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УСЛОВИЯ ОБЕСПЕЧЕНИЯ СРЕДНЕЙ МАКСИМАЛЬНОЙ СКОРОСТИ ПЕРЕДАЧИ ИНФОРМАЦИИ В НЕСТАЦИОНАРНЫХ КАНАЛАХ ПРИ ИСПОЛЬЗОВАНИИ ТАЙМЕРНЫХ КОДОВ

Аннотация

Определена зависимость между скоростью передачи и соотношением сигнал/шум в канале, максимизирующая среднюю скорость передачи при постоянстве средней вероятности ошибки.

Ключевые слова: таймерный код, средняя скорость, передача информации.

Кілт сөздер: таймерлік код, барынша орташа жылдамдық, ақпарат.

Keywords: timer code, average speed, the transmission of information.

Реальные каналы связи в силу воздействия аддитивных флуктуационных помех, сосредоточенных во времени и других электромагнитных влияний, обладают нестационарностью [1].

При средней вероятности ошибочного приема элемента кодового слова $P_n \rightarrow 10^{-3} + 10^{-4}$ максимальная вероятность ошибки в «плохом» состоянии канала приближается к $P_{xn} \rightarrow 0,5$, а в «хорошем» – $P_{xx} \rightarrow 10^{-7} + 10^{-8}$. При этом вероятность P_{xx} нахождения канала (в зависимости от его типа) в «плохом» состоянии составляет $T_{nc} \geq 0,01 + 0,005$, и, соответственно, в «хорошем» – $T_{xc} \geq 0,99 + 0,995$ [2].

Для обеспечения заданной верности передачи используются обнаруживающие и исправляющие ошибки коды [3].

Построение простых и избыточных кодов происходит на базе так называемого позиционного кодирования, которое включает:

1. Нумерацию счетного множества передаваемых сообщений в десятичной системе исчисления (букв, команд, параметров).

2. Представление чисел десятичной системы в системе исчисления, определяемой алфавитом канала «а» (алфавит канала определяется числом различных значений информационного параметра канала: числом фиксированных амплитуд сигнала при АМ, числом фаз сигнала при ФМ и т.д.). Любое десятичное число N можно представить в «а»-позиционной системе исчисления:

$$N = \beta_n \cdot a^{n-1} + \beta_{n-1} \cdot a^{n-2} + \dots + \beta_1 \cdot a^0,$$

где коэффициенты $\beta_i \leq a - 1$ (для двоичной системы $\beta_i \in 0; 1$; для троичной – $\beta_i \in 0; 1; 2$ и т.д.). Например, число 11 в двоичной и троичной системах будет представлено как:

$$a = 2; \quad 11 \rightarrow 1 \cdot 2^3 + 0 \cdot 2^2 + 1 \cdot 2^1 + 1 \cdot 2^0 \rightarrow 1011;$$

$$a = 3; \quad 11 \rightarrow 1 \cdot 3^2 + 0 \cdot 3^1 + 2 \cdot 3^0 \rightarrow 102.$$

Из последней записи видно, что с увеличением алфавита канала «а» уменьшается количество цифр передаваемого числа. При необходимости построения равномерного кода в кодовых словах с меньшим числом цифр слева добавляются нули (для получения максимального значения цифр для данной реализации) [1].

3. Информация о номере передаваемого символа передается по каналу последовательностью коэффициентов β_i , представляющих соответствующее число [2].

Задача кодирующего устройства – передавать по каналу связи с минимально возможной ошибкой, информацию от источника сообщений, который характеризуется энтропией $H(x)$. Предположим, что источник формирует n -значные двоичные сообщения $\{x_k\}$. Вероятности $P_n(x_k)$ таких последовательностей могут быть различны, поскольку они зависят от вероятностей появления отдельных символов, входящих в эти последовательности. Исключение составляют случаи, когда символы алфавита некоррелированы и равновероятны. Из сказанного следует, что энтропия n -значных последовательностей $H_n(x)$ также может изменяться в процессе работы источника. Так как

$H_n(x)$ зависит от n , то целесообразно пользоваться усреднённой характеристикой возможных реализаций сигналов $\lim_{n \rightarrow \infty} \frac{H_n(x)}{n}$.

На множестве 2^n возможных реализаций сигналов можно задать любую числовую функцию $f_n(x)$, которая сама будет случайной величиной. Выберем для примера

$$f_n(x) = \frac{1}{n} \log_2 P(x). \quad (1)$$

Предел математического ожидания этой функции [5]

$$\lim_{n \rightarrow \infty} E[f_n(x)] = \lim_{n \rightarrow \infty} \frac{H_n(x)}{n} = H(x). \quad (2)$$

Из последнего следует, что не только математическое ожидание функции $E[f_n(x)]$ при $n \rightarrow \infty$ стремится к $H(x)$, но и сама функция n_0 вероятности стремится к $H(x)$. Указанная особенность эргодических источников называется асимптотической равновероятностью сообщений (или E -свойством) [5]. Согласно теореме Мак-Милана оно формируется следующим образом: для любых сколь угодно малых чисел $\varepsilon > 0$, $\delta > 0$ можно найти такое число элементности кода $n_0 > 0$, что все реализации сообщений длины $n \geq n_0$ распадаются на две группы: маловероятную, для которой общая вероятность появления сообщений не превышает δ , и высоковероятную, для которой вероятности сообщений удовлетворяют условию

$$|f_n(x) - H(x)| < \varepsilon. \quad (3)$$

Из свойств асимптотической равновероятности вытекает следующее:

– все реализации высоковероятностной группы приблизительно равновероятны и число их составляет

$$N_\varepsilon = \frac{1}{P(x)}; \quad (4)$$

– с высокой степенью точности энтропия n -значной последовательности

$$H_n(x) = \log_2 N_\varepsilon; \quad (5)$$

– для случаев, когда символы алфавита источника сообщений имеют m неравновероятных и независимых состояний, при больших значениях n , высоковероятностная группа реализаций содержит N_ε сообщений:

$$N_\varepsilon \approx 2^{nH(x)}, \quad (6)$$

где $H(x)$ энтропия в двоичных единицах.

