

International Market Segmentation: Reviews of the main components of conducting and measurement stages

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Abstract:

International activities have become a crucial step for the survival and development of companies. Exporting the company's product or externalizing the company's activities in foreign countries generates considerable outcomes. It allows to increase sales numbers, minimize costs through economies of scale, manage risks, improve the competitive and negotiation power, and improve the product quality to respond to the needs and the preferences of international customers. However, to take advantage of international activities and develop relevant strategies at the international level, companies should overcome various issues and problems that may arise in the decision-making process. International segmentation identifies the similarities and differences between countries or international customers based on specific characteristics by classifying them into homogeneous groups. The classification result can help the company to determine the group of potential consumers to target, identify and select attractive and relevant markets, transfer the experience previously gained in one market to similar ones, and choose a successful method of serving international customers. International segmentation can also help marketers implement standard marketing products or programs for homogeneous consumer segments. So, marketers can target global customers in several foreign countries or set up an international marketing mix program. Indeed, international market segmentation is necessary for decision-making and solving various international research issues and has become a tool widely used by researchers and marketers. To conduct it, some steps should be followed. These steps are the same as in domestic market segmentation, with some differences. In fact, to segment, the international market, researchers and international marketers should consider and overcome significant issues, particularly in the data used or collected. This article presents a narrative review of the main reasons, components, and tools for conducting international market segmentation. The mainly topics covered are: reasons for international segmentation, segmentation bases used, databases used and data analysis techniques mostly performed.

Keywords: International segmentation, international marketing, global marketing, Segmentation bases, Data analysis techniques.

JEL Classification: M31

Paper Type: Theoretical Research

1 Introduction

Exporting the company's product or externalizing the company's activities in foreign countries generates considerable outcomes. It allows to increase sales numbers, minimize costs through economies of scale, manage risks, improve the competitive and negotiation power, and improve the product quality to respond to the needs and the preferences of international customers (Goodman (1983); Yip (1995); Steenkamp & Ter Hofstede (2002)). Therefore, given the benefits of international activities, it becomes an important alternative for the companies' expansion and survival.

Unlike the national market, the international market is more complex because of its extensive global heterogeneity. It is a market of individuals with, for example, different cultures, values, lifestyles, purchasing power, behaviors, needs, and preferences. It is, therefore, unlikely that appropriate standardized strategies or a standardized product are offered that satisfies the entire international population. Investigating the differences or similarities between international consumers or countries is critical before deciding to operate internationally. Based on this investigation, companies could decide which markets or types of consumers to target, what kind and type of product to offer, and whether it is necessary to adopt an adapted approach, a slightly standardized approach, or a fully standardized approach for a group of countries, etc ((Helsen et al., 1993; William & Richard, 1997)).

To facilitate decision-making at the international level, several researchers used segmentation (Helsen et al. (1993)). International market segmentation is defined as the process of identifying specific segments. These are either a group of countries or individual consumers with homogeneous characteristics who are likely to respond similarly to the company's marketing mix (Hassan & Katsanis (1991), p.17).

International segmentation identifies the similarities and differences between countries or international customers based on specific characteristics by classifying them into homogeneous groups. The classification result can help the company to determine the group of potential consumers to target (Steenkamp & Ter Hofstede (2002)), identify and select attractive and relevant markets (Cavusgil et al. (2004)), transfer the experience previously gained in one market to similar ones (Sethi & Holton (1973); Ye Sheng & Mullen (2011)), and choose a successful method of serving international customers (Brooksbank (1994)). International segmentation can also help marketers implement standard marketing products or programs for homogeneous consumer segments (Verhage et al. (1989)). So, marketers can target global customers in several foreign countries (Kramer & Herbig (1994)) or set up an international marketing mix program (Sethi (1971)).

Given the indispensability and importance of international segmentation for various strategic decision problems, several authors, such as Day et al. (1988), Nachum (1994), Papadopoulos & Martiín Martín (2011), as well as Steenkamp & Ter Hofstede (2002), have confirmed its importance and usefulness in the context of international and global marketing. Given its wide application in international trade and especially in international and global marketing, we believe that more attention should be paid to this concept and should be considered from different angles. Therefore, this paper examines the main components of international market segmentation.

This article is structured as follows. First, in section 2, we present the main reasons that may lead researchers and international marketers to segment the international market. Second, we define the possible bases for international segmentation. Then, in section 4, we present the types of databases used and the possible techniques for collecting new data. Finally, section 5 presents some classification methods used for international market segmentation.

2 Reasons for international segmentation

International segmentation is viewed as essential for the development of international marketing strategies. Given the important size of the worldwide populace and its large heterogeneity, several reasons may bring companies and international marketers to segment the international market in order to identify groups of homogeneous potential consumers.

Effectively, and without pretension of completeness, it is an important tool to select attractive markets (Cavusgil et al. (2004)), to apply a global marketing program for a set of countries (Kramer & Herbig (1994); Steenkamp & Ter Hofstede (2002)), to decide which marketing mix components to standardize and which ones to differentiate for an international marketing strategy (Kreutzer (1988); Sriram & Gopalakrishna (1991); Jeannet & Hennessey (1992)), to transfer the achieved experience to other countries similar to the origin country (Ronen & Shenkar (1985); Helsen et al. (1993); Ye Sheng & Mullen (2011)), and to define the company's positioning strategy (Arabie et al. (1981); Punj & Stewart (1983)).

International segmentation is considered essential for the development of international marketing strategies. Given the considerable size of the world's population and its heterogeneity, several reasons may lead companies and marketers to segment the international market to identify groups of homogeneous potential consumers.

Without claiming to be exhaustive, it is an essential tool for selecting attractive markets (Cavusgil et al. (2004)), applying a global marketing program to several countries (Kramer & Herbig (1994); Steenkamp & Ter Hofstede (2002)), deciding which marketing mix components to standardize and which to differentiate for an international marketing strategy (Kreutzer (1988); Sriram & Gopalakrishna (1991); Jeannet & Hennessey (1992)), and transferring the insights gained to other countries similar to the country of origin (Ronen & Shenkar (1985); Helsen et al. (1993); Ye Sheng & Mullen (2011)) and determining the company's positioning strategy (Arabie et al. (1981); Punj & Stewart (1983)).

2.1 Screening and market selection

International market screening expects to accomplish an initial and primary step in order to detect strategic opportunities. In other words, it represents a primary filtration and investigation of appealing worldwide markets. The purpose of screening is to identify, with a low-cost and quickly, possibly attractive markets (Russov & Solocha (1993), p. 67). While, market selection represents a final step in the process of selecting one or more markets, based on some criteria, from a set of potentially attractive markets (Sheridan (1988), p. 15).

Market screening is therefore the step to conduct before performing a market selection. They are an important and crucial steps in the whole market selection process which can be performed based on an international segmentation. The later may be based initially, for instance, on development economic indicators to identify segment of countries having high purchasing power and thus identifying potentially attractive countries from a set of countries initially considered as attractive. Secondly, it may be based on cultural variables, to identify specific category of countries or international consumers, and thus selecting the most attractive and appropriate market (Leino et al. (2016)).

As a matter of fact, international segmentation is an important tool that allows companies to identify countries segments in order to detect attractive markets and to select the most appropriate (Cavusgil et al. (2004)).

International market screening expects to accomplish an initial and primary step to detect strategic opportunities. In other words, it represents the initial filtering and screening of attractive global markets. Screening aims to identify potentially attractive markets quickly and with little effort. On the other hand, the market selection represents the final step in selecting one or more markets based on specific criteria from a set of potentially attractive markets.

Market screening is thus a step carried out before market selection. They are both crucial steps in the overall market selection process that can be carried out by international segmentation. For market screening, the segmentation task can be performed based on economic development indicators to identify a segment of countries with high purchasing power, thus identifying potentially attractive countries from a group of countries originally considered attractive. Secondly, it can be based on cultural variables to identify a specific category of countries or international consumers and select the most attractive and suitable market.

International segmentation is an important tool that allows companies to identify countries' segments to detect attractive markets and select the most appropriate ones.

2.2 Global marketing

To implement a uniform set of global marketing decisions for a group of countries or international consumers, companies must segment the international market, which is more complex than the domestic market, given other environmental variables to consider (Sethi (1971)). Companies should, for instance, analyze and respect the culture of their target clientele, such as habits, customs, and values, before deciding to serve global clients in foreign countries (Kramer & Herbig (1994); Rawwas (2001)).

The segmentation aims to find countries or international consumer groups having similar characteristics. It helps to identify a homogeneous consumer segment for which standard marketing programs can be implemented (Verhage et al. (1989); Sriram & Gopalakrishna (1991)). Indeed, international segmentation has become a helpful tool, especially for companies adopting a global strategy, which is a strategy that transcends national borders (Steenkamp & Ter Hofstede (2002)).

