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University of Pavia

MASTER THESIS

Unfolding an unexplored relationship: Gender inequality and export diversification

-Case of Central American countries-

Alejandra Castaneda

Supervisor: Professor Jean-François Brun

GLODEP 2022

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Declaration

I, Alejandra Maria Castaneda Canas, certify that the Master Thesis "Unfolding an unexplored relationship: Gender inequality and export diversification -Case of Central American countries- "submitted to GLODEP Consortium is my own work, based on my personal research and that I have acknowledged all material and sources used in its preparation.

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Zásady pro vypracování

The research aims to study the relationship between gender gaps and export diversification in a developing economy. Additionally, it attempts to provide a focused approach by analyzing the relationship by good/service classification and by sector of the economy. The results of the research are expected to give a novel analysis framework that has not been explored so much in the mainstream trade literature but that could have important policy implications. Historically, most developing countries have specialized in commodities and primary products leading them to be vulnerable to decreases in commodity prices and, as theory suggests, their lack of diversification is associated with lower economic growth and higher volatility. On the other hand, is has been addressed that the gap between women and men employment opportunities become more equal in time. However, there is little empirical evidence that provided a deeper understanding of how export dynamism and has impacted gender equality. The present analysis will combine an economic and gender-based analysis to understand how trade policies can affect gender equality in terms of employment and its implication in economic growth.

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*Jayachandran, S. (2015). The Roots of Gender Inequality in Developing. *Annual Review of Economics*, 63-88.

*Organization for Economic Co-operation and Development. (2021). *Trade and Gender: A Framework of Analysis.* OECD publishing.

*Quy-Toan, D., A., L. A., & Claudio, R. (2015). Comparative advantage, international trade, and fertility. *Journal of Development Economics*, 48-66.

*World Trade Organization. (2020). *Woman and Trade: The Role of Trade in Promoting Gender Equality.* International Bank for Reconstruction and Development / The World Bank and the World Trade Organization.

Vedoucí diplomové práce:	**Jean-Francois Brun**
	University of Clermont Auvergne

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L.S.

_____
doc. RNDr. Martin Kubala, Ph.D.
děkan

_____
doc. RNDr. Pavel Nováček, CSc.
vedoucí katedry

V Olomouci dne 20. ledna 2022

Abstract

Throughout history, Central American countries had adopted many policies which incentivize economic growth, export diversification being one of them. Countries' policies should move from producing agricultural products to more specialized and added-value products. In this context, gender inequality appears supported by SDGs remarking an existing gap between women and men that should not be increasing anymore.

The present study explores the relationship between gender inequality and export diversification for countries part of the Central American Common Market using the Global Gender Gap Index from the World Economic Forum and the Theil Index from own calculation as measurement. To explore this relationship two analyses were performed: On the one hand descriptive, to provide accurate context and knowledge of the current situation in the countries on export diversification and gender inequality, on the other hand, an econometric analysis where non-linear relationship and bidirectionality were tested through Random Effects, Fixed effects, TOBIT model, and Generalized Spatial Panel Data Model with Random Effects from 2006 to 2019. The results suggest that there is a positive statistically significant non-linear relationship between export diversification and gender inequality. The study provided evidence that relationships among countries can be different so deeper focused studies are relevant.

Keywords: trade; gender inequality; export diversification; development

Contents

List of tables

List of figures

List of abbreviations

BDPfA:	Beijing Declaration and Platform for Action
CACM:	Central American Common Market
CEDAW:	Committee on the Elimination of Discrimination against Women
ECLAC:	Economic Commission for Latin American and the Caribbean
FDI:	Foreign Direct Investment
GAD:	Gender and Development
GDP:	Gross Domestic Product
GGGI:	Global Gender Gap Index
GII:	Gender Inequality Index
GSPRE	Generalized Spatial Panel random Effect
HDI:	Human development Index
HS	Harmonized System
ILO:	International Labour Organization
OECD:	Organization for Economic Cooperation and Development
OLS:	Ordinary Least Squares
RTA:	Regional Trade Agreements
SAP:	Structural Adjusted Programs
SDG:	Sustainable Development Goal
SIECA:	Secretariat for Central American Economic Integration
SIGI:	Social Institutions and Gender Index
UN:	United Nations
UNCTAD:	United Nations Conference on Trade and Development
UNDP:	United Nations Development Program
WAD:	Women and Development Gender and Development
WB:	World Bank
WEF:	World Economic Forum
WID:	Women in Development

Introduction

The concept of development is linked with many more phenomena than only economic growth, and realizing this has usually happened late, when the effects on the development itself take place. In the last four decades, Structural Adjustment Programs (SAP) were implemented by Central American countries and recommended by institutions such as the World Bank and International Monetary Fund where the main goal was to reach economic growth. Policies such as trade liberalization, deregulation of markets, and privatization of public enterprises and promotion of export diversification started to be implemented and countries effectively saw positive effects in their GDP, becoming more industrialized and attracting Foreign Direct Investment (FDI). Macroeconomic indicators could reveal a positive impact of these policies on the development of such countries.

However, the story is not yet completely told. Countries experienced consequences in a human development context that even now are not well accounted for and, therefore, no corrective, preventive, or supporting policies have been implemented. In this context, gender inequality has come as one of such social issues that has been gaining relevance in the last decades because there has een evidence supporting the hypothesis that the current development framework is impacting negatively women with lower salaries, sectoral discrimination, ignoring the social role that women have in a family and, as an extreme case, how the economic system itself has been developing a unbalanced relationship of power between men and women. Such disparities have been linked to gender violence which, conjunctively, impact the long-term macroeconomic development of the country itself.

Given the idea that sustained development in the long term should consider more than economic factors, this research aims to explore the relationship between one of those elements, gender equality, and one of the flagship liberal economic policies that has been adopted almost universally, promotion of export diversification. Gender equality is analyzed in parallel with export diversification, having the same relevance and importance meaning that every policy implemented to promote development should incorporate economic and gender lenses. As interrelated phenomena, one can not progress without the other and any isolated improvement could hinder the other and the progress of society, overall. In that sense, an empirical and descriptive analysis is provided to deepen the understanding of goods export dynamism and gender equality. This study explores the feasibility of such export-led development processes in terms of contribution to the gender equality indicators in the context of Central American countries. It further examines how export diversification under the backdrop of

trade opportunities could cause and impact gender indicators and the direction of the relationship between these two variables for Central American countries.

This study is organized as follows. Chapter 1 is divided into three main sections the first two review the literature on export diversification and gender inequality providing context, definitions, and key aspects to understand the main variables of this study. In the last section of the chapter, it is developed the link between both variables the section attempts to establish a relationship between export diversification and gender inequality through the review of the empirical literature. Chapter 3 presents the data, the methodology used and the limitations found. Chapter 4. Results of the descriptive and econometrical analysis will be presented. Chapter 5 will conclude and discuss some policy implications.

Chapter 1: Exploring the concept of Export Diversification and gender inequality.

Section 1: Export diversification

This section aims to provide context and definitions necessary to understand the dynamics of export diversification. Additionally, the section presents findings from literature regarding previous studies of export diversification and how it is related to economic development.

1.1 Context

The world's economic dynamic in the second half of the 20th century did not follow a uniform pattern, different regions in the world were experiencing different stages in their development. As an example, African countries just gained their independence in the earlies of the 1960s while some Latin American countries were experiencing economic crises, political instability, and social unrest (Blyde & Fernandez-Arias, 2004). The developing world was experiencing economic growth overcoming the expectations. However, many people in those countries were living in poverty without any source of nutrition and access to public services (The World Bank, 1978).

In Latin American, before the World War II era, countries were specialized in a small number of primary goods and former literature established the unbalanced exiting relationship between the terms of trade in developing countries compared with developed countries. Prebish (1950) noticed that developing countries were engaged in exports of primary goods while developed countries were the exporters of industrial goods, having as result differences in income growth. Following the same argument, Singer (1950) highlights that export industries in developing countries are for primary goods highly capital intensive with foreign imported technology implying the remarkable importance of

international trade for these developing economies. Additionally, another study shows the negative relationship between primary goods exports (e.g., agricultural, minerals, and fuels) and growth rate, where countries with these exports goods performed poorer than the countries with more specialized export offers (Sachs & Warner, 1995).

In this context, most all Latin American Countries adopted a policy of "Import Substitution Industrialization (ISI)" or "State-Led Industrialization" under SAP which took place from 1950-to 1960 supported by an international organization ECLAC. This policy establishes restrictions on imports of manufactured goods to promote domestic industries, reduce their dependence on foreign trade and achieve economic growth. Additionally, is required for countries to implement high tariff protection and without any criteria across industries which made it unrelated to any apparent economic logic, small and inefficient firms were created that served only domestic markets. The outcome of the ISI policy was only to increase the challenge of economic growth for Latin American countries (Irwin, 2020).

In the 1970s, the idea of ISI began to decline. According to the Inter-American Bank (2004) despite the improvement in income per capita, life expectancy, and years of education, it was found that Latin American countries experienced a lower growth rate than developed countries, as a result, the gap between Latin America and the developed world increased. Additionally, the were empirical studies analyzing such policies in the area and many economists started supporting other policies.

In the 1980's Latin American countries started to follow the SAPs due to the macroeconomic situation and the need for debt relief, where countries have to follow certain conditions and reforms in order to be eligible to receive aid from WB or IMF. These policies include trade liberation, a decrease in public spending, and an increase in FDI, among others (Dollar & Svensson, 2000). In parallel, ECLAC started to develop the idea of "neostructuralism" which is focused on the expansion of export markets, achieving more equal income distribution, and more rapid technological change. This concept is based on the idea to use industrial policies geared more toward promoting rather than protecting certain sectors of the economy. An important element of the strategy proposed by the neostructuralists is that it finds action in the State's action cooperating with the market and society (CEPAL, 2015).

Building on this, one of ISI's results in Latin America was the total neglect of exports, traditionally and new goods having no success to diversify the commodity composition of exports. Therefore, most policymakers have been interested in achieving diversification in developing countries. Especially

for those economies based on primary goods where international price fluctuations are a common event and macroeconomic challenges take place. In this regard, the argument pro export diversification is to reduce the dependency on external markets and at the same time the risk of external shocks which can be difficult to overcome (Giri Rahul et al., 2019).

1.2 Concept of export diversification

Export diversification is defined as the change in the composition of a country's existing product basket or export destination (Imbs & Wacziarg, 2022). It also refers to the spread of the production of goods across different sectors (Hesse, 2008). In a simpler definition, it is the changing of a country's export structure. Exports are diversified in two main areas: product and geography.

Export diversification can occur, through introducing new product lines (the extensive margin) or through exporting a more balanced mix of existing products when the distribution of trade values across existing export lines becomes more even. (the intensive margin). (International Monetary Fund, 2014) (Cadot et al., 2011). Furthermore, economic gains of export diversification can be obtained through two distinct channels: (i) diversification in export products or industries; and, (ii) diversification in export partners or markets. First, countries with greater export diversification at the early development stages are more likely to move into new products or industries (horizontal diversification) and/or into manufacturing from primary products (vertical diversification) (Lee & Zhang, 2022)

Additionally, there's another aspect regarding innovation that can exist inside-the-frontier goods (goods produced elsewhere) and on-the-frontier innovations (patents) (Hesse, 2008), building on this concept developing countries that are in the diversifying stage have a higher frequency of inside-the-frontier goods. Conversely, more advanced countries that have their exports concentrated are characterized by more on-the-frontier innovation goods (Lederman & Klinger, 2006).

In addition in some countries below the technological frontier, comparative advantage can be used in order to diversify their exports by imitating and adapting existing products (M. Agosin, 2009). Conversely, entrepreneurs face significant cost uncertainties in the production of new goods, this leads to an under-provision of investment into new activities and sub potential of the level of innovation (Hausmann & Rodrik, 2002)

1.3 Why export diversification is important.

The literature has well established the positive effects of export diversification and different development indicators in countries. The International Monetary Fund (2014) has made important findings regarding the link between income per capita at the early stages of development and the transformation in a country's production and export structure. This can include diversification into new products and trading partners as well as increases in the quality of existing products. This link is also confirmed by Hesse (2008) where is tested that countries that have diversified their exports in the past decades have on average enjoyed higher per capita income growth.

Moreover, export diversification and diversification in domestic production have led to faster economic growth in Low-Income Countries (LICs) (International Monetary Fund, 2014). Further studies demonstrate that export diversification is linked to economic growth via externalities of learning activities set off by exporting and the capability of different economic sectors towards exporting (Herzer & Nowak-Lehnmann D., 2006).

Another aspect that is highlighted about export diversification for developing countries is that managing to diversify from agriculture into manufacturing and services experience lower inflation volatility and volatile shocks to food supply play a relatively smaller role in the dynamics of inflation (International Monetary Fund, 2014). The effect of openness on volatility is shown to be negative for a significant proportion of countries with relatively diversified export baskets (Haddad et al., 2013). Also, diversified economies provide insurance against sectoral shocks, especially at the early stages of development when countries produce only a small number of export goods, such as agricultural products and natural resources (Lee & Zhang, 2022). For instance, a country can reduce the impact of external demand shocks by diversifying its export partners, without shifting into new economic sectors. LICs generally have greater potential for geographic diversification because less developed countries cannot exploit the available export markets for their products sufficiently (Brenton & Newfarmer, 2007).

It is also important to highlight the link between export diversification and the products cycle. In developing countries, the expansion of existing trade flows to existing markets with slow export growth this likely to experience a greater rate of product death than in countries with superior export performance (Brenton & Newfarmer, 2007). Export diversification is related to gains in firms' productivity since only a portion of the firms perceives benefits from trade in the form of gains in market share and profit. Less efficient firms lose both. The exposure to trade, or increases in exposure,

force the least efficient firms out of the industry (Melitz, 2003). This reallocation of economic activity across firms raises aggregate productivity and provides a nontraditional source of welfare gains from trade (Bernard et al., 2007.).

The literature has identified that one of the benefits of export diversification is the diversification of productive sectors and the increase of income per capita growth (Love, 1986; McIntyre et al., 2018). This relationship follows a nonlinear pattern, more gains from diversification are shown in the first stages of development (developing economies), where the income per capita increases, until a certain level, after sectors start to specialization again (developed economies) (Imbs & Wacziarg, 2022). Similarly, Cadot et al, (2011) found a robust hump-shaped relationship between export diversification and the level of income. Diversification occurs mostly at the extensive margin, especially early in the development process, as new export products appear and are marketed at increasingly large initial scales. This relationship does not appear to be spurious or driven only by variations in the share of primary products. As stated by Hesse (2008), the effect of export diversification on income growth is nonlinear among developing countries in contrast to advanced countries where export specialization performs better.

1.4 Experience of countries with export diversification

A country's success in export diversification growth depends fundamentally upon the types of commodity exporters and how the demand for each type evolves (Bond & Milne, 1987). As an example of this, Chile is a resource-based economy that experienced diversification in export products such as wine, salmon, and fruits. These products are part of Chile's comparative advantages and where manufacturing has been absent from their export diversification (Agosin & Bravo-Ortega, 2009). There is also evidence from 1960 when exports were more concentrated in relation to the 2000s when exports were more diversified, the real GDP per capita in Chile grew (Hesse, 2008).

