

**CHARLES UNIVERSITY IN PRAGUE**

**FACULTY OF SOCIAL SCIENCES**

Institute of Economic Studies



*Bachelor thesis*

**Demand and investment for jewelry at the time of  
economic crisis**

**Author:** Valeria Efimenko

**Supervisor:** Doc. Ing. Tomáš Cahlík CSc.

**Academic Year:** 2014/2015

## **Declaration of Authorship**

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.
2. The author hereby declares that all the sources and literature used have been properly cited.
3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague, July 31, 2015

---

Signature

## **Acknowledgments**

I would like to express my deepest gratitude to doc. Ing. Tomáš Cahlík, CSc. for his availability, valuable comments and overall supervision of this thesis.

Furthermore, I would like to thank for inspiration and helpful advices all professors, who were teaching classes of microeconomics and macroeconomics I attended.

## **Bibliographic note**

Efimenko, Valeria., 2015. *Demand and investment for jewelry at the time of economic crisis*. 66 p. Bachelor thesis. Charles University, Faculty of Social Sciences, Institute of Economic Studies. Supervisor Doc. Ing. Tomáš Cahlík CSc.

## **Extent of the thesis**

**103,358 (with spaces)**

## Abstract

The consumer demand defines strategy and tactics of the organization of jewelry manufacture. The demand and its forecasting for short-term and long-term prospect is one of the major problems of marketing for the various organizations and firms. The demand size is influenced by price and non price factors which should be traced accurately on a constant basis by special departments of firms. My research question is how the demand for jewelry changes at the time of economic crisis in Russia. In this work a number of the major factors are identified which influence almost all buyers to get the jewelry.

The concept of elasticity of demand has a direct bearing on the pricing policy of the companies. Therefore, considerable attention in this work is given to this economic category. In real life it is very difficult to obtain reliable and stable data on factors of cross elasticity to use it for pricing. The analysis carried out shows that price elasticity of jewels in most cases is low. Demand for luxury goods linearly depends on the personal income.

The demand research accepts a special urgency in the conditions of the economic crises aggravating the competitive struggle between suppliers of jewelry. The world economic crisis has brought a rise in prices for gold and falling incomes of the population. It has led consumers to switch demand in the market of jewelry in a direction of the goods of a lower price category. The requirement for jewelry from buyers in the conditions of crisis remains, however consumers in the majority cannot pay for it the same money, as before crisis. Demand for cheaper jewelry of original design from silver therefore rises.

The greatest popularity of gold jewelry among buyers is presented by products of an average price at this period, and the first place on popularity is occupied with gold ornaments without inserts. The crisis has affected demand for jewelry of the lowest price category less than the expensive one. First of all there are products from silver and costume jewelry.

In a study several shops of Russia in the crisis years (2008-2010) the practical analysis of change of demand for jewels is carried out. The results testify to positive dynamics in the growth of demand for jewelry in the conditions of financial crisis declining. In the conditions of the crisis all factors influencing demand become aggravated. In the process of the crisis declining and growth of well-being of the population elasticity of demand is restored and becomes less

**JEL Classification** A12, C00, D14, D24, E22, G01

**Keywords** Investment, crisis, Russia, jewelry, demand, elasticity of demand

**Author's e-mail** Lerikk.91@mail.ru

**Supervisor's e-mail** cahlik@fsv.cuni.cz

## List of tables

**Table 1.1** Classification of investment market

**Table 1.2** The proportion of the precious metals in unallocated metal accounts in Russian banks for the period from 2012 to May 2015

**Table 1.3** Comparative characteristics of the main ways of investing in precious metals

**Table 2.1** Consumer demand for jewelry in the world, IV quarter of 2013 and 2014

**Table 2.2** Statistics of jewelry sales in major cities of Russia from January to June 2015

**Table 2.3** The dynamics of sales of jewelry store in Moscow in the period from January 2014 to June 2015

**Table 2.4** The dynamics of sales of jewelry store in Perm in the period from January 2014 to June 2015

**Table 2.5** The frequency of buying jewelry by the respondents, in %

**Table 2.7** Evaluation of various properties of the brands Jewelry

**Table 3.1** The coefficient of elasticity of jewelry

## List of figures

**Figure 2.1** Consumer demand in India

**Figure 2.2** The dynamics of the US dollar in the period from July 2014 to July 2015

**Figure 2.3** The schedule of sales of jewelry in shops in the city of Moscow, Perm and Sergiev Posad in the period from January 2014 to June 2015

**Figure 2.4** The goods, most frequently appearing in glossy magazines

**Figure 2.5** Respondents' preferred selection of jewelry

**Figure 2.6** Respondents' selection criteria for purchases of jewelry

**Figure 2.7** Respondents' distribution of investment funds in the jewelry, comprised of the different age groups.

# Bachelor Thesis Proposal

**Author:** Valeria Efimenko  
**Supervisor:** Doc. Ing. Tomáš Cahlík, CSc.  
**Proposed Topic:** Demand and investment for jewelry at the time of economic crisis

## Topic Characteristics:

The consumer demand defines strategy and tactics of the organization of jewelry manufacture. The demand and its forecasting for short-term and long-term prospect is one of the major problems of marketing for the various organizations and firms. The demand size is influenced by price and non price factors which should be traced accurately on a constant basis by special departments of firms.

During difficult times like times of economic crisis (oil crisis, Great Depression, Second World War) many investors try to preserve their assets and invest them into metals like gold or silver. That's why in my work I will try to analyze the level of investment into gold and silver during crises.

The concept of elasticity of demand has a direct bearing on the pricing policy of the companies. Therefore, considerable attention in this work is given to this economic category. In real life it is very difficult to obtain reliable and stable data on factors of cross elasticity to use it for pricing. I will try to analyze the price elasticity of jewels and see if it is low or high in most cases. Demand for luxury goods linearly depends on the personal income.

The world economic crisis has brought a rise in prices for gold and falling incomes of the population. It has led consumers to switch demand in the market of jewelry in a direction of the goods of a lower price category. The requirement for jewelry from buyers in the conditions of crisis remains, however consumers in the majority cannot pay for it the same money, as before crisis.

My research question is how the demand and investment for jewelry change at the time of economic crisis. In this work a number of the major factors will be identified which influence almost all buyers to get the jewelry.

## Hypotheses:

1. Economic crises caused income to fall; will it affect the demand for jewelry to fall?
2. How the investments to metals will be affected during economic crises
3. Since the economic crises, it must be true that even a small change in income would affect demand for luxury good a lot.

**Methodology:**

1. Elasticity of demand for luxury goods
2. Functions of Tornkvist
3. Investment function

**Outline:**

Introduction

Influence of the price on demand

Influence of personal incomes of the population on demand

Influence of crisis on demand on jewelry in Russia and other countries

Conclusion

Bibliography

**Core bibliography:**

1. "RosBusinessConsulting", Retail jewelry systems, Analytic review, Moscow, 2010
2. O.O Zamkov, A.V. Tolstopetenko, U.M. Cheremnih, Mathematical methods in economics, Moscow, published by "Business and Service", 1999.
3. Nepsha V.I., Okoemov U.K., Svetkova N.V. Jewelry with diamonds: income and price elasticity of demand// Marketing in Russia and abroad.-2003.- — № 2
4. "Inventica", Jewellery Russian Market, Marketing research, Moscow, 2007
5. [http://www.gks.ru/bgd/free/B10\\_00/IssWWW.exe/Stg/d04/6-0.htm](http://www.gks.ru/bgd/free/B10_00/IssWWW.exe/Stg/d04/6-0.htm)
6. <http://www.humanities.edu.ru/db/msg/2320>
7. Nepsha V.I., Okoemov U.K., Svetkova N.V. Jewelry with diamonds: valuation of price elasticity of demand on retail market in Japan// Marketing in Russia and abroad.-2004.- — № 2
8. [http://www.gold.org/assets/file/pub\\_archive/pdf/what\\_are\\_commodities\\_0305.pdf](http://www.gold.org/assets/file/pub_archive/pdf/what_are_commodities_0305.pdf)
9. Nepsha V.I., Okoemov U.K., Svetkova N.V. Jewelry with diamonds: a unifactor model of retail market USA// Marketing in Russia and abroad.-2003.- — № 6
10. <http://www.econfin.ru/rus/library/marketing/marketprice/index.php?8811>

---

Author

---

Supervisor



# Table of Contents

**Abstract**

**List of Tables**

**List of Figures**

**Bachelor Thesis Proposal**

**Introduction**.....10

**Chapter 1. Theoretical and methodological basis for assessing demand and investment for jewelry**.....13

1.1 Investment market during crisis.....13

1.2 Demand for jewelry and precious metals during unsustainable economic conditions.....16

1.3 Quantitative and qualitative methods of evaluation and analysis of demand for jewelry...22

**Chapter 2. The analysis of jewelry as a good way to invest during the economic crisis**.....26

2.1 Analysis of demand for jewelry in the world market.....26

2.2 Analysis of the Russian jewelry market.....30

2.3 Assessment of the dynamics of demand for jewelry in a particular city (for instance, in Sergiev Posad).....38

**Chapter 3. Conclusions and recommendations for timely assessment changes in demand for jewelry investment during economic crisis**.....48

3.1 Conclusion of the study.....48

3.2 Increase the demand for jewelry.....49

3.3 Trends and forecasts of demand for the jewelry market.....50

**Conclusion**.....52

**Bibliography**

**Appendix**

## Introduction

Crisis covers many areas of human activity. During a global financial and economic crisis it is difficult to survive. Falling purchasing power is becoming the main challenge for many businesses.

The question is rising: How to hedge against financial losses, as a primary task during crisis-do not lose earnings. Experts recommend to invest into real estate, diamonds, precious metals and currency. Moreover, shares of oil companies can be useful in difficult situations. However, most investment has a downside and it is risk. The more profitable investment the more risky it is.

Many experts recommend to listen to the main advice: to invest into well known products. In this case, most likely, you will be able to avoid risks and save your earnings.

To determine what are the selling goods in times of crisis is not so simple. Traditional objects of investments may be out of interest due to the high cost, even with crisis prices fall.

Demand for gold has risen (as an object of investment). It's not just about the gold offered by the bank (bullion), but also in the articles of gold - coins, jewelry, etc. From gemstones the greatest interest for investments are diamonds.

Today the assortment of jewelry is varied in design, manufacturers (brand), the presence or absence of inserts and other features.

Demand for luxury goods (elite segment) rises during crises. Demand is distributed on the opposite ends of the price scale: low cost goods and luxury items. However, not all of the elite segment can be called popular. The greatest demand is for those goods, which can be considered as an investment.

The relevance of this topic is based on the fact that demand for jewelry has been always high. The range of jewelry design is constantly expanding, improving for both: foreign brands and domestic manufacturers. Status and development of the jewelry market is one of the indicators of the degree of welfare. Before the crisis, the development of Russian jewelry market was characterized by high rates.

The problem of this study: Does the economic crisis influence demand and investment for jewelry?

The aim of this work is to identify the impact of the economic crisis on demand and investment for jewelry.

The object of the research is demand and investment for jewelry during economic crisis.

Subject of study: the impact of economic crisis, particularly on the demand and investment for jewelry.

To achieve this goal it is necessary to solve the following problems:

1. Describe the basic concepts and functions of the investment market
2. To analyze and compare the ways of investing in precious metals
3. To determine the theoretical basis for assessing demand for jewelry.
4. To consider the main characteristics of jewelry
5. To examine the position of Russia on the market of jewelry
6. To organize and conduct the study: effect of economic crisis on demand and investment for jewelry
7. To formulate findings from the results of the survey.
8. To identify ways for increasing demand for jewelry

Hypothesis of the study:

1. . Economic crisis reduces income; subsequently jewelry demand drops.
2. Demand for precious metals during economic crisis increase
3. Level of jewelry demand may increase in times of economic crisis if the offered goods in precious metals are well-represented
4. Even a small change in income will affect the demand for luxury goods (luxury goods).

My work consists of an introduction, three chapters, conclusions, bibliography and appendices. The first chapter describes the basic concepts of investment activity in Russia, a comparative analysis of the ways to invest in precious metals. The second chapter is devoted to the study and analysis of the market of jewelry, the need to invest in jewelry and gems is considered. A practical study of demand and investment jewelry is held out. The third chapter is devoted to the development of recommendations for the timely evaluation of changes in demand and investment jewelry during economic crisis. The study was carried out by treating the material, based on which an analysis and conclusions were made. Appendix submits methodological tools, primary data obtained through questionnaires.