2.3 International marketing mix program

The task of segmentation is to identify groups of homogeneous international consumers, which can help companies decide how to target different groups based on fully or partially differentiated strategies. In particular, it can help in deciding which marketing mix strategies to differentiate for several groups.

As segmentation is an effective tool to study the potential behavior of each segment for a particular marketing mix program (Jeannet & Hennessey (1992)), it can help define very effective standardized strategies and thereby reduce some costs (Yip (1995); Steenkamp & Ter Hofstede (2002)).

Segmentation helps to implement an international marketing mix program (Sethi (1971)). Conducting international market segmentation to gain a competitive advantage in standardization at the global level is of utmost importance (Kreutzer (1988)).

2.4 Entry decisions

Segmentation helps to select the countries where a global company can expand its business (Helsen et al. (1993)). If the product or service satisfies buyers in a particular country, the company can look for other countries similar to that country to duplicate that performance (Johansson & Moinpour (1977)). The company can transfer the gained experience in the national market to a similar foreign market (Sethi & Holton (1973); Jain (1993)).

This comparability is sought based on certain factors such as social and cultural factors to identify groups of countries that are socially and culturally similar (Gupta et al. (2002)).

International segmentation identifies groups of identical countries, which helps companies choose new markets similar to a market already targeted (Ronen & Shenkar (1985); Helsen et al. (1993); Ye Sheng & Mullen (2011)).

2.5 Positioning strategy

Doyle (1983) defines positioning strategy as the process of choosing a target segment of consumers to target and choosing a differentiated advantage that characterizes the way the company faces its competition.

Developing a competitive advantage that differentiates the company's product or service from its competitors aims to create an optimal offer so that consumers are less inclined to choose the competitors' products based on price advantages (Brooksbank (1994)). Therefore, to determine a positioning strategy, marketers should evaluate the similarities between customer perceptions of a set of attributes that characterize the product (Arabie et al. (1981)). They should also compare the company's offer with that of its competitors. Clustering technics are generally used to segment customers and choose the target, and also to segment products or brands which allows comparing the company's offer to the competitors' products to identify improvements of new products (Punj & Stewart (1983)).

3 Segmentation bases

Day et al. Day et al. (1988) is one of the first authors to confirm the usefulness and importance of international segmentation for marketers and to point out the importance of the variables chosen as a basis.

Undoubtedly, choosing the variables to use as a basis to cluster consumers or countries is one of the critical elements for the successful implementation of international segmentation (Steenkamp & Ter Hofstede (2002); Budeva & Mullen (2014)).

There is a large family of variables used as a basis for segmentation. Therefore, these variables should be relevant to the task and the problem to solve. Furthermore, the segments identified based on these variables should respect some criteria to enable proper results interpretation and successful strategic decisions.

3.1 Segmentation criteria

Selecting variables for segmentation is the first step in exploring relevant segments. Segmentation based on a single variable may be insignificant and irrelevant, resulting in wasted resources and incorrect decision-making (Baalbaki & Malhotra (1993)). It is therefore fundamental to use several variables and ensure that the segments respect the following criteria (cf, Frank et al. (1972); Fred van Raaij & Verhallen (1994); Wedel & Kamakura (2012)):

- **Measurability:**

The segments must be easily characterizable and interpretable. The variables utilized must be quantifiable and measurable. Variables that describe a country's economic level, such as per capita income, can be easily measured, while values and lifestyle variables are increasingly hard to measure.

- **Accessibility:**

The identified groups should be easy to reach and serve. Differences in regulation, distribution, and media infrastructure, for instance, imply that some segments are reachable in contrast to others.

- **Profitability:**

It refers to whether the distinguished segments are profitable to consider for marketing programs.

- **Stability:**

Stability refers to the composition of segments that must be stable over time. A change in the groups' composition means a modification of the characteristics of the observations. It will be the fact of an economic change if the variables used as a basis are economic indicators. A

change of values or culture if the variables are related to values and culture. So the marketing strategies selected for some countries may no more be effective.

- Responsive:

It refers to the fact that each segment should have a different potential response and reaction.

- Relevance:

Alludes to the capacity to formulate and implement specific programs for the identified segments. The needs and preferences of the selected groups must be compatible with the goals and the organization's capacity.

3.2 Types of variables

Samli & Hill (1998) recognized two levels of variables that can be used as a basis for international segmentation: a macro and a micro level. The first consists of objective and measurable country-level variables that can be collected and shared as secondary data, such as language, religion, geography, or economic development indicators. The second level contains subjective variables and requires the development of a methodology to measure consumer behavior, lifestyle, and attitudes (Peterson & Malhotra (2000)).

Frank et al. (1972) and Wedel & Kamakura (2012) proposed a more detailed classification. The authors distinguish two large families of variables: general and domain-specific variables (see Table 1).

Domain-specific variables are related to the problem the company faces or to its provided product (Steenkamp & Ter Hofstede (2002)). These variables are partitioned into two sub-families; observable and unobservable variables.

Observable domain-specific variables are related to the consumer's buying behavior (Wedel & Kamakura (2012)), such as consumer characteristics, purchase frequency, the rate of diffusion, the frequency of use, and the degree of brand loyalty.

Segmentation based on this type of variable aims to find segments of consumers having different responses and behaviors toward the product or the service offered. A possible segmentation result could be groups representing users, rare users, and non-users of a particular product type or brand.

Unobservable domain-specific variables are hard to measure and include domain-related psycho-graphic variables such as consumers' opinions about a product, profits or values sought by consuming a product, preferences, and attitudes in a given field or vis-a-vis a type of product. The objective of segmentation based on these variables could be, for instance, discovering consumer segments that seek different interests or values by consuming a given product or service.

General variables do not have a direct relationship with the product provided or the problem at hand and can also be divided into two subfamilies; observable and unobservable general variables (Steenkamp & Ter Hofstede (2002)).

Observable general variables are easily measurable and correspond to the geographical, socio-demographic, socio-economic, and cultural variables.

Examples of observable variables are geographic location, population size, per capita income, education level, language, and religion.

The objective of this segmentation, for instance, maybe to discover groups of countries having similar positions and thus easily simultaneously attainable, or similar socio-economic characteristics and consequently having similar buying and consuming powers.

Unobservable general variables are psycho-graphic variables that are hard to characterize and gauge. Examples of unobservable variables could be personalities, values, habits, beliefs, preferences, opinions, and consumers' lifestyles.

The objective of segmentation based on these personality variables could be to find, for instance, groups of consumers with different beliefs and values to study their preferences in terms of messages incorporated in an advertisement.

Table 1: The types of international segmentation bases

	General	Domain-Specific
Observables	Geographical position Population size Per capita income Educational level Language Religion Culture	Purchase frequency Diffusion rate Degree of fidelity Use rate ...
Non observables	Personalities Values Habits Beliefs Preferences Opinions and lifestyles ...	Opinions about a product Profits sought by consuming a product Values sought by consuming a product Preferences in a given field Attitudes in a given field ...

Source: Author

It is important to note that most research that used international segmentation used cultural variables or variables measuring levels of economic development as a basis (Mitra & Golder (2002)). However, Budeva & Mullen (2014) believe combining both types is critical to obtaining a more relevant segmentation.

4 Databases

To perform an international market segmentation task, as a matter of first importance, marketers should assess and choose which variables to use as a basis and check if the data are already available or have to be collected.

One of the approaches to obtain data related to the variables chosen is to use secondary databases, which are principally composed of macroeconomic variables (Budeva & Mullen (2014)). The other approach, more suitable for domain-specific variables, consists of developing a data collection methodology to collect the information needed, called primary data (Cleveland et al. (2011)).

4.1 Secondary databases

Secondary databases are published and effectively accessible data. These data are gathered for another issue than the explicit one the organization or the international marketer is endeavoring to examine and are available via various sources of information (e.g. UN publications, World Bank Group data, Hofstede's indices (Hofstede et al. (1990))).

Because of the accessibility of various electronic sources on the Internet and the low cost of acquisition (Czinkota & Ronkainen (1994); Warren J. Keegan (2004); Cleveland et al. (2011)), Secondary data have been broadly used for international segmentation to assess worldwide markets according to several macro-level variables (Cleveland et al. (2011)).

Craig & Douglas (2005) have assessed the best sources for secondary data. These sources may be accessible, for example, as personal files, private or public libraries, government data, or

online databases. We present in the table 2 some secondary data sources available on the Internet.

