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Review

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Economic Policy Applications Utilizing the Survival Analysis Approach

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Abstract: While its origins lie in clinical research, survival analysis has emerged in years as a valuable tool for policymakers to evaluate the effectiveness of government interventions across diverse economic domains, including the political economy, industrial organization, social policies, and international trade. This comprehensive literature review explores the versatility of survival analysis in these sectors, showcasing its ability to provide policymakers with insights into the potential consequences of their policy decisions. The review highlights the unique advantages of survival analysis in analyzing dynamic economic phenomena, particularly those involving the resilience of political regimes, economic sectors, firms, and their relationships. This ability to track the duration and likelihood of various outcomes has enabled policymakers to understand the impact of government interventions on economic stability, competitiveness, and social well-being. Specifically, survival analysis has proven instrumental in examining the effectiveness of financial policies, the impact of social interventions on economic cohesion and poverty reduction, and the consequences of trade agreements on market access and firm performance. The review emphasizes the importance of employing survival analysis methodologies to inform evidence-based policymaking, enabling policymakers to make informed decisions that promote sustainable economic growth, social equity, and global trade stability. Overall, the review concludes that survival analysis is a powerful tool for policymakers seeking to navigate the complexities of the interconnected global economy and shape policies that foster long-term prosperity.

Keywords: Economic policy; Firm competitiveness; Global value chains; Industrial organization; Literature review; Political economy; Survival analysis; Trade agreements.

JEL Classification: C10, E62, F13, L16

Introduction

Building on decades of success in medical research, survival analysis has migrated to economic analysis as a powerful tool for exploring various implications related to individuals and firms engaged in diverse business activities. By studying the temporal dynamics of diverse business activities, survival analysis unveils hidden patterns and sheds light on the intricate factors that propel enterprises towards success or failure. This approach empowers researchers with a deeper understanding of market forces, enabling them to not only crack the

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"why" behind past outcomes but also forecast potential trajectories and anticipate forthcoming developments.

Nevertheless, survival analysis in drawing economic policy implications is still in its early stages. Using survival analysis methodologies, policymakers can effectively evaluate pertinent issues. Such evaluations may encompass the effectiveness of government policies aimed at promoting entrepreneurship, the assessment of preferential agreements' contributions to the competitiveness of diverse industries, and the identification of optimal economic incentives for enhancing regional development, social inclusion and more. These observations can help policymakers make informed decisions and targeted investments to promote socio-economic development objectives.

The article aims to provide an in-depth examination of how survival analysis techniques' utilization has been employed to explore the effectiveness of economic policy in recent years. While acknowledging that the review may not be all-inclusive, it aims to offer a detailed analysis of relevant economic scholarship. The analysis could potentially provide readers with a thorough understanding of how survival analysis methods are utilized to explore diverse economic inquiries. Furthermore, it can offer policymakers an evidence-based comprehension of the potential ramifications of adopting specific policy measures or strategies in the future and facilitate more informed policy decisions.

Particularly, the article delves into four key areas: the political economy and public policies, industrial organization, labour and social policies, and globalization issues, showcasing how survival analysis sheds light on the complex interactions between economic policies and societal outcomes. By integrating empirical findings, theoretical insights, and case studies, the article underscores the significance of survival analysis as a valuable tool for policymakers seeking to make informed decisions that promote sustainable economic growth, social equity, and global economic stability.

1. Political Economy and Public Policies

1.1 Political System, Governance and Institutions

The article begins with a collection of scholarly studies that employ survival methodologies to examine aspects of political economy and public policies. These studies contribute to a more nuanced comprehension of the interplay between economic norms and policies and the resilience of political regimes, institutions and societies. Jeitschko et al. (2014) demonstrate how democratic societies' survival depends on economic security and attachment to democratic values, with economic performance being more critical than wealth in determining democracy consolidation. Boudreaux and Holcombe (2017) contend that market-oriented economic institutions enhance the durability of democratic political institutions, with countries ranking in the top quarter of the Fraser Institute's EFW index having a 90% chance of remaining democratic after 20 years. De Mesquita and Smith (2010) examine the effects of political institutions and government finances on political leaders' ability to survive in office, highlighting leaders' primary goal of staying in power and the threats they face from within and outside the political system. Andersen and Aslaksen (2013) investigate the impact of natural resource abundance, particularly oil, on political leadership survival in various political systems, while Baccini and Urpelainen (2014) provide empirical evidence that leaders use international institutions to promote economic reform.

Next, Hollyer and Rosendorff (2012) find that political leaders sign PTAs to reduce policy uncertainty and establish bounds on possible policies, enhancing efficiency, citizen welfare, and limiting trade policy volatility. Bortolotti and Pinotti (2008) examine the timing of significant economic reform, revealing that political fragmentation plays a crucial role, with large-scale divestitures being delayed longer with greater fragmentation. Golub (2007) discovers that formal voting rules like Qualified Majority Voting expedite EU decision-making, but extreme preferences of EU member state governments and increased role of the European Parliament slow it down. Finally, Kono and Montinola (2015) argue that foreign aid given to democracies and autocrats with long-term horizons is more likely to be used in growth-enhancing policies.