Another example is Thailand, which has the highest diversification in products among ASEAN countries from 1995 to 2019 (Hong, 2021). During this period, they successfully moved from their resource-based sector (palm oil/ rubber) to manufacturing exports such as clothing and electronics, and as a result, the real GDP per capita has grown over the years (Hesse, 2008).

1.5 Critiques- challenges of export diversification policies

Countries tend to specialize once they have reached a certain level of income per capita. This suggests that the correlation between income per capita and export diversification depends on the level of

diversification (Imbs & Wacziarg, 2022). Additionally, government policies have been a key driver in the success of diversification, coordination, political stability, and information externalities (Hesse, 2008).

Moreover, developing countries are gaining improvements in export diversification due to the Foreign Direct Investment (FDI), which helps countries through diversification and sophistication and for the possibility of successful capabilities transferred to and built by local firms. (Iwamoto & Nabeshima, 2012). Therefore, if a country is not able to attract this kind of investment it will be harder to expand its export basket.

Nevertheless, in certain countries, export diversification has happened during times of severe structural changes and this suggests that a policy of deliberate diversification may not be as desirable as the diversification process that is a result of a change in currency valuation and trade liberalization (Gutiérrez de Piñeres & Ferrantino, 1995).

Section 2: Gender Inequality.

This section reviews the context and definitions to understand Gender Inequality. Additionally, it presents findings from literature regarding previous studies of these variables individually.

2.1 Context

As the world has been developing (e.g economic growth, world trade), social norms and power relationships have been evolving and changing impacting the outcomes and opportunities in groups of men and women. As an example, according to UN Women (2021), a gap in poverty levels among boys in girls exists, specifically, in Latin America and the Caribbean, the gap equates to four more girls for every 100 boys in households surviving on slightly more than $5.50 a day. Therefore, economic implications will be evidenced due to this inequality affecting the possible outcomes in development that a country may have.

Recently, economic theory has included a gender lens analysis in studies and public policies. More multilateral and development agencies have supported this vision and the studies have shown there's so much research to do on the gender and economic relationships. In this context, literature is established theoretical approaches to understanding gender inequality, such as modernization-neoclassical, Women in Development (WID), Women and Development (WAD), and Gender and Development (GAD).

Modernization-neoclassical approach has its roots in neoclassical theory, where gender inequalities will decline with economic growth (Blackwell, 2018) From this perspective, the process of economic growth, through the opportunities and constraints created by the expansion of markets, can be expected to undermine the inequalities that result from discriminatory practices. For instance, the assumption is often made that economic growth provides one of the most effective mechanisms for narrowing existing gaps between men and women. However in practice, this has not being true and most of the policies that followed this approach only made the gap wider (Morally, 2020).

WID approach is defined as the integration of women into global processes of economic, political, and social growth and change (Forsythe et al., 2000). This approach was developed by Ester Boserup (1970). According to the author, in the first stages of development, the gap between men and women increases, and in the later stages the gap become narrow. It was stated that the distribution of political power and the decolonization process promotes equality. Boserup was the first one to recognize other elements that are affecting the gap between men and women such as cultural traditions and trade. In the view of both Boserup and Kuznets, power relations shift in the early stages of development in such a manner that they result in greater inequality, but they become subsequently altered in ways that eventually act to reduce inequality as development increases. One of the main criticisms of this approach is that is focused only on woman's productivity rather than woman's reproductive side, aspects such as hygiene, literacy, or child care (Rathgeber, 1989).

WAD approach states that women always have been part of development processes, they did not suddenly appear as the result of the new policies and intervention strategies of a few scholars and agencies (Rathgeber, 1989). One of the main differences with WID is that the WAD perspective focuses on the relationship between women and development processes not only on the integration of women in development.

WAD mainly tries to recognize inequality among groups, meaning that this inequality can come from other kinds of relationships such as the current economic system and differences in income. Theoretically, WAD considers patriarchy, differing modes of production, and women's subordination and oppression. Additionally, WAD recognizes that designed intervention strategies are better tools to reach equality rather than more fundamental shifts in the social relations of gender. (Forsythe et al., 2000) and seeks to understand the place and the consequences of gender relations, understanding broadly the entirety of norms, practices, and social institutions governing gender inequality.

Both WID and WAD share a critique that is only focused on the productive sector at the expense of the reproductive side of women's work and lives because they concentrate the focus on the development of economic income-earning activities without considering social reproduction, with economic value. The labor invested in its family maintenance, including childbearing and rearing, housework, care of the ill and elderly, etc. in this approach is not seen as part of development.

GAD, on the other hand, is the newest approach it focuses on the nature of women's contribution within the context of work done both inside and outside the household, including non-commodity production, and rejects the public/private dichotomy which commonly has been used as a mechanism to undervalue family and household maintenance work performed by women (Rathgeber, 1989). GAD also considers the biological differences in men and women and how social roles, reproductive roles, and economic roles are linked to gender inequalities of masculinity and femininity (Forsythe et al., 2000).

2.2 Definitions

The World Bank in the World Development Report (2012) defines gender as the social, behavioral, and cultural attributes, expectations, and norms associated with being a woman or a man. Similarly, UNCTAD (2016) defines gender as a system of norms and practices which gives certain roles to men and women, at having these pre-constructed roles women are already in a lower position in the society compared to men, and the power relationship in a social, economic and politic sphere is already established.

Referring to gender equality the World Bank (2012) explains that gender inequality can be measured as equality of opportunities or outcomes due to the three facts that should be considered in its analysis: the welfare of women and men living in the same household is difficult to measure separately, preferences, needs, and constraints can differ systematically between men and women, reflecting both biological factors and "learned" social behaviors and gender cuts across distinctions of income and class.

Faming gender equality as equality of opportunity allows distinguishing between inequalities from circumstances beyond the control of individuals and those that stem from differences in preferences and choices. In this case, if men and women differ, on average, in attitudes, preferences, and choices, then not all observed differences in outcomes can be attributed to differences in opportunities (The World Bank, 2012). In the case of equality of outcomes, preferences and attitudes are the result of

culture and environment that lead men and women to internalize social norms and expectations. Persistent differences in power and status between men and women can become internalized in aspirations, behaviors, and preferences that perpetuate the inequalities (Terryl Blackwell, 2018).

The World Bank (2012) defines gender equality as how roles in society determine how women and men relate to each other and the resulting differences in power relationships between them. Following this concept, UNCTAD (2016) states that gender inequality is based on gender misconceptions that stop women from having the same economic, social, and political opportunities as men. Additionally, recognized that gender equality is a matter of human rights. Therefore, they define gender inequality as concrete manifestations of gender bias that create disadvantages for women.

2.3 Multilateral instruments related to gender inequality

- SGD 5: Achieving gender equality and empowering all women and girls became one of the Sustainable Development Goals adopted by the UN members. Previously, in the Millenium Development Goals, gender inequality was just intrinsically included. However, today targets are set such as eliminating discrimination, violence, and unpaid work is considered among targets.

- The Committee on the Elimination of Discrimination against Women (CEDAW) is, forum where Member States have to report measures adopted that may affect or have any consequences relating to the rights that the committee follows and the progress in upholding and supporting women's rights.

- Beijing Declaration and Platform for Action (BDPfA) signed by 189 countries in the fourth conference for women in 995, offers a roadmap and policy framework for the countries on how to reach gender equality.

- Regional Trade Agreements (RTA) is an instrument where parties can define the conditions under which commercial preferences will take effect, on that regard more countries are including a chapter related to gender and trade as part of the commitments made from the countries. As an example, Canada and Chile's RTA, where reaffirm their commitment to the pursuit of SDG 5, cooperation activities, the establishment of a gender committee, and others.

2.4 Why Gender inequality is important.

Gender inequality can be present in many aspects of human life. Literature has a special focus on health, education, and labor market impacts.

2.4.1 Health

There is a variety of measures on woman's health that can be studied that are affected by gender inequality and, therefore, impact economic development. A key manifestation of gender inequalities in the traditional medical system is the access and utilization of health services such as maternal care, family planning, and safe abortion, which is the reason why measures in gender inequality are usually designed to capture that impact (Okojie CE, 1994). For instance, high adolescent fertility substantially reduces the number of years for investment in human capital in form of years of formal education and teenage work experience, therefore, the total income of the young mother will be negatively affected in the long term together with economic well-being and their families(Smock, 1994). Through reductions in human capital, teenage childbearing has a significant effect on market wages at age 25, although, empirical evidence suggest that public policies addressing the issue are likely to have positive effects on the economic well-being of many young mothers. (Klepinger et al., 1999). Additionally, teenage childbearing is associated with less schooling, lower income, increased poverty, and economic dependency (Trussell, 2022). According to Duflo (2012), there is a link between economic development to potentially improve the relative welfare of women: by reducing the chance that they die at each childbirth and because economic development goes hand in hand with a reduction in fertility and improved healthcare services.

Another common measure of gender inequality in woman's health is maternal mortality for which the evidence in the literature shows that it has a negative impact on inclusive growth in some countries (Matthew et al., 2020). Moreover, age at first birth is a risk factor for maternal mortality because very young mothers are more likely to die or have complications in childbirth. However, through economic growth, fertility decreases, and income, education and age at first birth increase. (Duflo, 2012).

2.4.2 Education

Gender inequality in education pulls down economic growth directly by lowering average human capital and productivity, and indirectly through its impact on investment and population growth (Klasen, 2002). Dollar & Gatti (1999) suggest that gender inequality reduces the average amount of human capital in a society and thus harms economic performance. It does so by artificially restricting

the pool of talent from which to draw for education, thereby excluding highly qualified girls (and taking less qualified boys instead). In addition, a study performed by Fobes (2000) follows a model to study the relationship between inequality and economic growth in which the specification of the model was female and male education therefore shows that gender inequality in education has a negative effect on economic growth.

A second argument relates to the externalities of female education. Promoting female education is known to reduce fertility levels, reduce child mortality levels, and promote the education of the next generation, each of them which has been understood to has a positive impact on economic growth (Klasen, 2002). Gender equality in education should be promoted with bidirectional benefit with development strategies since the gains are many, not only in education indicators, but also in advances in economic prosperity and efficiency, and in promoting other essential human development goals (Pande et al., 2005).

A third argument relates to international competitiveness. Many East Asian and Latin American countries have been able to be competitive in world markets through the use of women-intensive export-oriented manufacturing industries. For such competitive export industries to emerge and grow, women need to be educated and there must be no barrier to their employment in such sectors. Gender inequality in education and employment would reduce the ability of countries to capitalize on these opportunities (Busse & Spielmann, 2006; UNCTAD, 2021)

Another important finding not related to economic productivity is that rising levels of education improve women's productivity at a household level which in turn can increase family health, child survival, and the investment in children's human capital. The social benefits of women's education range from fostering economic growth to extending the average life expectancy in the population, to improving the functioning of political processes (Hill & King, 1995).

Gender inequality is at the same time impacted by changes in per capita income which may lead to improvements in different measures, suggesting that there may be market failures hindering investment in girls in developing countries. There is strong evidence that income per capita leads to improvements in gender inequality in secondary education where the relationship is given by the investment in secondary education that rises national income and higher income leads to more gender equality (Dollar & Gatti, 1999).

2.4.3 Labor Market

Theoretical papers identify several channels through which gender inequality may decrease as countries develop. First, as countries develop, fertility rates fall, and as a result, female labor force participation rises. Becker and Lewis (1973) assume that the income effect on a household's fertility and desire to have more children is reduced by the substitution effect which motivates households to have fewer children. This implies there is a threshold of income per capita above which a country's fertility starts to decrease. This decline in fertility facilitates the incorporation of women into the labor market and therefore helps reduce the gender gap in labor force participation (Becker 1985).

It is reported by the International Labor Organization (2017) that women's employment has increased in the last few years. Some studies attribute this boost in woman's employment due to the openness to the service sector in which women are likely to be more productive (Akbulut, 2011; England, 2005). Additionally, economic losses are shown in countries where gender inequality in the labor market persists in the form of lower productivity and differentiated earnings as a result of discrimination against women. Per World Bank (2012), if women and men in the agricultural sector have the same resources and access to them, the output in developing countries could increase between 2.5 to 4 percent. It also argues that women are not less productive than men and what causes a difference between men and women is gender segregation, differences in time use, access to productive inputs, and differences stemming from the market and institutional failures, in the different sectors of the economy which affect the actual outcomes of the economy.

Section 3: Links between Export Diversification and Gender Inequality

As the previous sections discuss, export diversification and gender inequality individually may have impact on economic and human development. However, is not stated the direct relationship between them. To complete the previous idea, the following section aims to present previous studies trying to link these two concepts. Rather than have a clear understanding of how export diversification and gender inequality are related, the link between these two phenomena is complex and explorations in this matter are scant. This study attempts to explore the interaction between these two variables in the context of Central American countries, filling a gap in the literature since both variables have taken a mainstream in public policies individually ignoring the possible outcomes and the effective resources allocation to improve both.

A Study on the effect of gender inequality on export diversification argue that gender inequality in India, a developing country, reduces trade diversification directly through gender gaps in labor opportunity and indirectly by impeding economic growth which adversely impacts trade diversification having a bidirectional relationship (Ghosh, 2021). The effect of this on gender inequality according to Kazandjian et al., (2019) is that both outcomes and opportunities negatively impact export diversification in low-income and developing countries. The study shows that gender inequalities in opportunities, such as education, and lower female labor force participation, are negatively associated with diversification.

From the opposite perspective (the impact of export diversification on gender inequality), UNCTAD (2016) has linked trade openness (one relationship that is well established in the literature is the one between trade openness and export diversification) and gender inequality through changes in the structure of a country's matrix of production, where the export-producing sector expect to expand gender gaps, and other sectors sensitive to import competition expect to contract it. In a similar sense, UNCTAD (2014) establishes that through export diversification the expansion or contraction of a specific export sector could occur. Workers employed in an expanding sector potentially could experience a positive shock in their income. Conversely, the total opposite will happen with the ones working in a sector that is contracting. This is relevant in the context of a female-labor intensive sector where an impact could be the exclusion and displacement of these women from the traditional labor market. Regarding outcomes, with more traditional female labor force participation, educational disparities between girls and boys could decrease (Pande et al., 2005). Another aspect that should be considered when the export-producing sector expects to expand or contract is the demand for women's labor in the productive work which is important in diminishing gender inequality in the labor market, where sectors with a female over-representation can be more affected (Cotter et al., 1998).

Additionally, according to UNCTAD (2016), the changes in the export-producing sector through trade openness can reduce tariff revenues and gender-specific effects could take place on the size and composition of public spending (e.g. availability of public resources for infrastructure and social programs), this is confirmed by International Monetary Fund (2015) suggesting that if export-producing sector is reduced, governments are forced to increase support for those displaced workers, having fewer resources for social expenditure having long term effects in gender inequality. One of the forms of public expenditure which have more impact on gender inequality is education, a fact that

should be considered for governments at the moment to increase or decrease public expenditure. (Vereinte Nationen, 2015).

Chapter 2: Data and Methodology

2.1 Research framework

The following research attempts to provide a comprehensive, accurate and in-context results by exploring quantitatively the the relationship between export diversification and gender inequality. In that regard, the analysis is divided into two parts: descriptive and inferential. The first, presents the current situation of each country for export diversification and gender inequality. The second organizes multiple results from statistic models attempting to model the relationship between these concepts.