Table 2: Some secondary data sources available on the Internet

Name	Abbreviation	Missions and objectives	Published data	Website
Statistical Office of the European Communities	Eurostat	The Statistical Office Of The European Communities have as missions to frequently publish data with good quality for the benefit of the European Countries.	Publish many statistics that cover several areas such as regional statistics, economy and finance, population and social conditions, industry, trade and services, agriculture, foreign trade, transportation, environment and energy, and science and technology	http://ec.europa.eu/eurostat
Freedom House		Freedom House is an independent monitoring organization. It aims principally to defend human rights and to promote democracy around the world.	The databases provided measure the degree of freedom in the countries across the globe on the basis of two categories: political rights and civil liberty.	https://freedomhouse.org
World Bank Group	WB	The World Bank Group is an organization composed of five institutions whose objective is to reduce poverty in the world and to promote global economic development. The group offers financial and technical assistance for developing countries.	Offer through its visualization and analysis tool DataBank a set of time series data for a very diverse set of topics like indicators of development, health statistics, education statistics, and population statistics.	http://databank.worldbank.org/data/home.aspx
International Monetary Fund	IMF	The IMF is an organization composed of 189 countries. Among its objectives the promotion of a global development, monitoring the evolution of members' economic indices in order to ensure their financial stability, the elaboration and the publication of data series and controlling and monitoring the international monetary system in which the promotion of exchange between members is assured.	Publish data sets and time series corresponding to the members' economic and financial indicators.	http://www.imf.org/external/index.htm
European Central Bank	ECB	The European Central Bank supervises the European Union's banks via	The principal purpose of the published data is to control the European	http://www.ecb.europa.eu/home/html/index.en.html

		its monetary policy and provides data that are principally collected to measure the degree of which its objectives and missions are achieved.	financial system. These data correspond to several field such as the balance of payments, the financial market and the macroeconomic indicators.	
United Nations Statistics Division	UNSD	A division of the Department of Economic and Social Affairs (DESA), which has as objectives collecting, analyzing and providing to the whole world a set of data related to the entire United Nations system.	Uploads and provides to potential users through its online service a variety of databases corresponding to the United Nations system.	https://unstats.un.org/home

Source: Author

4.1.1 Evaluation of secondary databases

The secondary databases could be in the wrong form. Verifying the accuracy and equivalence of the values of the variables is problematic for correct country classification (Schlegelmilch (2016), p24). Therefore, these data must be cleaned and prepared before performing statistical analysis.

Malhotra & SPSS (2012) (p101-104) and Cateora et al. (2012) (p223-226) have established criteria to evaluate secondary databases before using them for segmentation.

- Collection methodology:

Reviewing the overall data collection methodology is a critical step in assessing data quality process. The population chosen, the sampling method, the characteristics of the participants, the sample size and representativeness, the survey instrument, and the procedures used represent some methodological aspects that must be examined to verify the quality of the data and the possibilities of using them for other problems (Malhotra & SPSS (2012); Cateora et al. (2012); Kotabe & Helsen (2010)).

- Data validity:

The accuracy and validity of the data may deteriorate because of several reasons. Sources of error include the method of data collection, the conduct of the survey, and data entry (Malhotra & SPSS (2012)). Another potential source of error for data published by developing countries is that, unlike developed countries, these countries do not have more sophisticated means of data collection and management (Kotabe & Helsen (2010)). In addition, these less developed countries may be particularly optimistic and unreliable in reporting national data (Cateora et al. (2012)).

Malhotra & SPSS (2012) point out that checking the validity of secondary data is difficult because the researcher seeking to use the data was not involved in its collection. One way presented by Malhotra & SPSS (2012) to check data validity is to search and compare data from different sources.

- Collection date:

Secondary data may contain old values because their publication may require a long time before being available for users (Malhotra & SPSS (2012)). Searching for current and updated data is essential for decision-making. Therefore, it is critical to check the data collection date (Kotabe & Helsen (2010)).

- **Collection purpose:**

The original purpose for which the data were collected should be investigated; the reasons for collecting the data may help to examine their usefulness for other purposes (Kotabe & Helsen (2010); Cateora et al. (2012)).

- **Data nature, content and comparability:**

Examining the nature of the data helps to detect if the variables of interest are well defined as desired by the researcher (Malhotra & SPSS (2012)).

Besides, each source may contain different values. Obtaining data from several sources and comparing each variable's values to investigate the reasons behind these differences is one approach to managing this issue Kotabe & Helsen (2010); Williams (1996)).

Another source of comparability problems is the lack of functional or conceptual equivalence (Kotabe & Helsen (2010); Mullen (1995)). For Kotabe & Helsen (2010), "functional equivalence refers to the degree to which similar activities or products in different countries perform similar functions". Whereas "conceptual equivalence reflects the degree to which a given concept has the same meaning in different environments". Thus, verifying that variables measuring activities, products, or concepts, are conceptually and functionally equivalent is essential.

- **Data reliability:**

Another critical question is who has collected the data (Kotabe & Helsen (2010); Cateora et al. (2012)). Verifying the reliability of secondary databases means checking the data source's credibility and reputation (Malhotra & SPSS (2012)). To find out if some reasons prompt to report erroneous data (Cateora et al. (2012)). One approach to verify the reliability of secondary data is to ask for feedback and criticism from subsequent users (Malhotra & SPSS (2012)).

4.1.2 Benefits of using secondary databases

Although secondary databases might be obtained in an inappropriate, irrelevant, or inaccurate form (Malhotra & SPSS (2012)), as long as they are collected for a different topic or problem, they are largely used for international segmentation. In fact, using secondary databases is relatively supported by the relative ease of acquisition (Cleveland et al. (2011)), the availability of many sources, and the low acquisition cost, contrary to primary data collection (Warren J. Keegan (2004), p203; (Czinkota & Ronkainen (1994), p.22)).

Malhotra & SPSS (2012) have stated that these databases might help to:

- Identify a problem,
- Define well a problem,
- Develop an approach,
- Formulate a conceptual framework of a research study (e.g., identifying of the principal variables),
- Answer some research questions and test some hypotheses,
- Interpret the results of primary data.

In fact, given the advantages of secondary databases, Malhotra & SPSS (2012) have asserted that checking the availability of secondary databases is an important step to conduct before collecting primary data. Indeed, data should be collected if the secondary databases are unavailable or unsatisfactory.

4.2 Primary databases

Sometimes, the information required for international segmentation may not be available as secondary data. To settle on imperative choices, investigating the relevant variables and choosing the data collection method must be carried out. Such data gathered by the researcher specifically for the research purpose at hand is called "primary data" (Malhotra & SPSS (2012); Cateora et al. (2012)).

These primary data can be collected according to two classes of research: qualitative or quantitative research (Malhotra & SPSS (2012); Cateora et al. (2012)).

Qualitative research usually consists of interviewing a sample of small size and unrepresentative to study deeply or conduct an exploratory study of a given research topic (Malhotra & SPSS (2012); McCall & Stone (2004); Cateora et al. (2012)). In qualitative research, generally, open questions are prepared, to which the participants are invited to answer freely. While, quantitative research involves the participation of a representative sample of a large size. In this approach, participants are, for the most part, requested to answer structured and closed questions with pre-established choices, apply statistical analysis and perform statistical inference (Malhotra & SPSS (2012); McCall & Stone (2004); Cateora et al. (2012)). The two research methods are not in opposition to one another; they are complementary to study a given research topic (Malhotra & SPSS (2012)). The joined utilization of the two sorts is extremely valuable to carry out an appropriate study (Cateora et al. (2012); McCall & Stone (2004)). Qualitative research methods, in some cases, are used as exploratory investigations before quantitatively treating a given research topic (Cateora et al. (2012)) and are sometimes conducted to deeply interpret and analyze the results of a quantitative research technique (Malhotra & SPSS (2012)).

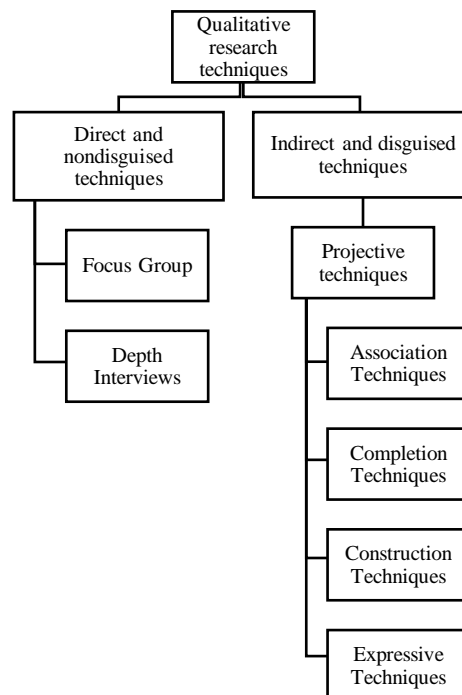
4.2.1 Qualitative research

Qualitative research methods can be classified into two groups of methods; direct techniques and indirect techniques (Malhotra & SPSS (2012)).

In direct and undisguised techniques, such as the in-depth interview and the focus group, the purpose of the study is communicated to participants or explicitly communicated through the questions asked. While, in indirect and disguised techniques, such as the projective techniques, participants ignore the study purpose (Malhotra & SPSS (2012)).

Figure 1 presents a classification of qualitative research methods.

