

AMERICAN UNIVERSITY OF ARMENIA  
TURPANJIAN RURAL DEVELOPMENT PROGRAM

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# Survival Analysis of TRDP Businesses

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<sup>1</sup> The analysis has been conducted with the support of Dr. Byron Crape who provided consultations throughout the study. The report has been reviewed and edited by Dr. Haroutune Armenian.

## **Table of Contents**

<b>Introduction.....</b>	<b>3</b>
<b>Literature Review .....</b>	<b>4</b>
<b>Methodology .....</b>	<b>6</b>
<b>Descriptive Statistics.....</b>	<b>6</b>
<b>Survival Analysis.....</b>	<b>11</b>
<b>Conclusions and Recommendations.....</b>	<b>19</b>
<b>Bibliography .....</b>	<b>21</b>

## Introduction

The American University of Armenia's Turpanjian Rural Development Program (TRDP) was created in 2006 with a mission to provide education and economic opportunities to people living in rural areas of the Republic of Armenia (RA) and Republic of Artsakh (officially known as Nagorno Karabakh Republic, NKR). The first regional office was opened in Gyumri (Shirak) in 2006, followed by the offices in Stepanakert (Artsakh), Ijevan (Tavush) and Javakhk (Georgia). Since TRDP's inception the program has consistently given support to the development of continuing adult education in business entrepreneurship, leading to the creation or facilitation of the conditions necessary for creating new businesses in various regions of rural Armenia.

Overall, since its launch the program has supported over 250 beneficiaries. Moreover 80-90% of TRDP entrepreneurs consider their ventures to be profitable, in demand, and competitive in the local market. A number of these businesses have plans to expand to national and international markets. However, almost 50 businesses in the course of the years have closed because of various reasons ranging from emigration to personal characteristics of entrepreneurs.

This study is a survival analysis to identify the life-cycle dynamics of TRDP start-ups. More specifically, the study aimed at **(a) revealing the stage(s) in which newly created businesses are at the highest risk of closing down, and (b) understanding the factors that contribute to the sustainability of a new business or its failure.**

The study is relevant in the current context as TRDP is considering options for expansion to other regions of Armenia. The conclusions of the study will help to understand what impact individual characteristics (education, age, gender, employment, prior business, business sector) have on the probability of an applicant/potential entrepreneur to succeed. It will help TRDP to better address the challenges and reduce the rate of business closures or candidate withdrawals.

## Literature Review

In the reviewed academic literature, there is a vast number of studies that use survival analysis to better understand the conditions that contribute to the survival and success of businesses, particularly small ones. Several authors agree on the theoretical framework for the analysis of start-ups dividing the factors that affect business survival rates into three groups: individual characteristics of the founder, strategies of the venture itself, and the characteristics of the environment in which the firms operate (H. Aldrich & Zimmer 1986; Brüderl, Preisendörfer & Ziegler 1992).

The human capital concept has been identified as key to the survival of businesses in several empirical studies. Some authors, for example, regard the lack of prior experience in managing a business as one of the key characteristics hindering the survival of a business (Mayer and Goldstein 1961; Boswell 1973). Others state that prior experience in the specific industry or sector, as well as experience in entrepreneurship are crucial factors that affect the survival of start-up businesses (Young and Francis 1991). Classical economist and scholar Jean Baptiste Say (1713) posits that survival of a business depends on the knowledge and experience of the world of business, as well as the ‘openness’ of the industry which the entrepreneur intends to enter. Reuber and Fischer (1999), Luk (1996), Cooper et al., (1994) share this view confirming that relevant prior experience in the specific business field or industry affects the survival of a new business undertaking. Alfred Marshall (1890), in his turn, states that survival of business depends not only on “specialized abilities” — i.e., industry specific abilities that the entrepreneur would need to have — but also on his/her education, talent, skills and background.

While Brüderl et al (1992) also agree with the above, they further add that education and general work experience are critical success factors, arguing that education, work experience and industry-specific experience have turned out to be influential in the capacity for the survival of new business ventures. The authors further argue that in addition to human capital, other characteristics such as population density, political environment and other associated features also affect the survival of small businesses.

Among the human capital factors, scholars cite age and gender of the entrepreneur as contributing factors of business survival. Preisendorfer and Voss (1990) posit that the survival rates of young entrepreneurs are comparatively lower than those of middle-aged ones, and again lower in the case of older entrepreneurs. In contrast, other authors argue that the younger the

entrepreneur, the more chances his venture will survive (Sapienza and Grimm 1997; Van Praag 1996). However, the latter position also argues that this relationship works only when combined with work experience in the field.

As observed in the literature, in most cases the correlation between the age of an entrepreneur and the survival rate of his/her business is negative, whereas in the case of the age of an organization, the situation is completely the opposite. As Carroll (1983) concludes, the probability of business closure declines with the increasing age of the business. Businesses are more likely to fail in the first years of operation.

As to gender, several research studies posit that women entrepreneurs are more likely to fail in business than men because of constraining factors specific to women (family issues, education, work places) (Aldrich, 1999; Goffe & Scase, 1983). But, there are also studies that argue to the contrary: that there is not much difference between men and women on the psychological factors that play into establishing and running a business. Those characteristics include work related values such as sense of independence, motivation, and willingness to take risks (Humphreys and McClung 1981; Pellegrino and Reece 1982; Schwartz 1976). Nonetheless Koellinger et al (2011) conclude from a survey conducted in 17 countries that the lower engagement of women in entrepreneurship is due to women's lower inclination to start a business rather than the lower survival rate of a women-owned business. According to the latter study, most women are more inclined not to start a business because of the lack of confidence in their skills, the inadequacy of their social networks and the relatively higher level of fear from failure.

Forsyth (2005) in his study of rural businesses of Washington State, U.S. reveals that rural business' survival rate largely depends on the sector in which the business operates. In the sample of the study, wholesale/retail businesses showed the lowest overall survival rates. Whereas Buss and Lin (1990) have conducted similar studies in other U.S. states looking to rural start-ups conclude that the survival rates of different sector businesses are more or less comparable.