# Chapter 1. Theoretical and methodological basis for assessing demand and investment for jewelry

## 1.1 Investment market during crisis

Investment activity is one of the most important conditions for the development and for the economy in general. Without investments it is impossible to achieve growth and even save progress.

Investment market is a set of economic relations between buyers and sellers of investment products and services<sup>1</sup>. Products on the market are the objects of investment activity. In accordance with the classification, investment market is structurally divided into a number of relatively independent segments<sup>2</sup>, Table 1.1

**Table 1.1**

### Classification of investment market

Market of real investments:	1. Real estate market	industrial facilities, housing, objects of small privatization, land, construction in progress, lease
	2. Market of direct investments	new construction, reconstruction, technical re-equipment
	3. Market of other objects of real investment	art treasures, precious metals and products, and other tangible assets
Market of financial investments:	1. Stock market	shares, government bonds, options and futures
	2. Money market	deposits, loans and credit, currency values.

This classification of investment market allows more fully to analyze and to forecast market's development in context of individual segments. It also allows to determine prioritize objects for investment at a particular economic level of a country.

The degree of activity of the investment market (the ratio of its elements) is determined by market research. It is a form of factors, which appear on investment market, which determine the ratio of demand, supply, price and level of competition<sup>3</sup>.

<sup>1</sup> Galician O. Gems: Advices for investors [electronic resource]. - Access: <http://www.prostobank.ua/depozity>

<sup>2</sup> Klochkova N.V. Russia's economic development: institutions, infrastructure, innovation, investment [Text]: Scientific Thought, 2010. Page 360.

<sup>3</sup> V. Bezrukov, B. Safronov, V. Markov environment of investment market. [Text]: V. Bezrukov, B.Safronov, V. Markov // The Economist. - 2007 - № 7. - page.3-7.

Free capital, which is in the form of public savings, i.e: cash and other types of investment resources of the population, enterprises, government agencies, which are not spent on current consumption, is involved through the mechanism of the investment market by its individuals for further efficient use of the investment process in the country. Mechanism of functioning of the investment market provides detection of the level and the structure of demand for certain capital goods.<sup>4</sup>

The formation of market prices for some investment products, tools and services, most objectively reflects the ratio between the supply and demand.<sup>5</sup> Market pricing mechanism is completely opposite to the state mechanism. Although there is a certain influence of state regulation, market-pricing mechanism allows fully take into account the current supply and demand for a variety of investment products and services.

Members of capital investment are individuals and legal entities, including foreign ones, as well as state agencies, public authorities, self-governing authorities, international associations and organizations, which are those objects. Users of capital investment can be investors.

Investment demand - demand in the economy for investment goods: machinery, equipment, building materials. Demand arises from the intentions or plans of firms to increase their physical capital (fixed assets), as well as inventory. Investment demand is part of the aggregate demand in the economy, along with consumer demand. Its value depends on the level of real interest rates: the higher they are, the lower the investment demand, and vice versa, *ceteris paribus*.

There are potential and actual investment demands. Potential investment demand reflects the value of income that can be directed to investment and constitutes a potential investment capital. Real investment demand characterizes the actual demand of economic entities in investment and represents investment resources that are directly intended for investment purposes - planned or deliberate investment.

Investment demand develops under the influence of diverse and divergent factors determining its flexibility and dynamism.

Investment demand is rising if for the funds which are invested, rate of return is higher than the percentage of investments the same amount of money in to bank. Investment demand falls if interest rate for the loan increases and capital investments become less profitable.

---

<sup>4</sup> Ivanov G.I Investments: the nature, types, mechanisms of functioning. Text: G.I. Ivanov - Rostov N.D: Phoenix, 2007.

<sup>5</sup> Prices and pricing , V.E Esipova: Textbook for Universities, 3rd ed. St. Petersburg: Publishing "Peter", 1999. Page 464

Investment demand slows down when interest rates rise and rate of the securities falls. In this case capital resources from the sale of shares and bonds are reduced.<sup>6</sup>

As a result it can be concluded that the use of any source of financing investments will be profitable as long as the interest rate does not exceed the expected rate of return, i.e. investment demand is inversely proportional to the rate of bank interest.

The investment proposal is a set of objects of investment in all its forms: the newly created and reconstructed fixed assets, current assets, securities, scientific and technical production, and intellectual property rights and other.

Formation of the investment proposal has a number of distinctive features. It is due to key factors such as price and non-price components: costs, improving technology, tax policy, the expectations, the level of competition, and others.

The rate of return is the basis of the prices of financial instruments that mediate the movement of real capital. The market price of financial assets indicates the attractiveness of investment in capital goods.

A significant impact on the investment proposal has the interest rate on deposits in the banking system, which determines the value of household savings. The development of the stock market and loan market advocates an important condition for improving the investment proposal.

Because investment demand focused on the more profitable assets at a certain part of the investment proposal, the amount and structure of the investment proposals affect the volume and structure of investment demand. Investment proposal is a major factor in determining the scope of functioning of the investment market, because it causes a change in the demand for investment goods. The feedback mechanism is not so expressed; it appears only in a free competitive market. The balance of investment demand and supply can only be achieved in the general scale of the investment market. Their adjustment happens on the market system through the establishment of equilibrium prices. The mechanism of equilibrium prices belongs only to a free competitive market.<sup>7</sup>

This mechanism requires a change in the price of investment goods and capital on the basis of balancing supply and demand as long as the dynamic equilibrium will be established on investment market.

At the time of economic crises the nature of consumption for the most of Russian population has poor pattern, it is focused on priority needs in food and clothing, a low level of involvement in investment activities. Financial crisis does not worry about the bulk of the population.

---

<sup>6</sup> Igonina L.L. Investment [Text]: a tutorial / L.L.Igonina - M. : Youth 2009 - 149 p.

<sup>7</sup> Evsenko O.S. Investments in the questions and answers. [Text]: Textbook TC Welby, Prospect 2008 - 256 p.

Reducing consumption is now expressed in the refusal of the population from big purchases. The reasons for this are often the lack of funds and lack of access to consumer loan.

In such a situation it is advisable to stimulate demand, otherwise the crisis situation in the country or in certain sectors may be exacerbated.

Traditional investments are becoming uninteresting because of the high cost, even with crisis prices fall.

The demand for gold jewelry rises (as an object of investment).<sup>8</sup>

Statistics show that it is beneficially to open jewelry stores during economically difficult times..

---

<sup>8</sup> Mordovina I.A Development of the Russian gold market and improve the banks' operations with precious metals.  
- Kursk: Publishing House of the Regional Financial and Economic Institute of the 2008.

## **1.2 Demand for jewelry and precious metals during unsustainable economic conditions.**

Demand is a fundamental concept of the market economy, which is supported by a desire and monetary possibility, and the intention of customers to buy this product. Demand is characterized by its size, meaning an amount of goods that a buyer is willing and able to buy at a given price at a given time.

Jewelry is a product made mainly from precious metals, precious and semi-precious stones or other durable materials (horn, enamel art, ceramics) and performing the role of a variety of jewelry and also used for decorative purposes.<sup>9</sup>

Often jewelry is made using expensive materials (gold, silver, alloys of other precious metals, precious stones, and others.) So a piece of jewelry may indicate social status. Jewelry from cheap materials is called bijouterie.

The specific feature of jewelry is also in the fact that the life of jewelry from precious metals is estimated in tens and even hundreds of years.

Jewelry is not a good of prime necessity, however retailers that specialize in selling jewelry registered almost 100% increases in sales during the crisis has begun. This is due to the fact that people exchange cash for gold, jewelry and diamonds when they search for opportunities to keep their savings. It would be better if we talk about the bullion of precious metals, because jewelry is purchased at the price (a large part of the cost is not a metal but the work of a jeweler) much higher.

Good to know that the price of 1 gram of gold in jewelry is much lower than the price of gold bullion or gold bank coins.

The reason lies in the quality, and specifically in the rate of gold. For gold bullion and coins pure gold higher test (999.9) is used but to make jewelry it is enough to use rate of gold (585).

The question arises, where is it more profitable to invest money: into the purchase of jewelry or gold bullion and coins? According to research, about 15% of Russians find it profitable to invest money into purchase of jewelry. According to experts, investing money in jewelry is justified only if they have in addition to cost also cultural or historical value or works of art or antiques.

However, some people spend their money, while others earn good money. To establish production of jewelry is a good idea during the crisis and it is available not only to investors that

---

<sup>9</sup> Timiriyaev V. jewelry market and its development / V. Timiryazev // commodity market trends. - 2014. - № 3. - p. 15-19.



have sufficient free to invest, but also to more modest players who are able to pay for the work, at least one jeweler.

The standard ways of escaping from the crisis are gold deposits, silver, platinum and other metals.

A number of key factors influence desire of almost all buyers to purchase those or other jewelry. These include:

1. The price of good. The price of jewelry directly depends on the cost of raw material (type of metal).
2. The price of substitute goods. Will the change in price of substitute good lead to a fall, or raise the demand of jewelry? The spectrum of jewelry is wide with the price, raw material and design. Raising the price of a product of one group may increase the demand of products of another group. For example, a financial crisis that began in 2008, has made adjustments in the development of the jewelry industry. In such a way, raising the price of gold (and therefore on jewelry made of gold), and lower income populations have led to an increase in demand for products which are in a lower price category.
3. Population income. As income increases, consumers (in the absence of inflation) tend to buy more luxury items (more expensive and high quality). And conversely, demand for such products declines if it is a loss of income.
4. The number of buyers. The demand for jewelry is directly related to the number of buyers. In turn, the number of customers depends on the location of retail stores and seasonality. In the real market economy, when we talk about the number of buyers, it is extremely important to take into account their sex and age structure, the average size of families, the proportion of people of retirement age, etc.
5. Consumer`s taste. Change of the tastes and preferences of buyers is connected first of all with fashion (for example products from yellow gold, a product with the garnet, etc.). Quality of the goods has the great influence on tastes (its durability, reliability). For example, in Russia products of Russian manufacture are appreciated more than products of Turkish manufacture. Traditions of different people have important value also. So, Russian women like to decorate themselves with the gold earrings, chains, rings. It can explain the great demand on gold jewels. In Japan among working women there is a tradition to get jewels with diamonds in connection with their career and business successes.
6. Expectations. When people are afraid of inflation, a rise in prices and deficiency in the future, they are likely to increase demand for the goods at present. So, if consumers wait in the near future for increase (decrease) in the price for such goods they will aspire to

buy more (less) than these goods under the present price. For example, at the end of 2008 there was an information about that prices for gold will go up by 20 % at the beginning of 2009 .This has affected the demand of jewels during this period. The same situation we saw in 2013.

Transfer funds into gold is the most standard way of protecting money from the consequences of the financial crisis. However, some analysts believe that the list of precious metals in your portfolio should begin not with gold but with other platinum group of metals.

Of course, one cannot ignore the growth of demand for gold - as an object of investment (gold itself, in gold products - coins, jewelry, etc.) and gemstones (especially diamonds).

Some economists believe that the demand for premium products in general should fall.<sup>10</sup> But in this segment there are different levels. The demand for premium-class products will decrease. It is difficult to say what will happen to premium-class products, which are not only consumer goods, but also a way of investment. On the one hand, people will refuse expensive products. On the other hand it is necessary something to save capital but investment instruments are now not so much available (nobody trusts stocks and bonds, nobody believes in a foreign currency and don't want to keep their money in it). This factor increases demand for goods that can be considered as investments (real estate, gold, precious stones and jewelry).

Demand for precious metals traditionally increases during times of economic crisis. Such a surge of interest easily explained: during instability in the financial markets the value of most investment assets becomes difficult to forecast and for investors the most important to save their capital, not to multiply. For this reason, in order to protect their assets against increasing the level of economic risk, investors are choosing the precious metals as objects of investment activity. Today Russian investor can invest precious metal in three ways: buy a bar, open unallocated metal accounts (UMA) or purchase investment coins.