Central American countries part of the CACM were chosen as the objects of study (Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama). For the descriptive analysis, the period analyzed is from 2000 to 2019, larger series of data will be presented when possible with the aim to have a better understanding of a longer term context. Additionally, the scope of the present work excludes the analysis of the service sector and market diversification. Therefore, the main and the only focus that will be explored is trade in goods.

As was stated in Sections 1 and 2, export diversification and gender inequality are complex and abstract concepts, where quantification can be done through multiple measurements and multiple criteria. In the present study, the Theil index is the measure chosen for export diversification and Global Gender Gap Index (GGGI) for gender inequality. Other measurements were also tested but disregarded due to several reasons. For instance, the Gini Index and the Herfindahl-Hirschman index were also tested for export diversification, however, they were highly correlated to the Theil index, which has been more common in the export diversification literature. Regarding gender inequality, there are few international measures available for comparison between countries or that have enough historical data. The UNDP Gender Inequality Index is a popular one, but it has been developed just recently with data unavailable before 2011. Since the goal of this research is to explore econometric techniques that could model expor diversification and gender inequality at the country level, longer time series were needed. The following section explains in detail the measurements used.

2.2 Quantification of the relevant variables: Export diversification and gender inequality

- Export diversification

For this study, Theil Index will be used as a measure of export concentration. This measure follows Cadot et al., (2011) methodology which is also used to measure export diversification in other studies (Ghosh, 2021; International Monetary Fund, 2014; Kazandjian et al., 2019; Osakwe & Kilolo, 2018). The index can capture the extensive and intensive margin of diversification. The values this index can take from zero to infinity, lower values of the Theil index indicate higher levels of export product diversification:

The index (Theil, 1972) is given by:

$$T = \frac{1}{N} \sum_{k=1}^{n} \frac{x_k}{\mu} . \ln\left(\frac{x_k}{\mu}\right), \quad with \ \mu = \frac{1}{N} \sum_{k=1}^{n} x_k$$

Where:

T = Theil Index

N = Total number of products exported

k = Product indicator

μ = Average Export Value

The index can be decomposed into a between-group (extensive margin) and a within component (intensive margin) explained in Section 1. Nevertheless, this research addresses export diversification as a whole, and does not explore each component of it since it is out of the scope of the study.

$$T = \frac{1}{N} \sum_{i}^{n} \underbrace{\frac{Export\ Value}{Average\ Export\ Value}} . \ln \underbrace{\frac{Export\ Value}{Average\ Export\ Value}}$$

$$\qquad\qquad Extensive\ margin \qquad Intensive\ margin$$

- Gender Inequality

As it was stated in Section 2 gender inequality affects different aspects of the social sphere, such as education, health, and empowerment. With the aim to have a comprehensive idea of how gender inequality has an effect in a specific sphere a composite index was elected. The Global Gender Gap Index (GGGP) designed and estimated by the World Economic Forum (WEF) was selected as a measure of gender inequality for this reearch. This index was selected among other composite indicators as Gender Inequality Index (GII) used by UNDP and Social Institutions and Gender Index (SIGI) compiled by the Organization for Economic Cooperation and Development (OECD), due to the focus on the gap's measure in outcomes and on gender inequality instead of women's empowerment, and its division into four main areas (health, education, economy, and politics). Additionally, other advantages of working with this index such as the availability of temporal series and updated data and its feasibility for comparison between countries. Finally, it was also found in extensive literature as an accurate measure of gender inequality (Kim, Sangyoon & Seo, Jonggook, 2017; Seung-Ah Choe et al., 2016; Sharon Mastracci, 2017)

Regarding the structure of the index, it considers 14 indicators, building 4 subindexes: Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment. The composition of every subindex is illustrated in Annex 1 where the indicators are classified and explained accordingly.

For the computation of the GGGP index four steps are necessary according to the WEF methodology:

1. The dataset format must be female-to-male ratios, all the raw data should be converted to this format.

2. Indicators are truncated to be considered 1, meaning equal numbers for women and men. Some indicators follow other criteria (e.g., sex ratio and healthy life expectancy)

3. Calculation of subindex scores as the weighted average of each indicator. A process of normalization through equalization is necessary. Each indicator is weighted, so the relative impact to each subindex will be the same. The highest score is 1 (gender parity) and the lowest score is 0 (imparity) for each subindex.

4. Compute a simple average for the subindexes. Similarly, the highest score is 1 (gender parity) and the lowest score is 0 (imparity).

2.3 Data

Descriptive analysis

The descriptive analysis is structured into three main sections: export diversification aggregate analysis, gender inequality aggregate analysis, and country profiles.

1. Export diversification aggregate analysis: The goal of this section is to provide an idea of the trends regarding the export situation in CACM countries. Indicators such as share of GDP by economic sector and export evolution in current US$ were retrieved from UNCTADStat both from 1980 to 2020. The Theil index was an own elaboration based on SIECA data using the 6-digit HS product-level data on exports of each country from 2006 to 2020.

2. Gender inequality aggregate analysis: The indicators described in this section were chosen according to the literature review in Section 2. Indicators such as general employment and desegregated by gender were retrieved from ILOStat from 2005 to 2019. Mean years of education and adolescent fertility rate were taken from UNDP Data.

3. Country profiles: This section is divided into three parts: The first part is General information: Provides a general overview of the country's situation, and at the same time it will provide important information which provides context and insights to support the results. Data such as GDP, GDP per capita, and population were taken from the WB, as the share of exports worldwide and within the CACM the data was retrieved from UNCTAD Stat and the HDI index from UNDP Data. In this section, the most updated data for each country was used.

   The second part is a descriptive export diversification analysis yearly of 1994, 2000, 2010, and 2020. The main three export products were computed by the author and the goal is to check the changes (if any) in the export basket composition and how the share of exports from the total value of these products has changed in time. This data was retrieved from SIECA data using the 6-digit HS product-level data on exports of each country. In some cases, to support findings, a Trade map database was also used.

In the third part, a general context for each country on gender inequality is provided. The information was retrieved from the CEDAW reports in UN Treaty Body Database for each country. For the GGGI, data from WEF was retrieved for 2020 in each indicator.

Inferential analysis:

For the statistical modelling, the research uses balanced panel data for every country from 2006 to 2019 with 90 observations,

Relevant variables:

- Export diversification: will be measured with Theil Index computed as chapter 4.3 explains with the data specified in chapter 4.4.

- Gender inequality: Will be measured through GGGI, information regarding computation in data follows what is explained in sections 4.3 and 4.4.

Control variables:

Name	Description	Source
GGGI	Global Gender Index (dep variable)	WEF
Theil	Theil Index	Own computation, SIECAdata
inf_cp	Inflation, consumer prices (annual %)	World Bank
urban_pop	Urban population (% of total population)	World Bank/GenderStats
exchange_rate	official exchange rate (lcu per us$, period average)-value	World Bank/GenderStats
selfe_tot	self-employed, total (% of total employment)-percent	World Bank/GenderStats
lgdp	log gdp per capita, ppp (current international $)-value	World Bank
unem_tot	unemployment, total (% of total labor force) (modeled ilo estimate) (wdi)-value	World Bank
women	% of women population form the total	World Bank
fert_rate	Fertility rate, total (births per woman)	World Bank

Table 1: List of control variables

2.4 Control Variables

In accordance with the literature review in Chapter 1, control variables are included in the econometrical analysis to be evaluated conjunctively with the two main variables. In this case, the literature suggests controlling for misspecification bias.

Building on that, the control variables can be classified by the structural characteristics of each country and cyclical factors:

- Structural characteristics: variables as log GDP per capita, urban population. As the literature suggests these factors can impact the capacity of each country to diversify (Kazandjian et al., 2019).

- Cyclical factors: Variables such as inflation, FDI, and exchange rate, can impact diversification over time(Ghosh, 2021).

- Other factors: Literature also suggests that self-employment as it is a variable that could also affect female employment participation(Cotter et al., 1998), and information and communication technologies which can make a difference in the diversification of developing new industries as it was explained in Chapter 2.

2.5 Econometric methodology

Previous studies discuss the possible relationship between export diversification and gender inequality without agreement or a conclusive direction for the relationship of such concepts. There's evidence that they could have a bidirectional impact depending on the level of diversification (Ghosh, 2021). As the aim of this research is to explore that relationship, the econometric analysis took diverse steps and is supported by many tests which intend to provide robust results. Therefore, several aspects are addressed, such as non-linearity, truncation of the dependent variable (GGGI) and the results for different models for panel data as the literature suggests.

In order to explore the relationship between the variables, this study starts from the hypothesis that gender inequality is affected by export diversification over time which is based on the tests provided by Ghosh (2021). To initially address this, GGGI is set as the independent variable and the Theil index as the explanatory. The modeling process begins with the the traditional statistical methods for panel

data (between, random and fixed effects for countries) in a basic model considering only the two relevant variables to check the basic correlation between them (Model 1).

$$gggi = \beta_0 + \beta_1 theil + u \tag{1}$$

The between effects is presented as a benchmark since it is based on the pooled ordinary least square (OLS) estimator, which yields biased results for focues cross-country analysis. The random-effects (RE) and fixed-effects (FE) results are presented as a more viable model for this type of phenomena. However, since the assumptions of the RE estimator are more restrictive (the method omits any observations or time dependency) and the FE recognizes idiosyncrasies of the unit of analysis, in this case, the countries, it is expected to be the most appropriate theoretically (Schmidheiny, 2021). Nevertheless, the Hausman test iss provided to check which method outperformed between the fixed and random effects.

As it was stated in Section 3. There is a possibility of a nonlinear relationship between these two variables. To address that, the square of the explanatory variable (theil) ws added to the original set of models, which again were estimated by the three methods and the Hausman tests was also performed for the FE and RE estimators (Model 2).

$$gggi = \beta_0 + \beta_1 theil + \beta_2 theil^2 + u \tag{2}$$

Following this, in the next step, the control variables mentioned in Table 1 were added for the fixed and random effects method. Then again, the Hausman test was performed to check which method provided the better fit (Model 3). The idea of this recursive and step-by-step estimation is to generate robust estimation of the coefficient relevant to the analysis of gender inqueality and export diversification (β_1) in a sense that multiple specifications are explored.

Moreover, a fact to consider is the truncation of the dependent variable (GGGI). As the nature of the index, it can only take values from 0 to 1. Given that, the estimations obtained for the coefficients through panel data methods are consisten but inefficient. To address that a Tobit mode was estimated, just to verify that the standard errors didn't shift the hypothesis testing in comparison with the linear model. In this case, this model will consider that GGGI is a non-negative dependent variable with the rest of the dependent variables (McDonald & Moffitt, 1980).

Another issue that could be leading to biased estimation of the effect of export diversification on gender inequality is spatial correlation. As it is usually the case in trade models and in models that account for variables that are interrelated to each others geographically (exports of countries belonging to the same region and trading with each other in this case), spatial correlation could lead to omitted variable bias and inefficient results. To account for the correlation within the Central American countries in terms of trade, the results of a statistical method for spatial correlation analysis, the GSPRE model, are also provided . As is shown in Table 1 to Table. 6 a considerable part of the exports of each country are for the CACM, meaning that a spatial interaction exists among them (Salima et al., 2018). The model was constructed using the equation system (3) (Belotti et al., 2017).

$$gggi_t = X_t\beta + \mu + v_t \tag{3}$$
$$v_t = \lambda M v_t + \epsilon_t$$

$$\mu = \Phi W \mu + \eta$$

This is a simultaneous equation system in which both the panel effects (represented by the vector μ) and the errors (represented by the vector v_t) are included and assumed to be spatially autocorrelated. Such autocorrelation is accounted for by the matrices M and W, for the errors and panel components, respectively. Regarding the error term, the matrix M is a spatially and temporally lagged matrix, whereas for the panel component the matrix W only considers the spatial effect. The matrix W is the normalized contiguity matrix between all countries included in the dataset, and the matrix M is the inverse distance contiguity matrix for the same units. The term X_t contains the control variables aforementioned.

A key aspect of interest for this research is the possible bidirectionality between export diversification and gender inequality or. To explore this, a panel data version of the Granger causality test, the Dumitrescu–Hurlin test, wasestimated. This test is suitable for panel data and is designed to detect a possible causality at the panel level, in at least one of the units, meaning that it does not exclude non-causality just for some individuals (Lopez & Weber, 2017). Additionally, as a complementary analysis, a PVAR model was estimated to test the reciprocal influence on each other of the variables of interest, controlling for other factors. The model follows equation (4).

$$Y_{it} = Y_{it-1}A_1 + Y_{it-2}A_2 + \cdots + Y_{it-p}A_p + X_{it}B + u_i + e_{it} \tag{4}$$

Where X_{it} is, again, the matrix of exogenous covariates used in the previous models, u_i and e_{it} are (1 × k) vectors of dependent variable-specific panel fixed effects and idiosyncratic errors, respectively (Abrigo & Love, 2016), and the matrices A capture the lagged structure of the relationship between gender inqueality and export diversification. Because in this model, both variable are assumed to simultaneously determine each other, they are both included in the matrix Y_{it}.

After testing all the statistical methods aforementioned, for gender inequality measured as GGGI and export diversification as the computation of the Theil index, the different results are analyzed in the following chapter. Finally, to further discuss on the possible focalized effects of export diversification on key areas of gender inqueality, the GGGI subindexes (educational attainment, health and survival, economic participation and opportunity, and political empowerment) were used also individually modelled as the dependent variable using the GSPRE especification. The analysis of each specific dynamic goes beyond the scope of this study but they are presented as a initial step for further research.

2.6 Limitations

The analysis is limited by the measurements themselves iun the sense that the relationships and analysis conducted rest on the assumption that the indexes are methodologically correct and a good measure of the abstract concepts of interes for this research. Because it is not within the scope of this study, there is no discussion on the accuracy of each index and they are taken as feasible given proxies.

Methodological limitations are also in place in terms of data. The main limitation in this area is data availability on gender inequality indicators. More indicators could have been added to test another possible relationship in the econometric analysis. However, comparable databases such as WB, IMF, UNCTAD has missing values for specific years in different countries.

Additionally, on Theil index computation for export diversification the HS-6 nomenclature was used the subheading was not the same number every year due to the update made every five years which make variations and some additional computation in order to have accurate results. These changes are not expected to impact substantially the estimations for the Theil index because the number of 6-digit HS product-level data on exports of each country is very high.

Chapter 3: Results

3.1 Central American countries and Export Diversification.

Central American countries have a background in integration history. Since 1960 the region has been trying to reach economic integration which had important progress with the establishment of the Central America Common Market (CACM) whose members are: Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica y Panama. Nowadays, the countries have adopted a common external tariff for all but 4 percent of products of the Central American Tariff System (SAC). (United Nations Conference on Trade and Development, 2021) aimed to boost trade openness and export diversification.

The main goal of CACM was to establish a customs union to reduce dependence on the external sector, improve the net terms of trade and achieve industrialization at the same time (Bulmer-Thomas, 1998). Moreover, since all Central American countries were producing and exporting agricultural products (e.g., sugar, cocoa, coffee, bananas) the economies were heading to an unsustainable situation where they were competing among themselves for external markets. Therefore, the intraregional trade was almost nonexistent and the developed countries were just perpetuating the underdevelopment of the region. (Economic Commission for Latin America and the Caribbean (ECLAC), 2018.)