Так как общая вероятность высоковероятностных сообщений сколь угодно близка к единице, то их число находится в пределах:

$$\frac{1}{[P_n(x)]_{\max}} \leq N_\varepsilon \leq \frac{1}{[P_n(x)]_{\min}}. \quad (7)$$

Переходя к энтропии, получим

$$2^{n[H(x)-\xi]} \leq N_\varepsilon \leq 2^{n[H(x)+\xi]}. \quad (8)$$

Теорема позволяет решить вопрос об отыскании наиболее экономного кода, имеющего минимальное среднее число двоичных знаков на символ алфавита источника n_c . При этом должны учитываться лишь высоковероятные последовательности символов. Это означает, что при достаточно большом n неравномерный код, учитывающий статистику алфавита источника сообщений, теряет свои преимущества относительно скорости передачи по сравнению с равномерным. Можно показать, что среднее число двоичных знаков на символ (n_c) находится в пределах [5]

$$\frac{H(x)}{\log_2 m} \leq n_c < \frac{H(x)}{\log_2 m} + 1. \quad (9)$$

Для кодов, исправляющих пакеты ошибок длиной λ и менее элементов,

$$\eta_n = \frac{P(\geq 1, n)}{P_n(\geq \lambda, n)}. \quad (10)$$

Так как при $\lambda = 1$ $xP_n(x+1, n) \geq P(x+1, n)$, то

$$\eta_n \leq \frac{P(\geq 1, n)}{P_n(\geq \lambda+1, n)}. \quad (11)$$

На рисунке 1 приведены графики зависимости $\eta = f(t)$ для различных значений n , полученные на основании экспериментальных данных для телефонного кабельного канала ($p = 3,07 \cdot 10^{-4}$; $\alpha = 0,613$). Из зависимостей видно, что для данных каналов применение кода

в режиме исправления ошибок при $n < 511$ не приводит к повышению достоверности более чем в 10 раз [1].

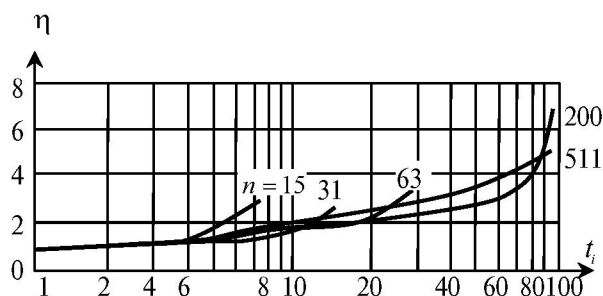


Рисунок 1 – Зависимость $\eta = f(t_i)$ для телефонного кабельного канала

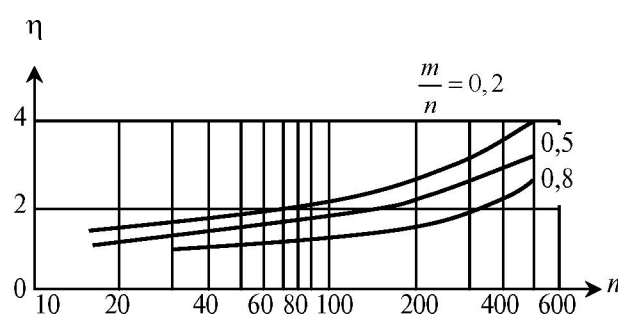


Рисунок 2 – Зависимость $\eta = f(t_i)$ для телефонного кабельного канала

На рисунке 2 приведена зависимость коэффициента η от элементарности кода при различных значениях отношения $m/n = 0,2; 0,5; 0,8$.

Следовательно, коды, исправляющие пакеты ошибок в этих каналах при $n < 511$, также не обеспечивают заметного повышения достоверности.

В отличие от разрядно-цифрового способа кодирования (РЦК), когда информация о передаваемом разряде определяется видом сигнала на единичном (найквистовом) интервале, в таймерных сигнальных конструкциях (ТСК) [6] информация заложена в длительностях отдельных временных отрезков сигнала τ_c на интервале $T_{ск}$ и их взаимном положении. Это максимальное расстояние между соседними моментами модуляции не меньше t_0 , но и не кратное ему

$$\left. \begin{aligned} \tau_{ci} &= S\Delta + k\Delta, \quad k \in 0; 1; 2 \dots \\ \Delta &= \frac{t_0}{S}, \quad S \in 2; 3; 4 \dots \end{aligned} \right\}, \quad (12)$$

где k, S – целые числа.

Удовлетворение расстояния τ_{ci} уравнению (12) обеспечивает минимизацию межсимвольных помех. Число реализаций ТСК определяется [6] согласно формуле:

$$N_p = C_{ms-i}^i (S-1). \quad (13)$$

Таким образом, в ТСК кодовое расстояние определяется нецелым числом найквистовых элементов.

На рисунке 3 изображены графики зависимостей пропускной способности каналов с различным уровнем флуктуационных шумов с учетом потерь в канале для таймерных сигналов. При этом пропускная способность определяется по формуле

$$\left. \begin{aligned} C_m &= \frac{1}{m} (\log_2 N_p - H_n), \\ N_p &= \sum_{i=1}^m \frac{1}{i!} \prod_{k=1}^i (ms - is + k) \end{aligned} \right\}, \quad (14)$$

где H_{nom} – потери в канале из-за неопределенности в приеме кодовой сигнальной конструкции.