Figure 1: Classification of the main qualitative research techniques ()



Source: Malhotra and SPSS (2012), p140-141

4.2.1.1 Focus group

A focus group is a discussion interview animated by a qualified moderator or animator in a fluid and unstructured framework (Kotabe & Helsen (2010); Malhotra & SPSS (2012)). Usually, the group is composed of eight to twelve participants (Kotabe & Helsen (2010)) selected and gathered to discuss and study, based on their own experiences (Powell & Single (1996)), a given research topic.

A focus group aims to extract information on a research topic, in which the researcher supervises and listens attentively to the discussion between individuals related to the research topic (Malhotra & SPSS (2012)).

Characteristics:

Generally, the size of a focus group varies between 8 and 12 individuals, depending on the study objective, which may require a single or several focus groups (1 to 30 groups or more). A small heterogeneous number is favorable if the study objective is to develop new unique ideas. While a large number to bring participants to focus on common points of view will be appropriate if the goal is to test or establish hypotheses on a given topic (Fern (2001)).

In some cases, to ensure a dynamic discussion for the successful completion of a focus group, the researcher should consider a number equal to or bigger than 8 participants. In other cases, considering 12 participants or more may lead to an unnatural and incoherent discussion (Malhotra & SPSS (2012)) or may make some participants focus on the information or speeches of other participants or even not participate (Fern (2001)).

The participants should be related to the study subject and have a good knowledge of the research field (Burrows & Kendall (1997)) and a minimal experience (Malhotra & SPSS (2012)) for the treatment of the subject research. In addition, they should not participate in several focus groups and should have similar socio-demographic characteristics to encourage them to discuss freely and openly (Richardson & Rabiee (2001); Gibbs (1997)).

Advantages and limits (disadvantages):

The focus group has many advantages in contrast to other methods. We can mention that the focus group:

- Represents a data collection technique that reduces the collection time and cost by interrogating multiple individuals at once (Robinson (1999)).
- Represents an effective way to collect information about a person's attitudes and opinions in front of a group of individuals (Morgan (1988)),
- It may be a data collection tool that invites participants to express their opinions spontaneously (Butler (1996)).
- Encourage shy individuals to participate (Kitzinger (1995)), as they feel liberated since they won't need to answer all the study questions (Vaughn et al. (1996)).

Despite its advantages, the focus group technique has some limitations. We can refer to that:

- Unlike other methods, the number of possible questions is limited, as the time required to have the response from the entire participants, who may require distinctive durations to reply, might be colossal (Robinson (1999)).
- The technique requires a qualified interviewer to bring all participants to give their opinions and to take an interest in the discussion. To prevent one or two participants from monopolizing the conversation, at least two people should manage the data collection process (one person for the data entry) (Robinson (1999)).
- Unlike the in-depth interview, the focus group may be inappropriate for collecting sensitive and personal information (Kitzinger (1995)). For confidentiality reasons, the participants may refuse to interact during the discussion.

- Participants may be influenced by the group's opinions, especially on sensitive research topics (Kitzinger (1995)).
- Given the low sample size, the focus group results cannot be generalized to the entire population (Robinson (1999)).

4.2.1.2 In-Depth Interview

The in-depth interview is a qualitative data collection method in which the qualified interviewer conducts unstructured interviews to extract the individuals' points of view, motivations, beliefs, and attitudes in a given research field (Boyce & Neale (2006), Malhotra & SPSS (2012)).

Characteristics:

The in-depth interview, as for the focus group, is an unstructured qualitative method of data collection, but unlike the focus group, in this method, each participant is interviewed by a qualified interviewer separately from other participants (Webb (1995); Malhotra & SPSS (2012)).

Legard et al. (2003) have distinguished four in-depth interviews characteristics:

- The in-depth interviews are structured but flexible to study a given topic in the best possible conditions and to ensure that the participant feels good.
- The in-depth interviews should be interactive. Questions asked should encourage the respondents to express themselves freely while answering questions.
- The in-depth interviews should seek depth answers from the participants. The interviewer successively asks questions to explore the reasons, feelings, and participants' opinions, understand the true meaning and encourage them to develop and clarify their answers.
- The in-depth interview should be a source of new knowledge by encouraging participants to give their real opinions about a given topic.

Use cases:

The in-depth interview is mainly practical for exploratory research. Researchers use it frequently as an initial step of the analysis process to explore and understand a given research topic (Malhotra & SPSS (2012)). Moreover, one can use in-depth interviews to:

- Obtain detailed information about personal beliefs and behaviors (Boyce & Neale (2006)),
- Keep the participant at ease and comfortable while obtaining sensitive information or discussing an embarrassing research topic (Malhotra & SPSS (2012); Boyce & Neale (2006)).

Advantages and limits (disadvantages):

Among the benefits of the in-depth interview that encourage researchers to use this method:

- The ability to provide, unlike other data collection methods, more detailed information on a given topic (Boyce & Neale (2006); Malhotra & SPSS (2012)).
- The relevance of conversations for data collection as they make participants feel more at ease and comfortable when expressing themselves freely in contrast to other methods (Boyce & Neale (2006)). Such as in focus groups, where it is probable that the opinions of some may influence the responses of others (Malhotra & SPSS (2012)).
- The possibility of analyzing the respondent's motivations and opinions (Berent (1966)).
- The possibility of being the only applicable method to obtain some sensitive and personal information (Robson & Foster (1989)).

- The advantages in terms of sampling; a non-random selection of participants allows a depth analysis and flexible control of the study (Cassell & Symon (2004)).

Despite the benefits of the in-depth interview as a qualitative data collection method, this method may have some limitations:

- The in-depth interview execution and formulation, the data recording, and the analysis and interpretation of the results may require significant time and cost (Boyce & Neale (2006); Zikmund (1997); Fern (2001); Cassell & Symon (2004)).
- The technique requires skilled interviewers and specialists in the field to extract depth and relevant data and information from the interviewees (Boyce & Neale (2006)).
- The information and the data obtained are sensitive to the interviewer's influence and quality and are hard to analyze and interpret (Greenbaum (1998); Malhotra & SPSS (2012)).
- The results of the in-depth interviews cannot be generalized to the entire population because of the non-random sampling and the low sample size (Boyce & Neale (2006)).

4.2.1.3 Projective techniques.

The main characteristic of this group of techniques is that the investigator does not communicate the study purpose to the participants (Malhotra & SPSS (2012)). The investigator presents a stimulus to the participants and observes their responses and reactions to extract the desired information. Consequently, they are brought and guided indirectly to project their beliefs, attitudes, opinions, and judgments when they react to the presented stimulus (Donoghue (2000); Guerrero et al. (2010); Vidal et al. (2013)).

Types of projective techniques:

These methods, used mainly in psychology, are widely used for qualitative data collection and can be classified into four types of techniques (Lindzey (1959); Malhotra & SPSS (2012)):

- Association techniques:

In these techniques, the investigator presents a stimulus to the participants and asks them to respond with the first word, image, or thought that comes to mind (Donoghue (2000); Steinman (2009); Vidal et al. (2013)). The most used technique is the Word Association, in which a list of words is prepared in advance and presented to the participant word by word, to which the participant associates the first word that comes to his mind (Malhotra & SPSS (2012)).

- Completion techniques:

In this technique, an incomplete stimulus, in the form of a sentence, story, or conversation, is presented to the participants who have to complete it (Donoghue (2000); Burns & Lennon (1993)). The most well-known and used techniques are; sentence Completion and Story Completion (Malhotra & SPSS (2012)). In sentence completion, the participants try to complete sentences prepared and presented by the investigator, usually with the first word that comes to mind. While in story completion, the investigator presents an incomplete story without indications on how the story should end and invites participants to think about probable ends (Malhotra & SPSS (2012)).

- Construction techniques:

The construction tests are similar to the completion techniques, but, unlike the latter, little information on the test subject is provided to the participants (Malhotra & SPSS (2012)). In this type, participants are challenged to construct a story, image, dialogue, or comments and descriptions of the presented stimulus (Burns & Lennon (1993); Donoghue (2000); Vidal et al. (2013)). Picture Response and Cartoon Tests are the most used techniques (Malhotra & SPSS (2012)). The TAT (Thematic Apperception Test) is a picture response test in which the participant tells stories suitable for the presented images. The Cartoon Test is a test in which

drawn characters are presented in some situations. The investigator asks participants to give the responses or dialogues of some characters in response to the words and behaviors of other characters.

- Expressive techniques:

In expressive technique, participants are motivated to describe and present visually or verbally the potential behaviors and feelings of others in a given situation (Burns & Lennon (1993); Donoghue (2000); Vidal et al. (2013)). Some of the most popular expressive tests are Role Playing and Third-Person Technique (Malhotra & SPSS (2012)).

In role-playing, in a given situation, participants attempt to simulate or express visually or verbally the possible behaviors of others. While the third-person technique invites participants to tell or describe the potential behaviors of others in a situation presented in advance.