In the following years, Central America fell under the "lost decade" where civil wars and conflict between some countries took place, having all these goals displaced by other priorities for the countries. However, in 1990 an improvement in trade started showing (Bulmer-Thomas, 1998). Nevertheless, there are still missing steps to fully have a successful regionalism among the Central American economies. Hence each country has been developing individual policies to have economic and human development.

To have a better understanding of export diversification and the different behavior in Central American countries a descriptive analysis for each will be presented in Chapter4.

3.2   Descriptive analysis: Export Diversification in Central America

The graphs and figures presented in the following analysis are based on the author's calculations using different official sources which will be mentioned accordingly. One aspect considered to analyze export diversification is how the sectors of the economy have been changing in the last decades in Central American countries.

Figure 1:Economic activity by sectors 1980,1990,2010,2020 by country (share of GDP)
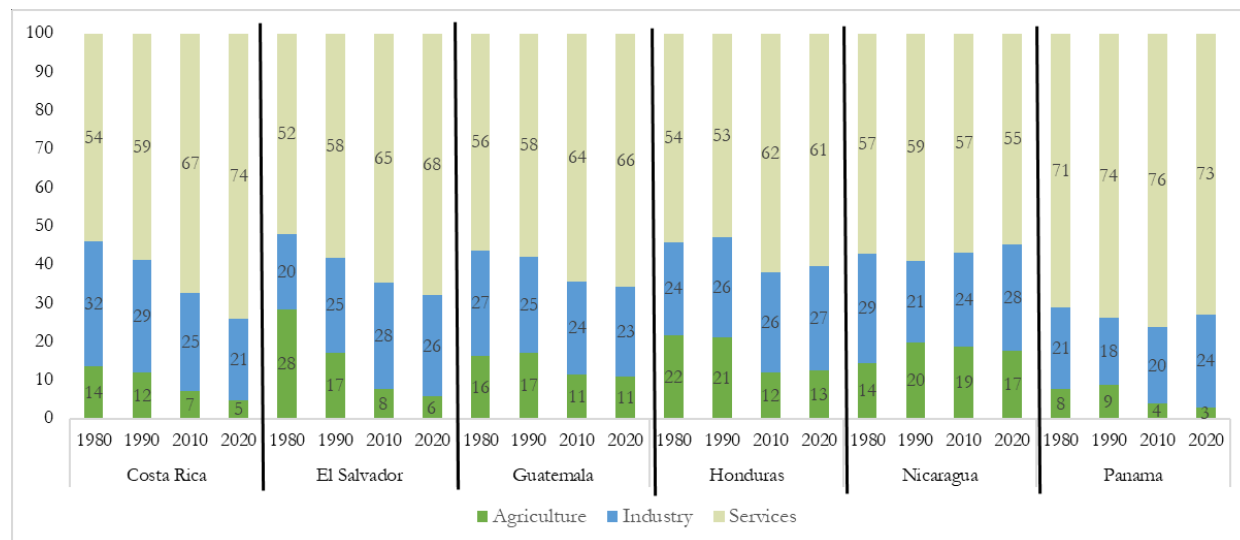
Source: Own calculations based on UNCTADStat.

As it is shown in the Fig 1, Agriculture has decreased its share in GDP for most of all Central American countries from 1980 to 2020, with Nicaragua as exception which decrease its agricultural sector in 3%. For the Industrial sector, it decreases from 1980-to 2020 for Costa Rica, Guatemala, and Nicaragua decrease. Conversely, El Salvador, Honduras, and Panama experienced an increase in their share of the country's GDP.

Figure 2: Export evolution in CACM, US dollars at current prices in millions 1980-2020
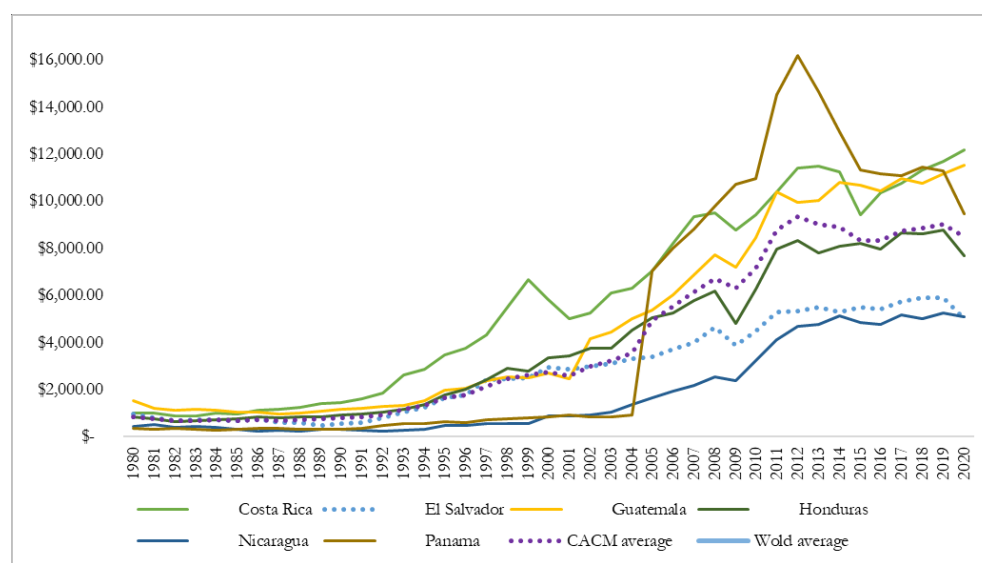
Source: own elaboration based on UNCTADstat data.

Additionally, as the framework of this study is the trade in goods, since the 1990's Central American countries began to increase the share of exports to the world, as shown in fig 2. It can be evidence that Panama's exports have risen in 2004 due to the policies the government adopted. Moreover, Costa Rica's exports have been remarkably superior to the CACM average, and the three countries: Nicaragua, El Salvador, and Nicaragua have been under the average.

Figure 3: Theil Index results from CACM countries. 2005-2020

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CA average	3.23	3.29	3.28	3.31	3.36	3.37	3.51	3.50	3.38	3.33	3.27	3.30	3.37	3.35	3.58	3.65
Costa Rica	3.47	3.56	3.71	3.56	3.76	3.62	3.69	3.80	3.83	3.66	3.48	3.62	3.64	3.71	3.78	3.86
El Salvador	2.76	2.92	2.84	2.85	2.84	2.82	2.93	2.88	2.81	2.75	2.76	2.72	2.80	2.82	2.76	2.71
Guatemala	3.34	3.26	3.27	3.31	3.49	3.43	3.53	3.55	3.50	3.50	3.40	3.42	3.43	3.37	3.42	3.36
Honduras	3.69	3.68	3.68	3.76	3.84	3.91	4.27	4.11	3.74	3.75	3.90	3.90	4.09	3.93	3.78	3.82
Nicaragua	3.53	3.69	3.68	3.79	3.84	4.12	4.28	4.33	4.10	4.09	4.03	4.12	4.21	4.17	4.33	4.34
Panama	2.58	2.63	2.49	2.56	2.40	2.32	2.33	2.34	2.30	2.22	2.07	1.99	2.05	2.10	3.40	3.79

Source: Own elaboration and computation of the index based on SIECA data

According to Theil's index calculation, El Salvador is the country with the lowest value meaning that its export basket is larger. Contrary to Nicaragua the most concentrated country. One highlight for Panama is that the increase in the index means less diversification. This issue will be discussed further on the country profiles.

3.3   Descriptive analysis: Gender Inequality in Central America

As Fig. 4 shows from 2000 to 2019 in all Central American countries, employment in general terms increased, this was higher for Honduras and Guatemala as Fig. 4 shows. Additionally, all countries increased their employment in the industry sector, especially Honduras and Panama with 76% and 62% accordingly. As the agricultural sector just for Nicaragua increased more than the industrial sector and El Salvador it experiences a decrease of 5%.

Figure 4: Employment growth from 2000 to 2019 by economic activity (excluding services)
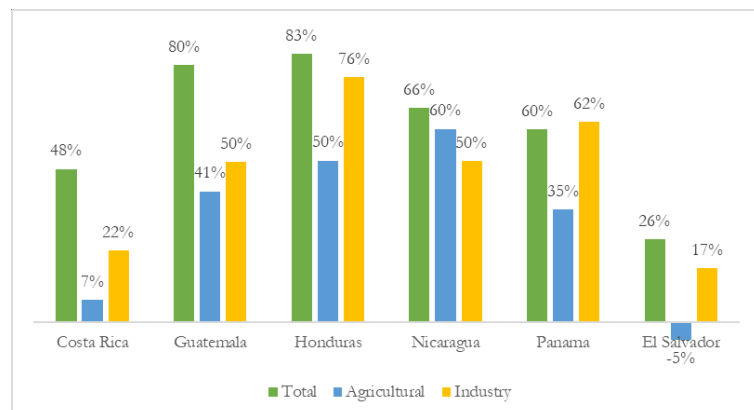
Source: Own elaboration based on ILOStats data

Moreover, when this data is disaggregated by gender, Fig.5a gives evidence for an increase in all the countries in female employment. However, when the data is disaggregated by economic sector, agriculture (Fig. 5.b) and industry (Fig. 5.c) are the ones that are lacking behind women's participation.

Figure 5: Employment by sex and economic activity by country
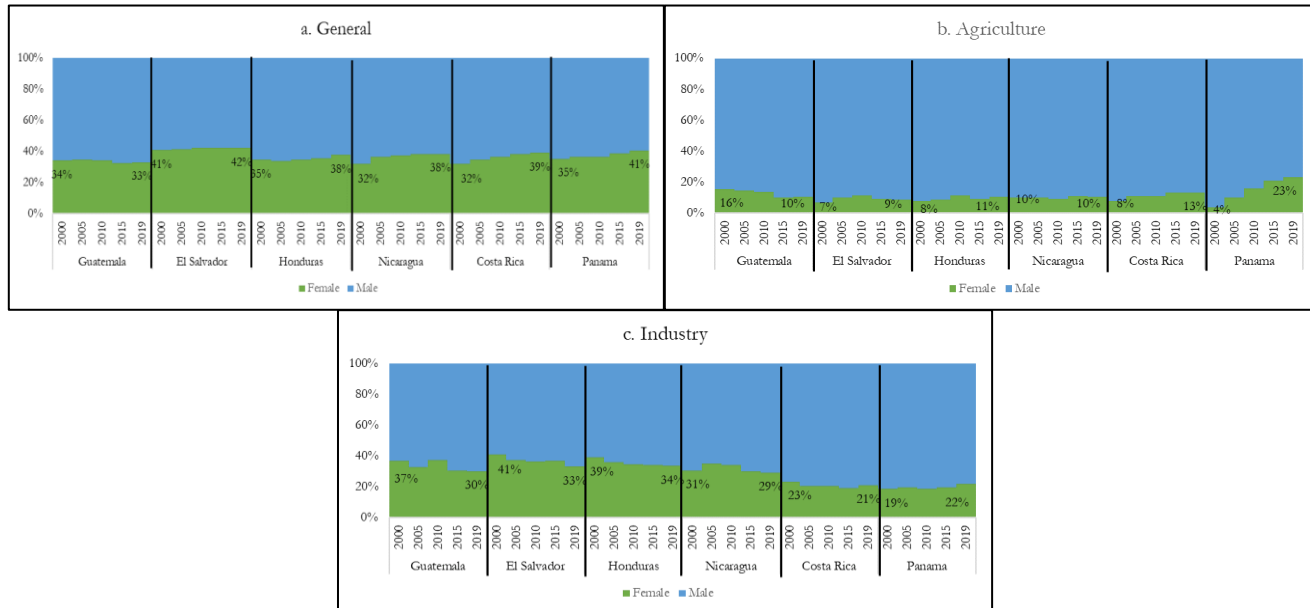
Source: Own elaboration based on ILOStats data

In these sectors, the trends have been relatively stable for all the countries since 2000, especially in Panama and Costa Rica women employment in those sectors is less than 30%. For the Industry sector

especially, in countries such as Guatemala, El Salvador, Honduras, and Nicaragua female employment is 30% or above, this trend has decreased since 2000.

Figure 6: Mean years of education by country. Years: 2005,2010,2015 and 2019.
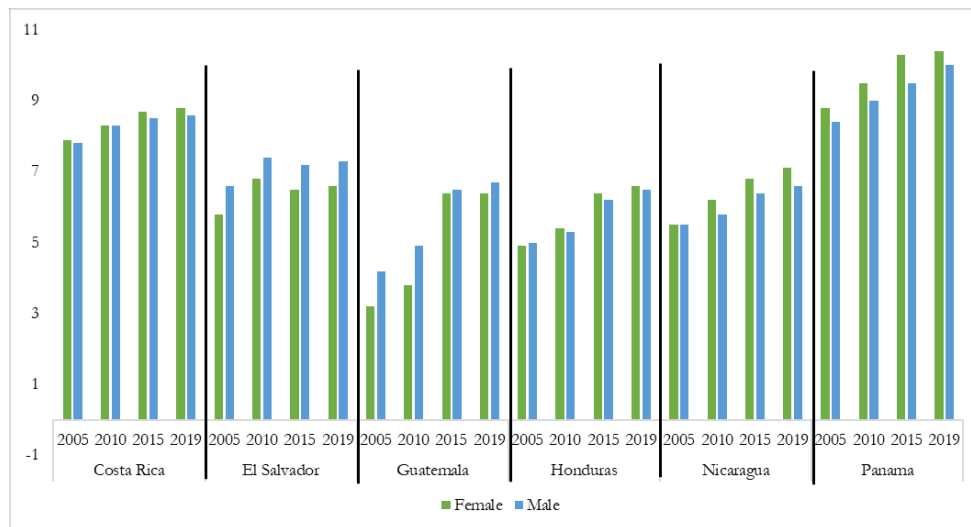
Source: Own elaboration based on UNDP data

Regarding education, Fig.6 shows that the average years of education are higher for countries such as Costa Rica and Panama. Among gender differences, just in El Salvador and Guatemala male is higher than female years of education in 2019, following the same trend since 2005. On the contrary, for Costa Rica, Honduras Nicaragua and Panama female mean years of education were relatively equal to males in the past, as a result in 2019 female indicator is higher than males.