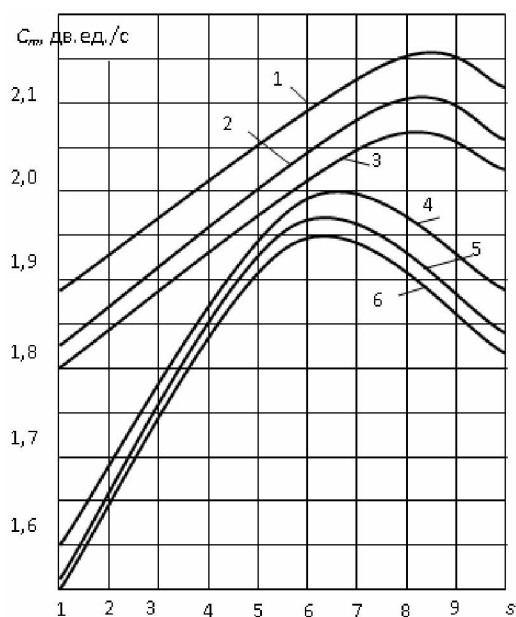


Рисунок 3 –
Зависимости пропускной
способности канала $C_i = f(s)$
(кривые 1–3 для отношения с/ш $h = 7,5$
и $m = 8$; 6; 5 соответственно,
кривые 4–6 для $h = 5,5$ и $m = 8$; 6; 5 соответственно)

Из рисунка 3 видно, что приведенные зависимости пропускной способности имеют максимум при некотором значении S . Это явление связано с тем, что с увеличением количества минимальных элементов Δ на интервале найквистового элемента t_0 растет не только число реализаций N_{pm} , но и вероятность их ошибочного приёма. Для случая использования в канале частотной модуляции [6]

$$\sigma_c = \frac{1}{4h}, \quad (15)$$

где σ_c – среднее квадратическое отклонение смещения ЗМВ; h – отношение с/ш в канале.

Таким образом, Δ определяется уровнем помех в канале h . Предположим, что передача производится по каналу, в котором величина смещения ЗМВ случайна и описывается законом $f(Q)$, а скорость в канале изменяется в зависимости от параметра величины Q и равна $B(Q)$ [3]. Определим, как должна изменяться скорость $B(Q)$ с целью достижения максимальной средней скорости передачи \bar{B} при ограниченной средней вероятности необнаруженной ошибки \bar{P} .

Так как скорость в канале изменяется с изменением параметра Q , то в каждый момент времени вероятность ошибочного приёма должна быть равной $P(Q, B)$. При каждом конечном значении скорости число ошибок равно

$$n(Q) = P(Q, B)B(Q). \quad (16)$$

Среднее число ошибок в единицу времени определяется функцией $f(Q)$ и диапазоном изменения Q в данных условиях

$$\bar{n} = \int_0^{Q_2} n(Q) f(Q) dQ. \quad (17)$$

Среднюю вероятность ошибки можно определить, зная среднюю скорость \bar{B} [5]:

$$\bar{P} = \frac{\bar{n}}{\bar{B}} = \frac{1}{\bar{B}} \int_{\alpha_1}^{\alpha_2} P(Q, B) B(Q) f(Q) dQ. \quad (18)$$

Следовательно, при изменении Q необходимо найти такую функцию для скорости, при которой будет достигнуто максимальное значение средней скорости \bar{B} :

$$\left. \begin{aligned} \max \bar{B} &= \int_{\alpha_1}^{\alpha_2} B(Q) f(Q) dQ, \\ \bar{P} &= \frac{1}{\bar{B}} \int_{\alpha_1}^{\alpha_2} P(Q, B) B(Q) f(Q) dQ = \text{const.} \end{aligned} \right\} \quad (19)$$

Условие (19) можно представить

$$\bar{P} = \text{const} = \frac{\int_{\alpha_1}^{\alpha_2} B(Q) P(Q, B) f(Q) dQ}{\int_{\alpha_1}^{\alpha_2} B(Q) f(Q) dQ}. \quad (20)$$

Умножая \bar{P} на знаменатель правой части, и учитывая, что пределы интегрирования одинаковы, получим

$$K(B) = \int_{\alpha_1}^{\alpha_2} f(Q)B(Q)[P(Q, B) - \bar{P}]dQ = 0. \quad (21)$$

Так как необходимо найти $B(Q)$, удовлетворяющую условию (19), то нахождение $B(Q)$ как функции Q представляет собою изопериметрическую задачу, т.е. среди всех функций $B(Q)$, для которых соблюдаются условия

$$K(B) = \int_{\alpha_1}^{\alpha_2} G(Q, B)dQ, \quad (22)$$

$$G(Q, B) = f(Q)B(Q)P(Q, B) - \bar{P}B(Q)f(Q) \quad (23)$$

найти такую зависимость B от искажений Q , при которой

$$\left. \begin{aligned} I(B) &= \int_{\alpha_1}^{\alpha_2} F(Q, B)dQ, \\ F(Q, B) &= f(Q)B(Q). \end{aligned} \right\} \quad (24)$$

достигается экстремума. Функция $B(Q)$ определяется из уравнения Эйлера [3], которое для данной задачи имеет вид

$$\left. \begin{aligned} F'(B) + \lambda G'(B) &= 0, \\ \lambda &= const. \end{aligned} \right\} \quad (25)$$

или

$$f(Q) + F(Q) \left\{ [P(Q, B) - \bar{P}] + B(Q) \frac{dP(Q, B)}{dB} \right\} = 0. \quad (26)$$

Воспользуемся отношением [3]

$$\left. \begin{aligned} P_0 &= 2[0,5 - \Phi(c)] = 2 \cdot 0,1 e^{-\frac{c^2}{2}}, \\ c &= \frac{\Delta}{\sqrt{2\pi} \cdot 2\sigma}; \quad \Delta = \frac{1}{Bs} = \frac{k}{B}. \end{aligned} \right\} \quad (27)$$

