Program Development of Small and Medium Enterprises in Stavropol Region of the Russian Federation

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ABSTRACT
Development of small and medium enterprise (SME) system as a cyclic process with basic principle of the continuity between development cycles and their development programs that provides potential stability of development of SME system in a prospective period has been considered in the paper. Research of the target programs implementation providing actions for support and development of SME in the Stavropol region has been conducted by the authors. The continuity of actions which is a cornerstone of the accepted programs is established. It forms the potential stability of development of SME system. The article proves necessity for modeling of the SME system development taking into account its cyclicality.

Keywords: Small and Medium Enterprises, Stability of the System, Development Program Indicators

JEL Classifications: D22, D84, L5, P42

1. INTRODUCTION
Development of small and medium enterprise (SME) in the Russian Federation as the controlled process is carried out according to the accepted programs of development on the regional and/or federal levels. According to these programs it is necessary to determine concrete targets, terms, indicators, resources provision and predictive vision of the SME system development and socioeconomic situation in general (Smallbone and Welter, 2001; Stavropol Region, 2009).

Each program of development is a separate cycle of the SME system development. Therefore it is supposed to observe the continuity when developing each following program of development. It is one of the necessary conditions of potential stability of its implementation, as well as coherence with long-term tendencies of SMEs’ development and its environment (Baydakov, 2004; Zapalska and Brozik, 2006). Besides, the monitoring system of each SME program implementation of has to be defined and realized. In our opinion, this monitoring has to include two obligatory components: Monitoring of indicators and program index numbers in the defined points of its implementation period, forecasting monitoring of its performance. Results of these processes and procedures realization form an informative and analytical basis for stability estimation of enterprises’ development - actual and ex ante (Agalarova, 2013; Bondarenko et al., 2005).

The effective solution of the task, in our opinion, is impossible without economic-mathematical modeling of development of SME system. Especially it concerns implementation of a predictive assessment of stability of the enterprise system development as an important role of SMEs in formation of the gross domestic product (GDP) of the state should be noticed. So, according to the Ministry of the Economic Development of the Russian Federation,
following the results of 2013, the SME contribution to GDP of the country made up to 21%. At the same time this indicator in the USA and Germany amounted for 50-52%, in France - 56-62%, in Japan - 52-55%. Based on the data provided by foreign sources, the Russian SME GDP constituted 25.2% (in comparison with the USA and France - 54%, Germany - 46%, Japan - 78%). The target reference point of this indicator declared by the government of Russia is 50-60% (Afanas'ev and Yuzbashev, 2010; Truhachev and Kurennaya, 2015). In this regard it should be noticed that foreign scientists contributed to the theoretical and practical researches connected with expansion of in SME share in the economic life of the state through stable development.

Most scientists studied problems of enterprise development and its support from the state in countries with emerging economy including the Russian Federation. Scase (2010), McIntyre, Dallago, (Lyles et al., 2004), paid attention to a survival of enterprise system in the conditions of transition to market relations. Holtz-Eakin and Rosen (2001) investigated various aspects of enterprise functioning and its development according to the state policy, revealing an economic role of enterprise in the development of the state economy.

Fogel and Zapalska (2001) analyzed the development of enterprise in the countries of the Central and Eastern Europe underlining the assessment of environment factors which are current at all stages of the enterprise system development. Ayaz Ahmed Chachar, Carmine Franco De Vita, Saleha Parveen, Zubair Ahmed Chachar, Woldie, Leighton, Adesua defined the system of factors influencing SME growth in regions which encourage the social and economic growth of the region (Alrabeei and Kasi, 2014; Lyovushkina et al., 2015; Stavropol Region, 2011; Stavropol Region, 2012; Zapalska and Brozik, 2004). Roxas, Lindsay, Ashill developed the concept of institutional factors impact on the formation of favorable climate for growth and success of micro, SMEs on the subnational level (Robson and Obeng, 2008; Savitskaya, 2008; Woldie et al., 2008; Zapalska et al., 2004) Alrabeei, Bharatesh Ramprakash Rasi, Robson, Obeng defined barriers interfering of SMEs economic growth. Also critical environmental factors can disturb the SME development program. Therefore, Dzhagler, Kitchin, Mitchell, Zhuglyar, Shumpeter’s scientific research of cyclic crisis deserves special attention.