1.2 Fiscal Policy

A natural place to initiate a review of the literature on economic policy is by examining the employment of survival analysis methodologies in analyzing government fiscal policies. Often, the efficacy of fiscal consolidation measures in developed countries is higher during challenging economic circumstances. Moreover,

the duration of such measures is influenced by debt level, cabinet fragmentation, adjustment strength, political constraints, and the type of adjustments made, with revenue-enhancing measures being more effective during a financial crisis.

For instance, Von Hagen et al., (2001) note that fiscal tightening measures are more effective in the European Monetary Union during challenging economic circumstances, as opposed to favorable times, as they are likely to impose a greater tax burden and could potentially hinder the prospects of long-term growth and employment. Illera and Mulas-Granados (2008) find that the duration of fiscal consolidations in the EU is mostly influenced by the level of debt, cabinet fragmentation, the strength and quality of the adjustment, and political constraints. Baldacci et al., (2012) argue that primary balance increases are the main source of debt reduction, and expenditure-based adjustments reduce the length of debt consolidation spells. Political fragmentation and proximity to elections hinder debt sustainability, while growth-inducing structural reforms shorten debt reduction. Fiscal consolidations that focus on revenue-enhancing measures are more effective, especially during a financial crisis.

In emerging markets, expenditure-based adjustments are more durable than revenue-based reforms. The risk of ending a fiscal adjustment episode decreases as an economy nears sustainable deficit levels. To achieve more sustained fiscal adjustments, public expenditure should be reallocated toward productive uses, wasteful spending should be cut, and revenue mobilization efforts should be enhanced. Strong institutions and a good policy track record are critical for sustainability (Gupta et al., 2005). Furthermore, (Berg et al., 2012) who identify that growth spells tend to be shorter in African and Latin American countries than elsewhere, highlight that more equal income distribution, democratic institutions, openness to trade and foreign direct investment, and an export or production structure that favors manufacturing and relatively sophisticated exports, as well as stable macroeconomic environments, are conducive to longer growth spells.

Corporate tax rates have a significant impact on a country's fiscal performance, as Cevik and Miryugin (2022) show that even a small rise in the tax burden can significantly decrease the survival prospects of non-financial companies. Policymakers must therefore take steps to level the playing field by standardizing tax treatments across sectors, capital asset types, and financing sources. Gillitzer and Sinning (2020) explore the impact of the timing of reminder letters on the payment behavior of taxpayers. The collection of unpaid tax debts poses a significant challenge for tax authorities, making it important to identify effective ways of prompting payment. Our results indicate that sending reminders early leads to faster payment of debts, without affecting the ultimate probability of tax compliance.

Host country corporate income tax rate (HCCITR) is crucial for foreign subsidiary survival. A lower HCCITR improves survival likelihood by 33%, surpassing other factors such as cultural distance, Multinational enterprises (MNE) and subsidiary size, and host country GDP growth (Farah et al., 2021). Lastly, the Brazilian Simplified Tax Regime is found to contribute to reducing companies' mortality and promoting employment (Conceição et al., 2018).

1.3 Monetary Policy

The subsequent focus is on scholarly studies that employ survival analysis methodologies to investigate diverse aspects of monetary policies. The first article underscores the significance of the impact of international law on the monetary policies of nations and that other countries' actions considerably impact a government's decision to commit and comply with international legal obligations. Also, governments with stable domestic rule-of-law frameworks are more likely to fulfill international monetary commitments (Simmons, 2000). An additional study indicates that greater concentration within the banking sector enhances the resilience of survival during times of banking crises, whereas non-G10 countries exhibit a higher incidence of failure in comparison to G-10 countries. Developing nations may have higher bank concentration due to a lack of competitive forces in their economic and political structure (Evrensel, 2008).

Additionally, the incentives to default and prepay for fixed-rate mortgages (FRMs) and adjustable-rate mortgages (ARMs) borrowers are very similar, implying similar behavior by both groups of borrowers when faced with the same financial incentives (Calhoun and Deng, 2002). A study by David and Gonçalves (2019) find that countries with flexible exchange rate

regimes experience shorter sudden capital flows stop episodes and output decelerations following sudden stops. Mosley (2005) examines how political factors affect governments' decisions to redenominate their currencies. The author's statistical analyses suggest that inflation and pressure from the IMF increase the likelihood of redenomination, while democratic and right-wing governments, ethnically diverse societies experiencing high inflation, and governments characterized by greater fractionalization are more likely to undertake a currency reform.

Furthermore, Serrano-Cinca et al. (2015) compare peer-to-peer (P2P) lending companies to conventional financial institutions and discusses their advantages and disadvantages. P2P lending can alleviate credit rationing, but credit risk is assumed by individuals, leading to significant information asymmetry. The loan grade assigned by P2P lending sites is the most predictive variable for loan defaults and encourages the use of sound credit scoring models. Geršl et al. (2015) find that loose monetary policy in the Czech Republic leads to decreased credit to borrowers with prior defaults but increased defaults on newly issued loans. Additionally, larger, more liquid banks reduce lending to risky borrowers, while less leveraged and foreign-owned banks exhibit lower and higher credit risk tolerance, respectively.