Следовательно,

$$\left. \begin{aligned} P(Q, B) &= 0,2 e^{-\frac{kQ}{2B}}, \\ \frac{dP}{dB} &= \frac{0,1Q \cdot k}{2B^2} e^{-\frac{kQ}{2B}}. \end{aligned} \right\} \quad (28)$$

Подставив в (26) условия (28) и произведя преобразования, получим

$$1 + \lambda \left(0,2 e^{-\frac{kQ}{2B}} - \bar{P} \right) + \lambda \frac{0,2Q}{2B} e^{-\frac{kQ}{2B}}. \quad (29)$$

Уравнение (29) определяет $B(Q)$. Для нахождения постоянной умножим обе части уравнения (29) на $B(Q)f(Q)$ и проинтегрируем его в пределах уравнения (21):

$$\int_{\alpha_1}^{\alpha_2} B(Q)f(Q) \left[1 + \lambda \frac{Q2k}{2B} e^{-\frac{kQ}{2B}} \right] dQ = 0. \quad (30)$$

Зная конкретные значения α_1, α_2 , можно найти постоянную. Перепишем уравнение (29) в виде [4]

$$1 - \lambda \bar{P} + 0,2 e^{-\frac{kQ}{2B}} \left(1 - \frac{Q}{2B} \right) = 0. \quad (31)$$

Продифференцируем обе части равенства (31)

$$0,2\lambda \left[e^{-\frac{kQ}{2B}} \left(-\frac{kQ}{2B} \right)_Q \left(1 + \frac{Q}{2B} \right) + e^{-\frac{kQ}{2B}} \left(\frac{kQ}{2B} \right)_Q \right]. \quad (32)$$

Равенство (32) возможно только в том случае, когда $\left(\frac{kQ}{2B} \right)_Q = 0$. Следовательно,

$$h' = \frac{kQ}{2B(Q)} = const. \quad (33)$$

Уравнение (33) говорит о том, что $h' = \frac{\Delta}{2k}$ при любых изменениях Q должно оставаться постоянным. Это значит, что в системе максимальную скорость можно получить, поддерживая её максимально возможной при любом уровне помех.

В самом деле, предположим, что в системе с обратной связью обратная связь разомкнута и осуществляется передача только в прямом канале. Если оставить требование получения максимальной скорости при постоянной вероятности ошибки, то учитывая, что [1]

$$P_0 = 1 - \left[2\Phi\left(\frac{\Delta}{2\sigma}\right) \right]^3 = \text{const.}$$

Величина $\frac{\Delta}{2\sigma}$ при всех значениях σ должна оставаться постоянной. Так как скорость передачи зависит от Δ , то максимальной она будет при минимальном значении Δ , обеспечивающем $P_{\text{зад}} = \text{const.}$

Вывод. Для получения максимальной скорости передачи при использовании таймерных сигнальных конструкций закон изменения энергии базового элемента Δ должен соответствовать закону изменения шумов в канале.

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Резюме

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ТАЙМЕРЛІК КОДТЫ ПАЙДАЛАНА ОТЫРЫП СТАЦИОНАРЛЫҚ ЕМЕС КАНАЛДА АҚПАРАТТЫ ТАРАТУДЫҢ БАРЫНША ОРТАША ЖЫЛДАМДЫҒЫН ҚАМТАМАСЫЗ ЕТУ

Қателік мүмкіншілігінің орташа тұрақтылығында каналдағы дабыл/шудың хабар таратудың барынша орташа жылдамдығы мен хабар тарату жылдамдығы арасындағы арақатынастың тәуелділігі анықталды.

Кілт сөздер: таймерлік код, барынша орташа жылдамдық, ақпарат тарату.

Summary

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CONDITIONS FOR SUPPORT THE AVERAGE MAXIMUM SPEED OF TRANSFER OF INFORMATION IN NON-STATIONARY CHANNELS WHEN USING THE TIMER CODE

Dependence between the speed of transfer and a ratio signal/noise in the channel, maximizing the average speed of transfer is defined at constancy of average probability of a mistake.

Keywords: f

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ON SOME ISSUES OF KAZAKHSTAN TAX LEGISLATION IMPROVEMENT AND ITS APPLICATION IN JUDICIAL PRACTICE

Grant holder of Erasmus Mundus Program,
Carl von Ossietzky Universität Oldenburg

Keywords: tax legislation, Supreme Court of the Republic of Kazakhstan, regulatory resolution, principle of taxation, amicable agreement, tax refund, tax authority, tax audit, hierarchy of legislation.

Кілт сөздер: салық заңнамасы, Қазақстан Республикасының Жоғарғы соты, нормативтік қаулы, салық қайтарымы, салық салу қағидаты, әлемдік келісім, салық қызметі органы, салық тексерісі, заңнама сатысы.

Ключевые слова: налоговое законодательство, Верховный суд Республики Казахстан, нормативное постановление, возврат налога, принципы налогообложения, мировое соглашение, орган налоговой службы, налоговая проверка, иерархия законодательства.

The Constitution of the Republic of Kazakhstan declares the focus on economic development as one of the fundamental principles of the Republic of Kazakhstan. Achieving the country's economic growth, sustainability and balance of development are impossible without proper management and regulation. The law as a regulator of social relations, including this field, is one of the most important components for the implementation of the above-named principle, an important tool for achieving the goals and priorities of the economic policy. At the same time, for the regulation of these relations it is necessary to comply with certain balance among the processes of governance, control and surveillance of economy (the so-called “government interference”) and the provision of freedom of private business initiatives.

Kazakhstan during the period of its independence has achieved significant results in the field of economic development and formed a legal framework based on the principles of market economy, the study of foreign experience and directed for stimulation of business initiatives.

