

A Creation Destruction Framework for Assessing Revenue and Employment Dynamics in Early Stage Companies

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Abstract – This paper delves into the role of business firms as an actor in the initial phase of development in the context of the simultaneous value creation and destruction process in economic growth. To investigate the changes in revenues and employment, a creation–destruction measurement framework is used for 158,681 firms in 10 countries. A longitudinal firm-level analysis is conducted for the Years 3, 4, 5 and also analysis of the gross creation, gross destruction and net changes. Our results show that startups create high economic impact at the same time suffering high losses in economic revenues and employment. Other growth measures do not capture the entrepreneurial dynamics, and the methodology provides a more meaningful understanding of the dynamics. The results show that this job loss can be more important than the revenue loss, and that the performance of start-ups is multifaceted, and that they can provide valuable lessons for policy makers aiming at establishing entrepreneurial ecosystems globally.

Keywords – Early-Stage Companies, Entrepreneurship, Economic Growth, Revenue Creation, Employment Dynamics, Firm Performance, Creation–Destruction Framework.

I. INTRODUCTION

In the current context, startups are becoming key drivers of economic development in regions and increasing the competitiveness of many industries. Modern start-ups are important nodes of innovation and technical advancement, and they make an important contribution to economic development and regional development, providing jobs and triggering the development of the economic system. Besides, start-ups encourage small and medium-sized enterprises and at the same time can be the foundation for large companies. Start-ups are a driving force for economic advancement, representing rising firm in their earliest stages, marked by inventiveness, flexibility and a willingness to take risks [1].

Innovation enables organizations to reduce costs, expand the market reach of their services and improve operational efficiencies. Start-Up The initial phase of implementation of creative ideas and search for commercial growth opportunities. The growth of start-ups brings one of the major advantages of starting a business into reality, the creation of new jobs. The growing number of varied start-ups allows us to develop and grow new industries and competitive companies, which improve and stabilize the region. At the same time, start-ups are fraught with risks and need entrepreneurs to be aware of all the expenses and hazards of the commencement process [2].

The economic literature has widely debated the importance of innovation for economic growth. It is claimed that there are major differences between the dominant approaches, the evolutionary approach and the neoclassical “endogenous growth theory”, in the academic debates. The evolutionary perspective considers the historical backdrop, the causal linkages between

events and systems, and views economic advancement as a considerable departure from a stable equilibrium. The neoclassical paradigm considers economic growth as a state phenomenon, and studies the causes and effects of growth as separate things [3].

To assess the influence of innovation on economic growth, researchers often use input indicators (e.g., R&D expenditure) or output indicators (e.g., patents) to quantify the role of technological innovation, especially at the firm and industry levels. They are mostly based on a neoclassical framework proposed by Welfens [4] using Cobb-Douglas production function to evaluate the effect of innovation on economic growth. Note that research using neoclassical economic development models does not deal with the subject of entrepreneurship, the main catalyst of technical innovation [5].

While there are some substantial differences in the patterns of growth and survival of embryonic firms and new establishments, both operate with an up or out logic. If they survive, new establishments (and, to a lesser extent nascent firms) expand faster than their older brothers. However, both have a failure rate that is much higher. The effect of the surviving companies is virtually offset by the very high incidence of failure of emerging companies. Five years after a regular cohort comes in, the employment rate is about 80 percent of the original contribution of the cohort. This is despite the reality that firms close and in that way lose about 50% of jobs [6]. The bulk of the ensuing discussion concerns embryonic enterprises rather than newly formed companies, as start-ups and young firms are more closely linked to our conceptions of entrepreneurship. The above-average net growth of long-lived startup enterprises hides great differences among these firms.

This is evidenced by Decker et al. [7] where they show in their **Fig. 1** that growth in nascent firms is highly variable and growth is highly skewed. Mead and Liedholm [8] further show that the median growth rates of nascent enterprises (and in fact nearly all enterprises) go toward zero. The anomaly for the media is associated with age-one firms, which is about 5%, but this number is still well below the average net growth rate of about 15% for new firms [9]. Their research highlights the fact that the median young enterprise shows little or no development, even when survival is considered. However, the distribution of nascent firms is right-skewed, and these firms are a disproportionate share of high-growth firms.

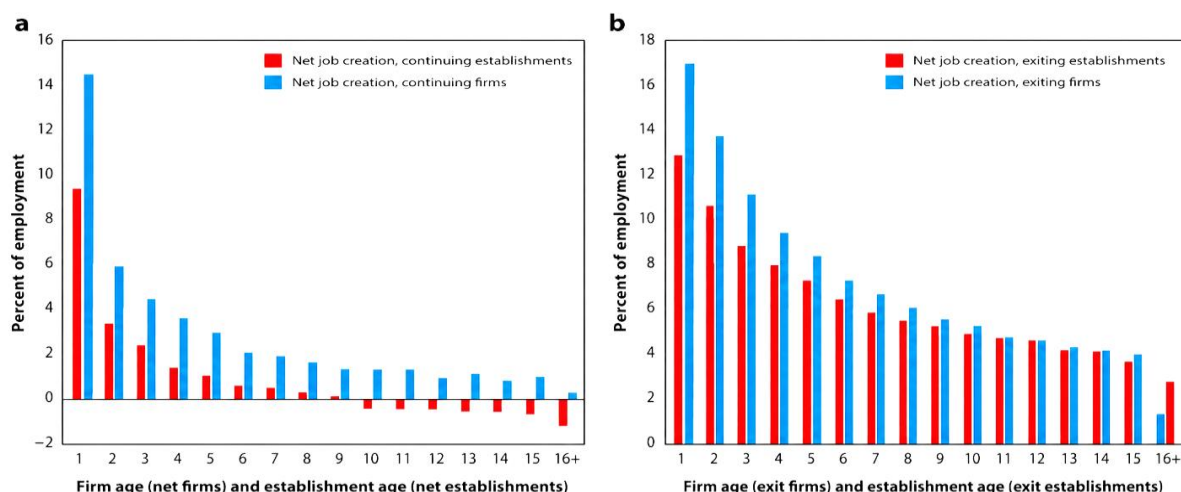


Fig 1. Net Employment Creation by Age of Enterprises and Establishments

The role of entrepreneurship in economic growth and economic advancement is discussed and recognized in a wide manner. Empirical studies have mixed results on impact of entrepreneurship on economic growth. This is because there is heterogeneity in entrepreneurship and there is a specific macro environment in boom periods. The impact of various types of entrepreneurship on the national economic growth in terms of Gross Domestic Product per capita (GDP/cap) was studied by Doran et al. [10]. They attempted to find out if the role of entrepreneurship in economic development differs depending on the level of economic development of the country.