1.4 Public Procurement

Public procurement is a critical function of government, and it involves the purchase of goods and services on behalf of the public. However, the impact of public procurement on the economy and the firms involved is complex and multifaceted. Public procurement can reduce exit hazards for all efficiency groups, but it may have a negative effect on economic growth by incentivizing inefficient firms to remain in the market (Bessonova, 2022). While insufficient experience of local governments increased likelihood of delays in the implementation of public works contracts (Gori et al. 2017), releasing cost estimates can reduce information asymmetries in procurement auctions and prolong entrants' length of presence (De Silva et al., 2009).

Open data about beneficial ownership and cash plans could improve the analysis of the cost of late payments in public procurement (Pane et al., 2020). The success of public-private partnership projects depends mostly on the type of private partner engagement and the experience of the public entity in conducting PPP procedures, but repetitive projects are not likely to perform better (Węgrzyn, 2018).

1.5 Business Development Support

Survival analysis has been employed also to examine the impact of managerial and technical assistance on small businesses' survival and financial outcomes. For example, counseling hours and technical assistance providers' capabilities and specialties significantly influencing survival and financial outcomes (Solomon et al., 2013). Soft policy measures, such as coaching and training, are associated with a positive impact on the performance of new technology-based firms (Ramaciotti et al., 2017).

Elert et al. (2015) investigate the effect of participation in high school entrepreneurship education (JACP) on long-term entrepreneurial performance. The study found that participation in JACP increased the probability of starting a firm and the income from those firms, but did not affect firm survival. Next, a study by Wise and Valliere (2014) examines the impact of the experience level of accelerator management teams on the performance of the accelerators they manage. Accelerator manager experience, particularly direct startup founding experience, significantly influences tenant firm survival and growth. This effect is mediated by reduced firm failure risk, with direct experience having a stronger impact than ecosystem connectedness.

1.6 Global Economic Challenges

The literature review suggests that global economic challenges, such as the financial crisis of 2008 and the COVID-19 pandemic, have varying impacts on business outcomes. It highlights the importance of resilience, risk-sharing, and government effectiveness in mitigating the negative effects of crises on firms and individuals' survival. These findings can help policymakers and business leaders make informed decisions for coping better with these challenges. Su et al. (2022) assert that reducing income inequality is essential for effective national pandemic strategies, as it is a critical factor in containing and mitigating COVID-19 globally. While short-term relief like financial aid and tax breaks offer limited reprieve, they fail to tackle systemic issues: eroded social capital, entrenched poverty, and neglected investment in marginalized communities.

By studying the impact of the Global Financial Crisis of 2008 on Japanese exports Okubo et al. (2014) show that Asian fragmentation can effectively share risk, leading to robust trade relationships that contributed to the economic growth in Asia. Orlando and Rodano (2020) explore business crises and survival before and after COVID-19, showing that an early warning system to identify undercapitalized firms can be an effective policy tool to mitigate the negative effects of crises on businesses. Nonetheless, during times of financial and political crises, the significance of a firm's survival is linked to several underlying factors, including but not limited to large shareholding, labour productivity, and firm age (Iwasaki and Kočenda, 2020). Also, Huang et al. (2020) show that Chinese companies with higher corporate social responsibility (CSR) performance before the COVID-19 pandemic experienced fewer losses and it took them a shorter time to recover from the Shock.

2. Industrial Organization

This scholarly literature offers insight into a range of facets concerning industrial organization policies, market structures, competitiveness, state-aid and innovation promotion. A particular focus is placed on their implications for the economic efficacy and sustainability of manufacturing and services firms. Furthermore, it facilitates an examination of inter-firm interactions, in a given market structure, under certain regulatory frameworks and the corresponding impact on market outcomes, such as pricing, production, and profitability.

2.1 Industrial Policy and Market Competitiveness

Bartelsman et al., (2005) study firm demographics and survival in 10 OECD countries, finding that sector and country effects impact these patterns. While entry and exit rates are similar, post-entry performance differs between Europe and the US, suggesting the significance of growth barriers over entry barriers. This has implications for economic policy and institutions' effect on employment, output, and productivity growth.

Survival analysis can be used to detect and predict the duration and stability of cartels, with the leniency program and market screening methods being effective tools in identifying and breaking down cartels, as shown in De (2010); meanwhile, Davies et al. (2015) highlight the importance of understanding the behavior of cartels and improving detection methods to prevent increased merger activity among former cartels. Goncharov and Peter, (2019) show that transparent reporting under US GAAP and IFRS reduces cartel duration, partially due to greater transparency of segment disclosures, which helps detect cheating cartel members. The findings suggest that improvements in reporting transparency and enforcement can complement competition policy and have important implications for antitrust authorities.

Next, survival analysis in Intellectual Property (IP) matters can provide policymakers with insights into mechanisms that facilitate technology innovation and patenting strategies, such as parameters affecting the patent application hazard function, as shown by Xie and Giles (2011). Additionally, van Zeebroeck (2007) explores the impact of patenting strategies on the length of patent rights in Europe to implement measures that prevent abuse of the patent system while promoting innovation.

Furthermore, several studies show that foreign direct investment (FDI) has become an essential aspect in the context of enterprise development and industrial policy. Burke et al. (2008) explore the impact of FDI on the survival of business start-ups and suggest that FDI has a net positive effect. In dynamic industries (high firm entry and exit), the effect is negative, while in static industries (low churn), it is positive. Nordås and Kim (2013) posit that the quality of key supporting services is essential for competitiveness in manufacturing industries with technological capacity. Particularly, restrictions on services FDI and burdensome behind-the-border regulation of services industries negatively affect competitiveness in manufacturing.