2. METHODS

2.1. Modeling of the Sustainable Program Development of SME System

We consider useful application of “parallel” modeling which main point is in the coordinated realization of actions to achieve the following purposes:

- Modeling of the formed and/or realized program of the SME development.
- Continuity of cycles (programs) of the SME system development.
- Assessment of its potential stability.
- Modeling of processes of realization of the development program the with use of information received during its implementation.

- Assessment of stability of development of the SME system.
- Prognostics of the SME process.
- Quantitative proof of actions for ensuring stability of the SME system development.

The formulated component structure ensuring stability modeling and of the SME development is presented in Figure 1.

Conditional transitions in Figure 1 are connected with the search of answers to the following questions:

I. Is transition to a new cycle (program) of SME system development required?

II. Does the crisis situation exist?

III. Is adjustment of the program of SME development required?

IV. Is adjustment of the program of SME development possible?

Mathematical modeling is the most important sustaining component of the SME development. Modeling is a necessary instrument of realization of the generalized stabilization algorithm for SME system development practically in all its components - trajectory formation and its acceptable fluctuations, creation of trends and prognostics, measurement of stability of the corresponding historic series and their trends, etc.

We shall consider the essential content of the offered modeling in relation to implementation of target Programs of SME system development acting as its cycles of development.

When constructing the model of the program of SME system development the following indices and indicators are used:

- Target indicators and Program index numbers
- Program lead time
- Forecasts volumes and sources of financing the program

Figure 1: Modeling of providing small and medium enterprise system stability
• Expected results of the Program implementation and indicators of its social and economic efficiency.

These indicators flow is divided into three groups:
• Development parameters of the SME system within the Program: Target indicators and Program indices and indicators of its social and economic efficiency.
• Controlled (impulse-reaction) variables of the SME system within the implementation of the Program - volumes, structure and sources of financing the Program.
• Indicators of the enterprise system disturbance, the risky index numbers connected with implementation of the program.

The mathematical model of the Program of SME development, more precisely, its construction, is represented by the following components:
• Formalization of change trajectories of all indicators, given above, for the Program lead time.
• Modeling of the previous program of the SME development (the previous cycle of SME development) if there aren’t any.
• Formalization of historic series of indicators of the Program for the previous cycle of SME system development.
• Formalization of program changes tendencies of indicator values for the aggregate period of time combining lead time of the previous and proposed Programs of development.
• Trends and indicators of the SME system development from the previous cycle and their program values of the forthcoming cycle on the actual value basis.
• Interconnection and coupling with the previous program of the SME development (the previous cycle of the SME development) together with the analysis of tendencies for the aggregate period of time.
• Assess of potential stability along with the implementation the development program.

Trajectories formalization of the studied enterprise system development means functional approximation of these trajectories reflecting values trend of the traced Program parameters.

Similar actions are made for indicators of the previous Program of SME development if they weren’t carried out in Program lead time, and also for the aggregate period of time - for two programs of development and for the actual values and the forthcoming Program of development.

The analysis of the previous development cycle implementation, tendencies of the aggregate period of time and the comparative analysis of parameters of the current and previous cycles, the forthcoming Program of development and tendencies of the aggregate period is also information analytical source of stabilization of the enterprise system development.

Besides, the analysis of functional relationships for the integrated period of two cycles (Programs) of development, firstly, allows estimating the continuity of these Programs, and, secondly, the stability of a tendency of development dynamics, as well as potential stability of tendencies of the Program of development at a stage of its approval and preparation of implementation.

Generally the consideration of more than two cycles of the SME system development is possible. However, in our opinion, such approach, on the one hand, brings doesn’t always subject “overloading” of modeling. On the other hand, it sets a task to provide indices comparability of the processes, spread out over a period of time, of the SME system development. This decision is not simple because of serious changes of the social and economic situation, and distinctions in the indices and indicators system of various development cycles.