We analyze the effect of new business on growth and explore trends in the creation of revenue and employment and destruction of revenue and employment. This study aims to analyze the entrepreneurial outcomes at country, industry and business development level. Both positive and negative impacts have been accounted to comprehend startups dynamics. In Section II, the research objectives, and the research framework for analyzing dynamics of business creation and destruction have been presented. The data source, sample construction, variables and analytical processes that were used in the production of creation-destruction curves are available in Section III. The empirical evidence of company output, and the nature of employment growth and decline during the early stages of company development is provided in Section IV. Finally, Section V provides a summary of the major findings, and what they mean for the understanding of the dynamics of early-stage businesses.

II. RESEARCH OBJECTIVES AND ANALYTICAL FRAMEWORK

This study's analytical structure aims at researching the role of early-stage enterprises in the process of economic growth by considering value creation and value destruction processes. The approach differentiates changes at the firm level into positive and negative outcomes. This enables the study to measure gains from successful companies and losses from unsuccessful

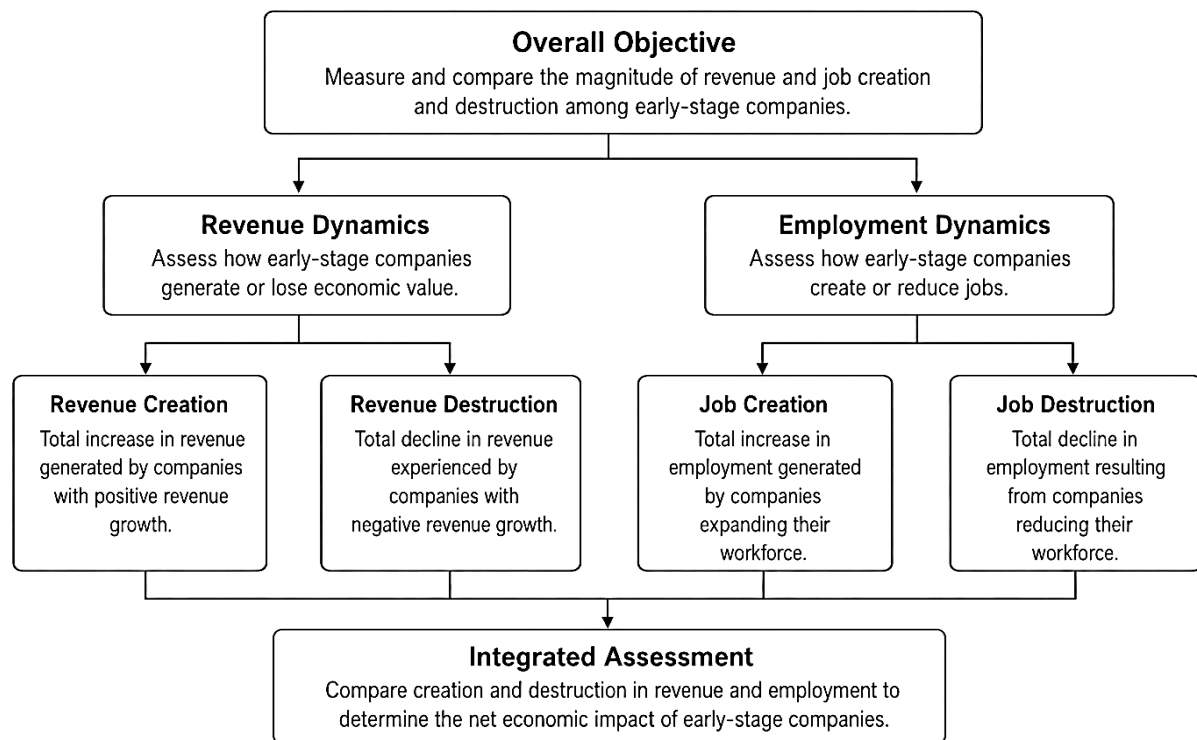


Fig 2. Framework of Research Aims

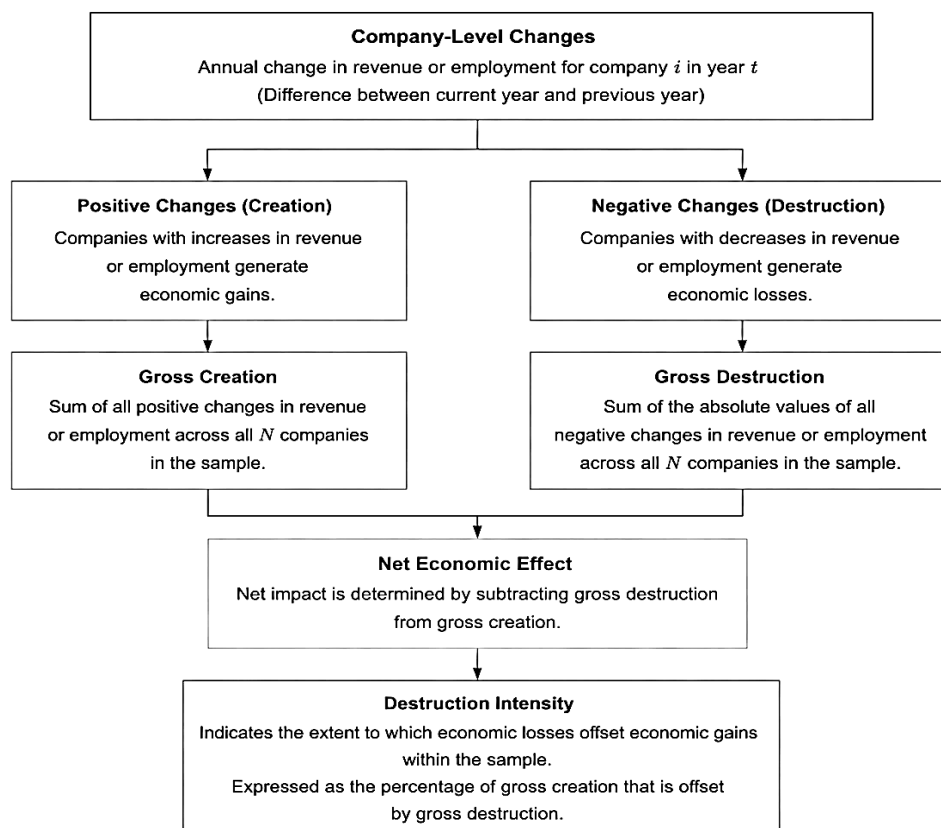


Fig 3. Creation-Destruction Measurement Framework