2.2 State Aid and Subsidies

Several studies look at the impact of government policies such as state aid and subsidies on the business performance and financial viability of business companies. For example, Nulsch (2014) finds that firms receiving rescue and restructuring aid in the EU had a higher probability of survival than those denied aid. Similarly, subsidized enterprises exhibited higher survival rates compared to their non-subsidized counterparts, indicating the efficacy of state aid policies. However, this finding also emphasizes the importance of carefully selecting enterprises with desirable characteristics for the success of such programs (Pellegrini and Muccigrosso, 2017). Also,

Désiage et al. (2010) suggest that the long-term effect of operating public subsidies is significant, as they lead to higher firm survival, turnover, and job creation at a limited cost to the public administration.

The longest duration and highest budget of state aid were for services of general economic interest, R&D or innovation aid, and environmental aid, among others (Ozbugday and Brouwer, 2016). Also, (Lam et al., 2017) show that Zombie firms and SOEs contribute to China's high corporate debt and low productivity. Policy measures that address redundant workers, reduce the debt burden, scale down state subsidies, and divest noncore business activities have the largest positive impact in restoring the viability of weak enterprises, which will be critical in reducing debt vulnerabilities and raising productivity and long-term growth potential. Glennon and Nigro (2005) claim that the hazard of default for medium-maturity U.S. Small Business Administration (SBA) guaranteed loans are time-dependent, conditional on several borrower, lender, and loan characteristics, as well as the economic conditions of the region and industry where the borrower operates.

The effectiveness of different types of public loans and partnerships in supporting businesses has been the subject of much research. Loans guaranteed by mutual guarantee institutions (MGIs) were less likely to default than those guaranteed by banks (Caselli et al., 2021). Also, Bartik et al. (2020) find that Paycheck Protection Program (PPP) had a large survival effect on small enterprises more affected by COVID-19, but the targeting effectiveness of loan approval was mixed, with banks favoring enterprises with stronger connections and better financial positions. Bertoni et al. (2019) examine the impact of a hybrid policy instrument, Participation Loans (PLs), on the growth of entrepreneurial ventures. PLs are effective in boosting employment and sales growth, particularly for young and small companies, high-tech sectors, and those operating during the financial crisis. Also, PLs have a persistent positive effect on beneficiaries without negative spillovers, and do not affect bankruptcy rates. Lastly, PLs should complement existing policy instruments such as R&D subsidies, subsidized loans, loan guarantee schemes, and governmental VC.

Furthermore, Cumming et al. (2017) compare the exit performance of different types of venture capitalist (VC) investors in Europe using a large sample of VC-backed and non-VC backed companies. They show that companies backed by independent VC (IVC) funds have a higher likelihood of reaching a positive exit than those backed by government VC (GVC) funds. However, mixed IVC-GVC syndicates lead to a higher likelihood of a positive exit than IVC alone. These findings have important policy implications, indicating that public-private partnerships are beneficial for young high-tech companies, but that the institutional heterogeneity of VC syndicates should be kept at a manageable level to limit negative side-effects.

2.3 Innovation Promotion

The relationship between innovation promotion and firm performance has been a topic of interest in the academic literature, with divergent findings on the matter. While some studies, such as Boyer and Blazy (2014) suggest that innovation has an unfavorable impact on the survival of micro-enterprises and SMEs, others, such as Cefis and Marsili (2006) show that innovation is significant in increasing the survival probability of manufacturing companies, particularly small and young firms. Additionally, significant innovations positively influence the probability of business survival, with total patent applications positively affecting manufacturing firms‘ survival, while significant innovations positively affect service firms' survival (Ortiz-Villajos and Sotoca, 2018).

Hyytinen et al. (2015) challenge the assumption that innovating enterprises are more likely to survive, and finds a negative association, suggesting that the interaction of innovativeness and entrepreneurs' higher appetite for risk further reduces the survival prospects of their startups. Zhang et al. (2018) demonstrate that innovation efficiency reduces exit probability, underscoring the need for government policies that promote innovation and eliminate barriers to support sustainable economic growth. Furthermore, Zhang et al. (2020) conclude that the advantages of innovation outweigh the costs in small enterprises’ exit risks, and Fernandes and Paunov (2015) highlight the requirement for prudently crafted innovation policies that avoid moral hazard issues for risky innovation.

2.4 The World of Services

Various studies have explored the factors that contribute to the success and survival of businesses in different

services sectors, such as tourism, finance, digital services, and sharing economy, offering important insights and recommendations for stakeholders. Starting with studies of tourism services, Gokovali et al., (2007) and De Menezes et al. (2008) have identified specific trip characteristics, supply-side parameters, and socio-demographic variables, including nationality, quality assessments, and motives/image factors, that are correlated with the duration of hotel stays. Martinez-Garcia and Raya (2008) investigate low-cost hotels and report similar outcomes. Barros et al., (2010) find that the length of stay of golf tourists is positively associated with respondents' nationality and education, as well as with age, climate, events, and hospitality. Conversely, they discover a negative relationship between the length of stay and beach-related variables.