According to the data of the Doing Business 2013 by the World Bank the Republic improved its ranking by 7 positions – from 56 to 49 – if to compare with 2012. Since 2008 to 2013 the significant reforms for business development on the opinion of the World Bank are: simplification of the business start up process by simplifying documentation requirements and abolishing the requirement to register at the local tax office (2010); eased business start-up by reducing the minimum capital requirement to 100 tenge (\$0.70) and eliminating the need to have the memorandum of association and company charter notarized (2011); simplification of starting a business by eliminating the requirement to pay in minimum capital within 3 months after incorporation (2013)¹.

At the same time, Kazakhstan tax legislation from the view of certainty and clarity, compliance to the global best practice, as well as within the country's ongoing centrifugal integration processes into the world economy, requires its improvement.

Legal regulation of relations in the field of taxation is one of the most important components for creation a favorable climate for the purposes of private entrepreneurship development and capital inflow. The Republic was the first of the former Soviet Union countries that adopted a single legal act, which combined and systematized the numerous legislative and subordinate normative legal acts regulated the issues of taxation. In spite of numerous attempts to improve the legal regulation of tax relations by adopting laws devoted to reduction of the tax burden, the abolition of inefficient tax breaks, simplifying the tax system, improving tax administration, elimination of gaps and contradictions, the harmonization of tax legislation in the framework of regional unions of states (the Common Economic Space, the Customs Union), etc., some of its shortcomings needing elimination are revealed. And a significant role in the

¹ Doing Business 2013. Smarter Regulations for Small and Medium-Size Enterprises. Economy Profile: Kazakhstan. The World Bank, 2013. – P. 20.

development of tax legislation, besides law-making process, belongs also to the enforcement activity including judicial practice.

According to the Constitution of the Republic of Kazakhstan, “the fundamental law of the state and society”², the courts play a special role in this regard. Only the courts shall exercise justice in the Republic of Kazakhstan (point 1 Article 75). Judicial power shall be exercised on behalf of the Republic of Kazakhstan and shall be intended to protect the rights, freedoms, and legal interests of the citizens and organizations for ensuring the observance of the Constitution, laws, other regulatory legal acts, and shall ensure international treaties of the Republic. Judicial power shall be extended to all cases and disputes arising on the basis of the Constitution, laws, other regulatory legal acts, international treaties of the Republic (points 1,2 Article 76). The courts shall have no right to apply laws and other normative legal acts infringing on the rights and liberties of an individual and a citizen established by the Constitution. If a court finds that a law or other normative legal act subject to application infringes on the rights and liberties of an individual and a citizen it shall suspend legal proceedings and address the Constitutional Council with a proposal to declare that law unconstitutional (point 1,2 Article 78). Accordingly the article 81 of the Constitution the Supreme Court of the Republic of Kazakhstan shall be the highest judicial body for civil, criminal and other cases which are under local and other courts, exercises the supervision over their activities in the forms of juridical procedure stipulated by law, and provide interpretations on the issues of judicial practice, which are made in regulatory resolutions and are the part of functioning law of the Republic of Kazakhstan (article 4, point 1 of the Constitution).

In this regard the regulatory resolution of the Supreme Court of the Republic of Kazakhstan on clarifying certain provisions of the tax legislation dated February 27, 2013 is of interest. This act was issued in order to replace the previously operating regulatory resolution of the Supreme Court of the Republic of Kazakhstan “On Judicial Practice of Applying the Tax Legislation” dated June 23, 2006, which clarified a number of provisions of the Code of the Republic of Kazakhstan “On Taxes and Other Obligatory Payments to the Budget” dated June 12, 2001 adopted and came into effect since January 1, 2002.

There is no doubt that the defense of violated or disputed rights, freedoms and lawful interests of individuals and legal entities, the state, as well as strengthening the rule of law and monocracy, and the prevention of commission of offenses depend on how officials of the bodies resolving disputes are informed about problems in the field of taxation, and qualified in the application of tax law.

In the act of the plenum of the Supreme Court of the Republic of Kazakhstan certain provisions of the tax legislation and its application in the resolution of cases by the courts clarify, attention is drawn to the inconsistencies among the Tax Code and other legislative acts (the Civil Procedure Code of the Republic of Kazakhstan dated July 13, 1999, the Criminal Procedure Code of the Republic of Kazakhstan December 13, 1997).

Thus, the following provisions are stipulated in point 13 of the regulatory resolution: “Subject to point 3 of Article 6 of the Law of the Republic of Kazakhstan “On Normative Legal Acts” the provisions of the first part of Article 139 and subpoint 5) of Article 140 of the Civil Procedure Code regarding the issuing a writ on recovery of arrears of taxes and other obligatory payments from the legal entities cannot be applied. These provisions are contrary... to the norms of the Tax Code providing for the powers of tax authorities for the forced recovery of tax arrears (articles 614 - 622 of Chapter 86 “Measures of Forced Recovery of Tax Arrears”). In this regard, the norms of the Tax Code, which came into effect later than the Civil Procedure Code, shall be applied”.