companies. The research goals stated in **Fig. 2** relate to the economy and employment; and view production and destruction as mutually complementary facets of the entrepreneurial process. The study overcomes the limitations of the net growth measures with the methodology of creation-destruction measures. Net growth is a general indicator of an increase in

economic activity and cannot be used to measure simultaneous increases and decreases in economic activity of individual enterprises [11]. The gross creation (see Fig. 3) is the creation of the expanding enterprises and the gross destruction is the destruction of the falling enterprises. The net effect is this difference between the two.

Comparative analysis perspective is adopted in order to understand the differences in the entrepreneurial dynamics of the economic environment. This approach focuses on the distinctions among countries and sectors and/or the differences between various stages of company development and whether the creation and destruction is in keeping or not [12]. The structure for the comparison is given in Fig. 4.

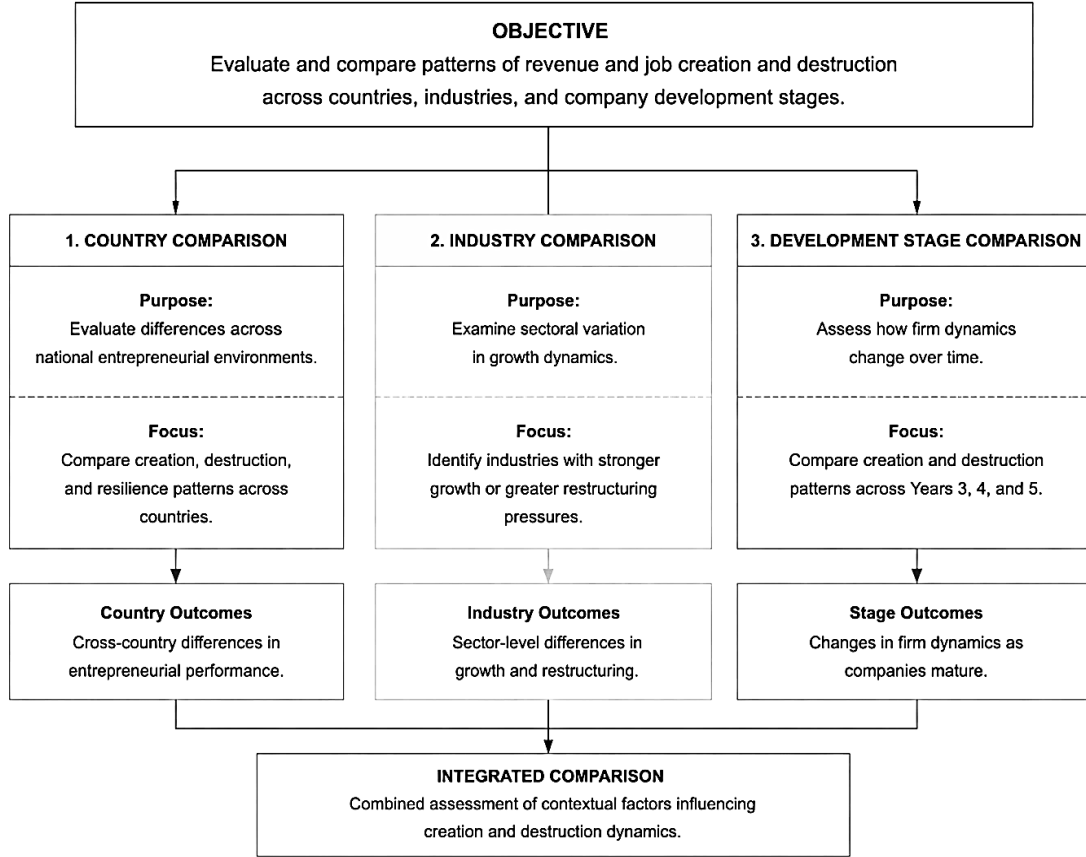


Fig 4. Comparative analysis framework

III. DATA AND METHODS

Data Source, Sample Construction, and Variables

The paper leverages longitudinal firm-level data for 158,681 early-stage firms in 10 countries, such as South Korea, Japan, Finland, Norway, Sweden, Belgium, Spain, Italy, France and the United Kingdom. The empirical design tracks the companies from their infancy to their older years, and supplies measures for Years 3, 4 and 5. The unit of analysis is the company-year. The sample covers only enterprises for which data are available to determine the annual revenue and employment changes. As observation in Year 5 can only be done from enterprises visible from Year 5, the effectiveness of the Year 5 estimates is therefore subject to survivorship bias.