Further confirmation of the fact that gold is the most investment-attractive metal can proof the structure as unallocated metal accounts of banks of Russia Russian (see. Table 1.2):

**Table 1.2**

**The proportion of the precious metals in unallocated metal accounts in Russian banks for the period from 2012 to May 2015**

Period	Proportion of metals with respect to UMA in Russian banks (% of total)			
	gold	silver	platinum	palladium
2012	75	15	5	5
2013	75	17	5	3
2014	76	11	11	1,5

<sup>10</sup> Rodionova NюV Anti-crisis management / N.V Rodionova.- M .: UNITY-DANA, 2011. - 680 p.

May2015	70	17	9	4
---------	----	----	---	---

As we can see from the table above, the proportion of gold in UMA is much higher than the share of all other metals combined.

Despite the fact that precious metals (primarily gold) have been always popular among investors and they are also a promising area for placement of temporary free funds during the financial crisis, investors must have a clear idea of the main advantages and disadvantages of different ways of investing in precious metals.

In accordance with the legislation of the Russian Federation, the precious metals are: gold, silver, platinum and platinum group of metals.<sup>11</sup> At the same time, according to the instructions of the Central Bank of the Russian Federation № 50 from November 1, 1996, only four out of eight of these metals are considered to be the bank metals, and therefore only those groups are available for the investor's operations in Russia.

The main ways of investing in precious metals in the Russian Federation are as follows: investment coins, unallocated metal accounts (UMA), bullion and jewelry<sup>12</sup>. At the same time, each of the methods of investing in precious metals has its advantages and limitations of use (Table 1.3).

**Table 1.3**

**Comparative characteristics of the main ways of investing in precious metals**

<b>Characteristics</b>	<b>UMA</b>	<b>Investment coins</b>	<b>Bullions</b>	<b>Jewelry</b>
Investors need to pay VAT on the use of the tool	none	none	paid	paid
The form of the metal	virtual metal	in the form of bullion coins made of precious metals	in the form of bullion	in the form of jewelry
Regulation of precious metals by the Bank of Russia	Regulated (Regulation №50 CBR)	Regulated (Regulation №50 CBR)	Regulated (Regulation №50 CBR)	Not regulated
Storage of metal	Not necessary	Carried out by the investor or the bank	Carried out by the investor or the bank	Carried out by the investor
The presence of the added value to the investment object	none	None except of collector's coins	none	has more "artistic value". In addition, many products contain inserts of gemstones
Sources of income	Interest is (0-7%) and changes in the market value of the metal	Changes in the market value of the metal. In the case of collector coins is possible additional income"	Changes in the market value of the metal	Changes in the market value of the metal. It is also possible to obtain additional income due to the increase of "artistic value" products
The degree of liquidity of the investment	high	medium	Lower than medium	low

<sup>11</sup> Federal Law "On Precious Metals and Precious Stones" (in red. July 24, 2007).

<sup>12</sup> Market Overview gems Newly Independent States and Baltic countries.

In this table the meaning of liquidity doesn't mean the ability of objects of investment to turn into money but the possibility of their implementation of "fair value" and not at the price of scrap, or the possibility of putting in a pawnshop.<sup>13</sup>

VAT is paid only when the movement of the physical metal is made, while the UMA deals with virtual metal (except in cases where savings withdrawn from the account in the form of bullion)

Income from operations with precious metals using UMA is not subject to personal income tax. When purchasing the metal in the form of bullion person can avoid paying VAT if it leaves the bars deposited in the bank, but in this case person pays storage services. VAT is not payable when buying coins, however, VAT is payable for the collection coins.

Issue of collector coins, usually connected usually to special events and memorable dates, in addition, they tend to have a higher quality coinage than investment coins. The cost of collection coins, mainly determined not by the value of the metal but its collector quality (circulation coins, completeness of the collected series and so on.) Production of investment coins is usually large or even unlimited and their value is primarily determined by the value of the metal.

In respect of any coins from precious metal, bank can apply a discount to its original value at the time when it re-purchases from customer. An additional disadvantage of the UMA is that it is not included in the deposit insurance system.

Of course, changes in the market price of the metal will influence the level of return on investment in all the objects of consideration; however, such changes will affect bullion and investment coins, while for collector coins and designer jewelry basis gains will form their "artistic" values, respectively.<sup>14</sup>

Furthermore, in case of purchasing of jewelry, an additional source of revenue can be also increase the cost of precious stones used as inserts. The main ways of investing in precious metals, presented in the table, are considered from the perspective of small investors, individuals.

Compare with the traditional way to preserve capital (bank deposits), UMA is in first place in terms of "saving" and "multiplication" nowadays of capital.

Even the largest banks offer deposits with annual interest rate, which is equal to inflation rate. The loss of the UMA in case of gold is about 5%, and the percentage of price increase on current trends is a lot large.<sup>15</sup>

---

<sup>13</sup> Investments in precious metals: Prospects // Jewellery Russia, № 91, 2009 - p. 4-5.

<sup>14</sup> Crisis management / ed. A. Hraznova. - M.: INFRA-M, 2011. - 368 p.

<sup>15</sup> Banking legislation of the Russian Federation Collection of federal legislation on banking law. Moscow, publishing house "Economy" in 2008.

Demand for investment coins made of precious metals rose at the end of last year, with the rise of demand for bullion.

VAT is not included to the price of coin as in the case of UMA, price calculation is formed from the value of metal. However coin has another important advantage-it can be carried away and hidden in a safety place, and additional certificates are not needed. Furthermore, it can be easily sold to the bank.

So, for individual, small investors the most appropriate ways to invest in precious metals are unallocated metal accounts and coins made of precious metals.<sup>16</sup>

---

<sup>16</sup> Klochkova N.V Russia's economic development: institutions, infrastructure, innovation, investment [Text]: Scientific Thought, 2010. 360p.

### **1.3 Quantitative and qualitative methods of evaluation and analysis of demand for jewelry**

The structure and level of demand for goods depends on many economic and natural factors. Among economic factors there are rate of production of goods and services (R), level of income of different groups of people (I), rate and relationship between prices of goods (P). Among natural factors there are: demographic mix of people, firstly size and structure of a family (S), habits and traditions, level of culture, natural and climatic conditions and others.

Economic factors are very mobile. These factors are very changeable at the time when economical and finance crises begin. At this time there a lot of changes in the finance distribution between various groups of people and buying interest is getting lower. Because of that, demand analysis at the time of crises is very important for all employers.

The natural factors aren't as mobile as the economic factors, so their influence on the demand during short periods of time (from 3 to 5 years) is rather small. So in the present and forward-looking forecasts it is better to discount all natural factors in common by adding the factor which is called "time" (t).

Therefore, in times of crisis the problem of studying consumer demand for businesses that sell (manufacturer) of jewelry becomes especially relevant.

As a result, all these factors (economical and natural) are used in common formula of demand (multifactor formula):

$$Q = f(R, I, P, S, t)$$

In the essay I will particularize the most important factors of demand, such as personal incomes of population (I) and the price of goods (P).

Let's consider the demand depending on the income of consumers, as well as the income elasticity of demand and price of the jewelry.

Determination of the demand function is not so easy. For practical purposes, univariate and multivariate demand functions are used for the demand analysis. In the first case it is assumed that the demand is a function of only one factor and all others are considered to be permanent:  $Q = Q(P)$ ,  $Q = Q(I)$

Methods of determination of the function of demand break can be divided into two categories. The first group includes qualitative factors and the second group is all about quantitative factors. The qualitative methods are based on the intuition and experience of managers. Quantitative methods are based on the statistics collection. The information comes from the statistics of sales, testing of the market, questionnaires. Neither quantitative nor qualitative methods are ideal and they should supplement each other.

Methods for determining of the demand function fall into two broad categories: Group 1 - qualitative approach, subjective in nature. Qualitative methods are based on intuition and experience of managers and staff in the sales department; they look at the customer response to various actions on prices.

Group 2 - quantitative approaches. Quantitative methods for evaluating the elasticity based on the collection of statistics on the analytical processing of information. Information obtained from the sales statistics, market testing and questionnaires.

Do not forget that the elasticity helps to predict the dynamics of the income of firms when prices change, provided that other factors affecting revenues remain fixed, which is very important in today's market. The elasticity of consumer demand has a direct impact on such important economic components of any firm, as the price, costs and profits.

Elasticity is a measure of reaction of one variable value to changes of another. The dependence of a change of demand for the goods on a change of its price is called the price elasticity. Economists use the concept of price elasticity for definition of sensitivity of consumers to change of price of the product, formula (1.2)

$$E_p(Q) = \left| \frac{P}{Q} \cdot \frac{\Delta Q}{\Delta P} \right|.$$

For luxury goods  $E_p$  is usually more than 1, so demand is super elastic.

The most important factors of price elasticity of demand are:

- 1) Interchangeability. The more substitutes for the goods are offered to the consumer, the more elastically demand will be.
- 2) Share of expenses on the goods in the consumer's income. The more place in budget is taken by the goods, the more elastic demand for it. For example, all jewels are divided into several groups (price categories): mass-market ( to 150\$), middle-market( to 150\$-1000\$), premium (1000\$-2500\$), luxury (>2500\$). It is obvious that the goods from high-price groups are more elastic.
- 3) Time factor. The demand for a product is becoming more elastic if the period of time for decision-making on its acquisition is becoming bigger.
- 4) Quality of the goods. The better quality the goods are, the less elastic at the price they are.

The simplest single-factor demand functions  $Q$  of the price  $P$ , used in the assessment are:

- 1) Linear function, formula (1.3)

$$Q = a_0 - a_1 P$$

- 2) Power function, formula (1.4)

$$Q = a_0 P^{-\alpha}$$

where  $a_0 > 0$ ,  $a_1 > 0$

The goods are called “normal goods” when demand for them changes in a direct relation to a change of the monetary income. Though the majority of products are normal goods, there are goods which demand changes in an opposite direction. Demand increases when an income decreases. These goods are called inferior goods. Jewelry is a normal good.

In modeling of the connection between the size of demand  $Q$  and the size of income  $I$ , generally in consumer demand models the one-factorial functions of Swedish economist **Tornquist** are widely used.

1. Necessary goods (1.5)

$$Q = \frac{\alpha I}{I + \beta}$$

2. Necessity of second degree (1.6)

$$Q = \frac{\alpha(I - \gamma)}{I + \beta}$$

3. Luxury goods (1.7)

$$Q = \frac{\alpha I(I - \gamma)}{I + \beta}$$

Demand for diamond jewelry (particularly exclusive models) is described by the Tornquist for luxury goods (1.7). This function can also be used for products with other precious stones (emeralds, rubies, sapphires).<sup>17</sup>

Demand for cheap jewelry can be described by a function for Tornquist relative luxury items (1.6). This includes jewelry, lightweight products made of precious metals without inserts and synthetic inserts.

In the above functions, the parameter  $\gamma$  reflects the fact that demand for these products starts only with a certain (relatively high) level of income  $\gamma$ .

In a modern economic science the indicator of income elasticity of demand is used, measuring the responsiveness of the demand for a good to a change in the income of the people demanding the good

---

<sup>17</sup> Diamond Jewelry: income elasticity of demand and price. Nepsha V.I, Okoemov Y.K, Tsvetkova N.V



$$E_I(Q) = \frac{I}{Q} \cdot \frac{\Delta Q}{\Delta I}$$

If the index of income elasticity of demand is negative ( $E_I < 0$ ), the income increase leads to a falling of demand for the given good, and it is possible to say that it is a bad quality. As soon as the consumer becomes richer, he considers the possibility and necessity to switch this good to a better, more valuable good. For jewelry it means to buy the goods of higher price category: for example, to substitute products from silver to products from gold.

If the index of elasticity of demand is positive ( $E_I > 0$ ), the good is normal.

Let's consider jewelry which is luxury items, related to the commodity that has no substitutes or limited substitutability. This is the case with the jewelry with diamonds. Then the dependence of demand in terms of money from the income may be dependent of money that the consumer is willing to spend on the purchase of these products, even if the price of goods changes. <sup>18</sup>If the amount of income  $I$  is fixed then the change of price of goods will change the demand for it, so that revenues will remain unchanged, i.e.  $PQ = \text{const}$ , and the price elasticity of the demand:

$$E_p = \frac{\Delta Q}{Q} \cdot \frac{P}{\Delta P} \rightarrow \frac{\partial Q}{\partial P} \cdot \frac{P}{Q} = -1$$

It is usually assumed that the luxury goods are very elastic, in the case of price increases it is easy to refuse their consumption.

