ICEX España Exportación e Inversiones

ETPO Impact Assessment Seminar

The challenge of attribution

Vienna 16-17 January 2014

DEPARTAMENTO DE EVALUACIÓN

Evaluation and attribution

"There is nothing more deceptive than an obvious fact"

Arthur Conan Doyle (1891) The adventures of Sherlock Holmes

Evaluation and attribution

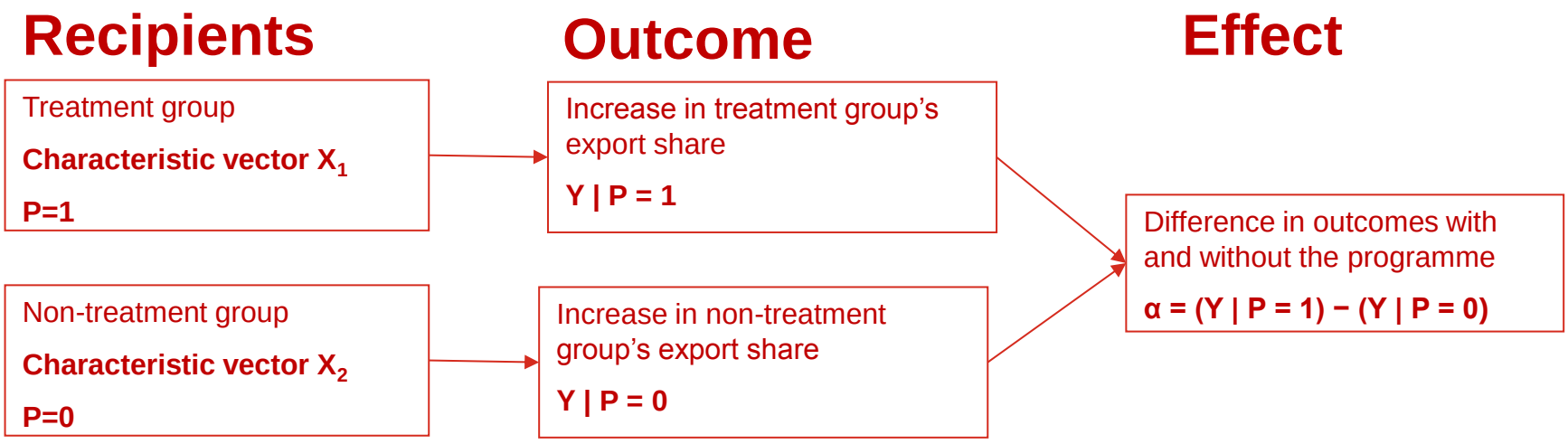
Simply put, an impact evaluation assesses the changes in the well-being of individuals that can be attributed to a particular project, programme, or policy.

This focus on attribution is the hallmark of impact evaluations. Correspondingly, the central challenge in carrying out effective impact evaluations is to identify the *causal relationship* between the project, programme, or policy and the outcomes of interest.

Therefore, an impact evaluation seeks to establish and quantify how an intervention affects the outcomes that are of interest to analysts and policy makers.

Evaluation and attribution

Basically an impact evaluation is as straightforward as follows:



Evaluation and attribution

Although cause-and-effect questions are common, *it is not a straightforward matter to establish that a relationship is causal.*

In the context of a foreign trade promotion programme, for example, simply observing that a company's exports increase after it has completed such a programme is not sufficient to establish causality.

The company's exports might have increased even if he had not taken the training course because of his own efforts, because of having found a good partner, or because of one of the myriad other factors that can affect income.

Evaluation and attribution

Impact evaluations help us to overcome the challenge of establishing causality by empirically establishing to what extent a particular program—*and that programme alone*—contributed to the change in an outcome.