Survival analysis techniques have been utilized to study policy considerations related to the financial services sector. For instance, Gomez-Gonzalez et al. (2007) assert that financial health and prudence significantly affect the failure of financial institutions in Colombia during the financial crisis, with the capitalization ratio being the most significant indicator of bank failure. Increases in this ratio reduce the hazard rate of failure, especially for less capitalized banks. Bank size and profitability also play important roles in explaining bank failure dynamics. Pappas et al. (2017) compare the risk of failure in Islamic and conventional banks, and indicate that small Islamic banks are generally less hazardous than small conventional banks. Differentiated failure risk models for the two bank types are needed, and bank heterogeneity across accounting information should be closely monitored to identify financial distress. Credit card customer default is also discussed.

Exploring aspects related to policies affecting digital services: Wang et al. (2013) focused on online stores and asserts that structural assurance, in the form of complying with consumer rights safeguarding programs, and positive word-of-mouth (WOM) evaluations contributed to store survival. Lee et al. (2012) propose a methodology for modeling and predicting online content popularity and show promising results in predicting the lifetime of threads and number of comments, with observations within the first few days. The approach can also be applied to predict the set of threads that would receive more than 100 comments. Kaimann et al. (2021) identify determinants affecting the chart survival of music tracks on digital streaming platforms and recommended managerial actions for the music industry. They posit that major label support, chart competition, and diffusion impact chart longevity. The authors recommend that artists should retain the support of a major label, release fewer, high-quality tracks at a time, and prioritize promotional activities around new releases. These observations offer insights into music consumption and provide important recommendations for music industry stakeholders.

The following studies examine the features that contribute to the success of mobile apps. Lee and Raghu (2014) show that diversification across selling categories, offering free apps, investment in less popular categories, and continuous updates on app features and price boost sales. Jung et al. (2012) find that customer ratings and content size are critical for free products' survival, while ranking is more important for paid products. Early entrant advantage exists in the App Store, greater for free products on the Free chart. Xing and Gao (2018) analyze how various dimensions of online discourse impact user retention in a Twitter learning community. Cognitive and interactive tweets increase user commitment, while social tweets reduce it. This info can be used to design interventions and identify users at risk of dropping out. Data-mining techniques can be used for large-scale data analytics.

With regards to the sharing Economy, Leoni (2020) examines the survival of listings on peer-to-peer marketplaces such as Airbnb and that quality, location, competition, and hosts' skills affect their chances of survival. User-generated content, particularly customer reviews, helps reduce information asymmetry and improve market efficiency. Low-quality listings tend to disappear as the reviewing system signals quality and drives market selection. Zhao et al. (2019) focus on the high donor attrition faced by online donation-based crowdfunding, where many donors make one or a few donations before leaving. They propose the Joint Deep Survival model (JDS), which integrates heterogeneous features to model donation recurrence and donor retention. The model addresses technical challenges such as censorship and dependence relations of different behaviors, and extensive experiments with Kiva.org data show the model's effectiveness.

Dos Santos Felipe et al. (2022) explore the factors that affect the time-to-success in reward crowdfunding campaigns, using data from over 4,200 campaigns in Brazil. They find that campaigns with lower target amounts, more pledges, and fewer rewards tend to achieve success more quickly, and successful campaigns are more common in cities with greater income inequality. The results suggest that pledgers are motivated by the quality and purpose of projects rather than compensation and prefer to invest in projects that can produce positive social impact and reduce inequality.

3. Labour and Social Policies

The impact of social policies on economic cohesion, education, poverty reduction, labour market and health outcomes is critical for promoting sustainable development, improving people's well-being and achieving social inclusion. This text presents a range of research studies that shed light on the importance of adopting policies that prioritize reducing inequality, promoting social and spatial integration, investing in early childhood programs, building supportive living environments, and encouraging civic engagement.

3.1 Labour Market

The labour literature has extensively used survival analysis to study key features related to the labour market, unemployment determinants, job match quality, and the effects of labour market policy programs, unemployment insurances and benefits. This chapter begins with an analysis by Madariaga et al. (2018) who find that the survival analysis approach is better suited for studying longitudinal risk of resignation, and the competing risks modeling allows for consistent results in both voluntary and involuntary resignation settings. Hom and Kinicki (2001) which confirms that dissatisfaction with work leads to employees quitting their jobs, and adds other determinants such as job avoidance and inter-role conflict. The study emphasizes the importance of considering economic factors such as unemployment rates, when predicting job turnover to suggest that addressing the underlying causes of employee dissatisfaction is crucial in reducing job turnover.

Pastore et al. (2021) find that school-to-work transition (STWT) duration is negatively related to labor-market policy education spending, and trade-union density, while GDP level and growth have a positive effect. Cassoni et al. (2002) find that Labor Unions in Uruguay increase wages, employment, and investment in profitable plants. Firm-level bargaining decreases investment but increases productivity and profitability, while also promote new technology and productivity growth, leading to higher profits. Lester et al. (2008) discuss the appeal of former government officials as outside directors for corporations and the impact of political party control changes on board appointments. The article also notes the decline of human and social capital over time.

Tatsiramos (2009) suggest that unemployment insurance (UI) has varying effects on unemployment duration and subsequent employment stability, with a stronger impact in countries with more generous systems. Reducing UI generosity may not be compatible with higher employment in Europe. Lastly, the high-skilled in the United States appear to benefit from more flexible labour markets, resources, and better benefits, thus providing a buffer effect on the impact of unemployment on health (McLeod, et al., 2012).