Finally, reasons of business failures or closures as identified by scholars and business administrators are many. Robert N. Lussier (1995) in the study argues that there is no common reason that explains the failures as each one depends on many other specific factors. However, the author identifies that the two most important factors for success (or failure in lack off) are capital and management. Along those lines, Michael Ames (1983) identifies the following reasons for small business failure: lack of experience, poor location, insufficient capital, poor

credit arrangement of business resources, poor overall management, personal use of business resources, unexpected growth of the market, and competition giving way to low sales.

## **Methodology**

An exploratory design using a quantitative research methodology is chosen as the most appropriate to answer the research questions of this study.

**R1: What is the survival probability of a TRDP business?**

**R2: What are the stages when a TRDP business is at the risk of closing down?**

**R3: What factors influence the survival rate of a TRDP business?**

### *Data Collection and Analysis*

Data collection was conducted in December 2014. The study sample included 185 TRDP beneficiaries from Tavush (43), Shirak (79) and Artsakh (63)<sup>2</sup> who established a business following training in entrepreneurship and with direct support from TRDP. The data were collected from various TRDP documents and records:<sup>3</sup>

- Applications submitted by TRDP beneficiaries
- TRDP statistical databases
- Regional Offices/Regional Leaders

The collected data was entered into the SPSS program (statistical software) for analysis.

## **Descriptive Statistics**

As of December 2014 - with program data updated and refreshed – of the 185 TRDP businesses that were established 139 (or 75%) are still operational, while 46 (or 25%) were closed. More closures are observed in the Shirak region and reveal the highest number of business closures at 32 (18%); 9 (5%); and 5 (3%) businesses were closed in Artsakh and Tavush respectively. See Table 1 & Chart 1 below:

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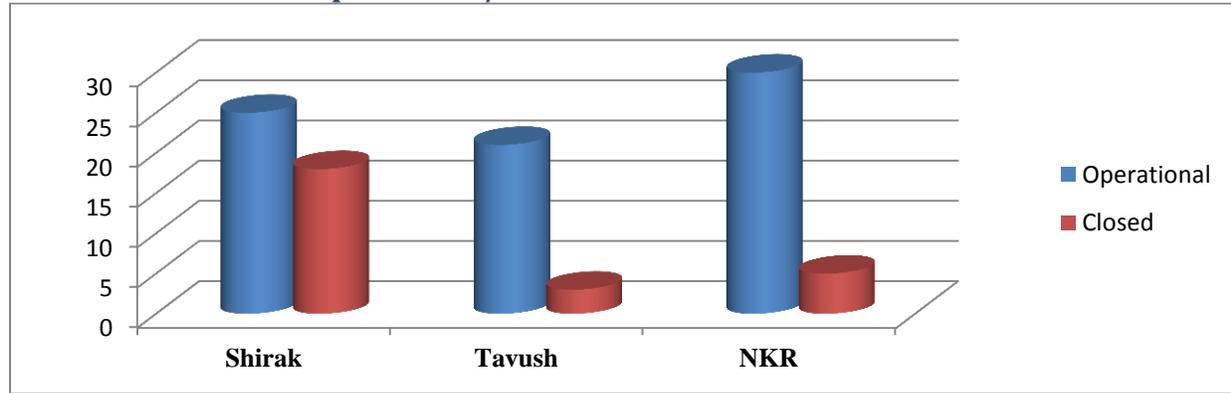
<sup>2</sup> Javakhk and YEP businesses are not included in the current study because of the small size of beneficiaries and lack of comparable early data

<sup>3</sup> Quality assurance evaluations were not included in the study because of the lack of the data on beneficiaries that established their businesses before 2012 and got closed before 2012.

**Table 1: Businesses: Operational/Closed in % of Total 185**

	<b>Shirak</b>	<b>NKR</b>	<b>Tavush</b>	<b>Total</b>
<i>Operational</i>	<i>47 (25%)</i>	<i>54(29%)</i>	<i>38(20%)</i>	<i>139 (75%)</i>
<i>Closed</i>	<i>32 (18%)</i>	<i>9(5%)</i>	<i>5(3%)</i>	<i>46 (25%)</i>
<i>Total</i>	<i>79(43%)</i>	<i>63(34%)</i>	<i>43(23%)</i>	<i>185 (100%)</i>

**Chart 1: Businesses: Operational/Closed in % of Total 185**

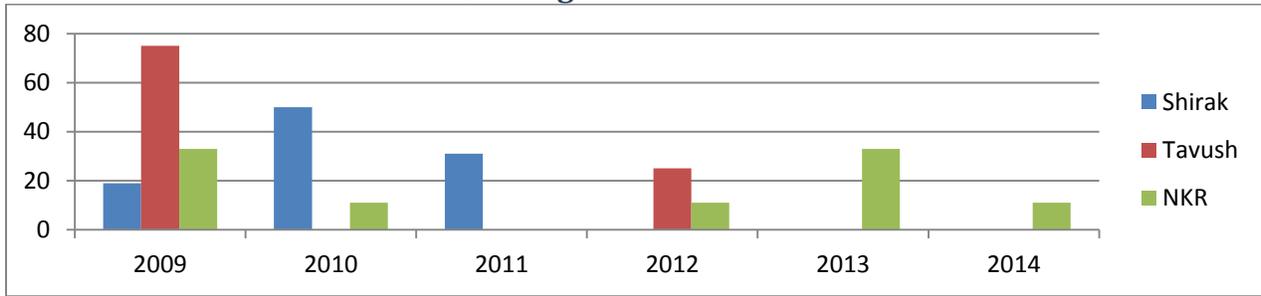


First business closures in all of the regions took place in 2009. In Shirak, 19% of all regional closed businesses stopped their operation in 2009, 50% in 2010 and 31% in 2011. Since 2012, no business closure has been observed in Shirak. In Tavush, most of the businesses (75%) closed down in 2009. The rest of closures (25%) occurred in 2012, with no any other closure thereafter. In NKR, the closure rate seems to go up and down starting from 2009 when 33% out of all regional closed businesses stopped their operation, followed by 11% in 2010, no closures in 2011 and 11%, 33% and again 11% business closures in 2012, 2013 and 2014 respectively. Overall, the analysis show that most of the TRDP businesses closed down before 2012. See Table 2 & Chart 2 below:

**Table 2: Businesses: Closed in % of Region Total Closures**

	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<i>Shirak</i>	<i>0</i>	<i>0</i>	<i>19</i>	<i>50</i>	<i>31</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Tavush</i>	<i>0</i>	<i>0</i>	<i>75</i>	<i>0</i>	<i>0</i>	<i>25</i>	<i>0</i>	<i>0</i>
<i>NKR</i>	<i>0</i>	<i>0</i>	<i>33</i>	<i>11</i>	<i>0</i>	<i>11</i>	<i>33</i>	<i>11</i>

**Chart 2: Businesses: Closed in % of Region Total Closures**



Since 2011 to contribute to the development and sustainability of its businesses, TRDP provided an opportunity for its beneficiaries to apply to the program’s financial assistance for the 2<sup>nd</sup> time to expand their ventures. 19 beneficiaries out of the observed total received 2<sup>nd</sup> loan by the support of the program and expanded their businesses, thus increasing and improving the production, expanding their markets, and creating more job places for their community members. Most of the expansions took place in Shirak (9), followed by NKR (7) and Tavush (3). See Table 3 below:

**Table 3: Businesses: Received 2<sup>nd</sup> loan in N**

	Shirak	Tavush	NKR	Overall
<i>2011</i>	<i>1</i>	<i>0</i>	<i>2</i>	<i>3</i>
<i>2012</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>2</i>
<i>2013</i>	<i>5</i>	<i>1</i>	<i>1</i>	<i>7</i>
<i>2014</i>	<i>3</i>	<i>1</i>	<i>3</i>	<i>7</i>
<b>Overall</b>	<b>9</b>	<b>3</b>	<b>7</b>	<b>19</b>
<b>Jobs created</b>	<b>19</b>	<b>15</b>	<b>7</b>	<b>41</b>

### Business Type

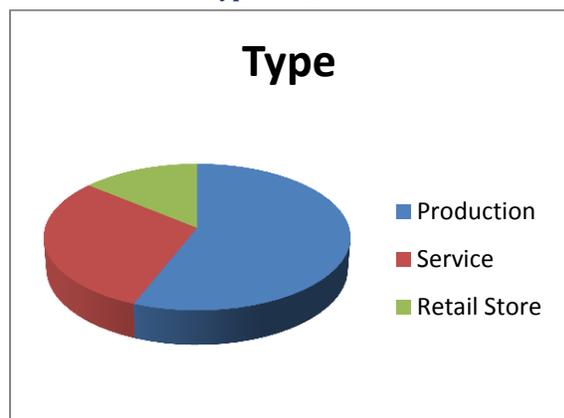
Data analysis shows that the majority of TRDP businesses (whether still operational or closed) are in production, followed by businesses in the services (38 operational and 18 closed ones) and retail stores (22 operational and 3 closed ones). See Table 4 and Chart 3 & 4 below:

**Table 4: Business Type: Operational/Closed in % of Type Total**

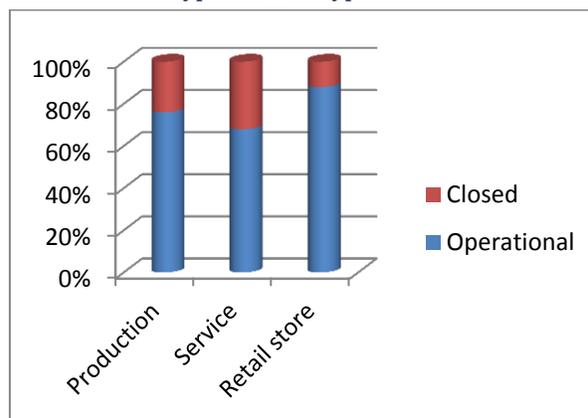
	Production	Service	Store

<i>Operational</i>	<i>79 (76%)</i>	<i>38(68%)</i>	<i>22(88%)</i>
<i>Closed</i>	<i>25 (24%)</i>	<i>18(32%)</i>	<i>3(12%)</i>
<i>Total in% of all businesses</i>	<i>104(56%)</i>	<i>56(30%)</i>	<i>25(14%)</i>

**Chart 3: Business Type: in % of Total**



**Chart 4: Business Type: in % of Type Total**



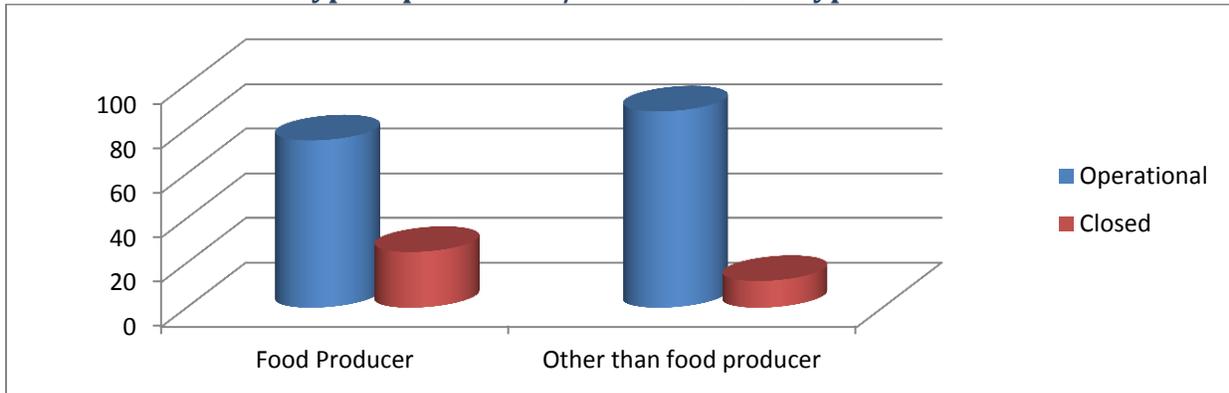
Retail stores appear to be the most sustainable of all TRDP businesses as only 12% of established stores were closed as of the date of this report, while in the case of businesses in production, the number of businesses that have closed represents 24% of the total and in the case of services, 32%.