To establish causality between a programme and an outcome, *we use impact evaluation methods to rule out the possibility that any factors other than the programme of interest explain the observed impact.*

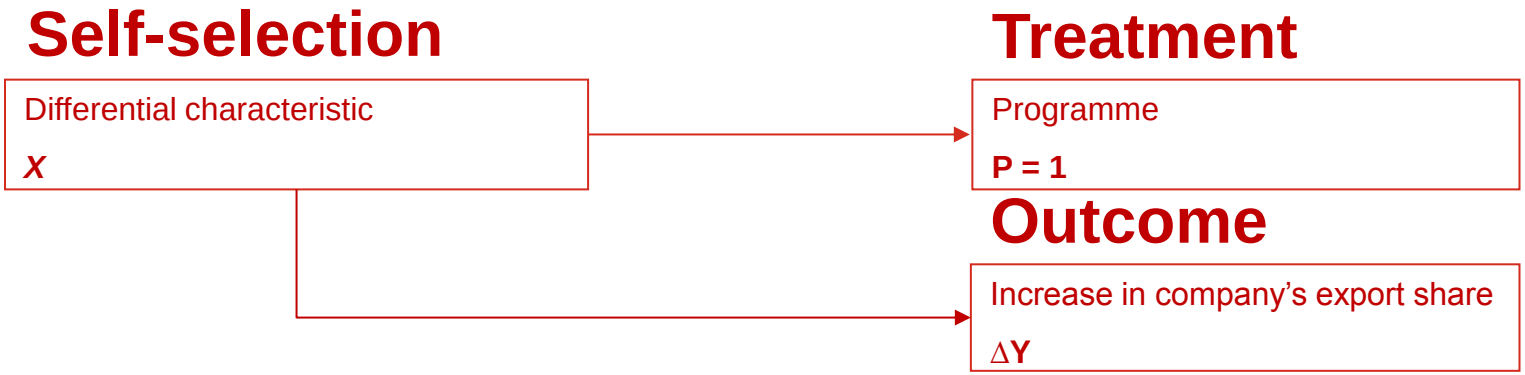
Evaluation and attribution

If there is not a robust cause-effect analysis, we can think that the relationship is the following:

If the relationship holds over all factors other than treatment/no treatment, then we can infer the desired conclusion, that is: we can attribute the outcome to the treatment.

Evaluation and attribution

However, if the relationship does not hold over treatment/no treatment, but it does over a differential company characteristic, we have:



Then the outcome is attributable to that differential characteristic alone, but not to the treatment. *It can even result the treatment isn't relevant at all!!*