It is important also to pay attention to point 16 of regulatory resolution, which clarifies the norm of the tax legislation provided for subpoint 2) point 9 article 627 of the Tax Code about the cases of unscheduled tax inspections. According to this norm, such inspections can be carried out including “on the grounds provided by the Criminal Procedure Code of the Republic of Kazakhstan. However, the Criminal Procedure Code does not contain the norm about the grounds on which tax audits can be assigned. At the same time, the second part of Article 123 of the Criminal Procedure Code recognizes the pre-investigation materials and particularly the acts of tax audits received, requested or submitted in the order prescribed in Article 125 of the Criminal Procedure Code to the documents as evidences. According to this norm gathering evidences is produced during the pre-trial and trial proceedings through the production of legal proceedings provided by the first part of article 125 of the Criminal Procedure Code. The body conducting

² Sapargaliyev G. Konstitutsionnoye pravo Respubliki Kazakhstan. Uchebnik. – Almaty, 1998. – P. 9.

the criminal proceeding has the right to demand the production of inspections from the competent authorities and officials on the criminal case in its production (part 2). Under subpoint 28) of Article 7 of the Criminal Procedure Code the pre-trial proceeding relevant to this situation is defined as the proceeding on criminal case since the initiation of the criminal case before its sending to the court for examination on the merits. According to the second part of Article 8 of the Criminal Procedure Code the criminal process is stipulated by the law procedure in criminal cases. These norms of the Criminal Procedure Code are a ground for concluding that the acts of tax audit carried out on the general basis shall be recognized as the pre-investigation materials stipulated by article 123 of the Criminal Procedure Code. Within the pre-investigation inspection the prosecuting agency is not entitled to demand doing tax audits from the tax authority. Therefore, prescription of the tax authority on conducting unscheduled tax audit under a letter or a resolution of the prosecution agency submitted before initiation of criminal proceedings is illegal on the grounds provided by the Criminal Procedure Code. By virtue of points 1 and 2 of Article 28 of the Law of the Republic of Kazakhstan "On State Control and Supervision in the Republic of Kazakhstan" such inspection is invalid due to a rough violation of the requirements of the above-named Law".

As we can see, in the normative act of the Supreme Court in the first case the focus was made on the existing contradiction between the Civil Procedure Code and the Tax Code. The reference to the Criminal Procedure Code provided by the Tax Code is also considered as a lack of current tax law so as the Criminal Procedure Code does not have such a blanket rule. This represents a mismatch of the above-named acts of the same level, as well as an internal contradiction in the Tax Code, which establishes the principle of certainty of taxation and, as a result, this can lead to different interpretations and applications of these rules. In this regard, it is necessary to make adjustments to the above legislative acts for the purposes of elimination of these disadvantages.

It should be noted that the regulatory resolution of the Supreme Court of the Republic of Kazakhstan in accordance with the Constitution is part of the existing law, as it was mentioned above. At the same time, the Law of the Republic of Kazakhstan dated March 24, 1998 "On Normative Legal Acts" contains a hierarchy of normative legal acts of the Republic of Kazakhstan. According to this hierarchy, the Constitution has the supreme legal force. The ratio validity of the other than the Constitution normative legal acts at the descending levels is provided by point 2 of Article 4 of the Law. However, point 4 of Article 4 of this Act has rule, which states that the regulatory decisions of the Constitutional Council of the Republic of Kazakhstan and the Supreme Court of the Republic of Kazakhstan are outside of this hierarchy.

Therefore, a regulatory resolution of the Supreme Court cannot be attributed to the acts of tax legislation. According to point 1 of Article 2 of the Code of the Republic of Kazakhstan "On Taxes and Other Obligatory Payments to the Budget" (Tax Code) tax legislation of the Republic of Kazakhstan is based on the Constitution of the Republic of Kazakhstan and consist of this Code and the normative legal acts the adoption of which is specified by this Code. The Tax Code also contains a clause: "When a contradiction exists between this Code and other legislative acts of the Republic of Kazakhstan, for taxation purposes the provisions of this Code shall apply". Furthermore, "it shall be prohibited to include rules regulating tax relations into non-tax legislation of the Republic of Kazakhstan, except for the cases specified by this Code".

Based on the provisions of the above listed norms of the Constitution, the Tax Code and the Law of the Republic of Kazakhstan "On Normative Legal Acts", our proposal about the need to refer to the Basic Law – the Constitution as the ground for the introduction³ of the regulatory resolution of the Supreme Court of the Republic of Kazakhstan has been implemented in the draft regulatory resolution, which was presented for consideration and scientific legal examination in August 2012. Thus, the final point of the regulatory resolution states: "This regulatory resolution is included in the existing law In accordance with Article 4 of the Constitution of the Republic of Kazakhstan, and it shall be obligatory and comes into effect from the date of its official publication".

As the result, it is appropriate to note the provision of the regulatory resolution relating to the acts of tax authorities, which are "subject to assessment by the court with regard to their compliance with tax legislation". This statement follows from point 1 of Article 2 of the Tax Code, which defines the tax legislation as the Code itself, as well as "the regulatory decisions of the Government of the Republic of Kazakhstan, normative legal orders of the head of authorized body in the system of tax authorities,

³ Lokteva Yuliya. On Some Legal Issues of the Access to Information in Field of Finance (Problems and Proposals) // State Audit. – 2012. – N 3(16). – P. 58.

normative legal orders of the Minister of Foreign Affairs of the Republic of Kazakhstan on specifying the rates of consular fees (point 2 article 552) and the normative legal decisions of local representative bodies of regions, cities of republic importance and the capital on the establishment of rates of certain taxes and other obligatory payments to the budget". In this context, an explanation of the Supreme Court of certain provisions of the tax legislation does not eliminate the existing cases of its imperfections, tax legislation needs some improvement within law-making process, and the provisions of this regulatory resolution shall be also assessed by the court "with regard to their compliance with tax legislation".

Noting the actuality and positive aspects of this regulatory resolution, however, some of its provisions, in our opinion, need comprehension and assessment from the view of their compliance with the principles of taxation. In this regard the point 24 of this act is of particular interest. The point reads as follows: "As provided by the Part 2 of Article 49 of the Civil Procedure Code, the court does not approve amicable agreement of the parties if it is contrary to the law. Amicable agreement between the taxpayer and the tax authority breaks the principles of obligatory nature, certainty and fairness of taxation stipulated by the Tax Code. In addition, the right of the parties to the amicable agreement as the ending the case is linked with the presence of property relations based on the equality among them. Tax relations are based on the authoritative subordination of one party to the other. In this regard, the court is not entitled to approve the amicable agreement on tax disputes".