Next, Wulfgramm and Fervers (2015) demonstrate that generous income support for the unemployed and spending on training programs and counseling services can improve reemployment stability. They state that efforts should focus on increasing reemployment stability as well as shortening unemployment duration. Non-recipients of unemployment benefits tend to experience shorter periods of unemployment but also exhibit significantly greater rates of transition to over-education than recipients of unemployment benefits; reducing unemployment benefits may lead to a rise in the prevalence of over-education and reduce overall job match quality in the labour market (Pollmann-Schult and Büchel, 2005).

3.2 Social Inclusion and Public Welfare

Benner and Pastor (2015) show that regions with lower income inequality, less social and spatial segregation, and a higher proportion of the population with middle education levels and lower reliance on manufacturing are more likely to sustain economic growth. The authors call for policies aimed at reducing inequality and promoting social and spatial integration to achieve sustained growth. Inoue (2013) observed that in the elderly population of Japan, an optimistic perception of community cohesion is linked to a decreased risk

of mortality from all causes as well as cause-specific mortality.

Bailey et al. (2020) look at the long-term impacts of early childhood access to the Food Stamps program in the US and report the positive effects on adult human capital, economic self-sufficiency, neighborhood quality, survival, and incarceration rates, indicating that investments in early childhood programs like this can generate long-term benefits for individuals and society, making them a cost-effective part of the social safety net. Muennig et al. (2018) find that living in a two-generational household is only significantly beneficial for healthy participants and emphasizes the importance of building supportive living environments and policies that might reduce social stressors and build cohesion. Rønsen and Skarðhamar (2009) evaluate a Norwegian initiative to combat poverty and find that the program's impact varies across different target groups, with positive effects on long-term social assistance recipients but no effect on immigrants and single mothers, and negative effects on youth. Their study suggests that the program has potential effectiveness in addressing poverty in specific groups.

According to Lockeman and Pelco (2013), a noteworthy correlation exists between meaningful civic engagement and an increased probability of successfully completing a degree program at colleges and universities. While acknowledging the variety of factors that affect school-to-work transitions (Nilsson, 2019), and considering the positive impact of community services and the potential for higher income prospects associated with obtaining an academic degree, it is essential to highlight the importance of encouraging young individuals to take on social responsibility and volunteer in their communities. Promoting community service and volunteerism can be a valuable approach to increase the likelihood of completing a degree, improve prospects for future employment, while building stronger, more connected societies.

Finally, Hoepner et al. (2021) explore the influence of institutional factors such as cultural values and regulatory environments on the adoption of the Principles for Responsible Investment (PRI), a voluntary initiative that aims to promote sustainable investment practices. The study finds that normative and cultural-cognitive factors have the most influence on asset owner adoption of the PRI. Moreover, voluntary codes and guidelines are more effective than mandatory regulation in fostering RI growth. Lallo and Raitano (2018) asset that that socioeconomic conditions strongly affect health and life expectancy, and that this should be considered when designing insurance and pension schemes. They found a significant social gradient in survival, with a more than five-year difference in life expectancy between individuals from opposite social positions. Additionally, the Italian public pension system is becoming a "regressive" redistribution system, as it is linked to the national average life expectancy and may not ensure actuarial fairness.

3.3 Gender Equality

Survival analysis has been used to examine gender equality objectives, specifically in the context of government policies aimed at boosting female entrepreneurship, the appointment of female CEOs, and the promotion prospects of women in the labor market. Gennari and Lotti's (2013) investigate the effectiveness of a startup subsidy for female-owned businesses on their survival rate. They indicate that the difference in survival curves between the treated and control groups was significant up to the sixth year, but became negligible thereafter. The study also revealed high revocation rates for subsidized firms, pointing to a lack of tradition and managerial skills.

In research focused on 193 female CEOs, Elsaid and Ursel's (2018) re-examine the glass cliff hypothesis and find that, in line with the hypothesis, women were appointed as CEOs in precarious situations. Additionally, female CEOs were 40% less likely to face turnover than male CEOs, which diverges from prior research indicating only a slightly lower risk for women. Hultin (2003) presents findings on gender differences in promotion prospects in typically female-dominated occupations in Sweden. The study found that men have better internal promotion prospects than their similarly qualified female counterparts in these occupations ("glass escalator" hypothesis). However, in male-dominated occupations, women and men have similar promotion chances.

Hirsch et al. (2010) analyze the labour supply of women and men to firms using a dynamic model of new monopsony. Here, women have a steeper labour supply curve to the firm compared to men, and men

earn 4.6%–17.4% more than women, which is partially explained by different labour supply elasticities at the firm level. The policy implication is that policies aimed at improving gender equality in the labour market should take into account the role of labour supply elasticities at the firm level.