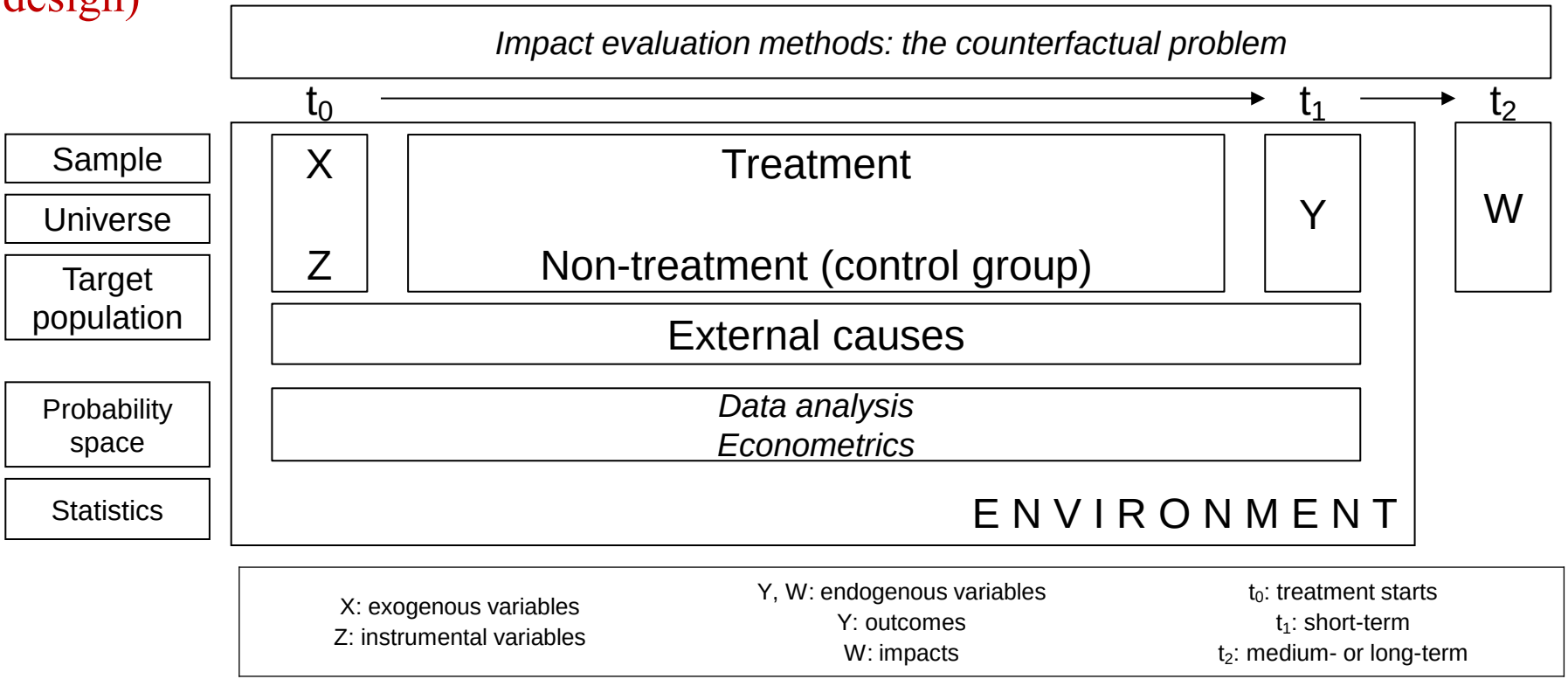
Evaluation and attribution

The answer to the basic impact evaluation question—*What is the impact or causal effect of a programme P on an outcome of interest Y?*—is given by the basic impact evaluation formula:

$$\alpha = (Y \mid P = 1) - (Y \mid P = 0).$$

This formula says that the causal impact (α) of a programme (P) on an outcome (Y) is the difference between the outcome (Y) with the programme (in other words, when $P = 1$) and the same outcome (Y) without the programme (that is, when $P = 0$).

Quasi-experiments (non-randomly assigned experimental research design)



Credible counterfactuals

Ideally, the impact (α) of a programme will be the difference in outcomes (Y) for the same individual with and without participation in the programme. The company cannot be observed simultaneously in two different states. This is called “the counterfactual problem”: How do we measure what would have happened if the other circumstance had prevailed?

The term ($Y \mid P = 0$) *represents the counterfactual*. We can think of this as *what would have happened* if a participant had not participated in the programme. In other words, the counterfactual is what the outcome (Y) would have been in the absence of a programme (P).

Credible counterfactuals

The outcome under treatment $(Y \mid P = 1)$ is simply the outcome of interest for the population that participated in the programme. The term $(Y \mid P = 0)$ cannot be directly observed for programme participants—hence, the need to fill in this missing piece of information by *estimating the counterfactual*.

To do this, we typically use *comparison groups* (sometimes called *control groups). Identifying such comparison groups is the crux of any impact evaluation,* regardless of what type of programme is being evaluated.

Simply put, without a valid estimate of the counterfactual, the impact of a programme cannot be established.

Credible counterfactuals

In the case of ICEX, we don't generally do a prior selection of the companies which are more apt for a particular programme. It's the company itself who knocks at our door in search of help. In some programs, we filter out companies that do not meet some administrative requisites, but the fact that these requisites really affect the outcomes sought by the programme is not proven.

Therefore, the first problem we generally have is *selection:* systematic differences over conditions in respondent characteristics that could also cause the observed effect (α).

Practical example: PIPE programme

Imagine we want to evaluate the impact of a time-intensive capacity-building programme for companies with no prior experience abroad.

We will easily agree that the export share evolution over time is a good variable to assess the outcome under treatment.

But we won't easily agree on the *counterfactual*.

Will any company without prior experience abroad that hasn't participated in the programme be a part of the counterfactual, that is, it's a company with no treatment in capacity-building?

Practical example: PIPE programme

If a company is absorbed by a large international group, won't it get a full capacity-building scheme?

If a company gets a contract with a distributor to be its provider, won't it get a full capacity-building scheme?

If a company embarks on a quality certification process, won't it get any capacity-building scheme?

Can we say that a company which hires a private consultant to develop its skills is not getting a full capacity-building scheme?