To analyze the demand for jewelry with either quantitative or qualitative methods are not perfect, so they should complement each other.

---

<sup>18</sup> Practical Marketing / T. Ambler. - SPb. : Peter, 2000. - 213 p.

## Chapter 2: The analysis of jewelry as a good way to invest during the economic crisis

### 2.1 Analysis of demand for jewelry in the world market

Jewelry and production statistics show that the demand for diamonds is still strong. The most popular combination of gold and diamonds is still very popular all over the world.

As for silver, the last two years the volume of production of silver products decreased significantly due to surplus of silver on the markets. During the crisis, many companies have survived by increasing the production of products made of silver, which people were willing to buy, but it caused a opposite effect. The oversupply of silver on the markets led to a decline in demand.

Jewelry industry, which is responsible for creating and developing jewelry, is present in almost all countries of the world. In many cases it also reflects national traditions. The leaders among manufacturers of jewelry (on the basis of the domestic amount of precious metals), are these:

- India (22% of world production of gold jewelry)
- Italy (16% of world production),
- but it is also (to a lesser extent) China, USA, Saudi Arabia, and Turkey, each of which accounted for 5% of world production.

On the other hand, the main consumers of jewelry are:

- India - 30%,
- USA - 19%,
- China - 9%,
- Saudi Arabia - 7%,
- Egypt - 6%,
- Italy - 5%,
- Turkey - 4%.

Consumer demand for jewelry in the world is represented below in the **Table 2.1**.

#### Consumer demand for jewelry in the world, IV quarter of 2013 and 2014<sup>19</sup>

Country	Consumption, Q4 2013, in tons	Consumption, Q4 2014, in tons	Change between Q4 2013 and Q4 2014, %
India	<b>185,0</b>	<b>103,0</b>	<b>-80</b>
China	<b>128,9</b>	<b>131,4</b>	<b>2</b>
USA	<b>47,0</b>	<b>42,7</b>	<b>-10</b>

<sup>19</sup> Consumer demand for jewelry in the world [http://www.wgc.org/2011/01/05/World-Gold-Council-\(WGC\)-2011-Table-5-RBC-research](http://www.wgc.org/2011/01/05/World-Gold-Council-(WGC)-2011-Table-5-RBC-research)

Turkey	<b>6,5</b>	<b>7,5</b>	<b>13</b>
Saudi Arabia	<b>9,3</b>	<b>8,1</b>	<b>-15</b>
UAE	<b>12,1</b>	<b>10,8</b>	<b>-12</b>
Russia	<b>18,1</b>	<b>21,9</b>	<b>17</b>
Egypt	<b>11,1</b>	<b>17,7</b>	<b>37</b>
Italy	<b>17,8</b>	<b>14,8</b>	<b>-20</b>
United Kingdom	<b>13,8</b>	<b>11,2</b>	<b>-23</b>
Total in the world	<b>562,0</b>	<b>476,5</b>	<b>-18</b>

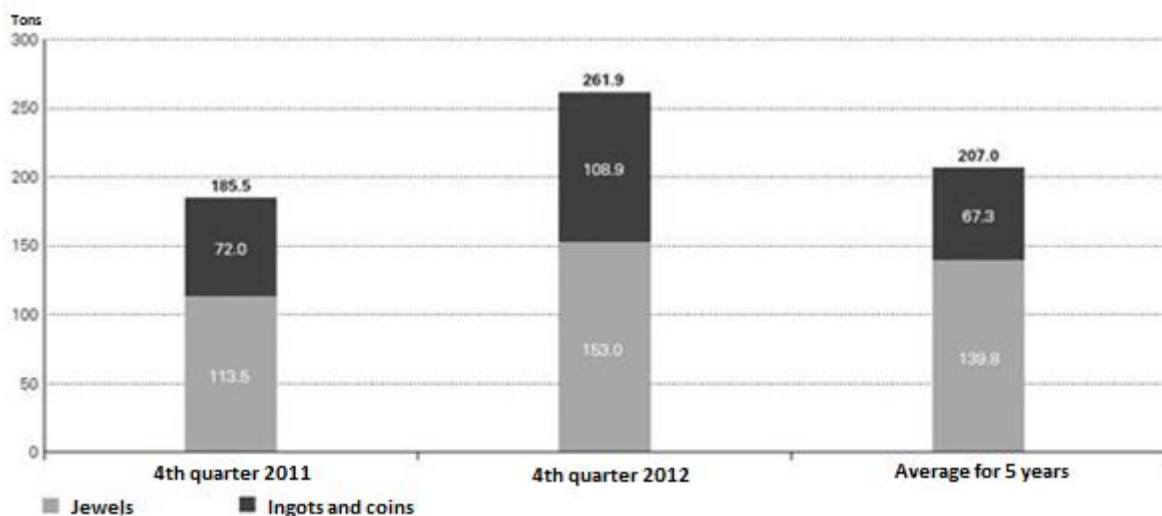
As it can be seen in the Table 2.1, the positive trend of jewelry consumption in the world can be seen between Q4 2013 and Q4 2014 in these two countries - Turkey (growth in consumption by 13%) and Russia (up to 17%), Egypt (37%) and China (roughly 2%).

One of the main reasons for the increased gold consumption in these countries is the continuous interest in gold jewelry during the New Year sales.

On the other hand, there also can be observed falling consumer demand for jewelry at the end of Q4 2014 in India (-80%), the UK (-23%), and Italy (-20%). Interesting fact is that main countries, which import jewelry, are India, China, and USA.

Even though the demand dropped by almost 80%, India still remains a central element in the global market of gold and jewelry and is at the same time the largest importer in the world, along with China. In Indian culture, gold is an integral part of an everyday life, where the purchase of jewelry is a form of liquid investment to accumulate wealth. It is important to emphasize on the fact that the analysis of the market of jewelry in India does not make difference between demand for jewelry as an investment tool and as a jewel. It, simply, is considered the same.

### Consumer demand in India



The **figure 2.1** above shows the consumer demand in India (Q4 2011, Q4 2012, an average change of demand during 5 years, all is show in tons). The grey figure is for jewels and the black figure is for ingots and coins as the investment tools.

We, therefore, can observe that the consumer demand gained its strength back in Q4 2012, after a slight decrease in Q4 2011. Demand in the Q4 2012 was 27% higher than the average quarterly figure for the five years.

According to India's largest jewelry retailer Gitanjali Gems, the demand for jewelry should increase by at least 10-15% in the year of 2015. Such estimate comes after the demand increase by 5-7% in 2014. Of course, the increase or decrease in demand is associated with the market fluctuations and an Indian currency; a rupee.

Because consumers actually expect the price of gold to keep increasing further, it means that the demand for jewelry and investment gold, will remain strong and keep increasing. Local investors are buying a lot of gold, as they are getting ready for more consumers.

There is no expectation for the demand for jewelry and investment gold to weaken, even despite the overall increase in prices. Therefore, local investors have a strong desire to buy more gold, which they expect to be attractive in the form of jewels, as well as in the form of investment.

One of other interesting figures is the country's rate of savings, which is around 30% and is considered to be highest in the world. From these 30% a solid amount of 10% is invested in gold. That speaks for itself. A Continuous rapid economic growth and urbanization of the country will create even more wealth, but also at the same time higher inflation, which will in turn stimulate demand for gold and jewelry to grow stronger

As for China, it is actively catching up to India in terms of volume of gold imports, while India is still the largest consumer of gold in the world.<sup>20</sup> The annual turnover of the jewelry industry in China is more than 120 billion CNY, and continues to grow, increasing annually by more than 10%. It is expected that in 2015, the sales of pearls and jewelry in the country will reach 180 billion of CNY. Exports are expected to reach 7 billion CNY.

Jewelry industry in China started to develop only recently, but the growth was very fast. The sales of jewelry worth more than \$ 120 billion CNY in 2004, was 600 times higher than the volume in 1980. The number of people employed in jewelry industry has increased from 20 thousand in the beginning phase to up to 2 million at present time. It is also known that China is the world's largest manufacturer and consumer of jadeite. According to Minerals.net<sup>21</sup>, Jadeite is a greenish precious mineral used for jewelry production.

---

<sup>20</sup> Consumer demand for jewelry in the world [http:// World Gold Council \(WGC\), 2011, Table 5, RBC.research](http://WorldGoldCouncil(WGC),2011,Table5,RBC.research)

<sup>21</sup> <http://www.minerals.net/mineral/jadeite.aspx> - The Mineral Jadeite

Besides Jadeite, there is also the production of pearls, which annually reaches 1 500 tones. That accounts for more than 95% of the world's total.<sup>22</sup> Also, three million carats of diamonds, with trade turnover reaching 1 billion USD, are processed in China every year.

The development in China was obvious; there were lots of new industrial enterprises and jewelry companies. China has become an essential base for processing and cutting of diamonds and other precious stones, but also of jewelry, which now, sells all over the world. It is safe to say, that the Chinese domestic market is developing very rapidly, and continues to increase the export of jewelry from China.

In the case of the USA, it consumes about 38 percent of total global production of finished jewelry. The US market is very interesting for exporters, which are closely watching this market. According to Mehula Choksi (Mehul Choksi), a head of the company Gitanjali Gems, the US market as a whole has improved by between five to seven percent, and his company recorded sales growth of about 9.5 percent for the last holiday season, which has ended with the New Year Eve.

Also, Varda Shine (Varda Shine), the executive director of the Diamond Trading Company (DTC), the trading division De Beers, said that the retail activity at the end of 2014 should have a significant impact on the demand for raw diamonds in 2015.

According to some preliminary data, the retail industry figures by the end of the year showed very positive results, which signaled that the US market achieved higher results in contrast to the Indian consumer market.

Many of the field experts believe that the global market for jewelry will continue to develop even further. They expect this industry to grow by 4-5% every year, and by the year of 2017, the sales should reach 250 billion USD. It is also expected that China and India will form the largest portion of the market with more than 30% of the world market sales. The Middle East will cover about 10% of global sales of jewelry. The production of jewelry will shift to countries, where it would be cheaper to produce. According to RosInvest, the volume of production of jewelry is expected to rise along with the variety of many different types and kinds of jewels.

---

<sup>22</sup> Market Overview gems CIS and Baltic countries [electronic resource]. - Access: <http://www.jewellerynews.ru/process/news.html?id=5606>.

## 2.2. Analysis of the Russian jewelry market

The Russian jewelry market is now over worth over 1 billion USD. While the demand for gold by Russian companies that produce jewelry is estimated at around 20 tons per year.

In the present time, the jewelry industry of the country – consists of more than 500 companies. Of these, 80 companies are engaged in the manufacturing of diamond jewelry.<sup>23</sup>

The market is now getting different. First of all it pushes for development of even wider retail chains, second, it is trying to decrease the portion of intermediary companies in the jewelry business as well as it seeks for widening methods of jewelry trade. The most successful and rapidly developing type of trade within the jewelry market is the online commerce (or basically on-line sale) and catalogue style of trade which delivers the acquired jewelry to your home or office. Both of these methods are mainly focused on groups of buyers with special needs or a unique combination of wishes in terms of jewelry. One of the strongest advantages of both types of trade is relatively low competition.

As a market grows and supply is getting stronger, the competition is massively increased. Consequently, the consumer is able to choose from a larger number of offers. As a consequence, a need for better quality, reliability and safety of production is getting a lot stronger. The consumer becomes extremely informed, mainly by researching on many available communication channels; Internet, e-mail, television advertising, mail advertising, etc.

Because there is a lot of competition, the market of jewelry becomes over overfilled with goods. As a result, the demand is somehow weakened and profits of jewelry producers are dropping. In the shadow of such development, many companies are building bonds with their loyal customers in order to keep them, but at the same time they are heavily oriented at search for new customers.

Finally, consumer is benefitting from this situation as with the higher level of competition, the higher is the win of the consumer.

In the developed capitalist nations the jewelry industry appreciates the work of masters – jewelers who create products with minimal labor costs and high grade gold. Such products are often used as a mean of investment. The Russian market of jewelry went further and moved itself to a higher level of development: the retail strengthens its position and stabilizes itself; the competition is very organized by the segments, while the market growth slows down.<sup>24</sup> Simply said, the industry is crystalizing itself.

While all of this, the economic crisis is still here and global markets are suffering. But even global crisis does not stop the demand for jewelry in the population to keep growing.