Characteristics:

Use cases: Projective techniques can be used for qualitative as well as for quantitative studies and have proved their usefulness for the both types (Levy et al. (1994); Boddy (2004, 2005)), although they are widely used for qualitative market studies (Gordon & Langmaid (1988); Donoghue (2000); Boddy (2005); Steinman (2009); Vidal et al. (2013)). In fact, these techniques are used if the data cannot be obtained by a direct method or used for an exploratory study (Malhotra & SPSS (2012)).

These techniques can be a source of deeper and rich information on a given research subject (Boddy (2005)), they are useful for studying the people perceptions and behaviors (Chaplin in Sampson (1972); Donoghue (2000)), and they can be used to generate hypotheses or to verify some hypotheses established on the basis of the researcher's intuition (Donoghue (2000)).

Advantages and limits (disadvantages):

Several advantages encourage researchers to use projective techniques. The richness, accuracy, and validity of the data collected (Burns & Lennon (1993); Wagner (1995)) especially if the research topic is sensitive or personal (Malhotra & SPSS (2012)), the compatibility and applicability of these methods for research topics related to individuals' personalities, values, beliefs, feelings, attitudes, opinions and behaviors (Kassarjian (1974); Kline (1983); Webb (1992); Donoghue (2000)).

However, despite their advantages, these techniques also have some limitations. The principal limit of projective techniques is the complex nature of the data collected and the indispensability of a trained interpreter and investigator (Burns & Lennon (1993); Donoghue (2000); Malhotra & SPSS (2012)). Besides, the interpretation of the participants' answers is problematic and influenced by the interviewer's level of subjectivity (Donoghue (2000)). In addition, the application of these methods is expensive. Therefore, the samples used are of small size and are unrepresentative, which does not enable generalizing results to the entire population (Webb (1992); Donoghue (2000); Malhotra & SPSS (2012)). Moreover, sometimes it is difficult for the interviewer to lead the participants to project themselves into the situations presented. Furthermore, in some cases, as in role-playing, participants may refuse to participate in the test (Berkman & Gilson (1986); Webb (1992); Donoghue (2000); Malhotra & SPSS (2012)).

4.2.2 Quantitative research (Survey)

The collection of quantitative data in marketing research generally involves the use of surveys, observation, and experimentation techniques (McCall & Stone (2004)). However, the survey is the most common method used to collect primary data in a quantitative approach. It is a widely used data collection method in social sciences and other research fields (Neuman (2007)). The principal purpose of surveys is to collect data corresponding to a population. They are conducted, if possible, as censuses by interviewing the entire population. However, censuses

are usually challenging to carry out because of the cost and time needed (Bowling (2002); Kelley et al. (2003); Fricker (2008)). Consequently, surveys are generally based on a relatively large sample, on which representative data of the population are collected (Kotrlik & Higgins (2001); Kelley et al. (2003); Creswell (2014)). In this context, with a margin of error, the results obtained from the sample-based survey can be generalized to the entire population (Kotrlik & Higgins (2001); Kelley et al. (2003); Fricker (2008)).

The survey collect data by interrogating the population or the sample elements. Given the topic of interest, the participants are invited to answer questions about their demographic characteristics, behaviors, intentions, attitudes, motivations, and lifestyles (Neuman (2007); Creswell (2014)). These questions can be asked verbally, in writing, or in electronic form, and answers can be obtained in one of these forms (Malhotra & SPSS (2012)). Furthermore, a questionnaire or an interview is used to collect these answers in a standardized form (Kelley et al. (2003)).

Typically, a degree of standardization is imposed on the data collection process to question all the participants in a structured form. In structured surveys, a data collection instrument is prepared in advance. The questions are asked in a pre-established form to ensure a direct collection (Malhotra & SPSS (2012)).

In survey research, first of all, a data collection instrument in the form of a formal questionnaire or an interview schedule, must be designed. Afterward, a sampling plan has to be developed. Once these two tasks are accomplished, the information needed can be collected by contacting the survey participants through the distribution of the questionnaires or by conducting interviews. It should be noted that, in surveys conducted on an international level, given the cultural heterogeneity of the worldwide population, each step can lead to significant problems (Neuman (2007); Kotabe & Helsen (2010)).

4.2.2.1 Design of a collection instrument

In this step, the interviewer must develop a data collection instrument, a questionnaire, or an interview model composed of several questions to measure the study's variables of interest (Neuman (2007)). However, the questionnaire is the most popular and the most used instrument to collect primary data (Kotabe & Helsen (2010)). The conception and administration of a direct and structured questionnaire represent a critical step in the conduction process of structured direct surveys.

Thus, depending on the research purpose, the characteristics of the participants, and the survey type, the researcher should convert the study variables into questions. These questions should be clear and complete, accompanied by instructions and remarks to clarify the study's purpose (Neuman (2007)).

The questionnaire usually includes questions and themes derived from the main research question. These questions, in large part, may be closed questions with a set of alternatives from which respondents are invited to pick multiple or a single choice, specifically when the survey is conducted on a large scale, allowing respondents to easily and quickly answer questions (Neuman (2007)). In small part are open questions to avoid a loss of information due to the limited number of possible answers when using closed questions, predominantly in the case of questions related to the participants' beliefs and thoughts (Neuman (2007)).

The preparation and administration of the questionnaires depend on the formulation and the sequence of questions (Neuman (2007)). Moreover, it depends on the degree of comparability of the results of surveys conducted at the international level. Therefore, as in the context of secondary data, conceptual and functional equivalence are necessary to avoid cultural bias (Kotabe & Helsen (2010)).

Other criteria are also to be considered for international research. In particular, the correct translation of questionnaire to be presented to individuals with different native languages

(Ronen & Shenkar (1985)). And the scalar equivalence which refers to the score and to the number of alternatives for closed questions that should have the same meaning for subjects from different countries (Malhotra et al. (1996); Kotabe & Helsen (2010)).

4.2.2.2 Sampling plan

Sampling consists of selecting a subset, called a sample, from the set of observations of a target population. Thus, the sample-based results obtained will be different from the true population nature due to the sampling error (Isaac & Michael (1995); Hill (1998); Kelley et al. (2003)).

The realization of a sampling plan usually attempts to answer some specific questions (Kotabe & Helsen (2010); Creswell (2014)):

- What is the target population, and what is its size if it is determinable?
- What is the sample size minimizing the sampling error, and how to maximize the response rate?
- What is the sampling method chosen to select the sample observations?

Typically, the original sample(s) size(s) depends on the available resources, the study purpose, and the target population size and culture (Alreck & Settle (1995); Hill (1998)). Additionally, it depends on the desired statistical quality measured by the generalization error. However, given the fact that some of the selected participants may be unavailable or may refuse to participate, larger final sample(s) size(s) must be considered to take into account the non-response bias (Kotrlík & Higgins (2001); Kelley et al. (2003)).

Preparing an international sampling plan is a difficult task. Hence, the sampling frames of the target populations are needed to draw samples. Furthermore, some information is required to calculate the sample sizes (Kotabe & Helsen (2010)).

The sample size may differ from one culture to another. In general, heterogeneous cultures require a large number of subjects to take into account this heterogeneity, unlike homogeneous cultures (Malhotra et al. (1996); Kotabe & Helsen (2010)).

Once the final sample(s) size(s) is(are) calculated, the sample(s) elements have to be selected based on a given method. There are two categories of sampling methods: probabilistic and non-probabilistic sampling methods. In probabilistic methods, such as simple random sampling, systematic sampling, and stratified sampling, each sampling frame unit has a sampling probability and may be selected (Fricker (2008)). Unlike random methods, in non-probabilistic methods such as quota sampling, snowball sampling, convenience sampling, and judgment sampling, the selected observations have unknown sampling probabilities and are chosen arbitrarily (Kelley et al. (2003)).

To use statistical inference and generalize the sample-based results to the entire population, the investigator should calculate the sample size and select participants by a random sampling method. However, the absence of a rigorous framework and the presence of cultural problems and obstacles have led several researchers to use non-random methods, such as convenience sampling, especially for developing countries (Kotabe & Helsen (2010)).

4.2.2.3 Data collection

Once the researcher made the sampling plan and designed a questionnaire, choosing a data collection method is a next step to conduct. Indeed, the researcher can investigate the participants in several ways: through face-to-face interviews that can be conducted at home or by an interception in shopping centers, by sending questionnaires by post, by telephone interviews if the sampling frame is a telephone directory (McCall & Stone (2004)), or by electronic interviews conducted online or by sending the questionnaires by electronic mail (Neuman (2007); Kotabe & Helsen (2010)).

For international segmentation purposes, the choice of a distribution and a collection method of questionnaires depends on factors such as cultural norms; collection methods may be effective for some countries and ineffective for others (Kotabe & Helsen (2010)).