The study is based on two key outcome variables: annual revenue change and annual employment change. Suppose that $R_{i,t}$ is the revenue, and $E_{i,t}$ is the employment of the company i in year t . This study annually characterizes the changes and their creating and destroying part with a single operator. The annual changes of the outcome variables are $\Delta X_{i,t} = X_{i,t} - X_{i,t-1}$ and the positive and negative values are obtained using

$$C_{i,t}^X = \max(\Delta X_{i,t}, 0), D_{i,t}^X = \max(-\Delta X_{i,t}, 0), \quad (1)$$

so that $\Delta X_{i,t} = C_{i,t}^X - D_{i,t}^X$ with $C_{i,t}^X \geq 0$, $D_{i,t}^X \geq 0$, and $C_{i,t}^X \cdot D_{i,t}^X = 0$, whenever $\Delta X_{i,t} \neq 0$. By substituting $X_{i,t} = R_{i,t}$ or $X_{i,t} = E_{i,t}$, equation (1) defines revenue creation/destruction $(C_{i,t}^R, D_{i,t}^R)$ and employment creation/destruction $(C_{i,t}^E, D_{i,t}^E)$, respectively.

The aggregation from the firm level to any analytical level (country, industry or pooled sample) is carried out by aggregating over the set of valid firms $\mathcal{J}_{g,t}$ in group g and year t . Gross creation, gross destruction and net change for outcome X are defined as

$$GC_{g,t}^X = \sum_{i \in \mathcal{I}_{g,t}} C_{i,t}^X, GD_{g,t}^X = \sum_{i \in \mathcal{I}_{g,t}} D_{i,t}^X, NX_{g,t}^X = GC_{g,t}^X - GD_{g,t}^X. \quad (2)$$

The basic intensity measure is destruction to creation ratio (%), defined as

$$\rho_{g,t}^X = 100 \times \frac{GD_{g,t}^X}{GC_{g,t}^X}, \quad (3)$$

defined whenever $GC_{g,t}^X > 0$. A value of $\rho_{g,t}^X < 100$ means positive net creation, $\rho_{g,t}^X = 100$ means there is zero net change, and $\rho_{g,t}^X > 100$ means that there is more destruction than creation within the group-year cell.

The analysis includes nine industry groups, including agriculture, forestry and fishing, construction, manufacturing, mining, retail trade, services, transportation, communication, electric, gas and sanitation, and others (which includes all other groups). Descriptive comparisons are based on three weighting schemes to avoid domination of the comparisons by large countries or industries. Let G be a set of groups (countries or industries) of cardinalities $|\mathcal{G}| = G$ and let w_g be the weight associated with group g . The destruction intensity of the group x is the same as the intensity of t and s , which is equal to 1. The destruction intensity of the group x is equal to the destruction intensity of t and s , which is equal to 1.

$$\rho_t^{X,GE} = \frac{100}{G} \sum \frac{GD_{g,t}^X}{GC_{g,t}^X}, \quad (4)$$

The company-equal weighted intensity weights all companies before calculating the ratio:

$$\rho_t^{X,CE} = 100 \times \frac{\sum_{i=1}^{N_t} D_{i,t}^X}{\sum_{i=1}^{N_t} C_{i,t}^X}. \quad (5)$$

Equations (1)-(5) completely describe the creation, destruction, net change and intensity at the firm, group and pooled levels in terms of revenue and employment.

Table 1 provides an overview of the sample composition, the definition of the variables, and important descriptive statistics for the pooled sample and per country. The table shows number of company-year observations, the annual mean and median changes, and the proportion of companies with positive, zero and negative revenue and employment growth.

Table 1. Sample Composition by Countries

Country	Year 3	Year 4	Year 5	Total Observations
United Kingdom	5,214	5,087	4,982	15,283
France	4,806	4,721	4,533	14,060
Italy	3,954	3,822	3,601	11,377
Spain	4,132	4,006	3,845	11,983
Belgium	2,871	2,746	2,615	8,232
Sweden	3,514	3,402	3,277	10,193
Norway	2,644	2,531	2,398	7,573
Finland	2,325	2,210	2,084	6,619
Japan	14,567	13,982	13,445	41,994
South Korea	7,214	6,982	7,153	21,349
Total	51,241	49,489	47,933	148,663

Analytical Procedure and Creation--Destruction Curves

Empirical analysis is descriptive, comparative and does not imply causality. It first estimates the annual changes at the level of each firm with (1) and then, combines the firm-level changes by evaluation year, country, industry and firm age with (2)-(5). To facilitate the study of the evolution of creation and destruction as firms grow, results are provided separately for each of Years 3, 4, and 5. The analysis is done for gross creation, gross destruction, net change and destruction intensity of revenue and employment. Both gross and net are important to report since a given net increase can be made through a combination of small-scale creation and destruction or through a combination of large-scale creation and destruction. Firms are ranked by their change in the outcome of interest in the given year to capture the full distribution of changes at the firm level. For

the creation curve the firms are ranked from those with the largest positive change to the largest negative change. Let $z_{(1),t}, z_{(2),t}, \dots, z_{(N_t),t}$ denote the ordered changes for outcome $z \in \{R, E\}$. The function of cumulative creation–destruction, along with the corresponding normalized function, is given by

$$M_z(k, t) = \sum_{j=1}^k z_{(j),t}, \quad M_z^*(k, t) = 100 \times \frac{M_z(k, t)}{GC_{z,t}}, \quad k = 1, 2, \dots, N_t, \quad (6)$$

where $GC_{z,t}$ is total gross creation of outcome z in year t . The horizontal coordinate is the percentage of the companies included in the ranking, accumulated on the same basis,

$$p_k = 100 \times \frac{k}{N_t}, \quad (7)$$

so that the creation curve is traced by the points $(p_k, M_z^*(k, t))_{k=1}^{N_t}$. The curve rises as firms with positive changes are included, is flat if there is no change, and falls if firms with negative changes are included by construction. It is directly related to the destruction intensity and its final value is the normalized net change.