---

<sup>23</sup> Dumoulin II world Trade Organisation. - M .: Economics, 2010. p.72

<sup>24</sup> Jewelry of gold production in Russia significantly decreased // Jewellery Russia, № 92, 2009. - p. 4-5.

According to experts, the annual increase in sales of jewelry is about 13%, and this is not the ceiling yet. Such rapid growth of sales can be explained; many individuals are inclined to invest in jewelry, because of the instability of the major currencies. Just take a look at what is happening with Russian RUB in these days. The currency suffers from sanctions and received a major hit. Such times are, indeed, important for gold industry. It is better to hold wealth in precious metals, jewels, instead of aggressively fluctuating currency. Many individuals are purchasing gold rings, earrings, bracelets and other items, which are considered to be an excellent investment.

If we consider the production of jewelry segment, the largest segment is diamond jewelry, which occupies almost 45% of the world jewelry market, which is about 80 billion USD. The second place is the production of jewelry made of gold, which shares 43.5%. The production increases annually by 5.7%. The global market for jewelry is, according to some experts, expected to develop even further. The growth is expected to be 4-5% every year, and in 2015 the sales should reach 250 billion USD. It is also expected to accelerate the pace of production and expansion of range of jewelry products.

However, if we compare the Russian jewelry market with leading global markets it represents a relatively small segment. Today, the Russian jewelry market is worth about 1.5-2 billion USD and is growing rapidly with an annual growth rate of 30%.

One of other interesting facts is the division of consumers of jewelry. In total, it would be about 10% of the world population, and the majority – are women. The share of men and children accounts for a very small percentage. According to some analysts, almost 50% of sales of domestic jewelry products in Russia are jewels made of precious metals such as gold, silver, platinum, and other 50% are jewelry with semi-precious and precious stones. Most popular jewels in Russia are rings, earrings, and necklaces, all three desired by women. Other products such as brooches buy only about 10 percent of all of the women surveyed.

Men, on the other hand, like to buy chains and about 42% of male respondents bought them. Other different products for men such as tie pins, cufflinks are not popular at all. In terms of foreign jewelry that is imported on the Russian market about 87% are silver jewelry, and the remaining 13% are jewelry made of gold.

It is clear that the demand for jewelry is determined by welfare of the population in terms of buying power, or simply said; its solvency. With lower solvency a decline in sales of jewelry follows.

However, over the past decade, the demand for jewelry is growing rapidly; beautiful earrings, fancy chains and other jewels are acquired by more and more consumers. On the other hand, it is important to note, that during times of financial crisis or economic decline a society is

concerned about its own savings and consequently, luxury items, such as jewelry, are one of last things people buy.

But such fact can be also approached in a very different way, because jewelry can also be considered as an investment during economic instability. It is known that the price of gold and jewelry is growing rapidly during times of crisis, because people are looking for safe and stable instruments they would like their money to invest to. Afterwards, if the economy is getting healthier, the price of gold stabilizes or falls. Thus, a good number of leading financial analysts agree with the statement that the gold – is a cure for inflation and devaluation for many decades rather than a tool for quick money. It is also good to note that the jewelry is a good investment in the long run. Many experts suggest, that gold is a way to diversify investments portfolio, but they also recommend buying it not during crisis, but rather in times of calm and peace.

Jewelry, at a present time, is considered by many as one of the most profitable investment options. This is especially true in the case of an expensive jewelry made of gold and precious stones. Therefore, the demand for jewelry, not only does not fall, but it even grows every day. The purchasing power of demand increases during times of crisis. It is believed that the jewelry can be used as a profitable investment, which will help to improve the financial situation during the unstable economic situation.

The global financial crisis has affected all spheres of our life, significantly changing the structure of social consumption. But despite the fact that the jewels have always been treated as luxury goods, which tend to be unpopular during times of crisis, the jewelry is one kind of luxury goods, that are popular even during the crisis. As it was already explained before, this is due to the fact that the financial instability in many cases results in the depreciation of money, the exchange rate is very volatile and unpredictable, the risks of investing in securities are too big, the businesses might go bankrupt, the banks one after another declare bankruptcy, the trust in bank deposits is getting weaker and weaker. Citizens, who wish to keep their savings, invest in the jewelry, because its value is not affected by the inflation or the exchange rate fluctuations. This makes jewelry even more desiring and the value is therefore growing higher.

So, is it worth to invest in jewelry? How to invest and where to invest? First of all, it is important to note that investing in jewelry is not only paying for the product. It is important to note that the price consists of a cost of the precious metal and stones, of the job of master, of intermediaries who distribute the jewelry, store costs, VAT, etc.

The paragraph above is pointing out, that it is better to buy a certified jewelry in a special dealer instead of trying to “create one” by ordering master and paying for the job. The more



historical and aesthetic value of jewelry, the better for the consumer. Jewelry must be exclusive and high quality.<sup>25</sup>

If possible, it is always better to consult the investment with a specialist, an antiquarian. Guided acquisition will allow consumer to sell the jewelry later with profit through jewelry auctions. Ordinary jewel shops, evaluate jewelry only by weight of metal. That means that the amount determined by such shop of consumers jewelry might be a lot less than the amount a consumer payed for the jewelry in the first place; hence the necessity of consultation with a specialist and importance of the certificates.

In the beginning of the crisis the growth in demand for expensive products was at its peak, but sales of an average priced jewelry fell. That is due to above mentioned facts. The amount of the sales of an expensive jewelry in 2014 was one and half size of the sales in 2013.<sup>26</sup>

The sales of a cheap gold jewelry with cubic zirconia, silver jewelry and precious stones has not changed very much, because such category will always be demanded; these are bought for loved ones and without investment goals.

Let's, now, analyze the information on jewelry stores in different cities in Russia, namely; Moscow, Perm, Astrakhan, Voronezh, Sergiev Posad.

The sales presented in the following table are divided by the different price groups. Products with low price group are products without any inserts and very simple. The high price group products are with precious stones. The gap between those products is jewelry with semiprecious and precious small inserts.

**Table 2.2**

**Statistics of jewelry sales in major cities of Russia from January to June 2015**

City	Month	Price Categories							
		0-2500	2500-5000	5000-9000	9000-15000	15000-22000	22000-45000	45000-90000	90-150000
Moscow	September	14	25	29	24	13	12	1	
	October	12	23	35	33	18	13	2	
	November	14	39	52	30	20	13	5	
	December	40	63	136	143	67	40	8	
	January	18	36	47	48	16	13	3	
	February	28	44	41	28	22	11	4	
	March	49	42	64	63	25	19	5	
	April	12	25	49	26	10	7		
	May	18	33	32	21	9	8	1	
	June	19	29	49	15	9	5	4	
Perm	September	32	41	57	40	35	31	10	1
	October	34	52	32	44	21	26	4	

<sup>25</sup> Balabanov IT Precious metals and precious stones: operations on the Russian market. - M.: Finance and Statistics. - 2006. - 288 p.

<sup>26</sup> Estimation of consumer properties and cost jewelry - [www.sakhatransneftegas.ru](http://www.sakhatransneftegas.ru)

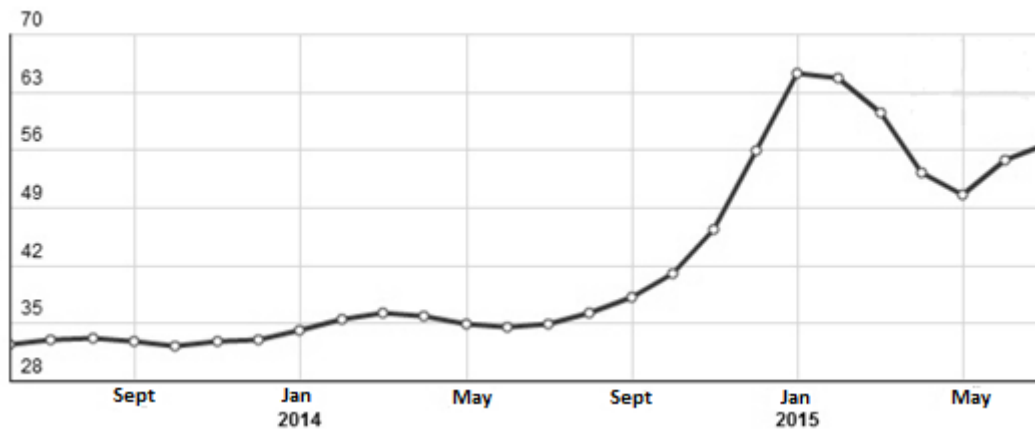
	November	41	40	49	44	34	31	16	2
	December	76	119	117	104	89	78	21	6
	January	42	51	50	50	23	29	11	1
	February	49	43	35	35	28	33	8	1
	March	61	54	36	42	33	17	8	1
	April	28	37	35	26	20	17	6	1
	May	45	46	39	29	12	11	3	
	June	49	54	31	29	20	15	6	1
Voronezh	September	7	37	47	31	19	12		
	October	8	22	50	30	14	11		
	November	8	40	38	31	13	14	2	
	December	27	92	141	89	46	22	5	
	January	9	15	52	23	23	6	2	
	February	8	33	32	29	15	11		
	March	15	22	33	34	15	5	2	
	April	20	23	22	21	15	5		
	May	13	20	23	22	6	3		
	June	18	34	30	26	17	5	1	
Astrakhan	September	46	53	46	45	13	11	7	
	October	55	39	33	27	18	16	2	
	November	38	37	36	21	14	9	3	1
	December	77	97	92	86	54	29	9	
	January	33	48	43	26	28	11	3	
	February	47	44	37	43	24	10	2	
	March	47	43	31	31	10	14	3	
	April	33	45	36	21	12	13	2	
	May	32	38	31	22	15	9	3	
		June	35	37	28	21	15	11	1
Sergiev Posad	September	4	10	13	10	11	3	2	
	October	10	19	11	14	7	11	1	
	November	8	11	15	19	17	5	1	
	December	17	43	73	61	54	23	9	
	January	6	15	24	18	8	9	2	
	February	4	13	19	21	8	8	-1	1
	March	5	15	21	27	12	6	3	1
	April	2	13	4	12	9	4		
	May	2	7	10	13	12	4	2	
	June	3	9	21	20	9	8	3	

From the table above it is possible to see, that the peak of sales growth was observed in almost all of the cities at the end of 2014, namely in December. At the same time the dynamics of the exchange rate (as can be seen in the following Figure 2.2) indicates the beginning of the current crisis. The financial situation of many Russian businesses and individuals is getting worse, but the sales figures provided by stores show the growth in demand for jewelry.

Let's analyze the relationship between the indicators using linear correlation coefficient, the formula 2.1:

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{n\sigma_x\sigma_y}$$

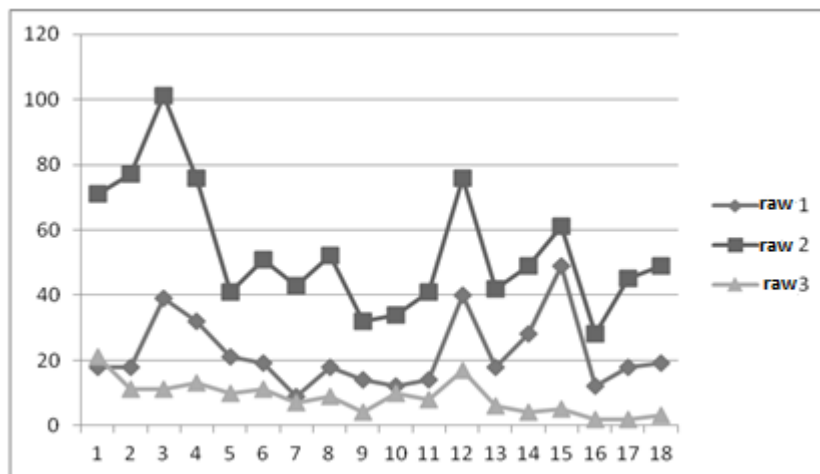
Where  $\bar{x}$  and  $\bar{y}$  - average characteristic values of x and y,  
 $\sigma_x$  and  $\sigma_y$  - standard deviations.



**Figure 2.2 - The dynamics of the US dollar in the period from July 2014 to July 2015**

Based on these data the demand and the exchange rate have a correlation relationship, but the linear correlation coefficient, calculated by the formula 2.3 gives an average value of 0.4 - 0.52, which means that the relationship between the signs is "average" and more research is needed.