4.2.2.4 Advantages and limits (disadvantages)

Unlike qualitative data collection methods, the data collected is voluminous. The survey-based results for which the sample size was calculated and the participants were selected randomly can be, with a low cost, effectively generalized to the entire population. In addition, surveys have several advantages, such as:

- The degree of standardization imposed on the data collected allows all participants to be interviewed with the same instrument (Burns & Veeck (2017)).
- The reliability of the answers provided by the presence of the alternatives for the closed questions reduces the differences between the individuals surveyed (Malhotra & SPSS (2012)).
- The questionnaires and interviews are easy to administrate; the data are collected quickly and inexpensively by completing the questionnaire or by recording participants' responses during interviews (Kelley et al. (2003); Malhotra & SPSS (2012); Burns & Veeck (2017)).
- The simplicity of statistical processing of standardized data (Burns & Veeck (2017)).

Despite the advantages of the survey, this method has some limitations. Among these limitations, it can be mentioned that:

- Participants may be discouraged from honestly answering the questions, especially if they are related to sensitive or personal topics (Malhotra & SPSS (2012)),
- Participants may be unable to answer some questions due to a lack of information on the study subject (Neuman (2007); Harkness et al. (2010)),
- The presence of fixed choices for the closed questions may be a source of deterioration of the validity of some data like beliefs and feelings (Malhotra & SPSS (2012)),
- The data collected, in some cases, are neither detailed nor deep (Kelley et al. (2003)),
- The possibility of non-response bias, especially for surveys conducted using a remote method (Kelley et al. (2003)).
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5 Data analysis

The availability of statistical methods for data analysis in several data processing software has prompted international marketers to use these techniques. Thus, researchers and marketers can use all data analysis techniques to facilitate decision-making for a given research topic. But, before proceeding with data analysis, it is critical to clean and prepare the data.

Researchers and marketers may proceed with one-dimensional analyzes, in the form of statistical tables, charts, calculation of central tendency or dispersion parameters, or hypothesis testing. They may use two-dimensional analyzes to examine the dependence between two variables. They may also use multivariate analyzes, depending on the purpose of the analysis. For example, multiple regression expresses a quantitative variable as a function of other quantitative variables. Or factor analysis to reduce a large number of quantitative variables to a small number of factors.

However, clustering or supervised classification techniques have often been used for international segmentation. These techniques aim to obtain groups of homogeneous countries or consumers. In this part, we limit ourselves to presenting some of these techniques.

5.1 Supervised classification

The purpose of supervised classification methods is to define rules for quantitative or qualitative variables from a learning database called a learning sample. The goal is to predict, based on these rules, for new observations, the value of a qualitative dependent variable representing the classes and thus classify them.

5.1.1 Decision trees

Decision trees aim to predict a variable value based on other explanatory variables' values via the interactions between these variables and the variable to predict. The model is in the form of a tree consisting of decision rules obtained by learning from a database containing values of the variable to explain and the explanatory variables.

The technique includes a set of supervised learning methods that allow the modeling of all types of dependent variables. If the variable is quantitative, the purpose of the analysis is regression, for which, for instance, one can use the algorithm CART (Lawrence & Wright (2001)). On the other hand, if the variable is qualitative, the purpose of the analysis is classification, for which one can use the algorithm CHAID (Haughton & Oulabi (1997)).

The algorithm CART (Classification and Regression Trees) can be used for regression and classification. However, to use this algorithm, the dependent variable and each predictor variables must be either a binary qualitative (example: (Buy/No)) or a quantitative variable. If the dependent variable has multiple modalities, the researcher can use Algorithm C4.5 (Quinlan (2014)).

In contrast, the CHAID (Chi-square Automated Interaction Detection) algorithm is based on the chi-square test and assumes that all independent variables are qualitative. Therefore, the researcher must dichotomize the quantitative variables before applying the method if they wish to use them as explanatory variables. In addition, the method is applicable when the dependent variable is quantitative. In this context, the relationship between the dependent and independent variables is measured using Fisher's test (Ritschard (2013)).

5.1.2 Conjoint analysis and componential segmentation

The purpose of the conjoint analysis (De Luca (2014)) is to evaluate the preferences of consumers or decision-makers regarding the values of variables characterizing a product or service. The method aims to determine how every combination of the considered variables' categories influences the respondent's decision-making by estimating the effect of each variable's categories on the respondent's choice.

Componential segmentation (Green (1977); Green & DeSarbo (1979)) considers variables that describe the product or service as well as variables that describe the respondents, such as sociodemographic characteristics. Thus, respondents' choices are evaluated based on the interactions between the various combinations of variable categories describing the product and those describing the individual.

5.1.3 Artificial neural networks

Neural networks can be used for supervised and unsupervised learning and have become a widely used method for international segmentation (Wedel & Kamakura (2012)). They are represented as a system of layers imitating the functioning of nerve cells (neurons). Each layer is composed of neurons to which weights are associated and produce, via a transfer function and an input value obtained from the previous layer, an output value used as input for the neurons of the next layer. The first layer represents explanatory variables, used as bases to predict the class of a dependent variable.

5.2 Clustering

Clustering techniques are a collection of methods aiming to find groups in a population or sample so that each one is composed of similar subjects. The interpretation of the heterogeneous groups obtained is performed on the basis of the variables used in the learning process.

Researchers and marketers use these techniques extensively to perform international market segmentation as they are proposed to respond to the same type of purpose (Talibi, 2022).

5.2.1 K-means algorithm

Given its simple theoretical basis and the ease of interpretation of its results, K-means is the well-known clustering method and the most used for international segmentation (Wedel and Kamakura (2012)). It is a non-hierarchical method that aims to classify a population or a sample into groups composed of similar observations. K-means is an iterative algorithm that, starting from an initial classification, re-ranks statistical observations at each iteration by minimizing the differences between the ones belonging to the same group.

5.2.2 Hierarchical classification

The hierarchical classification methods are presented in a dendrogram form, representing the classification results based on a calculated similarity or dissimilarity measure. These techniques are divided into two types: hierarchical agglomerative (bottom-up) and hierarchical divisive clustering (top-down) (see de Mantaras & Saitia (2004); Everitt et al. (2011)). In hierarchical agglomerative clustering, each observation at first is considered as a group. In subsequent steps, these groups are merged until a single group containing all individuals emerges. In hierarchical divisive, a single group containing all observations is considered first. Then the groups are subdivided into small groups until each observation represents a group.

5.2.3 Gaussian mixture model

Mixture models (Wolfe (1963); Scott & Symons (1971); Duda et al. (2000); Fraley & Raftery (2002)) have recently received much attention in clustering because of their intuitive notion of a population composed of multiple groups. These models assume that the probability density of a population can be viewed through probabilistic modeling as a mixture of probability densities representing classes.

The Gaussian mixture model is a model-based clustering in which classification is treated in a Gaussian probability framework. It models each class as a multivariate normal distribution that is distinct from the distributions of the others. The entire population is modeled as a weighted mixture of these probability distributions.

5.2.4 Latent class model

The latent class model (Clogg (1988); Vermunt & Magidson (2002)) was introduced by Lazarsfeld & Henry (1968) for the analysis of multidimensional contingency tables. It is based on the idea that the association between categorical variables is the result of a latent categorical variable whose categories represent classes of observations.

The traditional latent class model is a model-based clustering for multivariate categorical data, where for each class the probability distribution is multinomial, and the variables are independent.

6 Conclusion

International segmentation is an essential tool that helps marketers address various research issues related to international trade. So that companies can benefit from the advantages that international activities can provide. For this reason and because the topic is cross-cultural, it

should be defined according to several cultural points of view to avoid a single definition based on one's own culture. Thus, avoiding the problem of the criterion of self-reference that occurs when the topic is international and with multiple cultures to consider.

Once the topic is clearly defined and the segmentation objectives are established, researchers or international marketers must identify the necessary information and evaluate and determine the relevant variables that will serve as the basis for the segmentation task in order to conduct the proper analysis for decision making. These variables may be general, meaning they are not directly related to the research topic or domain-specific and related to the problem at hand or the offered product. They may also be observable and measurable or unobservable and hard to measure.

Once the relevant variables are established, the next step should be to check the availability and quality of secondary databases, which can be collected quickly and cheaply from some sources. If the secondary data are unsatisfactory, the variables of interest should be transformed into questions to collect the needed primary data. The latter can be collected by different approaches. These approaches are mainly two; quantitative and qualitative approach. Surveys, however, are the quantitative method most commonly used to collect new data, as the results obtained can be generalized to the entire population.

Depending on the nature of the variables used and the purpose of the analysis, researchers or international marketers may choose to use a large set of statistical methods to classify consumers, countries, or even companies. Usually, using supervised classification and clustering techniques.

However, in the field of international and global marketing, researchers mainly use clustering methods to discover segments in a population or sample. In particular, the K-means algorithm since it has simple theoretical foundations, and its results are easy to interpret.

