (205, 206, 208) evaluate the effectiveness of the Georgia Institute of Technology's Advanced Technology Development Center. However, the studies do not report the costs specific to firm incubation. Study 206 reports that the incubator is housed in a £197 million facility.<sup>2</sup> However, this building is also home to the Business School and Economic Development Institute. Furthermore, this value does not account for other incubation costs such as training and administration.

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<sup>2</sup> USD converted to GBP using exchange rate reported in Financial Times on 2/12/2016.

## Annex: Evidence Reviewed

Ref No.	Reference
201	Amezcuca, A. S. (2010). Performance analysis of entrepreneurship policy: which business incubators generate the highest levels of economic performance?. <i>Frontiers of Entrepreneurship Research</i> , 30(18), 1.
202	Stokan, E., Thompson, L., & Mahu, R. J. (2015). Testing the Differential Effect of Business Incubators on Firm Growth. <i>Economic Development Quarterly</i> .
203	Schwartz, M. (2013). A control group study of incubators' impact to promote firm survival. <i>The Journal of Technology Transfer</i> , 38(3), 302-331.
204	Amezcuca, A. S., Grimes, M. G., Bradley, S. W., & Wiklund, J. (2013). Organizational sponsorship and founding environments: a contingency view on the survival of business-incubated firms, 1994–2007. <i>Academy of Management Journal</i> , 56(6), 1628-1654.
205	Rothaermel, F. T., & Thursby, M. (2005). Incubator firm failure or graduation?: The role of university linkages. <i>Research policy</i> , 34(7), 1076-1090.
206	Rothaermel, F. T., & Thursby, M. (2005). University–incubator firm knowledge flows: assessing their impact on incubator firm performance. <i>Research Policy</i> , 34(3), 305-320.
235	Lasrado, V., Sivo, S., Ford, C., O'Neal, T., & Garibay, I. (2016). Do graduated university incubator firms benefit from their relationship with university incubators?. <i>The Journal of Technology Transfer</i> , 41(2), 205-219.

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