Overall, the growth in demand for jewelry offered by cities like (see. Fig. 2.3) can be seen below;



**Figure 2.3 shows the schedule of sales of jewelry in shops in the city of Moscow, Perm and Sergiev Posad in the period from January 2014 to June 2015. Number 1 is for Moscow, number of 2 is for Perm and number 3 is for Sergiev Posad. The shop in Perm throughout the whole period showed to be a bestseller.**

We carry out the calculation of the key performance indicators for the store in Moscow (Table 2.3.) and in Perm (tab. 2.4);

**Table 2.3**

**The dynamics of sales of jewelry store in Moscow in the period from January 2014 to June 2015.**

Month	Sales	Absolute increment		Rate of growth		Rate of increment		Absolute value of 1% increment
		continuous rate of change	benchmark rate of change	continuous rate of change	benchmark rate of change	continuous rate of change	benchmark rate of change	
January	18		0		100,0		0,0	
February	18	0	0	100,0	100,0	0,0	0,0	0,18
March	39	21	21	216,7	216,7	116,7	116,7	0,18
April	32	-7	14	82,1	177,8	-17,9	77,8	0,39
May	21	-11	3	65,6	116,7	-34,4	16,7	0,32
June	19	-2	1	90,5	105,6	-9,5	5,6	0,21
July	9	-10	-9	47,4	50,0	-52,6	-50,0	0,19
August	18	9	0	200,0	100,0	100,0	0,0	0,09
September	14	-4	-4	77,8	77,8	-22,2	-22,2	0,18
October	12	-2	-6	85,7	66,7	-14,3	-33,3	0,14
November	14	2	-4	116,7	77,8	16,7	-22,2	0,12
December	40	26	22	285,7	222,2	185,7	122,2	0,14
January	18	-22	0	45,0	100,0	-55,0	0,0	0,4
February	28	10	10	155,6	155,6	55,6	55,6	0,18
March	49	21	31	175,0	272,2	75,0	172,2	0,28
April	12	-37	-6	24,5	66,7	-75,5	-33,3	0,49
May	18	6	0	150,0	100,0	50,0	0,0	0,12
June	19	1	1	105,6	105,6	5,6	5,6	0,18

**Table 2.4**

**The dynamics of sales of jewelry store in Perm in the period from January 2014 to June 2015.**

Month	Sales	Absolute increment		Rate of growth		Rate of increment		Absolute value of 1% increment
		continuous rate of change	benchmark rate of change	continuous rate of change	benchmark rate of change	continuous rate of change	benchmark rate of change	
January	71		0		100		0	
February	77	6	6	108	108	8,45	8,45	0,71
March	101	24	30	131	142	31,2	42,3	0,77
April	76	-25	5	75,2	107	-25	7,04	1,01
May	41	-35	-30	53,9	57,7	-46	-42	0,76
June	51	10	-20	124	71,8	24,4	-28	0,41
July	43	-8	-28	84,3	60,6	-16	-39	0,51
August	52	9	-19	121	73,2	20,9	-27	0,43
September	32	-20	-39	61,5	45,1	-38	-55	0,52
October	34	2	-37	106	47,9	6,25	-52	0,32

November	41	7	-30	121	57,7	20,6	-42	0,34
December	76	35	5	185	107	85,4	7,04	0,41
January	42	-34	-29	55,3	59,2	-45	-41	0,76
February	49	7	-22	117	69	16,7	-31	0,42
March	61	12	-10	124	85,9	24,5	-14	0,49
April	28	-33	-43	45,9	39,4	-54	-61	0,61
May	45	17	-26	161	63,4	60,7	-37	0,28
June	49	4	-22	109	69	8,89	-31	0,45

Analysis of sales of jewelry in both stores showed an increase in demand in the months in which consumers celebrated national or international holidays and decrease during periods between the holidays.

It is important to consider not only the absolute sales figures from tables 2.3 and 2.4, but also relative figures as well; to see how the ratio of sales of a particular price category and the relationship between each other before the crisis and during the crisis.

For example, let's take data from the first half of 2014 and from the first half of 2015. Both stores in terms of growth showed a similar growth of sales, that is, demand for jewelry was up not only prior to the crisis, but also during it. Also, some months showed the increasing demand for products in both stores.

It is necessary to determine how much has changed the structure of price categories in relation to demand; do consumers buy more of expensive jewels, or rather low priced jewels?

Market of jewelry in Russia currently has a positive overall development. Many individuals believe that diamonds are the most reliable and risk-free way of savings. Prices for diamonds are stable and rarely reduced, in contrast to the currency shocks, price of stocks or prices of different precious metals. The fact is that diamonds never go out of fashion and they gain in price over time. Therefore, in the mass consciousness of Russians people, diamonds are perceived as a low-risk and reliable investment and way of savings.

The conclusion is obvious; the analysis showed that the jewelry is very popular during economic crisis. Gold, silver and other precious metals are an excellent investment in the future. These "savings" can be monetized at any time, when needed.

### **2.3. Assessment of the dynamics of demand for jewelry in a particular city (for instance, in Sergiev Posad)**

There are 11 stores in the town of Sergiev Posad, which specialize in the sale of jewelry. A store called “Golden Lion” is located in the center and is considered one of the oldest jewelry shops in the city. In addition, a store “Drakkar” has a chain of stores in the districts.

Two jewelry salons are selected for the survey. They are located at the station square, near the bus terminal of the town of Sergiev Posad. 100 residents and visitors to the city of Sergiev Posad were surveyed in order to identify the impact of the economic crisis on demand and investment of jewelry. Men and women aged from 18 to 51 years of age and older participated in the following survey. This research was conducted from the 1st to 10th of June, 2015.

The survey was taken by asking the visitors of jewelry stores and salons to fill the questionnaire.

The survey method was chosen not only because it could be relatively easy to interview enough people, but also because a well compiled questionnaire can provide the accurate results of the study of the subject and allows to quickly process given information. It appears that the following questionnaire corresponds to the essential requirements (see. Appendix 1), since it was made according to the common terms and rules of construction and consists of the following characteristics:<sup>27</sup>

The interview starts with a preamble, so each participant is given an explanation of the purpose of the survey that is conducted, and explanation of how to fill it and who shall fill it. The significance of the survey was justified as well. The questionnaire contains the amount of questions to be answered within 5-7 minutes. Text that is related to one question is not transferred to the next page. This is done for convenience and a better perception of the issue. All questions have a page order. Personal questions are placed in the end of the questionnaire. The questionnaire is anonymous.

The closed questions were used in the questionnaire, since this kind of questions is considered the best for testing the hypothesis. They allow to interpret the answer more strictly. The basis for an objective interpretation of the data is more reliable in case of closed questions. The close-ended questions help not only recognize the content of the remarks, but also to measure the intensity of the evaluations and of the opinions.

---

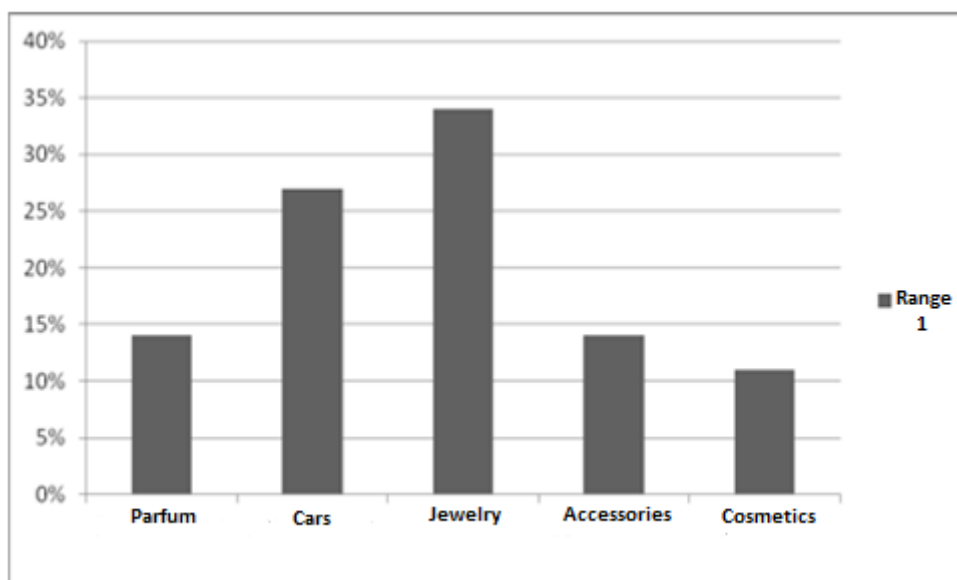
<sup>27</sup> Bachilo S.V. Esinova I.V., Mishin L.A., 2009. Direct Marketing: Ucheb. Allowance. Moscow: Dashkov i K

Subsequently, it was necessary to conduct an analysis, which aims to identify the impact of economic crisis on demand and the investment of jewelry, as a result of processing of the primary materials and of the meta-analysis of these results.

At the final stage, analysis has established the facts, which were used to draw the conclusion about the confirmation of the hypothesis on their basis.

As a result of the studies about the impact of the economic crisis on demand and investment of jewelry using a questionnaire created by the author, the primary data have been obtained and it is presented in the appendix (see. Appendix 2).

A meta-analysis was made using the obtained data.<sup>28</sup> To analyze the results of the first question about what draws the respondents' attention the most in glossy magazines, a histogram has been created (see. Fig. 2.4):



**Fig. 2.4 – The goods, most frequently appearing in glossy magazines**

As seen in Figure 2.4, the largest number of respondents said that they often turn their attention to jewelry, while the question appears if you have a desire to buy a piece of jewelry not only thanks to advertising. Two-thirds of the respondents have given a positive answer to this question. Besides, jewelry is the item that draws the respondents' attention the most. More than a third of the respondents mentioned jewelry, while a slightly less amount of people noted – the car. Described preferences for other goods (perfume, accessories and cosmetics) are the same level with each other. A table was made according to the results of the third question and the personal information provided by the respondents (see. Table 2.5).

**Table 2.5**

<sup>28</sup> F. Kotler, Principles of Marketing. Moscow: Progress - 2002

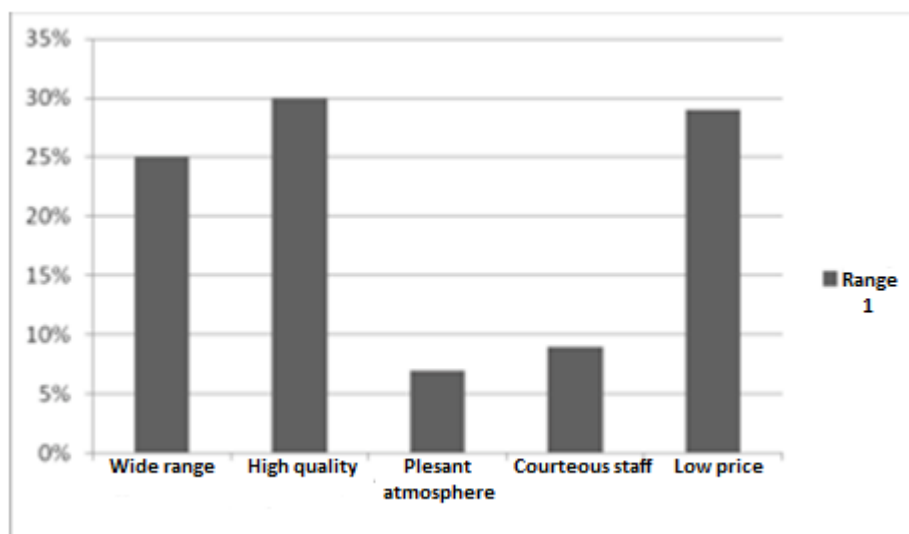
## The frequency of buying jewelry by the respondents, in %

Answers	Quantity of the answers in, %	The symptom of segmentation						
		Age (years)				Monthly salary in thousands of rubles		
		10-18	19-30	31-50	Older than 51	Up to 21000	21001-37500	More than 37501
A couple of times per year	28	1	19	8	-	-	14	14
1 time per year	42	3	25	7	7	3	33	6
1 time in a season	24	7	7	10	-	6	18	-
A couple of times in 3-4 years	6	3	3	-	-	-	6	-

According to the table, slightly less than a half of the respondents (42%) buy jewelry once a year, while the third of respondents (28%, to be precise) – a couple of times per year. The reason for it is the presents for birthdays and other important dates.