4. Globalization

4.1 World Trade Organization

Survival analysis has been employed in several studies to analyze the measures taken by the World Trade Organization (WTO) and their effects on international trade relations. Grinols and Perrelli (2006) reveal that the WTO increased the number of trade disputes but also shortened their lifespan. The level of global value chain integration affects a defendant's propensity to comply with adverse panel rulings in WTO disputes, according to Yildirim et al. (2018). The adoption of anti-dumping (AD) laws has been driven by retaliatory motives and past trade liberalization. AD laws are positively correlated with the size of the chemicals sector and the extent of steel imports, while inward foreign direct investment has a negative effect, as reported by Vandenbussche and Zanardi (2008). Moreover, AD petitions cause subject suppliers to abandon the US market completely (Besedeš and Prusa, 2013). The study suggests that the welfare effects associated with AD are underestimated, and potential trade may never be realized due to firms being reluctant to enter a market because of the risk of facing an AD petition. Furthermore, technical barriers to trade (TBT) have inconsistent effects on different components of trade, with TBT reducing trade probability but increasing trade volume and duration, according to Bao and Chen (2013).

4.2 Preferential Trade Agreements

Survival analysis has been increasingly used in understanding the factors that drive the formation of regional trade agreements (RTAs), the benefits of regionalism, and the impact of intra-regional trade on export expansion. Cyrus, 2021 seeks to determine why countries form RTAs and claims that trade, per-capita GDP, and similarities in culture and institutions increase the likelihood that two countries will form an RTA. Bergstrand, et al., 2016 posit that countries have found regionalism to be a beneficial approach in the absence of multilateral liberalization. This is particularly evident given influences such as geographical proximity, economic size, similarity, and interdependence, which have a significant impact on the formation of Preferential Trade Agreements (PTAs). As such, these factors play a crucial role in determining the likelihood of the occurrence of such events. In an analysis by Kamuganga (2012) intra-Africa regional trade cooperation improves the likelihood of export relationship survival. Also, enhanced regional integration has the potential to alleviate the undesirable repercussions of factors such as trade frictions stemming from infrastructure inadequacies, macroeconomic and financial development, and foster Africa's sustainable export expansion.

Other articles study the formation and impact of PTAs on international trade. For example, Baccini (2012) finds that exporters augment their level of political engagement in response to trade diversion resulting from the creation of (PTAs) from which they are excluded. This mobilization of exporters leads to a change in the balance of domestic interests, encouraging the government to pursue a preferential trade agreement with the discriminated country. The formation of PTAs is predominantly motivated by nations' reactions to the adverse externalities associated with preexisting agreements. Moreover, Ronen and Benizri, (2018) validate the considerable influence of free trade agreements on the export competitiveness of multiple economic sectors, although the extent of impact varies among the respective sectors. In the context of trade negotiations, a positive relationship has been observed between the number of countries involved and the duration of the negotiation process. Also, negotiations that include nations from different regions tend to have longer durations (Moser and Rose, 2012). Furthermore, Ronen (2024) validates the positive influence of PTAs on export competitiveness, while uncovering the temporal erosion of these benefits and sectoral discrepancies.

4.3 Global Value Chains

Several studies have explored the characteristics of Global Value Chains (GVC) and their interplay with export survival. Markedly, GVC involvement can lead to more stable export flows and greater benefits for developing countries, depending on the type of GVC participation and the level of development of the source and destination countries (Díaz-Mora et

al., 2018). GVC participation can extend the export duration and benefit enterprises by improving product quality, specific asset investment, and product diversity (Zhu et al., (2019). Integrating into GVCs can help raise productivity and competitiveness, by reducing fragmentation-related costs of production and improving domestic reforms (Cadestin et al., 2016). Enterprises are also shown to adapt their supply-chain networks in response to changes in the exposure of their suppliers to physical climate risks, and customers choose replacement suppliers with lower expected climate risks (Pankratz and Schiller (2021).

4.4 Firms' Internationalization

Governments aim to help local producers become successful exporters by identifying factors that impact the duration of successful exporting firms. This information is essential for policymakers to design effective strategies to optimize success in the global market. Multiple aspects related to firms' internationalization considerations were identified using survival analysis techniques. The subsequent subsection outlines various of these aforementioned considerations.

With regards to factors affecting export survival, exporting or investing abroad increases the risk of failure due to strong competition in international markets. To enhance the probability of survival, it is advisable to channel features such as firm size, technological sophistication, and resources towards those firms that demonstrate a greater propensity for thriving in exportation and reinforcing their standing in overseas markets. Giovannetti et al. (2011) assert that size and technological level reduce failure risk, with larger firms having a greater positive effect of technology on survival probability. Esteve-Pérez et al. (2007) show that exporting to closely-related markets and firm characteristics like size, productivity, and industry enhance exporting survival. Fugazza and Molina (2011) suggest policies aimed at increasing export revenues and reducing trade costs, with subsidies on export earnings having a greater impact than subsidies aimed at reducing fixed costs faced by new exporters. Araujo et al. (2016) study the effects of weak contracting institutions on the dynamics of exporting firms in foreign markets. Firms tend to have higher initial volumes and longer periods of service in countries with better institutions, but experience higher export growth in countries with worse institutions. The findings suggest potentially important consequences for aggregate trade flows and trade policies.