The analysis shows that among production businesses 76% are in the food industry, while the rest (24%) are in other sectors, including furniture production, textile, paper production, stone processing, wood processing, etc. 74% of food producing businesses are still operational. In case of businesses engaged in other types of production 81% are still working with only 19% closed. See Table 5 & Chart 5 below:

**Table 5: Production type: Operational /Closed in % of Type Total**

	<b>Food Production</b>	<b>Other than Food Production</b>	<b>Total in % of Production</b>
<i>Operational</i>	<i>58 (74%)</i>	<i>21(81%)</i>	<i>79(76%)</i>
<i>Closed</i>	<i>20 (26%)</i>	<i>5(19%)</i>	<i>25(24%)</i>
<i>Total in% of Production</i>	<i>78(75%)</i>	<i>26(25%)</i>	<i>104(100%)</i>

**Chart 5: Production type: Operational /Closed in % of Type Total**



Thus, the analysis illustrates that most TRDP businesses are in production. Though the number of food producing firms exceeds the number of producers of other goods, the latter seems more viable as only 19% of them have been closed as opposed to 26% of food producers. Overall, of the total, fewer closures are observed among retail stores (12%). However, this is only an observation as the model shows no statistically significant correlation between the type of production and status of the business.

### Gender

As one well familiar with Armenian male-dominated culture would expect, most TRDP businesses are established by men: 79% of the 185 total. Nevertheless, in terms of viability of established businesses, Armenian women are doing better than in those countries covered in the reports reviewed from the literature. The percentage of closed businesses that belong to women is similar to the ones that belong to men. About a quarter of businesses for both males and females closed. See Table 6 & Chart 6 & 7 below:

**Table 6: Gender: Status of Established businesses as % of Total**

	<i>Operational</i>	<i>Closed</i>	<i>Total in % of 185</i>
<i>Men</i>	<i>110 (75%)</i>	<i>36 (25%)</i>	<i>146(79%)</i>
<i>Women</i>	<i>29 (74%)</i>	<i>10(26%)</i>	<i>39(21%)</i>
<i>Total</i>	<i>139(75%)</i>	<i>46(25%)</i>	<i>185(100%)</i>

Chart 6: Opened Businesses/Gender in % of Total

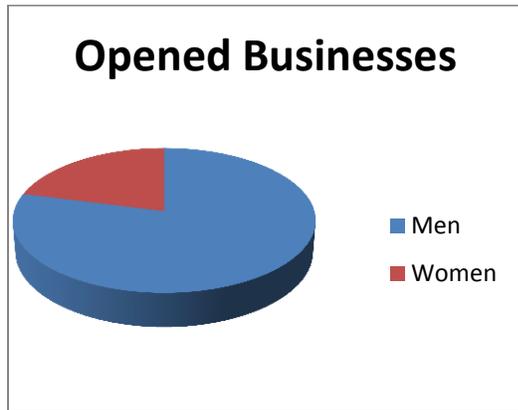
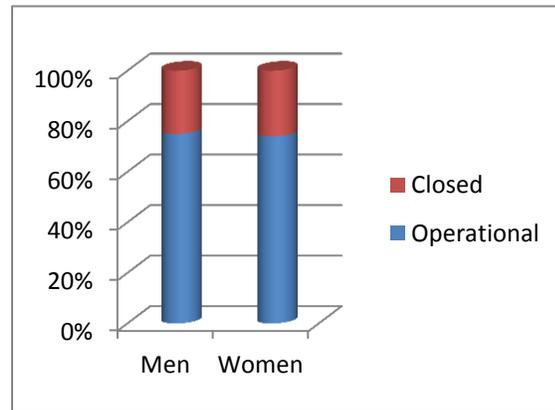


Chart 7: Closed/Operational: in % of Gender Total



## Age

Finally, the analysis shows that most of the TRDP beneficiaries are over 40 years old as the mean age is 42.11 according to the model. However, there is no significant association between the age of beneficiaries and status of the businesses.

## Survival Analysis

Life tables and Kaplan Meier survival models have been applied to analyze the data of 185 TRDP entrepreneurs, to generate the survival rate of TRDP businesses in the course of all these years and to find the stage(s) they are at the highest risk of closing down. The Kaplan Meier survival analysis through the help of explanatory variables has revealed the factors that affected the survival rate of businesses. The Cox Regression model showed how explanatory variables affected survival rates in the environment where all other affecting factors are kept constant.

A Life table analysis was conducted with the same data to find the survival rate of TRDP businesses as well as the hazard rate, to identify the phase in time when a business is at high risk of closure. See Table 7 below:

**Table 7: Life Tables**

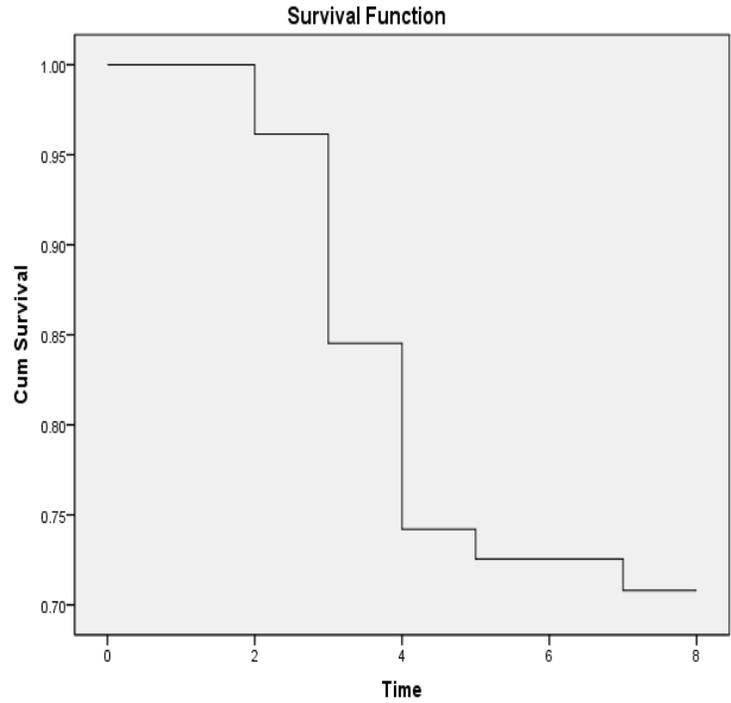
Interval Start Time	Number Entering Interval	Number Withdrawing during Interval	Number Exposed to Risk	Number of Terminal Events	Proportion Terminating	Proportion Surviving	Cumulative Proportion Surviving at End of Interval	Std. Error of Cumulative Proportion Surviving at End of Interval	Probability Density	Std. Error of Probability Density	Hazard Rate	Std. Error of Hazard Rate
0	185	0	185,000	0	.00	1,00	1,00	.00	.000	.000	.00	.00
1	185	7	181,500	7	.04	.96	.96	.01	.039	.014	.04	.01
2	171	11	165,500	20	.12	.88	.85	.03	.116	.024	.13	.03
3	140	18	131,000	16	.12	.88	.74	.03	.103	.024	.13	.03
4	106	32	90,000	2	.02	.98	.73	.04	.016	.012	.02	.02
5	72	19	62,500	0	.00	1,00	.73	.04	.000	.000	.00	.00
6	53	23	41,500	1	.02	.98	.71	.04	.017	.017	.02	.02
7	29	28	15,000	0	.00	1,00	.71	.04	.000	.000	.00	.00
8	1	1	.500	0	.00	1,00	.71	.04	.000	.000	.00	.00