Figure 7: Adolescent Fertility Rate by country. Years: 2005,2010,2015 and 2019
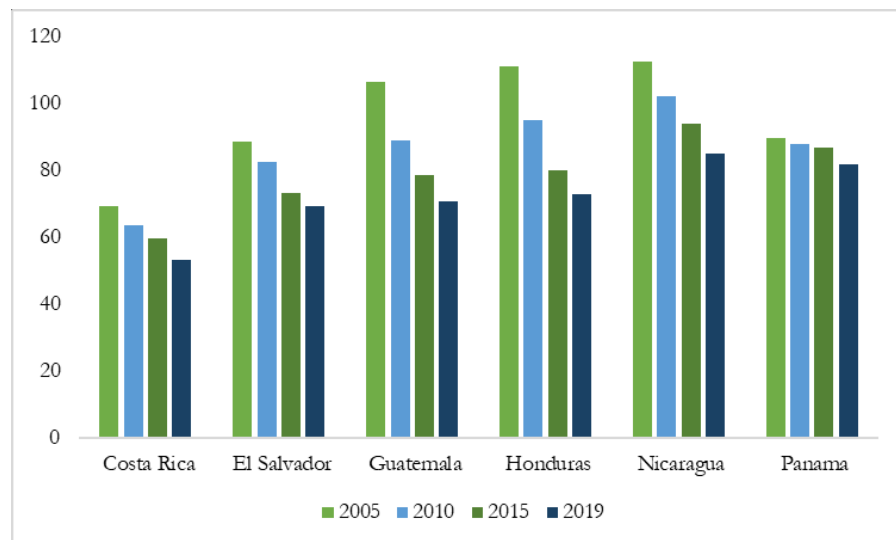
Source: Own elaboration based on UNDP data

One common indicator used to measure gender inequality is the adolescent birth rate since as was explained in Section 2, a young mother is more likely to have fewer years of education and work experience affecting the overall welfare of the household. In Central American countries, this tendency has been decreasing over time. It can be evidenced in figure 7 countries such as Guatemala, Honduras y Nicaragua where the rate was high in 2005 perceived a decrease of 33%, 35%, and 25% respectively. Among the six countries, Costa Rica is the one with the lowest rate in 2005, still, it managed to decrease the number by 23% for 2019.

Figure 8: Global Gender Gap Index, by country. Years 2006-2020

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CA ave	0.66	0.67	0.68	0.69	0.69	0.69	0.69	0.70	0.71	0.72	0.72	0.72	0.72	0.73	0.74
Costa Rica	0.69	0.70	0.71	0.72	0.72	0.73	0.72	0.72	0.72	0.73	0.74	0.73	0.75	0.77	0.78
Guatemala	0.61	0.61	0.61	0.62	0.62	0.62	0.63	0.63	0.68	0.67	0.67	0.67	0.67	0.67	0.67
Honduras	0.65	0.67	0.70	0.69	0.69	0.69	0.68	0.68	0.69	0.69	0.69	0.71	0.71	0.71	0.72
Nicaragua	0.66	0.65	0.67	0.70	0.72	0.72	0.77	0.77	0.79	0.78	0.78	0.81	0.81	0.81	0.80
Panama	0.69	0.70	0.71	0.70	0.71	0.70	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.73	0.73
El Salvador	0.68	0.69	0.69	0.69	0.66	0.66	0.66	0.66	0.69	0.71	0.70	0.71	0.69	0.70	0.71

Source: own elaboration based on WEF data

Countries such as Guatemala, El Salvador, and Honduras remind at a lower level than the rest of the other Central American countries from 2006-to 2020, especially Guatemala which has reminded at the same value since 2015. The country which has had outstanding participation is Nicaragua followed by Costa Rica.

3.4   Descriptive analysis: Country profiles

3.4.1 Guatemala

Table 2: General information Guatemala

GDP 2020 – Million US$	GDP per capita (current US$)	GDP per capita, PPP (current international $)	POPULATION Millions - 2020	HDI value & world ranking 2019	% of world exports – 2021/ % of CACM 2021
77,020.02	4,603.34	8,853.67	16.86	0.663 – 127	0.06% / 21%

Source: Own elaboration based on World Bank, UNDP data and UNCTAD stat.

Table 3: Exports evolution

1994

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	318,278.8	21%
Raw sugar	161,468.0	11%
Bananas, including plantains	114,316.5	8%

2000

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	575,024.4	23%
Raw sugar	190,782.0	8%
Bananas, including plantains	178,074.7	7%

2010

Products	Total Value Thousand US$	Share of total export value
Raw sugar	725,994.8	12%
Coffee - Not decaffeinated	713,882.7	12%
Bananas, including plantains	353,279.2	6%

2020

Products	Total Value Thousand US$	Share of total export value
Bananas, including plantains	815,816.2	10%
Cardamoms	717,854.3	10%
Coffee - Not decaffeinated	650,564.8	10%

Source: Own elaboration based on SIECA data

It can be evidenced that Guatemala's situation has improved regarding the concentration of the main export products from 1994 to 2000 where mostly 40% of export were concentrated in 3 products. However, the main export products still are agricultural non-processed products. Additionally, regarding the Theil index is important to mention the lowest value for Guatemala was in 2006 meaning the most diversified year and the highest value was in 2012 (less diversified) as Fig 3 shows. From 2005 to 2020 the Theil index suffered an increase of 0.002 points.

Gender Inequality

- **National policies**

Guatemala reports the highest proportion of the indigenous population in Latin America (44%). In this context, the government has implemented policies focused on this group, specifically, women are allowed access to public services through interpreters and translators of indigenous languages representing 15 linguistic communities. Moreover, the Constitutional Court in 2018, established a unit for the provision of assistance to vulnerable persons. The unit is focused on vulnerable groups with different cultural backgrounds. The aim is to strengthen and promote access to constitutional justice.

Regarding employment, a national policy for decent employment is being implemented by The Ministry of Labor and Social Security where gender equity is promoted, by ensuring women to have access to fairly paid and productive work under conditions of freedom, security, and human dignity. Guatemala's government is also promoting and spreading information to women concerning access to employment through job fairs and labor rights and technical training.

Figure 9: Global Gender Gap Index 2020
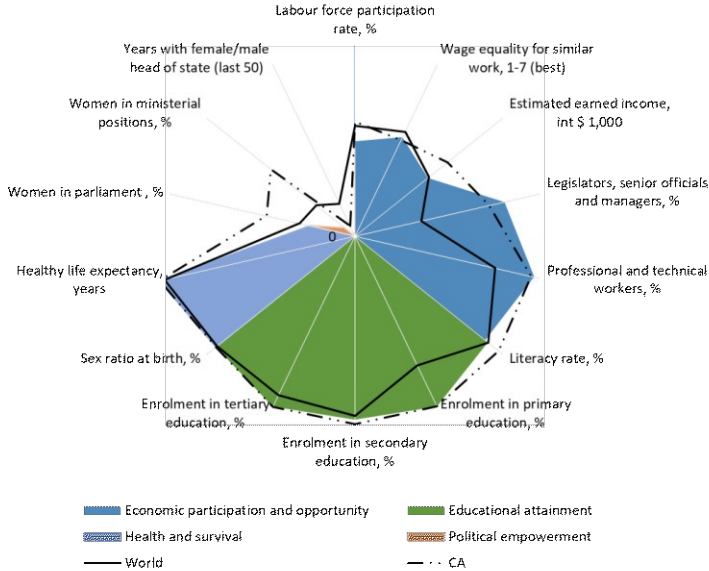
Source: Own elaboration based on WEF data.

Guatemala is ranked in the 113th position in 2020. As can be evidenced that health and survival and educational attainment are performing better than the rest of the world average. Regarding economic

participation and opportunity this country is lacking behind in comparison with its peers mostly in the indicator of estimated earned income. The political empowerment subindex is the worst performed compared with central America and the world average. Guatemala has moved from 2005 to 2020 by 0.06% toward gender equality according to its score in GGGI

3.4.2 El Salvador

Table 4: General information El Salvador

GDP 2020 Current US dollars – Thousand US$	GDP per capita (current US$)	GDP per capita, PPP (current international $)	POPULATION Millions - 2020	HDI value & world ranking 2019	% of world exports – 2021/ % of CACM 2021
24, 638,720	3,798.60	8,420.50	6.5	0.673 - 124	0.03% / 10%

Source: Own elaboration based on World Bank, UNDP data and UNCTAD stat

Table 5: Exports evolution

1994

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	265,392.99	32%
Cane sugar	27,570.47	3%
Shrimps and prawns	22,705.24	3%

2000

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	297,792.24	30%
Soap	68,432.71	10%
Dentifrices	39,969.65	3%

2010

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	212,672.76	10%
T-shirts	184,764.44	10%
Cane sugar	127,676.02	4%

2020

Products	Total Value Thousand US$	Share of total export value
Cane sugar	186,019.86	4%
Toilet paper	157,855.73	4%
T-shirts	138,564.76	3%

Source: Own elaboration based on SIECA data

As for El Salvador, it can be highlighted that in the first decade of this analysis the country was exporting only agricultural products. After that, other manufacturing products have been added to the export basket. From 2010 to 2020 textile products became highly important for El Salvador's economy, and much FDI from the textile industry was installed in the country (UNCTAD, 2021). Moreover, the three main export products have been decreasing the weight as the share of the total exports in the country, moving from 24% of the total exports in 2010 to only 11% in 2020. The lowest value in the Theil index was in 2020 (more diversification) and the highest value was in 2011, having a total decrease of 0.05 points.

Gender Inequality data

- **National policies**

A more institutional framework has been created in El Salvador to support women's equality. Issues such as sexist advertising and stereotyped messages and pornography distribution have been regulated by governmental institutions to incentivize a violence-free life for women. Additionally, now universities must have a program against gender discrimination and violence against women. A positive fact that is highlighted is that at least two procedures promoting and ensuring equality have been adopted for 64% of the government institutions.

El Salvador's policies are focusing on informing and educating all the population regarding gender inequality issues. Training for students, parents, and teaching staff has been used to sensitize regarding this issue. Moreover, the schools are considering special measures in equality of plans and educational facilities to retain and support girls and adolescents who are pregnant or are already mothers. Regarding employment, activities in women's inclusion have been developed, pursuing equality in professional/ technical and managerial positions. Another area of monitoring that has been treated is internal regulation in business to ensure that everyone has equal and non-discriminatory practices or

regulations. On the side of the government, inspections of businesses have been carried out to supervise that women's labor rights have been complying.

Figure 10: Global Gender Gap Index 2020
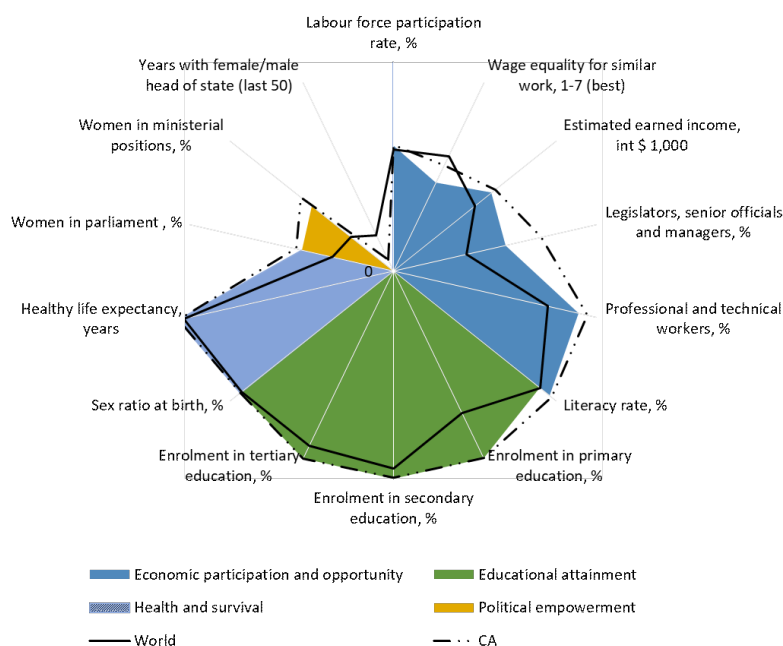
Source: Own elaboration based on WEF data.

EL Salvador is in the 80th position in 2020 in the GGI index. The highest performance in educational attainment and health and survival subindexes. In the economic participation and opportunity, some indicators are lacking behind from their Central American peers as legislators, seniors, and managers indicators and wage equality for similar work. The performance for political empowerment is quite outstanding for the country and is following the central American trends for women in parliament and women in ministerial positions.

3.4.3 Honduras

Table 6: General information Honduras

GDP 2020 Current US dollars – Thousand US$	GDP per capita (current US$)	GDP per capita, PPP (current international $)	POPULATION Millions – 2020	HDI value & world ranking 2019	% of world exports – 2021/ % of CACM 2021

23,662,231.00	2,389.00	5,420.20	9.9	0.634 - 132	0.05% / 16%

Source: Own elaboration based on World Bank, UNDP data and UNCTAD stat

Table 7: Export evolution

1994

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	185,951.99	30%
Bananas	124,794.61	20%
Shrimps and prawns	65,651.88	10%

2000

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	340,523.74	30%
Shrimps and prawns	147,600.01	10%
Bananas	113,620.29	10%

2010

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	722,630.56	30%
Bananas	335,714.42	10%
Shrimps and prawns	135,166.75	5%

2020

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	869,621.09	20%
Bananas	530,309.09	10%
Palm oil	265,975.75	10%

Source: Own elaboration based on SIECA data

Honduras has maintained agricultural products as part of its main export basket. Regarding palm oil, Honduras is the 6th largest world exporter in 2020 according to its own computation based on TradeMap data, the industry that has become a pilar for its economy (Fromm, 2021). Additionally, the

percentage as a share of total exports for the three main products reminds at 40% in 2020, a share that has been decreasing during the time from 1994 when it was 60%. The lowest value for the Theil index was in 2006 and the highest in 2011 as Fig. 3 shows. The change from 2005 to 2020 is 0.13 points.

Gender Inequality data

- **National policies**

One of the main challenges for Honduras is the inclusion and equality among indigenous and Afro-Honduran populations. In this regard, special attention has been established in schools' forms of inclusion and especially for girls, where is now mandatory to give sexual and discrimination rights education. Additionally, formal training for the teachers and parents in rural areas have been taken place.

Regarding employment, a national act has been approved where the remuneration for men and women is regulated. Moreover, a big step reached recently is the equal application of minimum wage among men and women. Another measure implemented was the total criminalization of abortion the country hasn't taken any further meaningful actions to control teenage pregnancy and maternal mortality rates. The country had progressed in women's inclusion in the financial sector where numbers show that the Honduran Bank of Production and housing have increased the percentage of loans acquired by women.

Figure 11: Global Gender Gap Index 2020
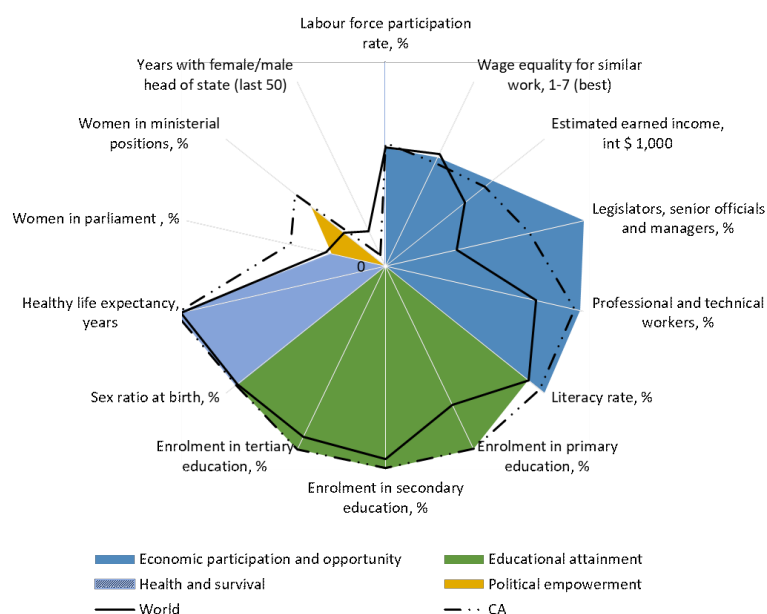
Source: Own elaboration based on WEF data.