In general, the steps to be followed and, in particular, the methods and procedures of data collection and analysis in international market segmentation are the same as in domestic market segmentation, with some differences. In fact, to segment, the international market, researchers and international marketers should consider and overcome significant issues, particularly in the data used or collected. For instance, the alternatives for the closed questions, the conceptual and functional equivalence, the translation of the questionnaires, the relevant target population, and the sampling frame should be well evaluated when conducting international analysis.

References:

- (1). Alreck, P. L. and Settle, R. B. (1995). *The survey research handbook: Guidelines and strategies for conducting a survey*, 2e. Edition, Chicago.
- (2). Arabie, P., Carroll, J. D., DeSarbo, W., and Wind, J. (1981). Overlapping clustering: A new method for product positioning. *Journal of Marketing Research*, pages 310-317.
- (3). Baalbaki, I. B. and Malhotra, N. K. (1993). Marketing management bases for international market segmentation: an alternate look at the standardization/customization debate. *International Marketing Review*, 10(1).
- (4). Berent, P. H. (1966). Depth interview. *Journal of Advertising Research*, 6(2):32-39.
- (5). Berkman, H. W. and Gilson, C. C. (1986). *Consumer behavior: Concepts and strategies*. 3rd ed. Boston. Kent.
- (6). Boddy, C. (2004). Projective techniques in business research: are they useful. In *Proceedings of the National Business Student Research Conference*, Perth, pages 1-2.
- (7). Boddy, C. (2005). Projective techniques in market research: valueless subjectivity or insightful reality? a look at the evidence for the usefulness, reliability and validity of

- projective techniques in market research. *International Journal of Market Research*, 47(3):239-254.
- (8). Bowling, A. (2002). The principles of research. *Research methods in health: investigating and health services*, 2:133-162.
 - (9). Boyce, C. and Neale, P. (2006). *Conducting in-depth interviews: A guide for designing and conducting in-depth interviews for evaluation input*.
 - (10). Brooksbank, R. (1994). The anatomy of marketing positioning strategy. *Marketing Intelligence & Planning*, 12(4):10-14.
 - (11). Budeva, D. G. and Mullen, M. R. (2014). International market segmentation: Economics, national culture and time. *European Journal of Marketing*, 48(7-8):1209-1238.
 - (12). Burns, A. C. and Veeck, A. (2017). *Marketing research*. Pearson.
 - (13). Burns, L. D. and Lennon, S. J. (1993). Social perception: methods for measuring our perception of others. *International textile and apparel association special publication*, 5:153-159.
 - (14). Burrows, D. and Kendall, S. (1997). Focus groups: what are they and how can they be used in nursing and health care research? *Social Sciences in Health*, 3:244-253.
 - (15). Butler, S. (1996). Child protection or professional self-preservation by the baby nurses? public health nurses and child protection in Ireland. *Social Science & Medicine*, 43(3):303-314.
 - (16). Cassell, C. and Symon, G. (2004). *Essential guide to qualitative methods in organizational research*. Sage.
 - (17). Cateora, P., Gilly, M., and Graham, J. (2012). *International Marketing*. McGraw-Hill Education.
 - (18). Cavusgil, S. T., Kiyak, T., and Yeniyurt, S. (2004). Complementary approaches to preliminary foreign market opportunity assessment: Country clustering and country ranking. *Industrial Marketing Management*, 33(7):607-617.
 - (19). Cleveland, M., Papadopoulos, N., and Laroche, M. (2011). Identity, demographics, and consumer behaviors: International market segmentation across product categories. *International Marketing Review*, 28(3):244-266.
 - (20). Clogg, C. C. (1988). Latent class models for measuring. In *Latent trait and latent class models*, pages 173-205. Springer.
 - (21). Craig, C. S. and Douglas, S. P. (2005). *International marketing research*. John Wiley & Sons Chichester.
 - (22). Creswell, J. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications.
 - (23). Czinkota, M. R. and Ronkainen, I. A. (1994). Market research for your export operations: Part i-using secondary sources of research. In *International Trade Forum*, number 3, page 22. International Trade Centre.
 - (24). Day, E., Fox, R. J., and Huszagh, S. M. (1988). Segmenting the global market for industrial goods: issues and implications. *International Marketing Review*, 5(3):14-27.
 - (25). De Luca, A. (2014). Componential segmentation based conjoint analysis: the dummy-coded parametrization of the model. *Procedia Economics and Finance*, 17:175-182.
 - (26). de Mantaras, R. L. and Saitia, L. (2004). Comparing conceptual, divisive and agglomerative clustering for learning taxonomies from text. In *16th European Conference on Artificial Intelligence Conference Proceedings*, volume 110, page 435.
 - (27). Donoghue, S. (2000). Projective techniques in consumer research. *Journal of Consumer Sciences*, 28(1):47-53.
 - (28). Doyle, P. (1983). *Marketing management*. unpublished paper.

- (29). Duda, R. O., Hart, P. E., and Stork, D. G. (2000). *Pattern Classification* (2Nd Edition). Wiley-Interscience, New York, NY, USA.
- (30). Everitt, B., Landau, S., Leese, M., and Stahl, D. (2011). *Cluster Analysis*. Wiley Series in Probability and Statistics. Wiley.
- (31). Fern, E. F. (2001). *Advanced focus group research*. Sage.
- (32). Fraley, C. and Raftery, A. E. (2002). Model-based clustering, discriminant analysis, and density estimation. *Journal of the American statistical Association*, 97(458):611-631.
- (33). Frank, R. E., Massy, W., and Morrison, D. (1972). Wind. y. market segmentation.
- (34). Fred van Raaij, W. and Verhallen, T. M. (1994). Domain-specific market segmentation. *European Journal of Marketing*, 28(10):49-66.
- (35). Fricker, R. D. (2008). Sampling methods for web and e-mail surveys. *The SAGE handbook of online research methods*, pages 195-216.
- (36). Gibbs, A. (1997). Focus groups. *Social research update*, 19(8):1-8.
- (37). Goodman, L. A. (1983). The globalization of markets. *Harvard Business Review*. Yip, G. S. (1995). Total global strategy. *Englewood Cliffs*, 61(3):92-102.
- (38). Gordon, W. and Langmaid, R. (1988). *Qualitative market research: a practitioner's and buyer's guide*. Routledge.
- (39). Green, P. E. (1977). A new approach to market segmentation. *Business Horizons*, 20(1):61-73.
- (40). Green, P. E. and DeSarbo, W. S. (1979). Componential segmentation in the analysis of consumer trade-offs. *The Journal of Marketing*, pages 83-91.
- (41). Greenbaum, T. L. (1998). *The handbook for focus group research*. Sage.
- (42). Guerrero, L., Claret, A., Verbeke, W., Enderli, G., Zakowska-Biemans, S., Vanhonacker, F., Issanchou, S., Sajdakowska, M., Granli, B. S., Scalvedi, L., et al. (2010). Perception of traditional food products in six European regions using free word association. *Food quality and preference*, 21(2):225-233.
- (43). Gupta, V., Hanges, P. J., and Dorfman, P. (2002). Cultural clusters: Methodology and findings. *Journal of world business*, 37(1):11-15.
- (44). Harkness, J. A., Braun, M., Edwards, B., Johnson, T. P., Lyberg, L. E., Mohler, P. P., Pennell, B.-E., and Smith, T. W. (2010). *Survey methods in multinational, multiregional, and multicultural contexts*, volume 552. John Wiley & Sons.
- (45). Hassan, S. S. and Katsanis, L. P. (1991). Identification of global consumer segments: a behavioral framework. *Journal of International Consumer Marketing*, 3(2):11-28.
- (46). Houghton, D. and Oulabi, S. (1997). Direct marketing modeling with cart and chaid. *Journal of Direct Marketing*, 11(4):42-52.
- (47). Helsen, K., Jedidi, K., and DeSarbo, W. S. (1993). A new approach to country segmentation utilizing multinational diffusion patterns. *The Journal of marketing*, pages 60-71.
- (48). Hill, R. (1998). What sample size is enough in internet survey research.
- (49). Hofstede, G., Neuijen, B., Ohayv, D. D., and Sanders, G. (1990). Measuring organizational cultures: A qualitative and quantitative study across twenty cases. *Administrative science quarterly*, pages 286-316.
- (50). *Interpersonal Computing and Technology: An electronic journal for the 21st century*, 6(3-4):1-10.
- (51). Isaac, S. and Michael, W. B. (1995). *Handbook in research and evaluation: A collection of principles, methods, and strategies useful in the planning, design, and evaluation of studies in education and the behavioral sciences*. Edits publishers.
- (52). Jain, S. (1993). *International Marketing Management*, 4th ed. PWS-Kent Publishing Company.
- (53). Jeannet, J. and Hennessey, H. (1992). *Global Marketing Strategies*. Houghton Mifflin.