As the statistics shows the minimum period TRDP businesses have survived is one year. Most TRDP businesses are operational, thus most of the cases discussed are censored. This means that business closure hasn't occurred in the period of observation and the subsequent period during which it has closed is unknown.

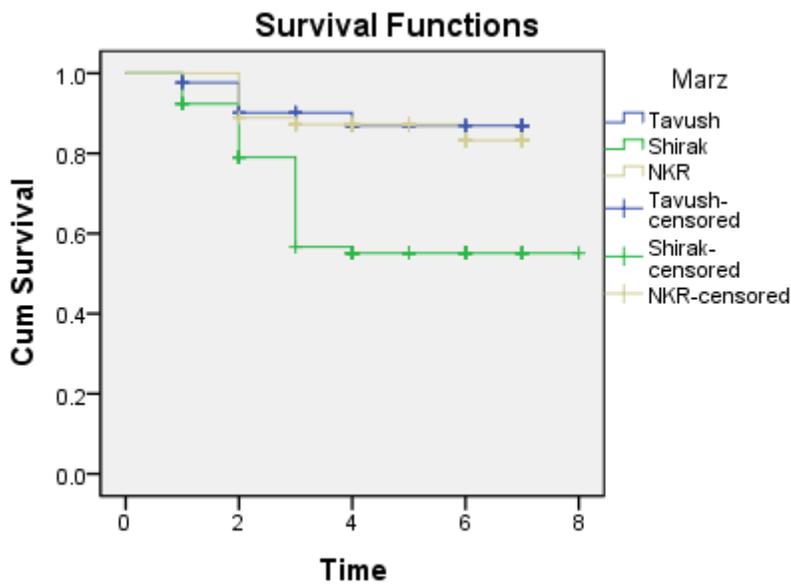
The interval start time row in the model shows the beginning of each step: in this model the beginning of each year. The number entering the interval shows that 185 businesses were started. Of these 171 had at least a two-year existence and 140 had a life of at least three years etc. However, as businesses have been established in different years the younger businesses have not had a chance to survive yet the full complement of eight years.

Cumulative Proportion Surviving at the End of Interval row shows the percentage of the businesses out of 100% at the beginning that survived to the end of the interval. Thus, we see that 96% of the businesses made it for two years; 85% survived for three years; 74% have survived for four years; 73% survived for six years; and 71% have not closed after eight years.

The hazard rate is the percent opportunity of having a terminal event; that is percentage chance of business closure for the group of businesses which were still operational at the start of that particular interval. The table illustrates that the largest hazard rate, therefore the time of greatest risk for closure of TRDP businesses is between 2<sup>nd</sup> and 3<sup>rd</sup> years as well as 3<sup>rd</sup> and 4<sup>th</sup> years when the hazard rate goes up to 13%. This can also be generated from the Survival function. See the Survival function below.



In addition, the study was able to find out the impact different factors have on survival probability of TRDP businesses. To generate the survival probabilities over the regions, the model runs the analysis using regions as a factor for survival. See Survival Function below:



The model shows that the probability of survival falls after two years of operation. In Shirak, though, the highest fall in survival probability has occurred from the third to the fourth years of

operation. As the model illustrates, there is a very slight difference between Tavush and NKR while there is a statistically significant difference between the survival rates of businesses in Shirak and in the two other regions (Log Rank P-value=0.000). In Shirak, business failure over time is much greater than in the two other regions, with the largest failure rate occurring in the third year of operation.

Overall, the greatest survival rate volatility occurs in the second and third years, but beyond three years all three regions show much lower failure rates and are similar to one another.

## Reasons for Closures

In order to reveal the reasons for the closures of businesses and to be able to explain the relatively lower survival rates in Shirak, an analysis was conducted of the reported reasons for closures.<sup>4</sup> The analysis shows that most of the closed TRDP businesses (20%) became non-operational with the arrival of new technologies into the region like internet cafes becoming obsolete with the availability of internet at homes through cell phones. Another 20% of closures happened because of various reasons, including land taken over by mining company; health conditions and death; inability of beneficiary to meet bank loan requirements; large debts and family problems; other issues related to employment. The reasons for closure are as follows: 16% is due to emigration to the Russian Federation; 13% because of overall poor management of the business and weak risk assessment and management by the founder; 9% because of low competitiveness; 7% for low demand for the type of product offered; 7% for low profit margins; 4% because of wrong spending of the bank loan on other than the purpose for which it was obtained; and 4% because of inability in repaying the loan.