A bit different approaches should be used while assessing the stability of the SME system development in the program development. The fundamental difference is in the available information base of modeling. When constructing the Program development model there is total volume of information for the Program lead time. Modeling of implementation of the Program of SME system development is carried out generally only on the basis of information reflecting retrospective period of its implementation. It makes an impact on the used modeling facility, significantly limited by quality and amount of the available information aggregates. But at the same time it is necessary to compare the received dependences with the tendencies presented in the models of the SME development system program.

A process modeling implementation of the program also means the implementation of its prognostic research. Though, in our opinion, stability of the SME development Program has to be estimated by means of forecasting on the basis of the construct trend dependences and out of the Program lead time, thereby the stability of the SME system development after the Program completion is checked, and proves accurate of its long-term effectiveness is proved. Besides, these forecasts need to be considered when developing the following Program (cycle) of the SME system development.

The process modeling of the SME system development has to consider the existence of several conditional transitions.

The identification of a phase state of the SME development has two main intentions:
• Providing adequacy of the development management.
• Defining the transition practicality to a new cycle (Program) of the enterprise system development.

Transition to a new cycle (conditional transition I) can be caused by two conditions: Completion of the current development cycle (program), the crisis situation leading to a conclusion about impossibility of the implementation the development program. Thus it is necessary to research nature of a crisis situation and its urgency (conditional transition II).

Not every crisis situation leads to the completion of implementation of the development Program. Quite often it only takes its adjustment according to changes of social and economic conditions, remaining in general in the main framework of the realized Program (conditional transition III) if, of course, such adjustment is possible (conditional transition IV).
All actions have to be made not only on the basis of current situation, but also taking into account its forecast development (Forecasting block).

Thus, the offered approach should be considered as standard, as all programs of SME development in Russia are based on the appropriate federal programs. Besides, many social and economic processes have nonlinear nature of development. In our opinion, it is quite acceptable and in many cases unique when modeling of the Program of SME system development and formalization of processes of its implementation to use linear dependences based on the relative fugacity of these Programs implementation.

2.2. Potential Stability of SME System Development in Stavropol Region

Stability of the SME system development is a set of two components including potential stability of the formed development programs and stability of implementation processes. Lack of the potential stability of SME system, in our opinion, is a direct threat to the achievement of the SME system development objectives. Research of the potential stability has double relevance both for formation of development programs and for their implementation.

These actions can be considered as model and applicable for any region as appropriate programs of SME development are formed and realized in all constituent entities in the Russian Federation and are based on the federal programs of enterprise systems development.

It is possible to specify three cycles of enterprise development in Stavropol Region according to:

- Departmental target program “Development of SME s in Stavropol Region, 2009-2011”

According to the approach mentioned above we will focus on two programs: Previous (2009-2011) and flowing (2012-2015) as the considered periods of time.

It is necessary to point to the programs similarity and difference which have to be considered in the modeling processes. It is related to the fact that one program follows the other; on the other hand, each cycle of the SME development has its own specific nature.

From the use of modeling methods in the formation and implementation processes of target programs of development of SME system it should be noted that departmental target program “Development of SME in Stavropol Region, 2009-2011” and regional target program “Support of Subjects of SME in Stavropol Region, 2012-2015” are integrally connected cycles of Stavropol Region SME development. They have identical purposes and generally one program is a logical continuation of another. Structures of programs coincide; indicators and index numbers are in many respects comparable.

But at the same time it is necessary to take the following circumstances into consideration:

- Different pertain of programs (departmental, target)
- SME problems
- Differences in the used target indicators
- Sources and amount of financing
- Financing procedure: 2009-2011 Program - more than 80% of financing is accounted for the first year of the Program implementation, 2012-2015 Program - rather uniform annual financing with some increase
- Differences in the used efficiency indicators
- In the actions of the current Program - foreign economic activity and transition to municipal and city levels.

All above mentioned similarities and differences of relating programs of development, their continuity have to be considered and find the corresponding reflection, both in modeling, and in the model of SME system development.

First of all, we define the trends (Table 1) characterizing changes of values of target indicators and index numbers for precedent and current Programs of the SME development, and for the integrated period of their implementation (2009-2015). Furthermore actual values of indicators and indices of development reached during implementation of the previous cycle of the SME system development (2009-2011) are considered.