$$M_z^*(N_t, t) = 100 \times \frac{GC_{z,t} - GD_{z,t}}{GC_{z,t}} = 100 - \rho_{z,t}. \quad (8)$$

The ranking in the valley-of-destruction representation is the opposite of the previous one, with the firms that are the most negatively affected appearing first. Let $z_{[1],t}, z_{[2],t}, \dots, z_{[N_t],t}$ denote the reverse ordering. The valley function and its normalized form are

$$V_z(k, t) = \sum_{j=1}^k z_{[j],t}, \quad V_z^*(k, t) = 100 \times \frac{V_z(k, t)}{GC_{z,t}}, \quad k = 1, 2, \dots, N_t. \quad (9)$$

Equations (6)–(9) completely determine the building of the destruction and creation curves for both employment and revenue. The curves are mathematically identical ways of representing the same distribution of firms, but represent different concepts: the creation curve reveals the accumulation of positive changes and the destruction curve reveals the extent and size of negative changes. **Table 2** presents the measurement specification and weighting scheme matrix that was used to obtain all pooled and subgroup estimates for reproducibility. Each reported statistic is specified in the table along with the equation numbers, aggregation level and weighting rules.

Table 2. Information on the Construction of Variables and The Aggregated Measures

Variable	Positive Changes	Negative Changes	Final Measure
Revenue	92,450	31,280	61,170
Employment	84,620	55,003	29,617
Total	177,070	86,283	90,787

The data-processing pipeline, starting from the raw company-level data and ending with the creation–destruction curves and intensity measures, is shown in **Fig. 5**. The diagram shows the steps of the transformations: variable construction (1 and 2), filtering (3 and 4), aggregation (5), and normalization steps (6 and 7).

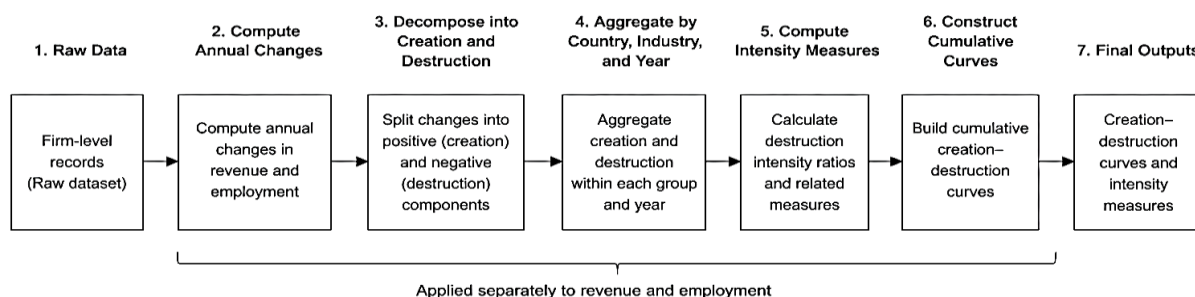


Fig 5. Data-Processing Pipeline Used for The Creation–Destruction Analysis

The coverage and completeness for the analytical sample are listed in **Table 3**. For each country and evaluation year, the number of companies excluded at each stage of the filtering process (exclusion because of lack of revenue, exclusion because of lack of employment, exclusion due to insufficient observation window) as well as effective sample sizes are provided.

Table 3. Sample Coverage and Final Analytical Sample

Selection Stage	Firms Remaining
Initial company records	182,450
Revenue observations available	171,220
Employment observations available	165,874
Complete longitudinal records	158,681

The distribution of firm age at entry and the survival profile is displayed in **Fig. 6** for the 10 countries. The figure illustrates the percentage of firms which are still “observable” in the year the results are interpreted, to provide context for the results, and to give some indication of survivorship bias.

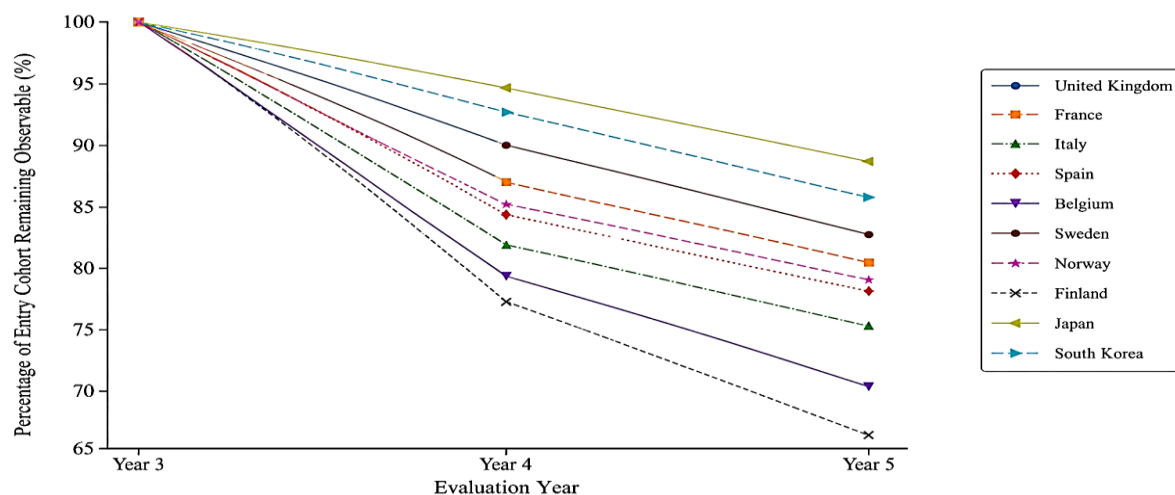


Fig 6. Firm Survival Profile (Country, Evaluation Year)

IV. RESULTS

The comparative size of destruction and creation in the emerging industry may be expressed in a variety of ways. First, we utilize a visual methodology, which covers the whole range of creation and annihilation. A revenue dynamic and a job dynamic (income and employment) are illustrated in **Fig. 7**. Both of these illustrations are the same and portray the same information, but with different emphases. The aggregated revenue generation (revenue dynamic) in the fifth year for all 10 countries is shown in **Fig. 7** (Panel A). The revenue dynamics is a hierarchy with the enterprise that creates the latest revenue on the top and the enterprise that loses the most revenue on the bottom for the year specified.