A Chi-square analysis showed that there is a two-tailed positive significant correlation between the reason of closure and the region in which the business operated. In fact, the model shows that of the 20% of the closed businesses, the dominant obstacle was the introduction of new technology in the region, 16% because of emigration to Russia (in Shirak P-value=0.000); Six businesses in Shirak got closed because of poor management and risk assesment; four because of low competitiveness; three because of low profitability; two for not using the bank loan purposefully; and two for other reasons. The businesses that were closed due to the introduction of new technology were the computer and internet centers the demand for which fell sharply after home computers increased in the region.

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<sup>4</sup> The information for the reasons of closures have been acquired form TRDP regional leaders

In contrast to Shirak, there are no businesses in NKR and Tavush that were closed because of emigration to Russia, poor management and/or risk assessment, for not being competitive or not profitable and for unpurposeful spending of the bank loan. In NKR three businesses were closed because of the low market demand for their product in the community (bakery, pasta production and Internet cafe) and six for other reasons mentioned above. In Tavush one internet club got closed because of the new technology introduction, one business because land was taken by the mining company and 2 other businesses got closed because beneficiaries didn't pay the loans back. See Table 8 below:

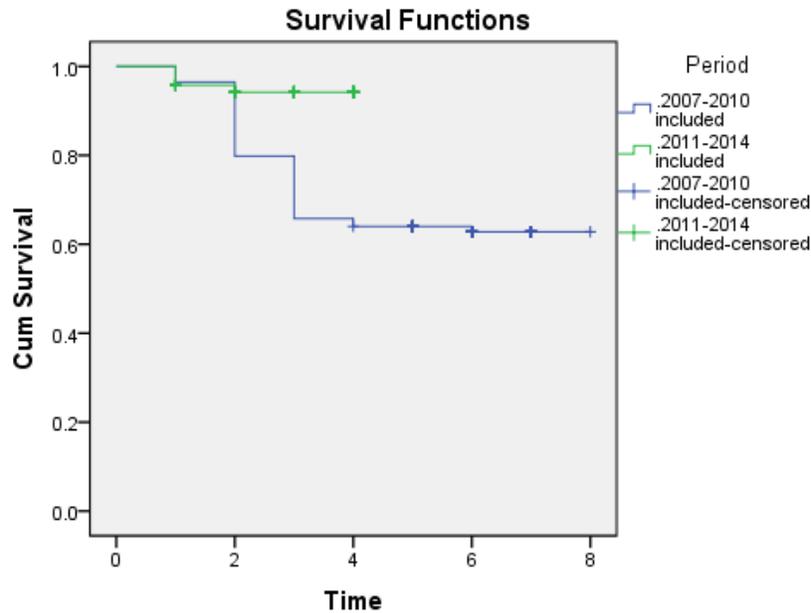
**Table 8: Reasons of business closures across regions in % of Regions' Total Closed**

	Tavush	Shirak	NKR	Total/Reasons
<i>Emigration to Russia</i>	0 (0%)	7 (22%)	0 (0%)	7 (15%)
<i>No enough market/Absence of market</i>	0 (0%)	0 (0%)	3(33%)	3 (6%)
<i>Not competitive</i>	0 (0%)	4 (13%)	0 (0%)	4 (9%)
<i>Due to new technology lost its demand</i>	1 (20%)	8 (25%)	0 (0%)	9 (20%)
<i>Unprofitable</i>	1(2%)	3 (9%)	0 (0%)	4 (9%)
<i>Poor management and risk assessment</i>	0 (0%)	6 (19%)	0 (0%)	6 (13%)
<i>Unpurposeful spending of loan</i>	0 (0%)	2 (6%)	0 (0%)	2 (4%)
<i>Loan not repaid</i>	2 (40%)	0 (0%)	0 (0%)	2 (4%)
<i>Other</i>	1 (20%)	2 (6%)	6 (67%)	9 (20%)
<i>Total/Closed</i>	5 (9%)	32 (71%)	9 (20%)	46 (100%)

The analysis also shows that most of the businesses in Shirak got closed in 2010, in Tavush in 2009 and in NKR in 2009 and 2013 equally.

### **Change with the Years**

The study also aimed at revealing whether the program has improved over the years and whether the survival rate of businesses has increased in the course of the years since inception. For this purpose the years of establishment were categorized into two groups: businesses established from 2007 till 2010 inclusive; and businesses established from 2011 till 2014. See survival function below:



The Kaplan Meier survival function shows that there is a significant difference between survival rates of businesses established before 2011 and the ones established after (Log Rank P-Value=0.000). The businesses established after 2011 have higher survival probabilities than those established before 2011. In other words, the failure rate of businesses established in the beginning of the program is higher than in those established in the second stage. The survival curve shows that there are major drops (in the 2<sup>nd</sup> and 3<sup>rd</sup> years of operation) in the survival curve of businesses established before 2011, while in the case of those established afterwards there is only a slight drop after 1 year of operation.

### Individual Characteristics of Beneficiary

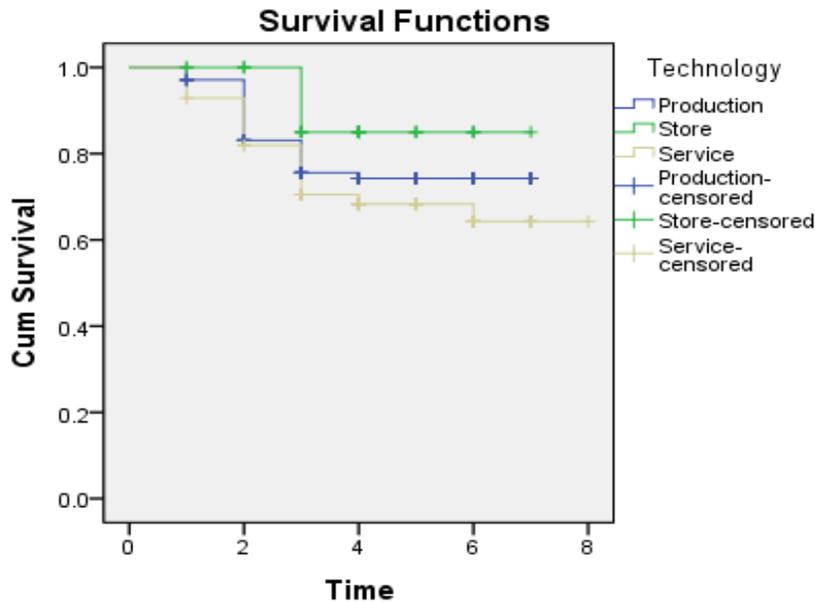
Aside from the annual and regional factors discussed above, the study takes into account the personal characteristics of the beneficiaries to see how they affect the survival function of TRDP businesses. The analysis shows that the factors of gender, age, education level, and employment of beneficiaries are not predictors of the survival rates.<sup>5</sup> The survival rates of TRDP businesses are not conditioned by either of the above mentioned factors.