Honduras in ranked in the 58th position in 2020 with an overall score of 0.722. Health and survival and Educational Attainment are the subindexes where Honduras has the best performance. Regarding economic participation and opportunity, wage equality for similar work and estimated earned income are the indicators with the lowest scores. For political empowerment, it can be evidenced that women in ministerial positions have an outstanding performance compared with the rest of the indicators of the subindex.

3.4.4 Nicaragua

Table 8: General information Nicaragua

GDP 2020 Current US dollars – Thousand US$	GDP per capita (current US$)	GDP per capita, PPP (current international $)	POPULATION Millions - 2020	HDI value & world ranking 2019	% of world exports – 2021/ % of CACM 2021
12,621,505.00	1,905.30	5,569.70	6.6	0.669 - 128	0.03% / 10%

Source: Own elaboration based on World Bank, UNDP data and UNCTAD stat

Table 9: Exports evolution

1994

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	76,104.78	22%
Meat of bovine animals	60,646.73	17%
Sea crawfish	20,207.03	6%

2000

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	170,596.60	30%
Sea crawfish	62,800.93	10%
Shrimps and prawns	55,146.79	10%

2010

Products	Total Value Thousand US$	Share of total export value
Coffee - Not decaffeinated	341,505.04	20%
Meat of bovine animals	229,751.45	10%
Gold	222,176.09	10%

2020

Products	Total Value Thousand US$	Share of total export value
Gold	666,642.23	20%
Coffee - Not decaffeinated	438,202.08	20%
Meat of bovine animals	276,893.23	10%

Source: Own elaboration based on SIECA data

Agricultural products have remained the main elements of the export basket in Nicaragua. 2020, is the year when gold is the most important export product for Nicaragua since mining is becoming a supported industry for economic growth. As a commodity, the prices of gold are highly fluctuating and set by the international market. Therefore, the increase in its exports can be due to an increase in price or the volume exported. For 2020, Nicaragua reported an increase both in the international prices and in the volume exported. Moreover, 50% of its exports basket is concentrated in the main

products, a tendency that has prevailed over time. Nicaragua is the most concentrated country in Central America according to Fig. 3. The lowest value was in 2005 and the highest (less diversified) was in 2020, in total the change in this period was 0.81 points.

Gender Inequality data

- **National policies**

Maternity homes have been implemented as a national health strategy where women have access to health services under the family and community health care model. Midwives were trained to take care of pregnant women. As a result, the maternal mortality rate has decreased nationwide. Additionally, childcare centers have been developed where that provide childcare for boys and girls under six years old. They provide education, health, and stimulation so the mothers can develop any other activity.

Special emphasis has been given to women's empowerment and in the insertion of new economic sectors, as training to be included in male-dominated sectors has been taking place. Nicaragua and its initiative to contribute to women's development are prioritizing and incentivizing them to get their land title plans which will give them certainty to the right of housing and an independent asset, as a result, the proportion of women having title is higher than men since 2007.

Figure 12:Global Gender Gap Index 2020
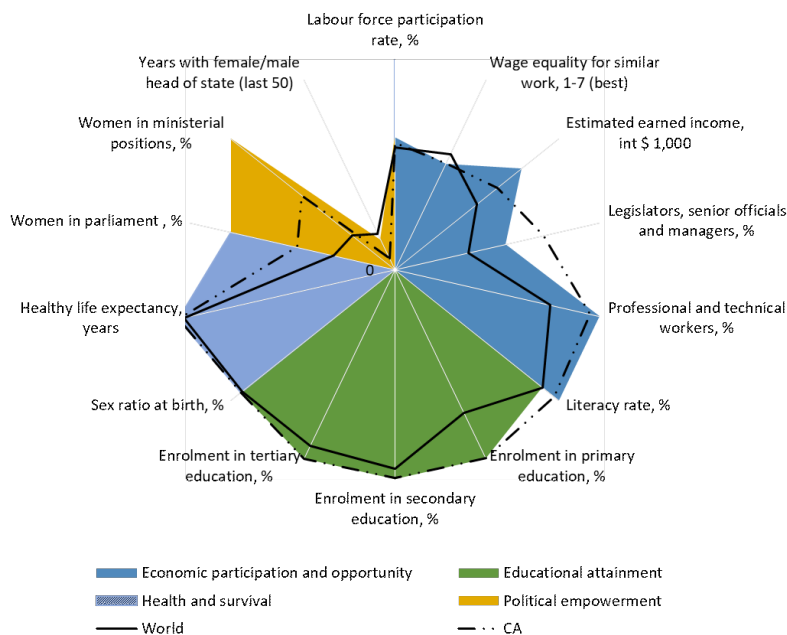
Nicaragua has the 5th position. Health and survival and educational attainment are the subindexes with the best performance. For economic participation, an opportunity is performing better than its peers except for legislators, senior officials, and managers indicator. For political empowerment, the subindex suggests that women in parliament and women in ministerial positions have an outstanding performance. Nicaragua had an exponential improvement in its overall performance, moving from position 62 in 2006 to the current position in 2020.

3.4.5 Costa Rica

Table 10: General information Costa Rica

GDP 2020 Current US dollars – Thousand US$	GDP per capita (current US$)	GDP per capita, PPP (current international $)	POPULATION Millions - 2020	HDI value & world ranking 2019	% of world exports – 2021/ % of CACM 2021
61,846,895.00	12,140.90	22,132.50	5.09	0.810 - 62	0.07% / 23%

Source: Own elaboration based on World Bank, UNDP data and UNCTAD stat

Table 11: Export products

1994

Products	Total Value Thousand US$	Share of total export value
Bananas	565,427.02	25%
Coffee - Not decaffeinated	307,601.61	14%
Pineapple	56,533.26	3%

2000

Products	Total Value Thousand US$	Share of total export value
Machines' part and accessories	1,627,282.93	29%
Bananas	550,296.80	10%
Coffee - Not decaffeinated	274,360.04	5%

2010

Products	Total Value Thousand US$	Share of total export value
Electronic integrated circuits	921,176.10	10%
Machines' part and accessories	877,743.01	10%
Bananas	706,136.07	10%

2020

Products	Total Value Thousand US$	Share of total export value
Instruments and appliances used in medical, surgical, dental or veterinary sciences.	2,811,342.22	20%
Bananas	1,080,970.69	10%
Pineapple	922,741.12	10%

Source: Own elaboration based on SIECA data

Since 2000, one main export product for Costa Rica manufactured products as part of machines and in 2020, was the only Central American country that reach an important share of its exports from medical products due to the COVID-19 crisis. According to its computations based on Trademap Data, Costa Rica is the first pineapple exporter in the world for 2020 and coherently, one of its main export products un 2020, having the 40% of its exports share concentrated in three products. According to Fig. 3, the lowest value was in 2005 and the highest in 2020. The change the index suffer was 0.39 points.

Gender Inequality data

- **National policies**

Costa Rica is trying to enhance its gender-related policies across all governmental institutions to prevent, and provide capacity-building and accountability for women. From 2017 to 2020, 40 laws have been accepted related to giving better access to justice to women. One remarkable action in Costa Rica is the initiative regarding statistical and qualitative data collection on gender-based violence disaggregated by different categories to measure the impact of public policies and legal initiatives.

Regarding education, Costa Rica is characterized by good access and quality of education. Regardless, the challenge remains in non-discrimination and retention of girls in schools, especially for the indigenous population that access in indigenous territories has improved, having more schools and

more trained staff to promote gender equality and improve gender violence acts in the school. For employment matters, it was established a specific activity where equal payment for women and men is pursued. One challenge in Costa Rica is decreasing the gap in financing access, for those commercial and national banks have implanted new programs focused on women.

Figure 13: Global Gender Gap Index 2020
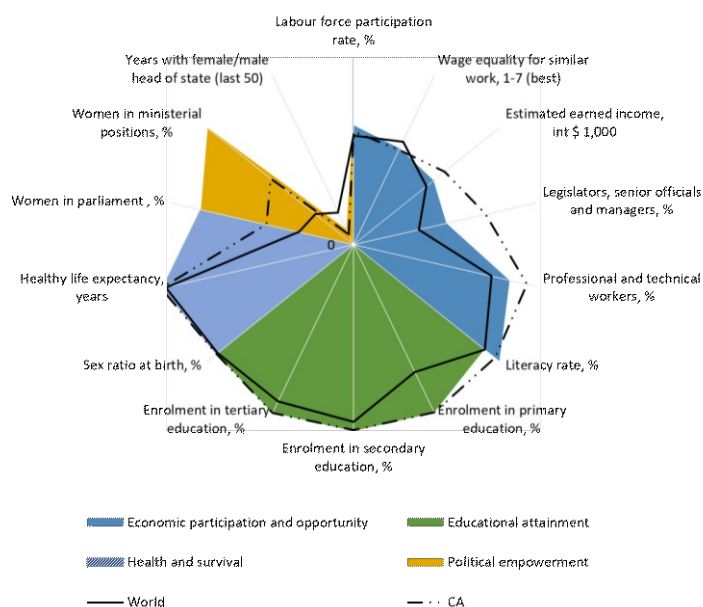
Source: Own elaboration based on WEF data.

Costa Rica was in 13th position in 2020. The economic participation and opportunity and educational attainment had an outstanding performance. However, for the economic participation and opportunity, legislator, senior official, and managers indicator was lower than the central American average. An aspect that is important to highlight is the high result for women in a ministerial positions. The highest among Central American countries.

3.4.6 Panama

Table 12: General information Panama

GDP 2020 Current US dollars – Thousand US$	GDP per capita (current US$)	GDP per capita, PPP (current international $)	POPULATION Millions – 2020	HDI value & world ranking 2019	% of world exports – 2021/ % of CACM 2021

53,977,037.00	12,509.80	26,782.50	4.3	0.663 - 127	0.06% / 20%

Source: Own elaboration based on World Bank, UNDP data and UNCTAD stat

Table 13: Export evolution

1994

Products	Total Value Thousand US$	Share of total export value
Coconut	206,842.31	38%
Live fishes	81,388.56	18%
Cane sugar	18,413.80	3%

2000

Products	Total Value Thousand US$	Share of total export value
Bananas	160,030.21	20%
Shrimps and prawns	59,403.44	10%
Fresh fish	48,767.98	10%

2010

Products	Total Value Thousand US$	Share of total export value
Fresh fish	80,287.50	10%
Gold	70,345.08	10%
Bananas	65,198.20	10%

2020

Products	Total Value Thousand US$	Share of total export value
Cooper ores and concentrates	1,065,592.5	60%
Bananas	151,330.6	10%
Wood	33,716.3	2%

Source: Own elaboration based on SIECA data

According to the Ministry of Commerce and Industry of Panama (2019), the country started its cooper ores exports and in 2020 was its main export product reaching 60% of the total export value.

Moreover, Panama remains an agricultural exporter country. As Fig 3. Shows the lowest value for Panama was in 2006, just right after the index started to increase as in 2020 when the highest value was reached for Panama.

Gender Inequality data

- **National policies**

Special family courts to assure access to justice have been implemented, mostly in rural areas where indigenous families are established to improve the inclusion of these communities, especially for women. Additionally, this, specialized police unit on gender violence has begun to operate to support women in special cases. Moreover, Panama's strategy to promote gender equality and gender rights education is through national media (e.g. television, radio).

Literacy programs have been implemented where indigenous rural women were educated in their mother tongue and Spanish. These first groups became teachers and professionals working as teachers for the community and educational materials have been created in their mother tongue. Panama hasn't approved a law where directly the minimum wage is equal for women and men. However, some articles implicitly reflect this desired status. As of 2020, Panama did not have a sexual and reproductive health program in schools for girls, the law initiative was rejected and currently, the country is only working through initiatives and external support from external institutions.

Figure 14:Global Gender Gap Index 2020
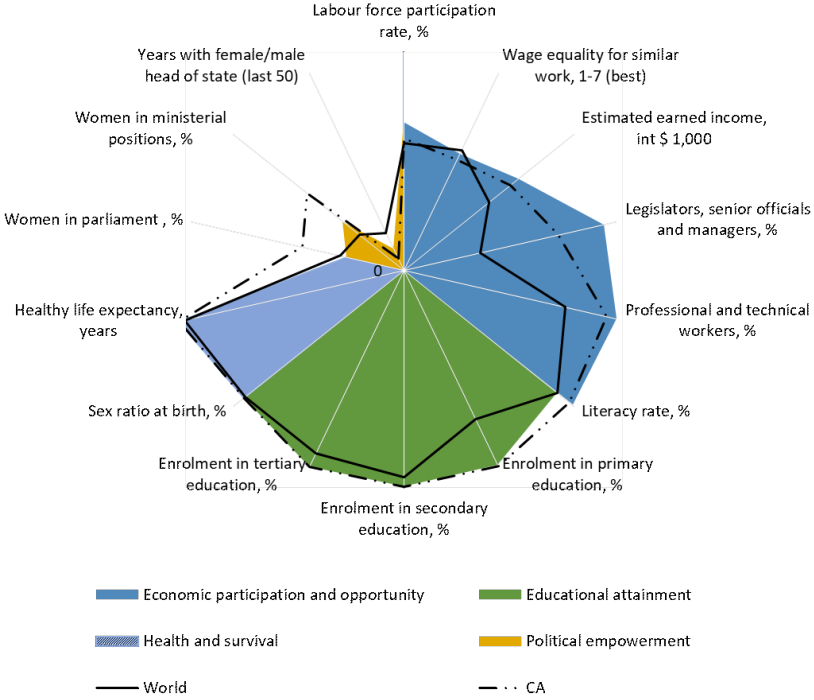
Source: Own elaboration based on WEF data.

Panama had the position 46th in 2020 with an overall score of 0.730. Economic participation and opportunity, health and survival, and educational attainment have a better performance than the central American and world average. Similarly, like the rest of the Central American countries, the subindex is lagging behind political empowerment.

3.5 Econometric results

As it was described in Chapter 4, different statistical methods were tested to explore the relationship between export diversification and gender inequality in Central American countries. As for the start of the modeling process, the first model as it is shown in Table 14, the Theil index is statistically significant for random effects and fixed effects. The null hypothesis of the Hausman test, was not rejected. Hence, the random effects method seems to outperform fixed effects in the initial model.

For the specification including non-linear effects, the square of the explanatory variable was added. In this case, the Hausman test does not reject the null hypothesis. Hence, random effects seem to outperform fixed effects as well. theil2 variable (square of theil) is significant for both methods random effects and fixed effects, providing evidence of a nonlinear relationship between export diversification

and gender inequality. As the model is structured right now, is not enough to confirm a nonlinear relationship, because other factors could also influence gender inequality.

Table 14: Results of Panel Models exploring the relationship of the Global Gender Gap Index and the Export Diversification Index

Variable	(1) Fixed Effects	(2) Random Effects	(3) Between Effects	(4) Fixed Effects	(5) Random Effects
Theil Index	0.0394	0.0355	0.0161	-0.327	-0.338
	(0.003)**	(0.002)**	-0.603	(0.000)***	(0.000)***
Theil Index (squared)				0.058	0.0587
				(0.000)***	(0.000)***
Constant	0.568	0.581	0.647	1.121	1.148
	(0.000)***	(0.000)***	(0.003)**	(0.000)***	(0.000)***
N	90	90	90	90	90
R-sq	0.102		0.074	0.344	
adj. R-sq	0.037		-0.158	0.288	

p-values in parentheses
** p<0.05, ** p<0.01, *** p<0.001*

Source: Own elaboration based on WEF, SIECA and World Bank Data.