Various features such as importer characteristics, importer-exporter relationships, country of origin, product type features, market structure, contract enforceability, trade financing, transport efficiency, and reducing trade uncertainty affect the duration of trade relationships. Nitsch (2009) identifies exporter characteristics, product type features, and market structure as factors that affect German importers' survival probabilities, including the standard 'gravity' determinants of trade. Hess and Persson (2011) highlight importer characteristics, importer-exporter relationships, and country of origin as significant determinants of import duration. Ancarani et al. (2015) reveal that various industry, nation, and firm characteristics, as well as strategic assets seeking reshoring motivations, such as quality and "made-in" effect, affect the duration of manufacturing offshore experiences before reshoring. Meanwhile, Besedeš and Blyde (2010) find that export relationships in Latin America are generally short-lived compared to the US, the EU, and East Asia. Regional differences in export survival rates are attributed to specialization patterns, along with facets such as contract enforceability, trade financing, transport efficiency, and reducing trade uncertainty. Obashi, 2010 find that trade relationships for machinery parts and components are more stable and longer-lived compared to final products.

Here are some examples for studies on tariff reduction, trade relationships and the potential challenges facing new exporters: Lin (2020) examines trade within the ASEAN+6 region, and demonstrates a negative relationship between trade relationship duration and tariff rates, meaning that reduced tariffs lead to longer trade relationships, especially in intraregional trade. Lower tariffs not only benefit intraregional trade but also the type of product, resulting in a significant reduction in hazard ratios. Nicita et al. (2013) show that in least developed countries' (LDCs) export of products that don't reflect the country's comparative advantage have a short survival in the international market, and the influence of comparative advantage on export longevity amplifies with the passage of time. According to Besedeš and Prusa (2011), most of the trade growth is driven by the

survival of existing trade ties, rather than the creation of new ones. his is especially pertinent in the case of emerging economies, where the duration of export survival is shorter when compared to that of developed nations. The authors caution against interpreting changes in the extensive margin as a sign of export success. Cadot et al. (2013) find that African exporters tend to experiment with export markets at a small scale, resulting in low survival rates, especially during the first year. The authors suggest that mutual-support professional organizations can help overcome the failure of exporters to internalize the positive impact they have on new entrants.

On the impact of costs on export survival, Albornoz et al. (2016) found that firm's survival rates when entering a new export market increase with the ratio of sunk to fixed costs and is insensitive to constant profitability factors that are specific to the firm and market. The results suggest that existing estimates of exporting costs may need to be re-evaluated based on their ability to explain survival patterns across distance and export experience. Brenton et al. (2010) indicate that both regional- and product-specific experience matter most for low-income economies and highlight the importance of considering unobserved heterogeneity.

The agri-food trade is a critical sector of many economies, and as such, it has been the subject of numerous studies examining various policy aspects of its competitiveness and sustainability. Bojnec and Ferto (2012) assert that the CE-5 countries have more products with relative comparative trade disadvantages and a higher significance of one-way imports in agro-food trade compared to the EU-15, but Hungary was different from the other CE-4 countries with advantages in several agro-food products. Akram et al., (2021) highlight the importance of non-financial incentives and environmental considerations in promoting the adoption of organic farming. Bojnec and Ferto (2017) claim that both supply-side and demand-side factors are crucial for agri-food export competitiveness, and export diversification and natural factor endowment are crucial driving forces for long-term competitiveness. Meanwhile, Lee et al. (2020) observe that intra-industry trade in fisheries among OECD members is more stable and has a higher survival rate than inter-industry trade. Also, that horizontal intra-industry trade (HIIT) has a higher duration rate than vertical intra-industry trade (VIIT). Lastly, in their study, Toeroek and Jambor (2013) provide evidence supporting the proposition that policy reforms and regulations play a vital role in augmenting the competitiveness and sustainability of the agri-food trade within the New EU Member States.

4.5 Multinational Enterprises

The longevity of Multinational Enterprises (MNEs) is shaped by a range of diverse economic factors. For instance, Swedish MNEs survival is influenced by decisions regarding the closure of foreign R&D units (Håkanson and Kappen, 2016). Additionally, joint ventures with non-SOEs in Vietnam are more likely to exit, while a higher proportion of foreign capital ownership raises the survival prospect, and the nationality of MNEs and local government performance can either prolong or shorten the duration of survival (Vu et al., 2017). Lastly, MNEs in Ireland experience lower survival rates than indigenous plants, but employment in MNEs is more stable, suggesting that multinationals may possess superior management expertise in anticipating market fluctuations and devising appropriate strategies in response (Görg and Strobl, 2016).

Concluding Remarks

The aforementioned economic literature review and content analysis validate the significance of survival analysis as a valuable instrument in economic policy research. Although not inclusive, the underlined studies offer meaningful insights into the effects of various policy measures and government incentives on different sectors and industries, thereby emphasizing the necessity of developing evidence-based policies that acknowledge sectoral and country-specific considerations. The findings highlight the importance of resilience, risk-sharing, and government effectiveness in mitigating the adverse impacts of global and domestic crises predominantly on businesses while emphasizing the necessity of prompt government response during such periods.

Furthermore, the literature stresses the significance of policies that facilitate innovation, prohibit the establishment of anti-competitive arrangements, remove trade impediments, and support social and economic equality. The findings hold implications for policymakers seeking to design effective strategies

to promote success in the global market, level the playing field, advance gender equality, and enhance social welfare, among other objectives. In sum, survival analysis is a potent instrument for regulators and policymaking decisions that can facilitate the formulation of policies to foster sustainable economic growth.

Conflict of Interest Statement

The author declares that there is no conflict of interest that could be perceived as prejudicing the impartiality of the work reported.

Artificial Intelligence

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