Without doubt, the equality of the parties is not peculiar to tax legal relations. Although there should be made a reservation stating that a certain optionality in tax relations, which has limited nature, is provided by the legislation. Thus, tax incentives for investors implementing strategic investment projects on the basis of concluded investment contracts with the authorized body in the order provided by the tax legislation of the Republic of Kazakhstan are sufficient example of this phenomenon. At the same time, the terms of such a contract are stipulated by the legislation. According to point 1 of Article 21 of the Law of the Republic of Kazakhstan "On Investments" dated January 08, 2003 the competent authority within ten working days from the date of the decision on granting investment preferences prepares for signing an investment contract based on the provisions of the model contract, approved by the Government of the Republic of Kazakhstan dated May 8, 2003. And the right of the parties is in the possibility to conclude such a contract or refuse entry into such contractual relationship.

The provision on disapproval of amicable agreement by the court due to its controversy to the law occurs, in fact, from the fundamental principle of civil justice - the principle of the rule of law - and its integral part - strict observance of the Constitution of the Republic of Kazakhstan, the Civil Procedure Code and other normative legal acts of the Republic of Kazakhstan in the resolution of a case. Meanwhile, the provision of the regulatory resolution referring to the principles of taxation (obligatory nature, certainty and fairness of taxation) stipulated by the Tax Code as making ban to the approval of amicable agreement by the court requires clarification.

Thus, the principle of obligatory nature of taxation under the current Tax Code is expressed in the duty of taxpayer to perform tax obligations, duty of tax agent to perform the obligation of the assessment, withholding and transferring taxes in accordance with the tax legislation of the Republic of Kazakhstan in full volume and within established time (Article 5). The principle of fairness means universal and obligatory nature of taxation, and prohibition on granting tax privileges of individual nature (Article 7). While the principle of certainty of taxation in the statement of the Tax Code characterizes the provisions of tax legislation, and namely, what they must specify in order to consider a tax or an obligatory payment as lawfully established and provides the following rules: "Taxes and other obligatory payments to the budget of the Republic of Kazakhstan must be well-defined. The certainty of taxation shall be understood as establishing in the tax legislation of the Republic of Kazakhstan of all reasons and procedure for the emergence, implementation and termination of tax obligations of taxpayers, duties of tax agents with regard to the assessment, withholding and transfer of taxes" (Article 6).

The principle of certainty of taxation was well described by Adam Smith. And he defined it in the sense that the tax rate, the term and method of payment should be clear and known as the payer as every other person. The certainty of taxation can be achieved only if the law precisely defines all elements of the tax (subject, object, rates, procedure and terms of payment, etc.). The absence of even one element means that the taxpayer's obligation to pay tax is not set, therefore, the taxpayer has the right not to pay this tax⁴.

⁴ Khudyakov A.I. *Nalogovoye pravo Respubliki Kazakhstan. Obschaya chast'*, Uchebnik. – Almaty: TOO "Izdatel'stvo "NORMA-K", 2003. – P. 118.

The importance of certainty of taxation in a joking manner was expressed by A. Einstein: “The hardest thing in the world to understand is the income tax”⁵.

In this regard, it is possible to conclude that the court in resolving a dispute arising from the tax legal relations in civil proceedings shall be guided by the principle of the rule of law and resolve a case on the basis of the Constitution and the legislation of the Republic of Kazakhstan, including the Tax Code, the provisions of which shall comply with the principle of certainty of taxation. Therefore, according to the norms of the Tax Code only the principles of obligatory nature and fairness of taxation on the basis of their content can be put into the ground of the above statement of the regulatory resolution.

At the same time, the provision itself of the regulatory resolution about impossibility of approval of amicable agreement on tax disputes by the court has to be rethought and clarified as well.

Thus, in accordance with current tax legislation and principles of taxation it is clear that amicable agreement cannot be approved on the dispute, which follows from the non-fulfillment or improper fulfillment of the tax obligations by taxpayer. At the same time, there may be the cases, for example, when a taxpayer applies to the court with a claim on recovery of overpaid amounts of taxes from the state budget. In this case, in our opinion, the approval of amicable agreement by the court is quite possible. So, for example, Chapter 37 “Relations with the Budget with regard to Value Added Tax” (Articles 272 - 276) of the Tax Code contains provisions on the return of the value added tax. It includes the rules about the order and terms of the return of the tax, but in the case of failure to follow these rules the taxpayer has the right to judicial protection of his rights and legitimate interests. In this regard, the existing wording in the regulatory resolution of the Supreme Court of the Republic of Kazakhstan concerning impossibility to approve amicable agreement on tax disputes by court, which completely duplicates the provision stipulated in the point 15 of the pre-existing regulatory resolution No 5 “On Judicial Practice of Applying the Tax Legislation” of the Supreme Court of the Republic of Kazakhstan dated June 23, 2006, may mislead the taxpayer in making the choice of resolving the dispute. The particularization of this provision has to be also set in the regulatory resolution so as the Tax Code does not provide the definition of a tax dispute. And this introduces some difficulties in the interpretation of this provision of the act of the Supreme Court of the Republic of Kazakhstan as well. In this regard, it is appropriate to specify the disputes on which amicable agreement cannot be approved, and when such an act of the court may be applicable.