The age segment, corresponding to the frequency of purchases of jewelry equal to once a year is mainly represented by the buyers in the age frame of 19-30 years (25%) with revenues varied from 21001 to 37500 Russian rubles (33%). It is rare to buy jewelry for the respondents aged 51 and older and for the ones with higher incomes (more than 37501 Russian rubles), who are choosing the other places of purchasing jewelry.

A histogram was made to demonstrate the results of the preferred selection of jewelry (see Fig. 2.5)



**Fig. 2.5 – respondents' preferred selection of jewelry**

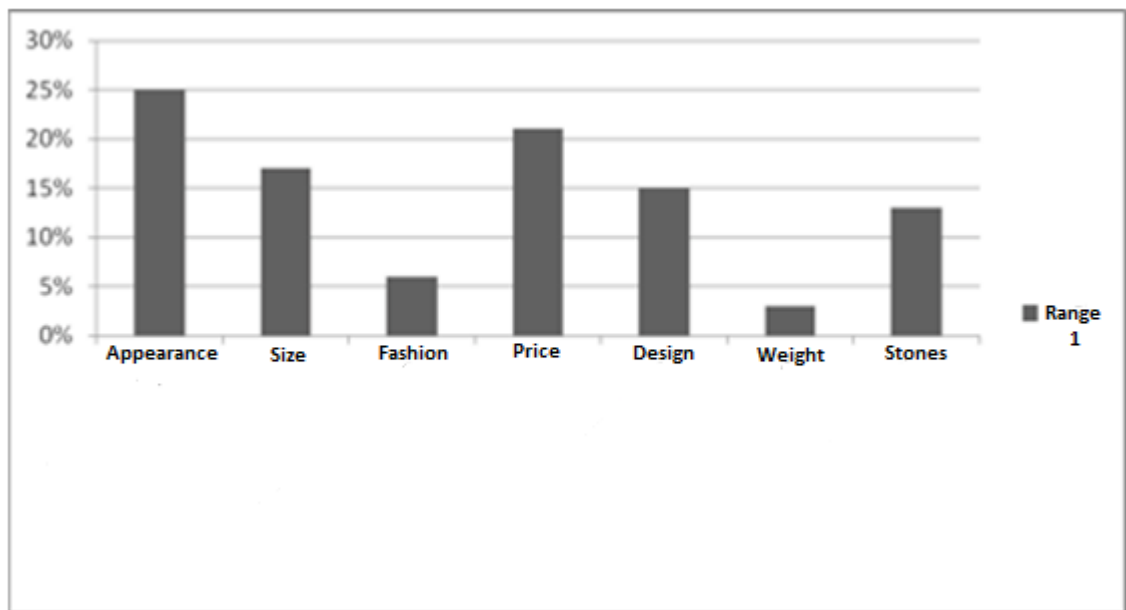


The figure 2.5 indicates that the structure of the factors, which influenced selecting the jewelry corresponds to the choice in favor of high quality product and a low price. Nearly a third of buyers gave their preference to described characteristics of jewelry (30% and 29% of consumers, respectively).

A wide range of jewelry was also marked high in the preference (25%). Courteous staff and a pleasant atmosphere in the store were not particularly essential as a factor influencing the customer's preference, according to the respondents (9% and 7%, respectively). In fact, it is common to provide a high level service and the product quality in jewelry stores.

In regard to the mentioned above, more than a half of the respondents mentioned their commitment to the domestic producers (58%), since such products are of high quality, affordability, and possess a diverse assortment of jewelry.

The next histogram was compiled, according to the results of selection preferences of jewelry (see. Fig. 2.6).

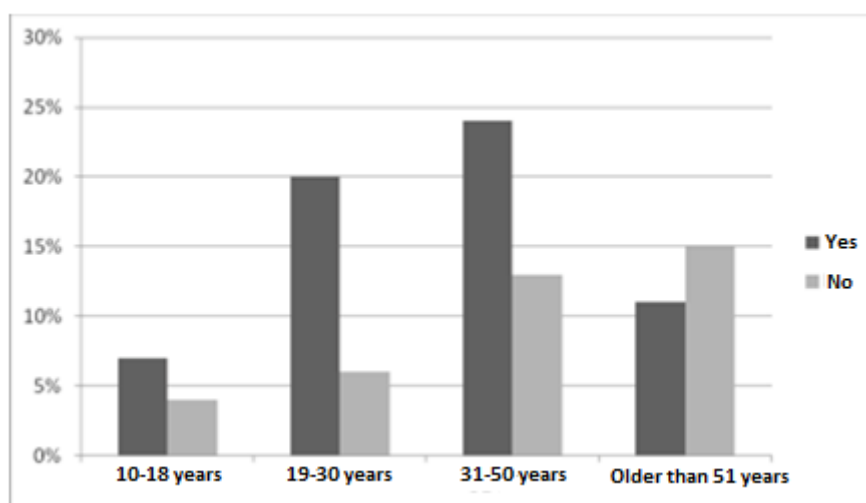


**Fig. 2.6 – Respondents' selection criteria for purchases of jewelry**

As seen in Figure 2.6, the main criteria of selection of jewelry shopping for a quarter of respondents is the selection by appearance and attractiveness of price (25% and 21%, respectively). The size and design of the product were also significant for a decent part of respondents (17% and 15%, respectively). Weight of jewelry and fashion relevance is the least significant criteria for respondents' purchase.

When asked about the completeness of the purchase package, most of the respondents opted for individual jewelry (93%).

A histogram was drawn in regard to a question about the profitable options in investing money in jewelry, and on the basis of the respondents' personal information, provided in the questionnaire (see Fig. 2.7)



**Figure 2.7 – Respondents' distribution of investment funds in the jewelry, comprised of the different age groups.**

It is clear from the Figure 2.7 that roughly two-thirds of respondents agreed on the assumption that jewelry is a lucrative option for investment (62%). Majority of the respondents that consider jewelry as a profitable investment is in the age group of 19-50 years of age (20% and 24%, respectively). Most of the older respondents (over 51 years) does not agree with this statement and suggest that jewelry investments are not profitable.

Research of the assortment of jewelry, according to the survey results, indicated that there was a high commitment of consumers to the ring purchases, earrings with inserts and single jewelry; 58 percent of respondents preferred the domestic producer of jewelry. The main criteria for the purchase of jewelry are: the appearance, price, and design. Most frequently, respondents buy the jewelry products only once in a year.

Also, regardless of age and sex, almost one third of people participating in the study, noted their preference in jewelry. Two-thirds of respondents voiced their desire to buy jewelry, regardless of any advertising. This confirms the fact that demand for jewelry is, indeed, big and jewelry will always be a fashion thing.

Slightly less than half of the respondents said that they buy jewelry once in a year, with a third of respondents at least several times a year. The age segment of buyers is the age of 19-50 years old with income from 21001 to 37500 rubles. In general, it turns out that almost every member of this research at least once in a year makes a purchase of jewelry.

Perhaps the reason for this are gifts for birthdays, other important holidays, such as two important ones in Russia; New Year and March 8 (Women Holiday). During these two holidays up to 80% of the total yearly sales figure of products are sold.

One of other facts is dependence of buying decision on product quality and the price of jewelry. More than half of respondents are rather committed to domestic producers. Therefore, currently, the main inflow of imported goods began to create direct competition to domestic jewelry producers in the lower price segment, which can be called; "mass market." In Russia, there are relatively high taxes and quotes on raw precious minerals and on the equipment and machinery used for jewelry production. At the end of the day, the price of domestic jewelry is automatically increased by about 35% in order to match the foreign competition. On top of that, Russian jewelry and gold are considered to be a very high quality (due to quality and processing) on the global market.

However, not all of the foreign products are good. For instance, the products of foreign artists, especially from Egypt, Turkey and China, are of poor quality. For Russia, the main danger is coming from Asians: even after the payment of all taxes and duties for their products, it is, still, more affordable than domestic counterparts. During the times of crisis, the demand is known for high-end products segment, but not only. It distributes on opposite ends of the price scale: one is interested in low cost products and one in luxury, high-end products.

Unfortunately, in this respect there is no accurate statistics, but market experts argue that the volume of sales of these two segments are roughly equal to each other, and by the final number of sales, the low price segment outweighs the high-end segment. As for today, lower price segment accounts for about 60% of all items sold.

Also, a quarter of respondents said that the main criterion when choosing the purchase of jewelry is the appearance. The most popular among respondents was jewelry for hands; in the form of rings, bracelets, but also earrings, so their requirements for the appearance of these products are quite special. Especially these products must be comfortable to wear, attractive, and please their owners, give them pleasure. The size of this jewelry is also important for them.

Almost all of the respondents opted for a single piece jewelry. Many of them prefer to pick additional pieces by themselves. Perhaps, such behavior also affects the pricing.

Another interesting fact can be shown from this research; the total utility. The questionnaire survey participants were offered to fill a table with some brands of jewelry, the quality of which they were to assess with the mark from 1 to 10 points. Participants were explained that 1 point means "very bad, can't even imagine how bad" and 10 points was "great, better than anything else." In addition, it proposed to place the coefficients of the importance of

each quality, so that together they accounted for 1 point. The results are shown in Tables 2.6 and 2.7.

**Table 2.6**

**Evaluation of various properties of the brands Jewelry**

Brand	Properties (1-10 points)						
	Social	Functionality	Ergonomic	Hygienic	Reliability	Safety	Aesthetic
Yves Saint-Laurent	8	7	6	9	7	8	6
Christian Dior	10	9	8	10	10	8	9
585	9	7	8	9	8	7	7
Christian Lacroix	8	6	7	9	8	7	7
Adamas	8	9	7	10	9	8	8
Valentino	9	7	8	10	10	9	10
Mango	8	7	9	8	9	8	6

The properties from the table are important for consumers. The products have to meet certain requirements (not only aesthetic) person in the course of their operation. Consumer properties that are important include; social, functional, ergonomic, hygienic and aesthetic properties, but also safety and reliability of consumption.

Social characteristics of a product are basically how well it satisfies the needs of population in terms of feasibility of its production, distribution and consumption. Is this product needed at all?

Functional properties determine the compliance of a product with the intended purpose of wear. This goes down to form and to the design of the product, which must correspond to the purpose of the product. For example a cup holder must hold a glass, a cigarette case - cigarettes, and so on.

Ergonomic properties of the goods are important for the convenience and comfort of use. The ergonomic properties are important as they are responsible for the easiness to use. The design and shape must provide the high comfort and good user experience.

Hygienic properties determine the relationship between the human body and the product. The conditions during the wear must be friendly to the body's health. For example, hooks of earrings should be made of only from precious metals or be gold plated, in order not to oxidize in the ear piercing and not cause a disease. The materials used in the manufacture of jewelry products must comply with strict norms of the Ministry of Health.

The reliability of consumer goods shows the preservation of the main parameters of the jewelry during prolonged periods of time. All of these locks, chain links, stones in personal

ornaments (brooches, earrings, bracelets, etc.), or let's say parts in items for smoking (cigarette cases, lighters), must always be functional, and work flawlessly. Nobody needs earring that breaks down after one year of medium usage.

Safety of consumption protects a consumer from dangerous and harmful effects arising from the use of the product. All jewelry mustn't have cutting edges, ledges, and other parts that can make injure to a human skin.

The aesthetic properties of the goods are characterized by its ability to express the social value and socio-cultural significance. Aesthetic qualities of jewelry include rational beauty, originality, forms and a reasonable size or miniaturization. Other important factors are matching plastic and texture properties of materials, production technology and a quality of a surface finish. However, the most important requirement of aesthetics jewelry is the very carefully chosen mix between the beauty, comfort and reliability.

A lot of jewelry represents a culture by its color and shape. Jewelry possesses special aesthetic qualities, because they can relate to the national art and craftsmanship. It is quite obvious, that beauty is of highest important for consumers. They have to like it, to buy it.