When control variables are included as shown in Table 15, the Hausman test suggests that the fixed effects model suits better the data than random effects, which is theoretically expected. One aspect that should be considered is the rank of the matrix due to some colinear variables (lgdp urban, women, and unemployment are divided by a population base). In this model, it seems that there is a significant relationship between export diversification and gender inequality, with the export diversification index having a quadratic effect, forming a marginal effect with a form of an inverted U.

When truncation is addressed through the Tobit model, in Table 15, theil variable is still significant and the coefficient results from panel data are the same as the ones estimated with OLS. Hence, the only consideration taken from the tobit model is the standard error and hypothesis testing results, which yielded similar results as the one in the linear model.

For the results of The Spatial Panel Model, in Table 15 as it is expected, there is a spatial effect in place. Also, both terms of theil index are still significant. But the coefficient is lower than the previous

ones (Tobit, fixed, and random effects) π is significant meaning that there is a spatial correlation between the variables. However, λ is not significant meaning that it does not drag over time. This could also be due to the fact that there is a trend variable already included in the model. Hence, the model is accounting for country-specific idiosynchrasies, a time trend. And spatial autocorrelation.

Results are presented in the following table:

Table 15: Estimation of Multiple Models for the Global Gender Gap Index

Variable	(1) Random Effects	(2) Panel Tobit	(3) Fixed Effects	(4) GSPRE[1]
Theil Index	-0.301	-0.301	-0.14	-0.151
	(0.000)***	(0.000)***	(0.002)**	(0.000)***
Theil Index (squared)	0.0536	0.0536	0.0249	0.0267
	(0.000)***	(0.000)***	(0.001)***	(0.000)***
Time	0.0022	0.0022	0.00993	0.00811
	(0.018)*	(0.011)*	(0.000)***	(0.000)***
Log of GDP per capita, ppp adjusted	-0.0301	-0.0301	-0.0451	-0.0296
	(0.024)*	(0.015)*	(0.078)	(0.091)
Exchange rate	-0.000137	-0.000137	0.000311	0.00027
	(0.000)***	(0.000)***	(0.042)*	(0.010)*
Inflation (CPI based)	-0.000165	-0.000165	-0.000647	-0.000792
	(0.853)	(0.843)	(0.365)	(0.245)
Urban Population	0.00308	0.00308	-0.0041	-0.00394
	(0.006)**	(0.003)**	(0.028)*	(0.007)**
Total Unemployment (# of individuals)	-0.000482	-0.000482	-0.000666	-0.000254
	(0.733)	(0.714)	(0.596)	(0.816)
Fertility rate	-0.0066	-0.0066	0.0585	0.0425
	(0.69)	(0.669)	(0.011)*	(0.018)*
Self-employment (# of individuals)	-0.00359	-0.00359	-0.00358	-0.00391
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Women (% of total population)	-0.832	-0.832	-3.456	-1.766
	(0.033)*	(0.022)*	(0.176)	(0.303)
Constant	1.751	1.751	3.184	2.261
	(0.000)***	(0.000)***	(0.014)*	(0.009)**
Variance (σ_u^2)		(1)		(0.014)*
Variance (σ_e^2)	0.0139	0.0174	0.0139	0.0131
Spatial Correlation (φ)				-1.047
				(0.000)***
Spatial Correlation (λ)				0.0248
				(0.845)
N	90	90	90	90
R-sq	0.6612		0.814	0.116
AIC	.	-446	-509.3	-462.9

p-values in parentheses

* p<0.05, ** p<0.01, *** p<0.001

[1] Generalized Spatial Panel Data Model with Random Effects

As the results of table 15 show, the relationship between the two variables of interest remains significant in every model, even when control variables are included. The coefficients of the panel models do not change much in relation to the model without control variables. However, when considering the fixed effects of each country in columns (3), there the coefficients do change by almost half (from approximately 0.3 and somewhat to 0.14 and from 0.053 to 0.0249 for the cuadratic term). The Hausman test suggests that the Fixed effects model is the valid one when comparing the RE versus FE especifications, so these results are the most appropriate for interpretation of the marginal effect of theil on gggi. Also, given that, the GSPRE model is also estimated with panel terms.

The tobit model is used to check the possible impact of censoring on the estimates, but it does not seem to affect the significant of the theil coefficients, thus the results obtained for hypothesis testing based on the p-values hold. This model uses the random effects estimator, so it is not used for interpretation. Unfortunately, there is no method yet to estimate a TOBIT fixed effect model, so the standard fixed effects model is used for interpretation and it is assumed that the results from the hypothesis testing from the random effects models hold.

Interesginly, the results obtained from the GSPRE specification aren't that different from those calculated by the fixed effect estimator. Nevertheless, the t-tests and the coefficient of the spatial terms for the matrix M (the panel term) is significant, which suggest that there is an effect of spatial correlation between countries, but this effect occurs at the panel level without spatio-temporal lags. Given that, even if the coefficient remains at a similar value, the model that seems to estimate the most appropriate marginal effect for export diversification on gender inequality seems to be the GSPRE, for which the partial derivative is determined by the equation gggi = -0.151theil + 0.0267theil2, which results in a U-shaped curve.

Assuming that the specification is correct, and that the direction of the effect goes from export diversification to gender inequality, these results are congruent with the literature and theory previously discussed. Export diversification seems to be associated with higher gender equality, but the effects has diminishing returns. Also, the marginal effect has a root in a theil value of approximately 5.65, for which the effect turns negative and increasing the levels of diversification could hinder gender equality. No country in the data has register such a value for its theil index in any point in time.

An important discussion in the literature is the possibility of a bidirectional relationship between the variables (also known as double causality). Even though there is no statistical measure that can actually

test for causality in a philosophical sense, the concept of Granger causality could be useful to at least identify if there is any evidence of a bidirectional effect. In a general sense, for two variables to cause each other, they should both have significant predictive power on each other with some temporal lag. That is, export diversification should impact gender equality and viceversa, and such effects are observed with a lag. In oder to address this, a PVAR model was estimated by modelling the theil index and the GGG index as endogenous variables interrelated with each other, and the control variables as exogenous. Also, the Dumitrescu–Hurlin test was conducted to assess a simpler relationship without controls. The results suggrests that the relationship between the variables is not bidirectional, as the model barely has any statistical meaning as seen in results in table 16.

Table 16: Panel Autoregressive Model Between Global Gender Gap Index and Export Diversifications with Control Variables

Variable	(1) Global Gender Gap Index	(2) Theil Index
Global Gender Gap Index (lag=1)	1.825	-18.23
	(0.648)	(0.709)
Theil Index (lag=1)	0.0191	1.008
	(0.579)	(0.051)
Time	-0.0109	0.179
	(0.77)	(0.709)
Log of GDP per capita, ppp adjusted	0.0529	0.441
	(0.687)	(0.782)
Exchange rate	-0.000797	0.0147
	(0.855)	(0.776)
Inflation (CPI based)	0.00354	-0.0473
	(0.794)	(0.766)
Urban Population	0.0132	-0.296
	(0.813)	(0.668)
Total Unemployment (# of individuals)	0.000215	0.057
	(0.958)	(0.32)
Fertility rate	-0.032	0.833
	(0.788)	(0.663)
Self-employment (# of individuals)	0.00668	-0.145
	(0.843)	(0.728)
Women (% of total population)	-4.343	134
	(0.893)	(0.725)

Instruments : lag(1/1) of (Global Gender Gap Index and Theil Index) + All Controls.
p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Another test that was performed was granger causality these results provide mixed evidence to uphold the hypothesis that there is a bidirectional effect. The Z tests are rejected in both cases, but the Z-bar test only holds for GGGI, which leads to the initial model where export diversification is a driver of gender inequality. Also, rejecting the test indicates that there is a relationship for at least one of the countries. It could be the case that the effects are differentiated across countries. However, if that is

the case, the model will end up being a system of individual equations for each country, which is not possible to estimate with the current data. Additionally, if the relationship does not hold over the whole panel, then the hypothesis of the existence of a two-sided relationship between both variable is probably not correct.

Table 17: Generalized Spatial Panel Data Model with Random Effects for the Global Gender Gap Index and its Components

Variable	(1) Global Gender Gap (Total Index)	(2) Global Gender Gap (Education Component)	(3) Global Gender Gap (Health Component)	(4) Global Gender Gap (Economic Component)	(5) Global Gender Gap (Political Component)
Theil Index	-0.151	-0.0117	0.000512	-0.223	-0.361
	(0.000)***	(.)	(.)	(0.003)**	(0.006)**
Theil Index (squared)	0.0267	0.00149	0.0000538	0.0405	0.0648
	(0.000)***	(0.009)**	(0.775)	(0.001)***	(0.002)**
Time	0.00811	-0.0000475	0.0000113	0.00234	0.0268
	(0.000)***	(0.958)	(0.957)	(0.111)	(0.000)***
Log of GDP per capita, ppp adjusted	-0.0296	-0.0188	0.00346	0.0167	-0.108
	(0.091)	(0.000)***	(0.000)***	(0.402)	(0.018)*
Exchange rate	0.00027	-0.0000315	0.00000733	-0.000456	0.000812
	(0.010)*	(0.606)	(0.651)	(0.000)***	(0.030)*
Inflation (CPI based)	-0.000792	-0.000109	-0.0000537	-0.00296	-0.000342
	(0.245)	(0.631)	(0.523)	(0.054)	(0.848)
Urban Population	-0.00394	0.000682	-0.000352	-0.00172	-0.00577
	(0.007)**	(0.67)	(0.176)	(0.264)	(0.231)
Total Unemployment (# of individuals)	-0.000254	-0.000183	-0.000269	-0.00231	-0.000671
	(0.816)	(0.676)	(0.059)	(0.299)	(0.84)
Fertility rate	0.0425	-0.0394	0.0001	-0.0958	0.305
	(0.018)*	(0.000)***	(0.97)	(0.000)***	(0.000)***
Self-employment (# of individuals)	-0.00391	0.000173	-0.0000713	-0.00604	-0.00781
	(0.000)***	(0.671)	(0.302)	(0.000)***	(0.000)***
Women (% of total population)	-1.766	-1.307	0.204	-2.447	-10.65
	(0.303)	(.)	(.)	(0.001)***	(0.109)
Constant	2.261	1.897	0.866	2.619	6.665
	(0.009)**	(0.000)***	(0.000)***	(0.000)***	(0.039)*
Spatial Correlation (φ)	-1.047	-0.948	-0.856	-1.256	-1.731
	(0.000)***	(0.013)*	(0.197)	(0.000)***	(0.000)***
Spatial Correlation (λ)	0.0248	-0.647	0.383	0.163	-0.204
	(0.845)	(.)	(0.001)***	(0.173)	(0.155)
Variance (σ_u^2)	0.032	0.00345	0.000905	0.0000373	0.0651
	(0.014)*	(0.474)	(0.331)	(0.863)	(0.002)**
Variance (σ_e^2)	0.0131	0.00611	0.00125	0.0267	0.0397
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
N	90	90	90	90	90
R-sq	0.116	0.822	0.288	0.718	0.053
AIC	-462.9	-608.4	-898.2	-359.4	-265.2

Note: Models (1) and (2) didn't achieve convergence. The results of the coefficient are reported but they are not relevant for analysis.

p-values in parentheses

* p<0.05, ** p<0.01, *** p<0.001

After the previous analysis, it evidences that the GSPRE model is the most robust, therefore in deep analysis will be performed using this method. Individual subindexes of GGGP will be modelled using the GSPRE especification to explore the individual relationship with export diversification (Table 17)

and for robustness and as a way of having a benchmark, estimates from fixed effects method are also presented (table 18).

Table 18: Panel Fixed Effect Models for the Global Gender Gap Index and its Components

Variable	(1) Global Gender Gap (Total Index)	(2) Global Gender Gap (Education Component)	(3) Global Gender Gap (Health Component)	(4) Global Gender Gap (Economic Component)	(5) Global Gender Gap (Political Component)
Theil Index	-0.14	0.0228	0.00973	-0.184	-0.403
	(0.002)**	(0.305)	(0.013)*	(0.036)*	(0.004)**
Theil Index (squared)	0.0249	-0.00368	-0.00167	0.0343	0.07
	(0.001)***	(0.301)	(0.008)**	(0.015)*	(0.002)**
Time	0.00993	-0.0000711	0.000508	0.00755	0.0317
	(0.000)***	(0.95)	(0.012)*	(0.094)	(0.000)***
Log of GDP per capita, ppp adjusted	-0.0451	0.0000102	0.000244	-0.0247	-0.155
	(0.078)	(0.999)	(0.914)	(0.626)	(0.053)
Exchange rate	0.000311	0.0000697	0.0000519	0.000301	0.000821
	(0.042)*	(0.368)	(0.000)***	(0.32)	(0.084)
Inflation (CPI based)	-0.000647	-0.000457	-0.0000273	-0.00192	-0.000167
	(0.365)	(0.212)	(0.667)	(0.182)	(0.94)
Urban Population	-0.0041	-0.0021	-0.0011	-0.00578	-0.00737
	(0.028)*	(0.028)*	(0.000)***	(0.12)	(0.202)
Total Unemployment (# of individuals)	-0.000666	0.000128	0.0000232	-0.00195	-0.00087
	(0.596)	(0.843)	(0.836)	(0.438)	(0.825)
Fertility rate	0.0585	-0.0415	0.000345	-0.0678	0.343
	(0.011)*	(0.001)***	(0.863)	(0.134)	(0.000)***
Self-employment (# of individuals)	-0.00358	-0.00122	-0.0000554	-0.00622	-0.00677
	(0.000)***	(0.007)**	(0.469)	(0.001)***	(0.013)*
Women (% of total population)	-3.456	0.972	0.729	-3.502	-12.16
	(0.176)	(0.456)	(0.002)**	(0.492)	(0.129)
Constant	3.184	0.739	0.653	3.529	7.864
	(0.014)*	(0.255)	(0.000)***	(0.165)	(0.049)*
N	90	90	90	90	90
R-sq	0.814	0.562	0.496	0.774	0.707
adj. R-sq	0.7730	0.4660	0.3850	0.7240	0.6430

p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001

As a result, for education and health, the models did not converge, meaning that the coefficient does not seem to exist. However, economic and political components did come out and they look relatively significant (5%). In which case it seems that when disaggregating the model into subindices it may be important to consider specific equations of each index and variable. Further study can be done regarding this finding.

Chapter 4. Conclusion

The newest development's approach can be framed in the SDGs framework where gender inequality is considered one of the goals to be achieved. This has taken a new field of research where more complex links and relationships have been found and should have a deeper understanding of the current economic conditions and goals. The cultural and social relationships in a specific country could be associated with economic development and affecting differently the outcome of gender inequality, hence regional and sectorial studies are important to unfold the true existing relationship between gender inequality and economic factors and therefore how the situation can be improved through public policy. This study explores the relationship between trade at export diversification level and gender inequality in Central American countries.