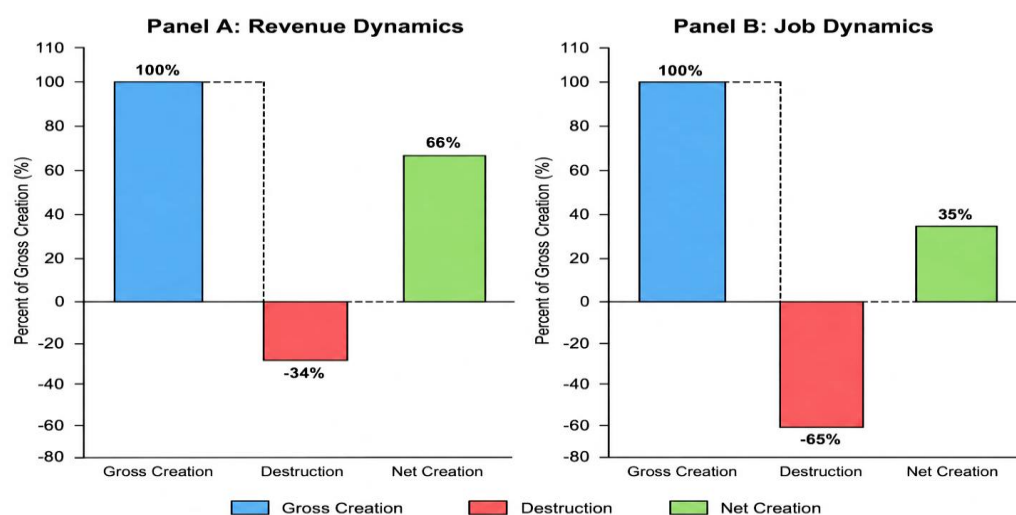


Fig 7. Generation Peaks, and Ruin Depressions, for Year 5 Revenue and Employment Changes (Aggregate Sample)

Only a single company will be represented for each graph. The creation curve which plots total revenue generated in the sector is shown in Panel A. As long as the company which follows the next year selected is profitable, the curve continues to increase. The graph is flat if there is no change in income for the year chosen. This negative slope in the second half of the graph is due to the fact that enterprises with negative revenue are being collected gradually. The last company to be incorporated to the analysis will be the company that suffers the biggest loss in sales that year. It is the job dynamics that is the inverse of the revenue dynamics (**Fig. 7**, Panel B).

Organizations are listed from largest-lost revenue organization in the year identified, to largest-income creating organization. Each horizontal axis in **Fig. 7** ranges from 0% to 100% representing the entire spectrum of organizations evaluated. The vertical axis with the highest figure at the top is “100%” or the gross revenue for the companies for which we have information for that year. This occurs when the cumulative curve “flattens out. The cumulative revenue dynamics (gross creation) graph will never be below the 0% when the net revenue is created in that year. The bottom of the vertical axis will be either net revenue generation (0% to –100%) or net revenue loss (-120% of gross revenue in that year to -100%).

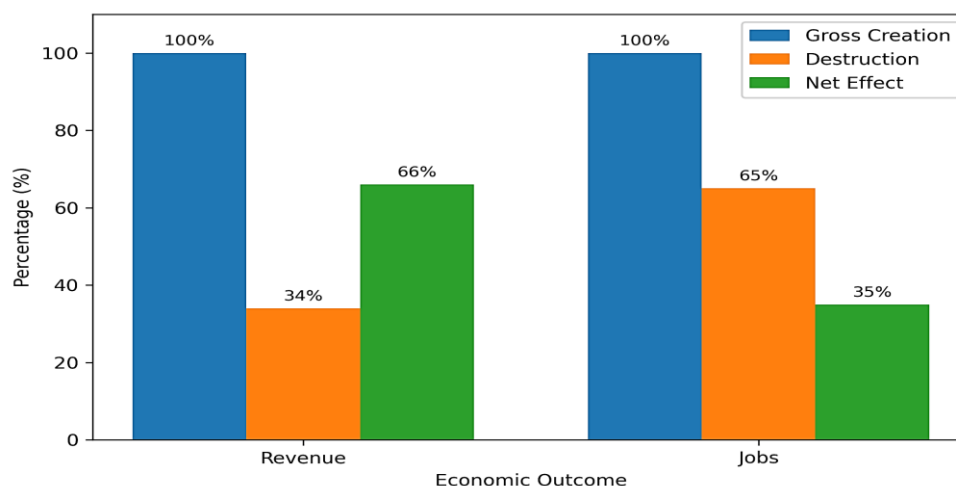


Fig 8. Year 5 Aggregate Elimination Patterns for The Early-Stage Enterprise Sample in Terms of Revenue and Job Creation

Two bars will be coinciding at a similar point that represents the total net income of all firms of this year, that is, the curve of creation of this year and the curve of destruction of the same year as shown in **Fig. 8**. The same cumulative plots are shown in **Fig. 8** for employment gains (panel C) and losses (panel D). This trend is seen in Year 5 only but also in Years 3 and 4. At first, the net revenue and net employment of all the 10 countries will be displayed in Year 5. This is consistent with the idea of the new economy being an “engine of economic growth. Second, we are losing revenue and jobs each year and at the same time. This end of the business is way underpriced. The annihilation ratio is greater for employment than income. For instance, 65% of the total gross employment gains by firms that have expanded employment in Year 5 are also experiencing job losses in Year 5.