Practical example: PIPE programme

One more thing: imagine a company with no prior experience abroad named “Braguitas Sara”, which in fact is a small family feminine underwear retail business. Shall we consider this company to be a part of the counterfactual? I guess nobody in the room would say yes.

Therefore*, it is extremely difficult to control for all possible variables that tell us if a company can be a part of the counterfactual.*

Yet it’s necessary and not at all impossible!

Practical example: PIPE programme

Come back to the *counterfactual*.

The counterfactual is a group of individuals (companies in our case) identical to the treatment group in three ways:

- The treatment group and the comparison group must be identical in the absence of the programme.
- The treatment and comparison groups should react to the programme in the same way.
- The treatment and comparison groups cannot be differentially exposed to other interventions during the evaluation period.

Practical example: PIPE programme

In our example, we need to know characteristics (variables) of the companies in order to build a credible counterfactual:

- Corporate structure over time
- Commercial partners abroad
- Quality certifications and other certifications
- Ability to export
- Eagerness to export
- Solvency
- Etc.

Practical example: PIPE programme

Some of these data exist in administrative records, like in Commercial Registers. Some other variables are more difficult to obtain. For instance, how can you assess a given company's ability or eagerness to export?

One way to get around this problem is to have a complete list of the rejected candidates for the programme and see what has become of them afterwards, given that they are suitable to be part of the counterfactual.

Practical example: PIPE programme

As we don't have access to all the necessary data to build credible counterfactuals, we have started using a kind of *false counterfactual,* that is: *a pre-test/post-test design.*

Segmentation via correspondence and cluster analysis has also helped us a lot in getting better insight as to what kind of companies really get a profit from our programmes and what kind of companies don't.

Practical example: PIPE programme

To finish this example, let us show you the following results, corresponding to a time-intensive capacity-building programme for companies with presumably no prior experience abroad.

Here we did a segmentation of the clients for the last three promotions: a promotion refers to the group of companies that enter the programme in a given year and "graduated" from it two years afterwards.

We found the following five clusters:

PIPE programme: client segmentation

Cluster 1 (175 companies)

- Overrepresentation of beverage companies
- High, diversified export share
- Increasing sales

Cluster 2 (126 companies)

- With no prior experience
- Low, scarcely diversified export share
- Decreasing sales

Cluster 3 (134 companies)

- Some experience prior to the programme
- Export share lesser than 50% but concentrated in very few markets
- Stable or increasing sales

Cluster 4 (204 companies)

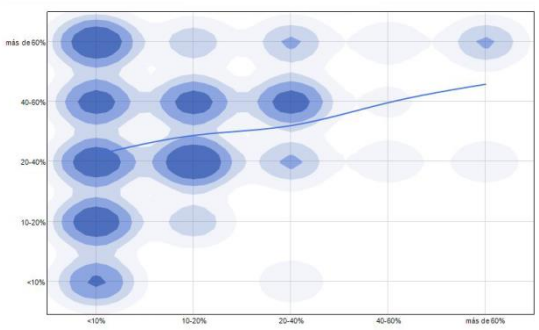
- Underrepresentation of service companies
- Medium to high experience abroad
- Sales between 2 and 6 million euros
- Medium export share, diversified
- Stable sales

Cluster 5 (108 companies)

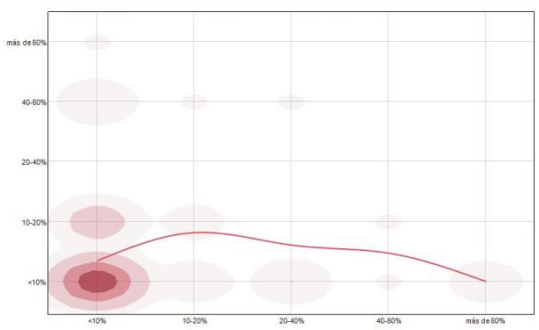
- Medium to high experience abroad
- Aware of quality certification
- Export share lesser than 20% concentrated in a few markets
- Stable or increasing sales