Thus, columns in Table 1 respectively show trend dependences for indicator and index numbers values:

<table>
<thead>
<tr>
<th>Phase of implementation</th>
<th>Values of target indicators</th>
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<tbody>
<tr>
<td>2 - 2009-2011 programs</td>
<td>3 - Actual values for the period of 2009-2011</td>
</tr>
<tr>
<td>4 - 2012-2015 programs</td>
<td>5 - Integrated values of 2009-2011 and 2012-2015 programs</td>
</tr>
<tr>
<td>6 - Integrated actual values of the period of 2009-2011 and 2012-2015 program.</td>
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</tr>
</tbody>
</table>

Hereinafter t=1, 2,… is a year number for each considered period of time, t=1 corresponds to the first year of the considered period. We consider as justified the creation of linear trends using 3-4 points as for indicator program values (columns 2 and 4) functional dependences practically to be taken. For their actual values (column 3) it is caused by reasons the comparative analysis of their variations - planned and actual. Besides, coefficients of determination are rather big in four cases out of six.

Modeling of dynamic pattern of indicators and index numbers of SME system development within two contiguous programs including actual values of indicators during implementation of the first program allowed to draw the following conclusions.

3. RESULTS

Development of social and economic processes in most cases has significantly nonlinear character. It is also confirmed by values variations of the considered indicators (program and actual), and distinction of their trends during 2009-2011 - terms of implementation of the first of the considered Program of SME development in Stavropol Region.
Besides there is a material incongruence of tendencies according to the Program of development and actual data on this interval for values of two indicators out of five.

Average monthly salary changes in SMEs in Stavropol Region both for the Program, and for the actual values have rather similar dynamics, especially in 2010-2011.

- Dynamics of indicators variation of average monthly salary, investment volume into stock capital of SMEs of Stavropol Region in 2009-2011 in all cases has a growth trend, but at the same time their rates for program and actual values significantly differ, moreover, they may have different nature.

- An important condition of sustainable development of SME system is the continuity of Programs of development. It is necessary to consider the following circumstances: Rigidity of the SME system which doesn’t assume sharp changes of the most indicators at short notice; possibility of faster growth in some directions providing its balance with other parameters of enterprise system and coherence with its environment, and any necessary resources’ provision.

- It should be pointed out that there is rather strong mismatch of growth characteristics for two Programs of indicator values of number of workers at SMEs, an average monthly salary, gross revenue of Stavropol Region enterprises, investment volume into SME stock capital; though this mismatch has different nature. Dynamic characteristics of the values planned by Programs of an indicator of SME subject number are more coordinated.

Conspicuous is the fact that trends, general for two Programs of development, are only in two cases (number of SME subjects and average monthly salary) out of five statistically significant.

In our opinion, divergences in dynamic characteristics of two programs are caused, on the one hand, by incongruity of their purposes and resources’ provision, and on the other hand, by incongruity of target values of the first Program (2009-2011) and actuality of indicators for this period of time.

Therefore it is necessary to distinguish qualitative and quantitative coherence of programs of development. The first one means coincidence of tendencies, the second one is quantitative continuity of indicators values and their growth rates.

4. DISCUSSION

Along with the SME development Programs, when forming a new Program, it is surely very important to take into consideration the actual change of program indicators, which are not always coordinated, and even can mismatch the planned dynamics within the previous cycle of development. For the target program of the SME development of the Stavropol Territory in 2009-2011 it is easy to be convinced of it, having compared the trend dependences and their statistical value presented in columns 2 and 3, Table 1.

Coherence of the new Program of the SME system development with the available actual retrospective values of its indicators and index numbers is one of necessary stability conditions of SME
system development in the corresponding cycle of the studied enterprise system development.

When forming the target program of SME system development in Stavropol Region for 2012-2015 including planned program actions and their resources’ provision which is adequately and following from an actual state of the studied indicators, program dynamics of the following indicators of development of SME of Stavropol Region in 2012-2015 is given:

- Number of employees at small and medium-sized enterprises, but in the terms of intention “to break” the developing unfavorable trend
- Average monthly salary at SMEs though indicator values at the beginning of the program period are unreasonably understated
- Gross revenue of SMEs, and a trend has rather high coefficient of determination
- Investment volume into SME stock capital
- Amount of sole traders in Stavropol Region, when growth rate is constant, though there are no justifications of so sharp increase in values of the indicator during Program implementation.