The results for equal weighting of enterprises are shown in total in **Table 4**. On the other hand, only 34% of the destruction of revenue is equal. Creating jobs for new businesses is always a problem, but the generation of revenue appears to be a bigger issue. The values in **Fig. 8** are for all 10 countries. **Table 5** shows an overview of the overall gains, both as a percentage of overall losses and gains as a percentage of total gross gains for the 10 countries for revenue and personnel. **Table 5** shows a summary statistic for years 3, 4 and 5. The general trends that are shown in the aggregated data can also be seen across each of the 10 countries, although there are some slight variations. Every country has an organized net yearly revenue, net job creation [13]. A secondary pattern means that there is a bigger reduction in jobs than in revenue.

Table 4. Results of Equal Weights

Scenario	Y3 (%)	Y4 (%)	Y5 (%)
Job obliteration	31	47	65
Revenue obliteration	13	19	34

The outcome is 100% complete at the nationwide level. It is reported in 9/10 nations in the third year (except Belgium), in all 10 countries in the fourth year and in 9/10 countries in the fifth year (except Japan). In 28/30 assessments shown in **Table 5**, the proportion of job loss is higher than the proportion of revenue loss in the year being studied. 10 countries have large differences between the degree of creation or destruction. In Norway, for instance, the percentage of job loss is much higher in the third year (78%), 4 (79%) and 5 (93%).

Table 5. Development and Removal of Income/Employment for Individual Countries and Samples for Years 3-5

Country	Revenue Creation			Revenue Destruction			Project Creation			Project Destruction		
	Y3 (%)	Y4 (%)	Y5 (%)	Y3 (%)	Y4 (%)	Y5 (%)	Y3 (%)	Y4 (%)	Y5 (%)	Y3 (%)	Y4 (%)	Y5 (%)
UK	89	81	64	11	19	36	77	75	55	23	25	45
France	81	88	70	19	12	30	70	56	47	30	44	53
Italy	92	83	63	8	17	37	80	47	25	20	53	75
Spain	87	78	66	13	22	34	64	46	25	36	54	75
Belgium	64	85	66	36	15	34	75	56	36	25	44	64
Sweden	79	80	64	21	20	36	70	52	46	30	48	54
Norway	85	85	70	15	15	30	22	21	7	78	79	93
Finland	63	50	47	37	50	53	62	49	30	38	51	70
Japan	84	74	64	16	26	36	83	72	75	17	28	25
South Korea	92	82	72	8	18	28	71	60	36	29	40	64
Country eq wt ^a	82	79	65	13	21	35	67	53	38	33	47	62
Company eq wt ^b	87	81	66	13	19	34	69	53	35	31	47	65

^aThe percentages are aggregated on a basis of 10% each nation. ^bThe aggregated percentages are calculated using the same weight for each corporation (1/158,681).

The level of employment loss in the UK is much lower, especially in the third year (23.01%) and the fourth year (25.2%). The UK had the second lowest proportion of people losing their jobs (45%) of the 10 countries in year 5. The job loss rate is relatively low in the third, fourth and fifth years in Japan (17%, 28% and 25%). This paper does not discuss nor test alternative explanations for the national differences. There are significant differences between countries: in the nature of the emerging startup ecosystem, in the attitude of government programs and also societal and cultural factors defining views on the success or failure of playing startups. They are distinct in terms of their disclosure requirements for public reporting. For our further analysis, the relative magnitudes of these and other factors amplifying our variations across countries can be considered.

Table 6 presents the results of sectoral analysis of the sampled enterprises. A similar trend is shown throughout the eight different industries identified in **Table 6** for the 10 countries that are undergoing widespread destruction. By the fifth year the net loss of net production for revenues is 26.9% for building and 44.9% for fishing, forestry, and agriculture. This spread for headcount/employment is from 48.2% in service provision to 99% in building. In all years and in all eight industries, the amount of employment loss is greater than the fall in income [14]. It is interesting to note from **Tables 5** and **6** that as the enterprises grow older, they become more devastated in the establishment phase. For firms that survive their first 5 years the ratio of overall earnings to losses across all nations (every firm is given an equal weight) grows as follows:

Table 6. Income and Employment Increase/Decrease Simultaneously

Industry	Revenue Creation			Revenue Destruction			Job Creation			Job Destruction		
	Y3 (%)	Y4 (%)	Y5 (%)	Y3 (%)	Y4 (%)	Y5 (%)	Y3 (%)	Y4 (%)	Y5 (%)	Y3 (%)	Y4 (%)	Y5 (%)
Agriculture, forestry, and fishing	81	80	55	19	20	45	59	53	17	41	47	83
Construction	86	81	73	14	19	27	69	45	17	31	55	99
Manufacturing	88	83	69	12	17	31	72	48	35	28	52	65
Mining	86	76	56	14	24	44	63	39	15	37	61	85
Retail trade	84	86	69	16	14	31	64	40	35	36	60	65
Services	86	80	63	14	20	37	76	66	52	24	34	48
Transportation, communication, electric, gas, and sanitation	92	88	75	8	12	25	74	57	47	26	43	53
Wholesale trade	86	79	71	14	21	29	56	60	32	44	40	68
Others	85	80	52	15	20	48	74	60	30	26	40	70
Industry eq wt ^a	86	81	65	14	19	35	67	52	29	33	48	71
Company eq wt ^b	87	81	66	13	19	34	69	53	35	31	47	65

^aAll the sectors have equal weightages of 10% for the calculation of the aggregated percentages. ^bThe aggregated percentages are computed as the average of all firms (weighted 1/158,681).

In 9 out of 10 countries, the employment figures expressed as a percentage of the total number of jobs created, tended to increase as the firms got older (only Japan did not show this trend with 17% in year 3, 28% in year 4 and 25% in year 5). There is a steady upward trend in 7 of the 8 sectors shown in **Table 6**, except for wholesale trade. This is not as consistent in the revenues. For 6 out of 10 countries, there is a trend of decreasing income as firms get older. The only exception to this tendency, which holds for 7 out of 8 industries, is retail business. Note that this age effect may be due to a survivor selection bias in our sample. The numbers reported in **Tables 5 and 6** for Years 3 and 4 can be greater than the actual numbers because of the drop out of entities from Year 5.