### Type of Business

The analysis shows no significant association between the sector TRDP funded businesses operate in and survival rate (Log Rank P-value=0.200). Nevertheless, the failure periods of the businesses vary slightly across business sectors. For production businesses the greatest failure

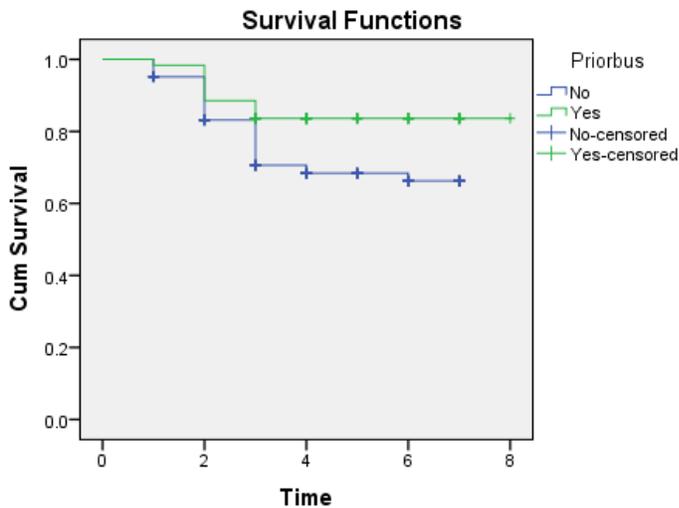
<sup>5</sup> Tables of the Analysis are available upon request

rate for production occurs in the 2<sup>nd</sup> year of operation and remains high into the 3<sup>rd</sup> year, while the greatest failure rate for retail stores begins in the 3<sup>rd</sup> year. Service businesses tend to have higher failure rates from the 1<sup>st</sup> to 3<sup>rd</sup> years. See Survival function below:



### Experience in Entrepreneurship/Prior Business

Those TRDP beneficiaries who had a business before applying to TRDP had lower failure rates than those who did not (Log Rank P-value=0.031). For the experienced entrepreneurs the greatest failure rate occurred in the 2<sup>nd</sup> year of operation, while the greatest failure rate for inexperienced ones started in the 2<sup>nd</sup> year of operation and remained high in the 3<sup>rd</sup> year. Consequently, we conclude that the factor of having a prior business positively affects the survival rate of TRDP businesses. See survival function below:



## Factors affecting survival rates of TRDP supported businesses

The Cox hazard proportional model is applied in the study to obtain more precise results on the factors affecting survival rates. The Cox model was created using explanatory variables of gender, age, education, employment and business type. The analysis confirms the results derived from the Kaplan Maier models in the study, which showed that all the above mentioned factors don't affect the survival rates of TRDP businesses. The model showed no statistically significant relationship between each of the factors and survival rates of the businesses (P Value > 0.05). Gender, age employment, education of the TRDP beneficiaries and the type of their businesses don't have any influence on their survival rates. See Table 9 below:

**Table 9: Cox Regression/ Gender, Age, Education, Employment, Business type**

Explanatory Variables	Significance (P-Value)	Hazard ratio (Exp(B))
Gender	.876	.943
Age	.104	.978
Education Level	.836	1.041
Employment at time of application	.743	.905
Business type	.555	1.102

Dependent variable: Survival rate

So far, the study observed that there is a significant difference in the survival rates of the businesses established before 2011 and after 2011, the ones established in different regions and the ones with prior business experience. The Cox proportional hazard analysis was conducted with specifically these factors to isolate the effects of each explanatory variable, and to understand whether after adjusting other influencing variables in the model an explanatory variable still affects the survival rate. The factors of having a prior business, the period and region of establishment are taken as explanatory variables to run the model. See Table 10 below:

**Table 10: Cox Regression/ Period, Region, Prior business**

Explanatory Variables	Significance (P-Value)	Hazard ratio (Exp(B))
Period of business establishment (before/after 2011)	.001	.527
Having prior business before applying to TRDP Program	.098	1.111
Region business have been established (Shirak, NKR, Tavush)	.553	1.321

Dependent variable: Survival rate

The analysis revealed that when all the confounding variables, in this case the region of establishment and prior business experience are kept constant, it is only the factor of period of establishing the TRDP business that still influences the survival rate. TRDP businesses established after 2011 have higher survival rates than the ones established before 2011. In other words, irrespective of the region where the businesses were established and whether or not the beneficiary had prior business experience, the probability of failure for TRDP businesses established after 2011 is reduced by 47% and is lower than in the case of those established in the beginning of the program.

## **Conclusions and Recommendations**

The following conclusions can be drawn from the study:

- The Turpanjian rural development program has been implemented successfully as out of total 185 businesses supported by the program 75% are still operational, competitive in their local markets, several with plans to expand and develop further.
- Most of TRDP businesses are in production, followed by service firms and retail stores. So far, fewer closures have been observed of retail stores. Though survival rates of TRDP businesses are not conditioned by the type of business, there is a slight difference between the stage(s) each may be exposed to risk. Therefore, particular attention should be paid to production businesses from the beginning of the 2<sup>nd</sup> year until the 4<sup>th</sup> year of the operation as it is the greatest failure time for those types of businesses. In case of retail stores, the most risky period is the 3<sup>rd</sup> year, while in case of services special attention should be paid from the beginning of the 1<sup>st</sup> to the 3<sup>rd</sup> year.
- Overall, the most vulnerable period for TRDP businesses, the stage(s) they are at most risk to close are the 3<sup>rd</sup> and 4<sup>th</sup> years of operation. Particular attention should be paid to all TRDP beneficiaries during the above mentioned volatile periods.
- The businesses established after 2011 have higher survival probabilities (less failure rates) than the ones established before, in the environment where all other confounding variables are controlled.