- (54). Johansson, J. K. and Moinpour, R. (1977). Objective and perceived similarity of Pacific rim countries. *Columbia Journal of World Business*, 12(4):65-76.
- (55). Kassirjian, H. H. (1974). Projective methods. *Handbook of marketing research*, pages 85-100.
- (56). Kelley, K., Clark, B., Brown, V., and Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care*, 15(3):261-266.
- (57). Kitzinger, J. (1995). Qualitative research: introducing focus groups. *Bmj*, 311(7000):299-302.
- (58). Kline, P. (1983). *Personality, measurement, and theory*. London: Hutchinson.
- (59). Kotabe, M. and Helsen, K. (2010). *Global Marketing Management*. Wiley.
- (60). Kotlik, J. and Higgins, C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information technology, learning, and performance journal*, 19(1):43-50.
- (61). Kramer, H. E. and Herbig, P. A. (1994). Cultural differences in doing business: Germany and the South. *Review of Business*, 16(2):33.
- (62). Kreutzer, R. T. (1988). Marketing-mix standardisation: an integrated approach in global marketing. *European Journal of Marketing*, 22(10):19-30.
- (63). Lawrence, R. L. and Wright, A. (2001). Rule-based classification systems using classification and regression tree (cart) analysis. *Photogrammetric engineering and remote sensing*, 67(10):1137-1142.
- (64). Lazarsfeld, P. and Henry, N. (1968). *Latent structure analysis*. Houghton, Mifflin.
- (65). Legard, R., Keegan, J., and Ward, K. (2003). In-depth interviews. *Qualitative research practice: A guide for social science students and researchers*, pages 138-169.
- (66). Leino, T. et al. (2016). International market selection and prospects for future internationalization: Case Harju Solutions Oy.
- (67). Levy, S. et al. (1994). Interpreting consumer mythology: structural approach to consumer behavior focuses on story telling. *Marketing Management*, 2(4):4-9.
- (68). Lindzey, G. (1959). On the classification of projective techniques. *Psychological Bulletin*, 56(2):158-168.
- (69). Malhotra, N. and SPSS, S. (2012). *Marketing Research: An Applied Orientation*. Pearson Education.
- (70). Malhotra, N. K., Agarwal, J., and Peterson, M. (1996). Methodological issues in cross-cultural marketing research: A state-of-the-art review. *International Marketing Review*, 13(5):7-43.
- (71). McCall, J. and Stone, M. (2004). *International strategic marketing: a European perspective*. Routledge.
- (72). Mitra, D. and Golder, P. N. (2002). Whose culture matters? Near-market knowledge and its impact on foreign market entry timing. *Journal of Marketing Research*, 39(3):350-365.
- (73). Morgan, D. L. (1988). Focus groups as qualitative research. In *Qualitative Research Methods*, number 16. Sage Publications.
- (74). Mullen, M. R. (1995). Diagnosing measurement equivalence in cross-national research. *Journal of International Business Studies*, 26(3):573-596.
- (75). Nachum, L. (1994). The choice of variables for segmentation of the international market. *International Marketing Review*, 11(3):54-67.
- (76). Neuman, W. (2007). *Basics of Social Research: Qualitative and Quantitative Approaches*. Pearson/Allyn and Bacon.

- (77). Papadopoulos, N. and Martiín Martiín, O. (2011). International market selection and segmentation: perspectives and challenges. *International Marketing Review*, 28(2):132-149.
- (78). Peterson, M. and Malhotra, N. (2000). Country segmentation based on objective quality-of-life measures. *International Marketing Review*, 17(1):56-73.
- (79). Powell, R. A. and Single, H. M. (1996). Focus groups. *International journal for quality in health care*, 8(5):499-504.
- (80). Punj, G. and Stewart, D. W. (1983). Cluster analysis in marketing research: Review and suggestions for application. *Journal of marketing research*, pages 134-148.
- (81). Quinlan, J. R. (2014). C4. 5: programs for machine learning. Elsevier.
- (82). Rawwas, M. Y. (2001). Culture, personality and morality: A typology of international consumers ethical beliefs. *International Marketing Review*, 18(2):188-211.
- (83). Richardson, C. A. and Rabiee, F. (2001). A question of access: an exploration of the factors that influence the health of young males aged 15 to 19 living in corby and their use of health care services. *Health education journal*, 60(1):3-16.
- (84). Ritschard, G. (2013). Chaid and earlier supervised tree methods. In *Contemporary issues in exploratory data mining in the behavioral sciences*, pages 70-96. Routledge.
- (85). Robinson, N. (1999). The use of focus group methodology with selected examples from sexual health research. *Journal of advanced nursing*, 29(4):905-913.
- (86). Robson, S. and Foster, A. (1989). *Qualitative research in action*. Edward Arnold.
- (87). Ronen, S. and Shenkar, O. (1985). Clustering countries on attitudinal dimensions: A review and synthesis. *Academy of management Review*, 10(3):435-454.
- (88). Russow, L. and Solocho, A. (1993). A review of the screening process within the context of the global assessment process. *Journal of Global Marketing*, 7(1):65-86.
- (89). Samli, A. C. and Hill, J. S. (1998). *Marketing Globally: Planning and Practice*. Ntc Publishing Group.
- (90). Sampson, P. (1972). Qualitative research and motivation research. *Consumer market research handbook*, 3:30.
- (91). Schlegelmilch, B. B. (2016). *Global Marketing Strategy*. Springer.
- (92). Scott, A. J. and Symons, M. J. (1971). Clustering methods based on likelihood ratio criteria. *Biometrics*, pages 387-397.
- (93). Sethi, S. P. (1971). Comparative cluster analysis for world markets. *Journal of Marketing Research*, pages 348-354.
- (94). Sethi, S. P. and Holton, R. H. (1973). Country typologies for the multinational corporation: a new basic approach. *California Management Review*, 15(3):105-118.
- (95). Sheridan, J. V. (1988). An examination of international market selection methods in small and medium-sized technology _rms. PhD thesis, Carleton University.
- (96). Sriram, V. and Gopalakrishna, P. (1991). Can advertising be standardized among similar countries? a cluster-based analysis. *International Journal of Advertising*, 10(2):137-149.
- (97). Steenkamp, J.-B. E. and Ter Hofstede, F. (2002). International market segmentation: issues and perspectives. *International journal of research in marketing*, 19(3):185-213.
- (98). Steinman, R. B. (2009). Projective techniques in consumer research. *International Bulletin of Business Administration*, 5(1):37-45.
- (99). Talibi, A. (2022). Contributions of clustering variable selection: Methods for international segmentation. *International Journal of Accounting, Finance, Auditing, Management and Economics*, 3(4-3):498-530.
- (100). Vaughn, S., Schumm, J. S., and Sinagub, J. M. (1996). *Focus group interviews in education and psychology*. Sage.

- (101). Verhage, B. J., Dahringer, L. D., and Cundiff, E. W. (1989). Will a global marketing strategy work? an energy conservation perspective. *Journal of the Academy of Marketing Science*, 17(2):129-136.
- (102). Vermunt, J. K. and Magidson, J. (2002). Latent class cluster analysis. *Applied latent class analysis*, 11:89-106.
- (103). Vidal, L., Ares, G., and Giménez, A. (2013). Projective techniques to uncover consumer perception: Application of three methodologies to ready-to-eat salads. *Food Quality and Preference*, 28(1):1-7.
- (104). Wagner, E. E. (1995). A logical analysis of projective techniques based on independence of items and latitude of response. *Perceptual and motor skills*, 81(3):868-870.
- (105). Warren J. Keegan, M. C. G. (2004). *Global Marketing*, 4th Edition. Pearson Education.
- (106). Webb, J. (1992). *Understanding & Designing Marketing Research*. Dryden Press.
- (107). Webb, J. (1995). *Understanding & Designing Marketing Research*. Dryden Press.
- (108). Wedel, M. and Kamakura, W. A. (2012). *Market segmentation: Conceptual and methodological foundations*, volume 8. Springer Science & Business Media.
- (109). William, H. and Richard, H. (1997). Key decision in international marketing: Introducing new products abroad. *Columbia J World Bus*, 12(4):15-23.
- (110). Williams, S. C. (1996). Researching markets in japan: A methodological case study. *Journal of International Marketing*, pages 87-93.
- (111). Wolfe, J. H. (1963). Object cluster analysis of social areas. PhD thesis, University of California.
- (112). Ye Sheng, S. and Mullen, M. R. (2011). A hybrid model for export market opportunity analysis. *International Marketing Review*, 28(2):163-182.
- (113). Yip, G. S. (1995). *Instructor's Manual: Total Global Strategy: Managing for Worldwide Competitive Advantage*. Prentice Hall.
- (114). Zikmund, W. G. (1997). *Exploring marketing research*. Fort Worth, Tex.: Dryden Press, 6th ed edition.