PIPE programme: export share evolution by cluster

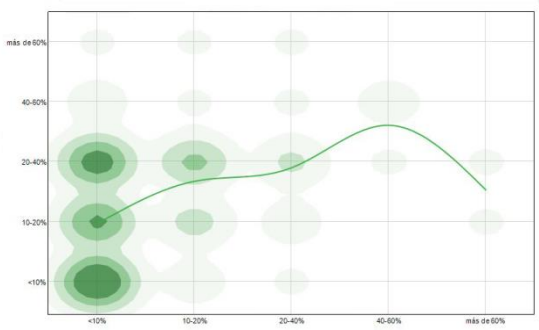
Cluster 1



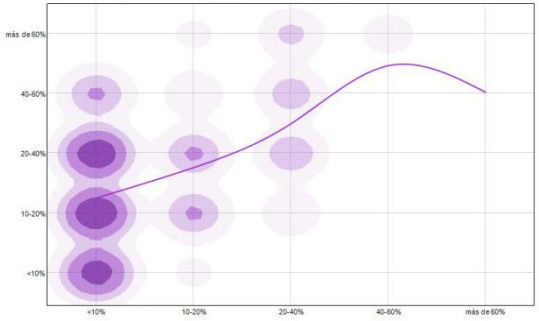
Cluster 2



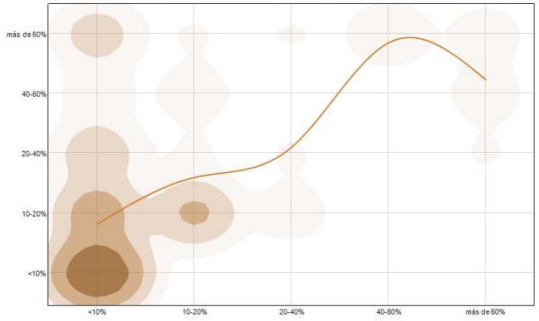
Cluster 3



Cluster 4



Cluster 5



Horizontal axis: *export share before entering the programme.*

Vertical axis: *export share at least one year after graduating from the programme*

Practical example: PIPE programme

Now, we'll top off our presentation sharing with you our findings about what aspects were related to the added value of the programme by means of a logistic regression.

In the following chart you will find that cluster 2 is the only cluster where the additionality is not related to anything but the achievement in hiring a subsidied foreign trade consultant.

Comparing with the findings of other clusters, our conclusion is that *cluster 2 companies are through with the programme but have not gone truly through the programme, that is: for them the programme didn't mean capacity building but just saving money.*

Practical example: PIPE programme

ADDITIONALITY

		ALL COMPANIES	Cluster					Phase			"Graduation" year		
			Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	P. PIPE cerrado	P. Seguimiento en curso	P. Seguimiento finalizado	2009	2010	2011
Changed behaviour	Introduction of improvements					X							
	Increased confidence		X						X				
	Expenditure on R&D									X	X		
	Creation of International Dpt												
	Culture change		X				X	X				X	
New skills	New ideas												
	Marketing strategy	X				X			X				X
	Research skills												
	Intangibles												
Commercial impact	Entry into new markets	X					X	X			X		X
	Mantain/increase customers		X		X							X	
	Impact on billing												
	Impact on personnel												
	Impact on profit/loss account												
Achievements	Diagnostics												
	Consultancy												
	Partner			X									
	Promotion	X	X						X		X	X	X
	ClubPIPE												
	Institutional awareness	X			X	X		X					

Practical example: PIPE programme

VALUE FOR MONEY

		ALL COMPANIES	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	P. PIPE cerrado	P. Seguimiento en curso	P. Seguimiento finalizado	2009	2010	2011
			Cluster					Phase			"Graduation" year		
Changed behaviour	Introduction of improvements								X			X	
	Increased confidence				X								X
	Expenditure on R&D									X			
	Creation of International Dpt									X	X		
	Culture change												
New skills	New ideas												
	Marketing strategy												
	Research skills												
	Intangibles												
Commercial impact	Entry into new markets			X									
	Mantain/increase customers	X	X				X	X					
	Impact on billing	X				X			X			X	X
	Impact on personnel							X					X
	Impact on profit/loss account										X		X
Achievements	Diagnostics	X	X	X	X			X			X	X	X
	Consultancy					X							
	Partner												
	Promotion	X	X		X	X	X	X	X	X	X	X	X
	ClubPIPE												
	Institutional awareness												

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“You measure. You know”