- In Shirak business failure is greater than in the two other regions, with the largest failure rate occurring in the 3<sup>rd</sup> year of operation. The reasons underlying business closures in Shirak were mainly attributed to the fall in demand of internet and computer centers in the country, tendency of Shirak beneficiaries to emigrate to Russia and poor management capacities of the entrepreneurs. Additionally, some businesses closed in Shirak because of not being competitive or not profitable and for unpurposeful spending of the loan. In NKR and Tavush only very few businesses closed mainly because of absence of the market, not repaying loan, other employment and health and family issues. Thus, particular attention should be paid to management capacities of Shirak entrepreneurs. Socioeconomic situation and political environment of Shirak region should be further analysed to find out the determinants of the tendency of emigration to Russia.
- Failure and survival rates of TRDP businesses are not conditioned and affected by individual characteristics of beneficiaries, such as educational level, age, gender and employment at the time of application. The percentage of closed TRDP businesses that belong to women is the same as the ones that belong to men. The problem of having less women entrepreneurs than men is conditioned by women's lower inclination to start a business rather than lower survival rates of their businesses. Certain strategies should be generated to increase the number of women applicants to the program.
- TRDP beneficiaries who didn't have prior business experience are more prone to experience failure over time than those with business management experience. In the course of the training as well as post training period more attention (monitoring, mentoring, and consultations) should be paid to the beneficiaries with no business experience.

The study answers the research questions and posits that in addition to this study, further analysis is needed to find out how the regional and organizational characteristics (strategies of businesses and environmental factors) affect the survival probabilities of TRDP businesses.

## Bibliography

- Aldrich, H. E. 1999. "Organizations and Environments, 1979." *Reprinted London: Sage Publications.*
- Aldrich, Howard, and Catherine Zimmer. 1986. "Entrepreneurship through Social Networks." *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.* [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1497761.](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1497761)
- Boswell, Jonathan. 1973. *The Rise and Decline of Small Firms.* Allen & Unwin London. [http://library.wur.nl/WebQuery/clc/373733.](http://library.wur.nl/WebQuery/clc/373733)
- Brüderl, Josef, Peter Preisendörfer, and Rolf Ziegler. 1992. "Survival Chances of Newly Founded Business Organizations." *American Sociological Review*, 227–42.
- Buss, Terry F., and Xiannuan Lin. 1990. "Business Survival in Rural America: A Three-State Study." *Growth and Change* 21 (3): 1–8.
- Carroll, Glenn R. 1983. "A Stochastic Model of Organizational Mortality: Review and Reanalysis." *Social Science Research* 12 (4): 303–29.
- Cooper, Arnold C., Gimeno-Gascon Javier F., Woo Carolyn Y. 1994. "Initial human and financial capital as predictors of new venture performance." *Journal of business venturing* 9: 371-395
- Forsyth, Grant D. 2005. "A Note on Small Business Survival Rates in Rural Areas: The Case of Washington State." *Growth and Change* 36 (3): 428–40.
- Goffee, Robert, and Richard Scase. 1983. "Business Ownership and Women's Subordination: A Preliminary Study of Female Proprietors." *The Sociological Review* 31 (4): 625–48.
- Humphreys, Marie Adele, and H. McClung. 1981. "Women Entrepreneurs in Oklahoma." *Review of Regional Economics and Business* 6 (2): 13–20.
- Koellinger, Philipp, Maria Minniti and Christian Schade. 2011. "Perceptions and heuristics in entrepreneurial decisions– the example of overconfidence. Excess entry and entrepreneurial decisions: the role of overconfidence", in Minniti M. (ed.), *The Dynamics of Entrepreneurship: Evidence from Global Entrepreneurship MonitorData*, Oxford University Press, Oxford, 11–30
- Luk, T. K. 1996. "Success in Hong Kong: Factors Self-reported by Successful Small Business Owners." *Journal of Small Business Management* 34 (3): 68.
- Lussier, Robert N. 1996. "Reasons Why Small Businesses Fail: And How to Avoid Failure." *The Entrepreneurial Executive* 1 (2): 10–17.
- Mayer, Kurt Bernd, and Sidney Goldstein. 1961. *The First Two Years: Problems of Small Firm Growth and Survival.* Vol. 2. Small Business Administration.
- Marshal, Alfred 1930. *Principles of economics:* London Machmilan & Co
- Michael Ames D. and Norval L. Wellsfry. 1983. "Small business management" West Publishing Company, College & School Division

- Pellegrino, Eric T., and Barry L. Reece. 1982. "Perceived Formative and Operational Problems Encountered by Female Entrepreneurs in Retail and Service Firms." *Journal of Small Business Management* 20 (2): 15–24.
- Preisendörfer, Peter, and Thomas Voss. 1990. "Organizational Mortality of Small Firms: The Effects of Entrepreneurial Age and Human Capital." *Organization Studies* 11 (1): 107–29.
- Reuber, A. Rebecca, and Eileen Fischer. 1999. "Understanding the Consequences of Founders' Experience." *Journal of Small Business Management* 37 (2): 30–45.
- Sapienza, Harry J., and Curtis M. Grimm. 1997. "Founder Characteristics, Start-up Process, and Strategy/structure Variables as Predictors of Shortline Railroad Performance." *Entrepreneurship Theory and Practice* 22: 5–24.
- Say Sean Baptiste .1971. "A Treatise on political economy or production, distribution and consumption of wealth. "New York AM. Kelley Publishers.
- Schwartz, Eleanor Brantley. 1976. "Entrepreneurship-New Female Frontier." *Journal of Contemporary Business* 5 (1): 47–76.
- Van Praag, C. Mirjam. 1997. "Determinants of Successful Entrepreneurship." <http://dare.uva.nl/document/506062>.
- Young, Ruth C., and Joe D. Francis. 1991. "Entrepreneurship and Innovation in Small Manufacturing Firms." *Social Science Quarterly* 72: 149–62.