As this study shows, the six countries have been working toward an improvement over the past decades for increasing economic growth and decreasing gender inequality. It is important to highlight that trough history on diversification's side policies seem to be more focused on increasing the economic output (e.g. total export value, increasing GDP) not considering the collateral effects, as many of these policies have almost no further analysis such as sustainability, gender inequality, etc. Agriculture keeps being one of the main export sectors with little value-added and industries such as mining are growing in some countries. The goal of becoming more industrialized and having a more diverse export basket is still in the process. The challenges regarding export diversification arising from this analysis are 1. The growing industries (e.g. mining, palm oil) 2. Level of concentration for the three main export products where it was shown that some countries are reaching high export dependency only products. Moreover, one important aspect to consider is the high dependence of each country on trade within the CACM which with further analysis can play as a weakness or as a strength.

Additionally, as in the case of Central American countries, the data shows that an attempt has been taking place by the governments to eradicate gender inequality. As a result, the subindex in the GGGI for educational attainment and health and survival shows practical equality among females and males in the referred countries, and in parallel, the analysis of the fertility rate and mean years of education sustain the idea about the good performance of the countries in health and education. However, the employment and empowerment subindex hasn't followed the same trend. This argument is also supported by the growth of certain economic sectors towards increasing the labor force for men rather

than women (mining, agriculture), potentially in the future increasing the existing gap or leaving women in not equal conditions.

For the econometric analysis, two hypotheses were tested: nonlinear relationship – bidirectional relationship. Results were mixed and still need further analysis to know the relationship between export diversification and gender inequality when controlling for other variables. To answer the research question of this study the data provided evidence of a statistically positive nonlinear relationship. However, it is not likely to be bi-directional.
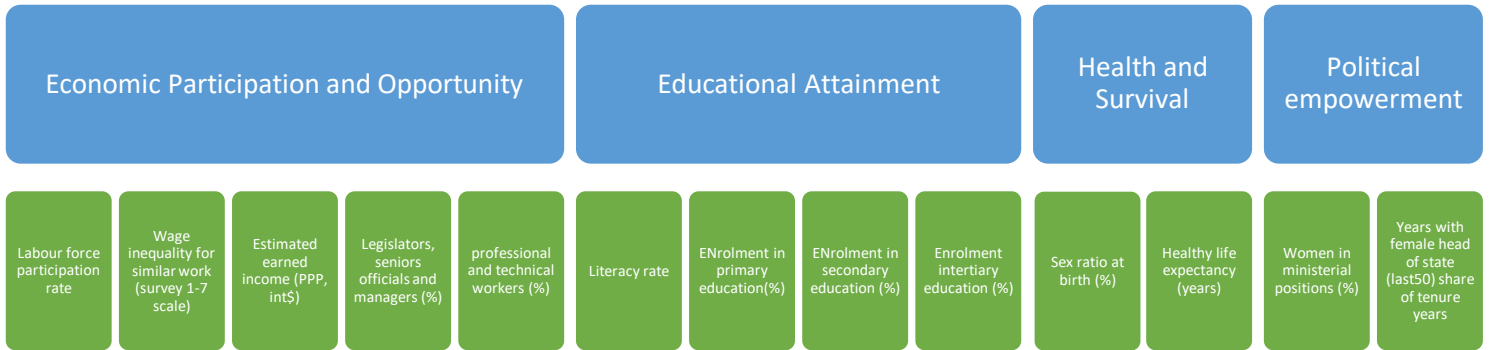
Evidence of different relationships among countries can be found as mixed results were found. This is an important finding and shed a light on the kind of hidden relationship that could exist between these two variables to perform further studies in individual countries. Moreover, this research provides the idea that the study of one specific dimension of gender inequality could provide more meaningful results than a composite indicator as it has many possible variables which are affected differently in a country. For instance, on the measurement of education gender inequality, all control variables could provide information about this specific dimension of gender inequality. In that regard, those countries should also be incentivized to produce updated data so better quality analysis can be performed.

Finally, it is important to highlight that context matters to have an accurate interpretation of numbers. Exploratory research is important more when there's not much literature focused on the region for the topic, but public policies are increasing their focus on that topic. To have a positive and sustained impact considerations in context must maintain the main goal in mind, to equalize women and men's outcomes and opportunities and improve the well-being of many women and girls that could live have been experiencing discrimination and abuse.

Global Gender Gap Index

Economic Participation and Opportunity					Educational Attainment				Health and Survival		Political empowerment	
Labour force participation rate	Wage inequality for similar work (survey 1-7 scale)	Estimated earned income (PPP, int$)	Legislators, seniors officials and managers (%)	professional and technical workers (%)	Literacy rate	ENrolment in primary education(%)	ENrolment in secondary education (%)	Enrolment intertiary education (%)	Sex ratio at birth (%)	Healthy life expectancy (years)	Women in ministerial positions (%)	Years with female head of state (last50) share of tenure years

Source: WEF

References

Abrigo, M. R. M., & Love, I. (2016). Estimation of Panel Vector Autoregression in Stata. *The Stata Journal: Promoting Communications on Statistics and Stata*, *16*(3), 778–804. https://doi.org/10.1177/1536867X1601600314

Agosin, M. R., & Bravo-Ortega, C. (2009). The Emergence of New Successful Export Activities in Latin America: The Case of Chile. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1807608

Akbulut, R. (2011). SECTORAL CHANGES AND THE INCREASE IN WOMEN'S LABOR FORCE PARTICIPATION. *Macroeconomic Dynamics*, *15*(2), 240–264. https://doi.org/10.1017/S1365100510000040

Belotti, F., Hughes, G., & Mortari, A. P. (2017). Spatial Panel-data Models Using Stata. *The Stata Jornal*, *17*(1), 139–280.

Bernard, A. B., Jensen, J. B., Redding, S. J., & Schott, P. K. (2007). *Firms in International Trade*. 79.

Bond, M., & Milne, E. (1987). *Export Diversification in Developing Countries: Recent Trends and Policy Impact*. 47.

Brenton, P., & Newfarmer, R. (2007). *Watching More Than The Discovery Channel: Export Cycles And Diversification In Development*. The World Bank. https://doi.org/10.1596/1813-9450-4302

Bulmer-Thomas, V. (1998). The Central American common market: From closed to open regionalism. *World Development*, *26*(2), 313–322. https://doi.org/10.1016/S0305-750X(97)10039-0

Busse, M., & Spielmann, C. (2006). Gender Inequality and Trade*. *Review of International Economics*, *14*(3), 362–379. https://doi.org/10.1111/j.1467-9396.2006.00589.x

Cadot, O., Carrère, C., & Strauss-Kahn, V. (2011). Export Diversification: What's behind the

    Hump? *Review of Economics and Statistics*, *93*(2), 590–605.

    https://doi.org/10.1162/REST_a_00078

Cotter, D. A., Defiore, J., Hermsen, J. M., Marsteller Kowalewski, B., & Vanneman, R. (1998). The

    Demand for Female Labor. *American Journal of Sociology*, *103*(6), 1673–1712.

    https://doi.org/10.1086/231404

Dollar, D., & Gatti, R. (1999). *Gender Inequality, Income, and Growth: Are Good Times Good for Women?*

    42.

Duflo, E. (2012). Women Empowerment and Economic Development. *Journal of Economic Literature*,

    29.

Economic Commission for Latin America and the Caribean (ECLAC). (2018). *CONTRIBUTIONS*

    TO INTEGRATION IN CENTRAL AMERICA. 30.

England, P. (2005). Gender Inequality in Labor Markets: The Role of Motherhood and Segregation.

    Social Politics: International Studies in Gender, State & Society, *12*(2), 264–288.

    https://doi.org/10.1093/sp/jxi014

Forsythe, N., Korzeniewicz, R. P., & Durrant, V. (2000). Gender Inequalities and Economic

    Growth: A Longitudinal Evaluation. *Economic Development and Cultural Change*, *48*(3), 573–617.

    https://doi.org/10.1086/452611

Ghosh, S. (2021). How trade diversification and economic growth affect gender inequality in female

    labour market participation? The case of India. *Journal of Economics and Development*.

    https://doi.org/10.1108/JED-12-2020-0194

Haddad, M., Lim, J. J., Pancaro, C., & Saborowski, C. (2013). Trade openness reduces growth

    volatility when countries are well diversified. *Canadian Journal of Economics/Revue Canadienne*

    d'économique, *46*(2), 765–790. https://doi.org/10.1111/caje.12031

Herzer, D., & Nowak-Lehnmann D., F. (2006). What does export diversification do for growth? An

    econometric analysis. *Applied Economics*, *38*(15), 1825–1838.

    https://doi.org/10.1080/00036840500426983

Hesse, H. (2008). Export Diversification and Economic Growth. *Comission on Growth and Development*,

    Working Paper 21.

Hill, M. A., & King, E. (1995). Women's education and economic well-being. *Feminist Economics*, *1*(2),

    21–46. https://doi.org/10.1080/714042230

Hong, P. M. (2021). *The Importance of Export Diversification for Developing ASEAN Economies*. *2021*, 15.

Imbs, J., & Wacziarg, R. (2022). Stages of Diversification. *THE AMERICAN ECONOMIC*

    REVIEW, 25.

International Monetary Fund. (2014). Sustaining Long-Run Growth and Macroeconomic Stability in

    Low-Income Countries—The Role of Structural Transformation and Diversification. *Policy*

    Papers, *2014*(38). https://doi.org/10.5089/9781498343688.007

International Monetary Fund. (2015). Dealing with the Revenue Consequences of Trade Reform.

    Background Paper for Review of Fund Work on Trade.

Is sustainable palm oil production in Honduras achievable? (2021). *Research Features*, *136*.

    https://doi.org/10.26904/RF-136-1503066798

Iwamoto, M., & Nabeshima, K. (2012). *Can FDI promote export diversification and sophistication of host*

    countries? : Dynamic panel system GMM analysis. Institute of Developing Economies (IDE-

    JETRO). https://doi.org/10.20561/00037822

Kazandjian, Kolovich, Kochhar, & Newiak. (2019). Gender Equality and Economic Diversification.

    Social Sciences, *8*(4), 118. https://doi.org/10.3390/socsci8040118

Kim, Sangyoon, & Seo, Jonggook. (2017). A Study on the Influence of Gender Gap on Economic

    Structural Improvement and Economic Growth. *Journal of the Society of Disaster Information*,

    13(4), 499–510.

Klasen, S. (2002). Low Schooling for Girls, Slower Growth for All? Cross-Country Evidence on the

    Effect of Gender Inequality in Education on Economic Development. *The World Bank*

    Economic Review, *16*(3), 345–373. https://doi.org/10.1093/wber/lhf004

Klepinger, D., Lundberg, S., & Plotnick, R. (1999). How Does Adolescent Fertility Affect the

    Human Capital and Wages of Young Women? *The Journal of Human Resources*, *34*(3), 421.

    https://doi.org/10.2307/146375

Lee, D., & Zhang, H. (2022). Export diversification in low-income countries and small states: Do

    country size and income level matter? *Structural Change and Economic Dynamics*, *60*, 250–265.

    https://doi.org/10.1016/j.strueco.2021.11.017

Lopez, L., & Weber, S. (2017). Testing for Granger Causality in Panel Data. *Stata Journal*, 972–984.

Love, J. (1986). Commodity concentration and export earnings instability. *Journal of Development*

    Economics, *24*(2), 239–248. https://doi.org/10.1016/0304-3878(86)90090-8

Marc J. Melitz. (2003). The Impact of Trade on Intra- Industry Reallocations and Aggregate Industry

    Productivity. *Econometrica*, *71*, 1695–1725.

Matthew, O., Adeniji, A., Osabohien, R., Olawande, T., & Atolagbe, T. (2020). Gender Inequality,

    Maternal Mortality and Inclusive Growth in Nigeria. *Social Indicators Research*, *147*(3), 763–

    780. https://doi.org/10.1007/s11205-019-02185-x

McDonald, J. F., & Moffitt, R. A. (1980). The Uses of Tobit Analysis. *The Review of Economics and*

    Statistics, *62*(2), 318. https://doi.org/10.2307/1924766

McIntyre, A., Li, M. X., Wang, K., & Yun, H. (2018). Economic Benefits of Export Diversification

    in Small States. *IMF Working Paper*.

Ministerio de Comercio e Industrias. (2019, June 15). *Inician exportaciones de cobre panameño*.

    https://www.mici.gob.pa/noticias/inician-exportaciones-de-cobre-panameno

Morally, R. E. (2020). Women in Development: A Critique of Neo-Classical Economic Theory as

    One of the Causes for Gender Inequality. *Open Journal of Political Science*, *10*(01), 1–14.

    https://doi.org/10.4236/ojps.2020.101001

Okojie CE. (1994). Gender inequalities of health in the Third World. *Soc Sci Med*.

Osakwe, P., & Kilolo, J.-M. (2018). What drives export diversification? New evidence from a panel

    of developing countries. *UNCTAD Research Paper No.3*.

Pamela J. Smock. (1994). *Gender and the Short-Run Economic Consequences of Marital Disruption*. 21.

Pande, R., Malhotra, A., & Grown, C. (2005). *IMPACT OF INVESTMENTS IN FEMALE*

    EDUCATION ON GENDER EQUALITY. 85.

Rathgeber, E. M. (1989). *WID, WAD, GAD: TRENDS IN RESEARCH AND PRACTICE*. 26.

Salima, B. A., Julie, L. gallo, & Lionel, V. (2018). Spatial econometrics on panel data. *Handbook of*

    Spatial Analysis: Theory and Application with R, 179–203.

Schmidheiny, K. (2021). *Panel Data: Fixed and Random Effects*. 8.

Seung-Ah Choe, Sung-il Cho, & Hongsoo Kim. (2016). Gender gap matters in maternal mortality in

    low and lower-middle-income countries: A study of the global Gender Gap Index.

    International Journal for Research, Policy and Practice, *12,2017*(9), 1065–2076.

Sharon Mastracci. (2017). The effect of women's representation on the Global Gender Gap Index.

    International Journal of Public Sector Management, *30*(3), 241–254.

Sheila Gutiérrez de Piñeres & Michael Ferrantino. (1995). Export diversification and structural

    dynamics in the growth process: The case of Chile. *Journal of Development Economics*, *52(1997)*,

    375–391.

Terryl Blackwell. (2018). *Gender Development and Globalization*. ED-TECHPRESS.

The World Bank. (2012). *Gender Equality and Development* (World Development Report).

Theil, H. (1972). Statistical decomposition analysis: With applications in the social and administrative sciences. *Amsterdam: North-Holland.*

Trussell, T. J. (2022). *Economic Consequences of Teenage Childbearing.* 8.

UNCTAD. (2021). *V??nculos entre comercio y g??nero: Un an??lisis de Centroam??rica.* https://www.un-ilibrary.org/content/books/9789210053419

United Nations Conference on Trade and Development. (2021). *V??nculos entre comercio y g??nero: Un an??lisis de Centroam??rica.* https://www.un-ilibrary.org/content/books/9789210053419

United Nations Conference on Trade and Development (UNCTAD). (2014). Empirical Analysis of the Trade and Gender Links. *Virtual Institute on Trade and Gender*, *2.*

Vereinte Nationen (Ed.). (2015). *Transforming economies, realizing rights.* UN Women.