Meanwhile, in the practice of the European Union (Lithuania, Portugal, The Slovak Republic, Austria, Luxembourg, Slovenia, Italy, Germany, Ukraine, Estonia, Greece and the Netherlands) with the information of the Association of European Administrative Judges “amicable solutions in tax cases are common in almost all of the countries. Judges tend to lead parties through a process to such a solution. And, if such a solution cannot be reached, the judges decide the matter”⁶. There were practical attempts to conclude amicable settlement agreements for tax disputes in the Russian Federation. Some amicable settlement agreements were approved by arbitration courts. For example, there was a case when a tax authority was obligated to repay the taxpayer the amounts of tax that were paid in excess, while the taxpayer refused to claim interest for breaching the repayment deadline (*Resolution of the Moscow Circuit FAC as of 8 January 2004 No. KA-A41/10810-03*). In other cases, arbitration courts have refused to execute amicable settlement agreements with some parties. In one such instance, an arbitration court did not approve an amicable settlement agreement that would have allowed the taxpayer to repay its tax debt in installments (*Resolution of the East-Siberian Circuit FAC of 10 December 2003 re case No. A69-883/03-8-Φ02-4285/03-C1*)⁷.

Therefore, this issue seems relevant for detailed examination in order to further improve the tax legislation of Kazakhstan.

At the same time, let's turn to the basic definitions of “taxes” and “tax liability”, which are provided by the Code of the Republic of Kazakhstan “On Taxes and Other Obligatory Payments to the Budget”, and are used in the above concepts of the principles of taxation. Thus, according to sub-point 34) of Article 12 of the Tax Code “taxes – obligatory monetary payments to the budget as established by the state through

⁵ <http://www.irs.gov/uac/Tax-Quotes>

⁶ Tax Law: The Alternative Dispute Resolution. Extrait du Association of European Administrative Judges. <http://www.aej.org/spip.php?article255>, p. 5.

⁷ <http://www.pwc.ru/en/tax-consulting-services/legislation/settlement-agreement-with-the-tax-authorities-on-the-loyalty-program.jhtml>

law in a unilateral procedure, except for the cases specified in this Code, which are paid in certain amounts, which are irrevocable and non-refundable”.

In accordance with point 1 of Article 26 of the Tax Code the tax liability shall be a taxpayer's liability to the state, which arises in accordance with the tax legislation of the Republic of Kazakhstan, by virtue of which the taxpayer is obliged to be registered by the tax authority, identify taxable items and (or) items related to taxation, assess and pay taxes and other obligatory payments to the budget as well as advance and ongoing payments on them, make tax forms, submit tax forms, excepted tax registers, to the tax authority within the established time.

Consequently, it is possible to make a conclusion that the statement of the regulatory resolution about inability of a court to approve amicable agreement using the definition of tax liability refers only to disputes between a taxpayer and the tax authorities related to the fulfillment of tax liability, i.e. performance of constitutional duty and obligation by the taxpayer (Article 35 of the Constitution). In this regard, the dispute between the taxpayer and the tax authority arising out of violation of the provisions about the return of overpaid VAT is a dispute arising out of tax liability and, in fact, is a legal requirement of an individual or legal entity for the return of his property, which was previously paid in the form of tax (Property dispute – such a concept is provided by subpoint 9) of point 1 of article 535 of the Tax Code). As is known, the tax is a transfer from the private property (property of a taxpayer – individual or legal entity) to the public one (funds of the state budget), and not vice versa. Tax is depersonalized in the budget. It means that it is impossible to return a tax from the budget. In this case, in our opinion, it would be correct to talk only about the refund of the excess amount of tax. In this context, certain formulations of the Tax Code, as, for example, Article 592 “Accounting for the Paid, Credited, Refunded Taxes and Other Obligatory Payments to the Budget, Obligatory Pension Contributions and Social Assessments” are incorrect. Therefore, the provisions of the Tax Code on the refund of excess amounts of tax, payment, levy, penalty (Article 602) are true.

We believe that shortcomings of the current tax legislation hereabove require exceptions, and some problematic issues raised in this article will be the subject of the further careful study and development for the purpose of improvement of the tax law of the Republic, the promotion of entrepreneurship and the effective integration of the country into the world economy.

Резюме

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ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ САЛЫҚ ЗАҢНАМАСЫН ЖЕТІЛДІРУДІҢ КЕЙБІР МӘСЕЛЕЛЕРІ ЖӘНЕ ОНЫ СОТ ПРАКТИКАСЫНДА ҚОЛДАНУ ТУРАЛЫ

Мақалада 27.02.2013 ж. қабылданған «Салық заңнамасын қолданудың сот практикасы туралы» Қазақстан Республикасының Жоғарғы Соттың нормативтік қаулысының бөлек ережелеріне байланысты салық заңнамасын жетілдіру қажеттілігіне назар аударылады, атап айтқанда, салық даулары бойынша бітімгершілік келісімді сотпен бекіту, артық төленген салық, төлем, алым, өсім сомасын қайтару мәселелері қарастырылады.

Кілт сөздер: салық заңнамасы, Қазақстан Республикасының Жоғарғы соты, нормативтік қаулы, салық қайтарымы, салық салу қағидаты, әлемдік келісім, салық қызметі органы, салық тексерісі, заңнама сатысы.

Резюме

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О НЕКОТОРЫХ ВОПРОСАХ СОВЕРШЕНСТВОВАНИЯ НАЛОГОВОГО ЗАКОНОДАТЕЛЬСТВА РЕСПУБЛИКИ КАЗАХСТАН И ЕГО ПРИМЕНЕНИИ В СУДЕБНОЙ ПРАКТИКЕ

В статье акцентируется внимание на необходимость совершенствования налогового законодательства в свете отдельных положений нормативного постановления Верховного суда Республики Казахстан «О судебной практике применения налогового законодательства» от 27.02.2013 г., в частности, затрагиваются вопросы утверждения судом мирового соглашения по налоговым спорам, возврата излишне уплаченной суммы налога, платы, сбора, пени.

Ключевые слова: налоговое законодательство, Верховный суд Республики Казахстан, нормативное постановление, возврат налога, принципы налогообложения, мировое соглашение, орган налоговой службы, налоговая проверка, иерархия законодательства.

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