V. CONCLUSION

The study establishes that the early-stage firms are important as they create output, create jobs and at the same time experience extensive destruction processes. In the context of creation and destruction, however, there are gains and losses at the same time among firms, thus a partial view of entrepreneurial performance. From our study, we can see that there is a consistency in terms of the creation and destruction of 10 countries, in different environments and industries. The findings demonstrate the need to look at dynamics of start-ups using holistic indicators that can be used to guide policy and business strategies. In the future, other firm survival and resilience long-term growth determinants might be studied. Lastly, the study of entrepreneurial evolution must take into account all the forces of growth as well as decay. Both forces are closely connected and are vital to the dynamics of the system and innovation ecosystems throughout today's world.

CRedit Author Statement

The authors confirm contribution to the paper as follows:

Conceptualization: Shigeru Asaba and Ofer Amiram; **Methodology:** Shigeru Asaba and Ofer Amiram; **Data Curation:** Ofer Amiram; **Writing- Original Draft Preparation:** Ofer Amiram; **Visualization:** Shigeru Asaba; **Investigation:** Shigeru Asaba and Ofer Amiram; **Supervision:** Shigeru Asaba and Ofer Amiram; **Writing- Reviewing and Editing:** Shigeru Asaba and Ofer Amiram. All authors reviewed the results and approved the final version of the manuscript.

Data Availability

The datasets generated during the current study are available from the corresponding author upon reasonable request.

Conflicts of Interests

The authors declare that they have no conflicts of interest regarding the publication of this paper.

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Competing Interests

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References

- [1]. B. P. Neupane, S. Zielinski, and C. B. Milanes, "Startup success in hospitality & tourism SMEs in emerging economies: How innovation and growth are driven by entrepreneurial orientation, networking strategy, leadership, and flexibility," *Sustainability*, vol. 17, no. 8, p. 3485, Apr. 2025, doi: 10.3390/su17083485.
- [2]. P. M. F. Teberga and F. L. Oliva, "Identification, analysis and treatment of risks in the introduction of new technologies by start-ups," *Benchmarking: An International Journal*, vol. 25, no. 5, pp. 1363–1381, May 2018, doi: 10.1108/BIJ-06-2017-0156.
- [3]. P. Mulder, H. L. F. De Groot, and M. W. Hofkes, "Economic growth and technological change: A comparison of insights from a neo-classical and an evolutionary perspective," *Technological Forecasting and Social Change*, vol. 68, no. 2, pp. 151–171, Oct. 2001, doi: 10.1016/S0040-1625(00)00078-0.
- [4]. P. J. J. Welfens, "Innovation, inequality and a golden rule for growth in an economy with Cobb-Douglas function and an R&D sector," *International Economics and Economic Policy*, vol. 12, no. 4, pp. 469–496, May 2015, doi: 10.1007/s10368-015-0314-2.
- [5]. C. Friis, C. Karlsson, and T. Paulsson, "Relating entrepreneurship to economic growth," in *Advances in Spatial Science*, 2006, pp. 83–111, doi: 10.1007/3-540-34488-8_5.
- [6]. C. I. Stubbart and M. B. Knight, "The case of the disappearing firms: Empirical evidence and implications," *Journal of Organizational Behavior*, vol. 27, no. 1, pp. 79–100, Jan. 2006, doi: 10.1002/job.361.
- [7]. R. A. Decker, J. Haltiwanger, R. S. Jarmin, and J. Miranda, "Where has all the skewness gone? The decline in high-growth (young) firms in the U.S.," *European Economic Review*, vol. 86, pp. 4–23, Feb. 2016, doi: 10.1016/j.eurocorev.2015.12.013.
- [8]. D. C. Mead and C. Liedholm, "The dynamics of micro and small enterprises in developing countries," *World Development*, vol. 26, no. 1, pp. 61–74, Jan. 1998, doi: 10.1016/S0305-750X(97)10010-9.
- [9]. K. K. Sinha and O. Osiyevskyy, "Reliability and risk in new ventures: Founding team's native immigrant composition and performance variability," *Thunderbird International Business Review*, vol. 64, no. 6, pp. 605–616, Sep. 2022, doi: 10.1002/tie.22313.
- [10]. J. Doran, N. McCarthy, M. O'Connor, and C. Nsiah, "The role of entrepreneurship in stimulating economic growth in developed and developing countries," *Cogent Economics & Finance*, vol. 6, no. 1, Jan. 2018, doi: 10.1080/23322039.2018.1442093.
- [11]. C. Leipert, "National income and economic growth: The conceptual side of defensive expenditures," *Journal of Economic Issues*, vol. 23, no. 3, pp. 843–856, Sep. 1989, doi: 10.1080/00213624.1989.11504942.
- [12]. J. Mezei, C. Brush, E. W. Liguori, and S. Nikou, "A configurational perspective on comparative international entrepreneurship: A new approach to examining entrepreneurial activity combining clustering and qualitative comparative analysis," *International Journal of Entrepreneurial Behaviour & Research*, vol. 31, no. 7, pp. 1647–1674, Mar. 2025, doi: 10.1108/IJEBR-06-2024-0644.

- [13]. D. B. Audretsch and A. R. Thurik, “Capitalism and democracy in the 21st century: From the managed to the entrepreneurial economy,” *Journal of Evolutionary Economics*, vol. 10, no. 1–2, pp. 17–34, Jan. 2000, doi: 10.1007/s001910050003.
- [14]. L. G. Kletzer, “Trade-related job loss and wage insurance: A synthetic review,” *Review of International Economics*, vol. 12, no. 5, pp. 724–748, Oct. 2004, doi: 10.1111/j.1467-9396.2004.00479.x.

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