Motivations of dynamic characteristics formation of an indicator “amount of subjects of SME in Stavropol Region,” which on the basis of the actual values of an indicator in 2009-2011 grow more, aren’t quite clear. Besides, the majority of other indexes and indicators of the SME system development in many respects are defined by number of SMEs in the region.

In this regard, as well as with the remarks stated above concerning other indicators, it is possible to speak about obvious prerequisites of instability of implementation of the Program of development (2012-2015) already taking place in its formation.

Besides indicators and indices of the SME system development productivity of target Programs of SME system development in 2009-2011 and 2012-2015 in Stavropol Region is estimated by system of indicators of their implementation efficiency (Table 2).

The analysis of their dynamic characteristics has revealed the following circumstances:

- There are rather expressed tendencies of value change in each case for efficiency indicators, except, maybe, social effectiveness of the Program of 2009-2011.
- Values of social effectiveness indicator in 2009-2011 in the Program and actuality are close, though the actual values show the negative tendency of change significantly surpassing program guidelines in rates of decrease.
- Changes of social effectiveness indicator of the Program of development in 2012-2015 have the expressed trend and meet their increase, though they don’t meet tendencies of 2009-2011 - Neither program, nor actuality (Figure 2).
- Values of budget effectiveness indicator have the expressed trends for both programs and their aggregates. However, the Program 2009-2012 doesn’t meet the actual values of 2009-2011 and planned values of the indicator of the Program of 2012-2015 aren’t coordinated with the actuality of 2009-2011, but in general they match the program of 2009-2011 (Figure 3).

5. CONCLUSION

Based on the analysis of the actual results of the program implementation of SME development in Stavropol Region as well as on the indicator research provided in the existing program the following conclusions can be made:

- In most cases the actual values of indicators of 2009-2011 don’t meet the corresponding values of the target program of the SME development in Stavropol Region in 2009-2011, including an indicator of the budget effectiveness, that is this program objectives are achieved not in full.
- When forming the target Program of 2012-2015 its developers proceeded from contradictory aspirations - to agree it both with the previous Program, and with the actual dynamics of the considered indicators that led to numerous mismatches of dynamic characteristics of the program of 2012-2015 with the actual value changes of its indicators and index numbers at the previous stage (2009-2011) which are a source of instability of the SME system development, enclosed in the Program before its implementation.
- When forming the Program of SME system development it is necessary to proceed, first of all, from actually developing condition of the enterprise environment, whenever possible coordinating it with the previous programs, and at the Program implementation it is necessary to correct it according to the changes of the social and economic situation and tendencies of its development.
- It is necessary to monitor stability of value changes (actual and ex ante) indicators of the Program and on its basis justification of actions for ensuring stability of SME system development. This monitoring has to include two obligatory components: Monitoring of indicators and index numbers of the program in the defined points of its implementation.

Table 2: Trend dependences of efficiency indicators of implementation of Programs of the SME system development in Stavropol Region

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<tbody>
<tr>
<td></td>
<td>Program</td>
<td>Actuality</td>
<td>Program</td>
</tr>
<tr>
<td>Social effectiveness, RUB</td>
<td>y=−3.2t+46.7R²=0.285</td>
<td>y=−11.2t+72.8R²=0.987</td>
<td>y=35.5t+119.6R²=0.994</td>
</tr>
<tr>
<td>Budget effectiveness, RUB</td>
<td>y=3.6t−2.3R²=0.750</td>
<td>y=−0.6t+2.0R²=0.750</td>
<td>y=1.5t+2.4R²=0.985</td>
</tr>
</tbody>
</table>

SME: Small and medium enterprise

period, of its implementation period, forecasting monitoring of its performance monitoring of indicators and program index numbers in the defined points of its implementation period, forecasting monitoring of its performance. Results of processes and procedures realization form an informative and analytical basis of an assessment of stability of enterprise system development - actual and ex ante.

REFERENCES