**Table 2.7**

**Evaluation of the importance of the properties of the goods**

Properties	Social	Functionality	Ergonomic	Hygienic	Reliability	Safety	Aesthetic
Importance	0,20	0,25	0,15	0,15	0,10	0,10	0,05

The Total utility, as already mentioned before, is a total value of all units of the product. The total utility is a total value of the “consumer basket”. Calculation of a total utility can be represented by the formula 2.2:

$$A_i = \sum_{k=1}^N W_k \times X_{ik}$$

- Where  $A_i$  - sets the individual with respect to i-brand;
- $W_k$  - relative importance of the k-th property to the individual;
- $X_k$  - perceived degree of presence the k-th property in the i-brand;
- N - number of properties of the product.

Using the survey results shown in Tables 2.4 and 2.5, we can calculate the total utility of each brand. Let's take a look:

Brand 1, Yves Saint-Laurent:

$$8 * 0,20 + 7 * 0,25 + 6 * 0,15 + 9 * 0,15 + 7 * 0,10 + 8 * 0,10 + 6 * 0,05 = 7,4$$

Brand 2, 585:

$$10 * 0,20 + 9 * 0,25 + 8 * 0,15 + 10 * 0,15 + 10 * 0,10 + 8 * 0,10 + 9 * 0,05 = 9,2$$

Brand 3, Christian Dior:

$$9 * 0,20 + 7 * 0,25 + 8 * 0,15 + 9 * 0,15 + 8 * 0,10 + 7 * 0,10 + 7 * 0,05 = 7,95$$

Brand 4, Christian Lacroix:

$$8 * 0,20 + 6 * 0,25 + 7 * 0,15 + 9 * 0,15 + 8 * 0,10 + 7 * 0,10 + 7 * 0,05 = 7,35$$

Brand 5, Valentino:

$$8 * 0,20 + 9 * 0,25 + 7 * 0,15 + 10 * 0,15 + 9 * 0,10 + 8 * 0,10 + 8 * 0,05 = 7,5$$

Brand 6, Adamas:

$$9 * 0,20 + 7 * 0,25 + 8 * 0,15 + 10 * 0,15 + 10 * 0,10 + 9 * 0,10 + 10 * 0,05 = 8,65$$

Brand 7, Mango:

$$8 * 0,20 + 7 * 0,25 + 9 * 0,15 + 8 * 0,15 + 9 * 0,10 + 8 * 0,10 + 6 * 0,05 = 7,9$$

What do we get?

On the basis of an overall assessment, it can be concluded that consumers prefer to buy products from Adamas.

According to the results of the study, these are conclusions:

- The choice of jewelry is based on the financial situation of the buyer. The middle-income class tends to acquire domestic jewelry, while the high-income class chooses foreign manufacturers of jewelry.

- During the process of deciding on a jewelry to buy, the brand and its popularity and name, does not play a big role. Still, the more known the brand is, the better it is for the consumer, the bigger advantage for the producer.

- Advertising plays an important role and affects preferences and decisions of consumers. Highly advertised goods are considered to be the most attractive in the eyes of potential buyers.

## **Chapter 3. Conclusions and recommendations for timely assessment changes in demand for jewelry investment during economic crisis**

### **3.1 Conclusion of the study**

If all investments in jewelry sector can be divided into private (small) and large investments, for the private sector to invest in jewelry it should be noted that this method is the direct purchase of jewelry. This area of investment is more or less stable, but its profitability is not so high. Large investments in jewelry sector can take the form of purchase of private salons, jewelry stores, or even large jewelry shops. It is important to note that the stability of income in the jewelry industry ensures extremely high demand for jewelry among citizens.

Study of demand and investment jewelry during economic crisis led to the following conclusions.

- The majority of respondents noted that often turn their attention to advertising jewelry in glossy magazines.
- Slightly less than half of those surveyed people buy jewelry once a year.
- Preferences divided equally for the benefit of the quality of performance and the low price.
- A quarter of the respondents indicated that they choose jewelry according to its visual appearance.
- Two-thirds of respondents believe that the jewelry - a profitable investment. It can be concluded that the hypotheses from the beginning of the work are confirmed:
- The economic crisis reduces income; subsequently jewelry demand drops.
- The economic crisis increased demand for precious metals.
- The level of jewelry demand will rise during economic crisis if the offered goods in precious metals presented, and potential consumers see investment of their savings is in this product - the only way to save the accumulated funds.
- Even a small change in income will affect demand for luxury goods. Reducing consumption is now expressed in the refusal of the population to major shopping and luxury goods. The reasons for this are not waiting for lower prices but lack of money. This leads to an overall reduction in demand and, consequently, a reduction in production.

### 3.2 Increase the demand for jewelry

Scientists do not stop to repeat that the stock of precious metals and gems in the world is limited. That is probably for this reason that the price is only increasing with time. By investing your money in buying jewelry, you protect your money from inflation, as the prices for precious metals and stones have very high growth rates. More advantage is that the jewelry have little damage and compared with other investments have greater safety.

To receive more timely response to the rapidly changing market environment or to response to the aggravation of the crisis, a range of activities to stabilize the demand for jewelry are offered:

- ❖ Development of marketing as a main factor affecting the demand (advertising, promotions, good price manipulation, etc.).

Positioning –is art of forming the image of the brand in the mind of the target audience in a way that it can be more favorably with competitors' brands. For example, the main goal of positioning of the jeweler can be to show price advantage in accordance with its competitors. Organization distributes advertising information concerning the coupon program, relatively low cost of products, as well as different ways to pay for jewelry (including credit). The company asserts quality of products and brand collections.

- ❖ Create an online store.

Creation of online jewelry store will save a lot of money necessary to organize off-line trade.

- ❖ Introduction of new services, such as "make decorations with their own hands." Such innovations will allow firm to be competitive during the crisis. Interest of potential buyer of such services will "outweigh" the desire to purchase this product in another jewelry store.

- ❖ Evaluation of elasticity of jewelry for the formation of optimum assortment of effective prices **Table. 3.1.**

**The coefficient of elasticity of jewelry**

Parameter	Name of product					
	Essemme Woman gold bracelet (weight: 19,05gm.)		Gold earrings with diamonds and emerald «Diana»		Fashion Gold earrings with semiprecious stones	
Cost of 1 jewelry	120000	100000	75000	50000	50000	30000



The number of sales per year	10	12	50	100	30	40
Total revenue	1200000	120000	3750000	5000000	1500000	1200000
Type of elasticity	Unit elasticity		High elasticity		Low elasticity	
Coefficient of elasticity	1		1,7		0,6	
	$E = \frac{Q_0 - Q_1}{Q_0 + Q_1} / \frac{P_1 - P_0}{P_1 + P_0}$ $E = \frac{2}{22} \times \frac{220000}{20000} = 1$		$E = \frac{Q_0 - Q_1}{Q_0 + Q_1} / \frac{P_1 - P_0}{P_1 + P_0}$ $E = \frac{50}{150} \times \frac{125000}{25000} = 1,7$		$E = \frac{Q_0 - Q_1}{Q_0 + Q_1} / \frac{P_1 - P_0}{P_1 + P_0}$ $E = \frac{10}{70} \times \frac{80000}{20000} = 0,6$	

Data from table. 3.1 suggest that the jewelry may have different elasticity, so it is necessary to control the response of potential buyers on the price change of each representatives of the investigated product.

After calculating elasticity it is useful to define a function that describes the relationship between price and demand. As mentioned earlier, the most simple one-factor demand function  $Q$  of the price  $P$  is linear function:  $Q = a_0 - a_1P$

It is not necessarily to use only simple functions that can not accurately describe the raw data, but according to which will have to make decisions in future. I offer several options to consider development of demand depending on price changes and market saturation, Appendix 3.

the entrepreneurs will be able to maintain or even increase the demand and jewelry buyers will save their money at the time when the factors ,affecting the demand for jewelry in crisis, change.

### **3.3 Trends and forecasts of demand for the jewelry market**

There are various methods to forecast demand.

Only few businesses apply quantitative methods. Most of them have only their experience, inference and intuition. It does not work always.

It is advisable to carry out research based on statistical data of your own organization and other organizations of the jewelry industry.

To construct mathematical models based on data about sales does not take a lot of time (for example, using Excel), but this is another way to prepare for crisis situations in the country. An example is given in Appendix 4.

Today, the picture of demand for jewelry in the current crisis is like this: Russian jewelry market is developing dynamically; it grew by 30% per year. This dynamic growth is largely explained by the growing prosperity of the population, allowing to spend money on luxury items, as well as the habit of our citizens to invest their savings in jewels.

The growth was strong at the beginning of crisis has began, but it will go down due to inability to pay of the general population. Demand may remain high for more expensive, exclusive, rare products that are truly reliable way to save money. With the end of crisis, market for jewelry will improve and growth in demand will be higher.

However, Russian jewelry industries do not fully use their potential.

Analysts of Russia jewelry business also produce a number of negative factors, which hold the further development of the jewelry business:

- Higher cost of production of the Russian manufacturers compared to similar products of foreign manufacturers due to applicable taxes and customs duties.
- A significant amount of smuggled and illegally manufactured jewelry in the Russian market.
- The growth of imports of jewelry in Russia is much higher than the growth rate of domestic producers
- Excessive government regulation of jewelry and other items made of precious metals.
- Weak development of self-regulatory mechanisms.
- Negative image of the jewelry market, created by the media

It is necessary to mention that there has been a growth in production and sales of jewelry, an upward trend in exports of jewelry and other items made of precious metals; a number of organizations and individual entrepreneurs engaged in entrepreneurial activity in the jewelry market is growing.

To summarize: positive factors largely influenced the development of the jewelry industry in the Russian Federation than the negative trends of the domestic and world market of jewelry. Also the growing price of gold has significantly influenced the expansion of the jewelry

market. This increase in price is very serious impact on the final retail price, which consequently leads to a significant drop in demand.

It should be noted that the Russian jewelry industry is one of the priority sectors of the Russian economy. From this it follows that a study of demand and investment for jewelry are needed not only in times of crisis but constantly. The strategy of development of the industry has to become one of the large-scale, national problems of state regulation.

## Conclusion

Theoretical analysis shows that investment activity is one of the most important conditions for the development of economy in general; also it is important for preserving and increasing funding. Without investments it is impossible to achieve growth objectives.

The investment market in times of crisis has certain characteristics which are necessary to take into account for the competent implementation of investments.

The study the features of demand for jewelry and precious metals during unstable economic conditions allow to adapt to rapidly changing market conditions, to respond to them safely and to optimize the implementation of their financial plans.

It is advisable to combine quantitative and qualitative methods of evaluation and analysis of demand for jewelry for optimal effect.

It is proved that it is profitable to open jewelry stores in the analysis of jewelry as a way to invest in times of economic crisis. Statistics has shown that demand for jewelry begins during economically difficult times. . Undoubtedly, gold jewelry and silver is an excellent investment to the future. These savings will be in demand at any time.

I have described the main ways of investing in precious metals.

For individuals and small investors the most appropriate way to invest in precious metals are unallocated metal accounts and coins made of precious metals.

Expanding the range of jewelry has led to the emergence of competition on the consumer market. Therefore, manufacturers have to improve the quality of products and improve their appearance, to pay great attention to raw materials, manufacturing processes of products, methods of storage and conditions of sale.

The level of welfare determines demand for jewelry on the market. Reducing welfare of people leads to a sharp decline in sales of jewelry. Scientists do not stop to repeat that the stock of precious metals and gems in the world is limited. That is probably for this reason that the price is only increasing with time.

Good to know that the price of 1 gram of gold in jewelry is much lower, compare to the price of gold bullion or bank gold coins. The reason lies in the quality, and specifically in the sample of gold. To tide gold bullion coins pure gold of higher test (999.9) is used, but to make jewelry alloys are used, that reduce the sample of the gold (585).

The question arises, where is it more profitable to invest money: to purchase jewelry or gold bullion and coins?

According to opinion of population, putting money in the purchase of jewelry are favorable among 15% of Russians.

According to experts, investing money into jewelry is justified only if they are in addition to cost have cultural or historical value. By investing your money in buying jewelry, you protect your money from inflation, as the prices for precious metals and stones have very high growth rates. More advantage is that the jewelry have little damage and compared with other investments have greater safety.

Jewelry is always at a price, it is not surprising that most people invest it in exclusive products with precious stones. These can be not only necklaces but also earrings, bracelets, brooches, watches and cufflinks.

Study of demand and investment jewelry during economic crisis led to the following conclusions.

- The majority of respondents noted that often turn their attention to advertising jewelry in glossy magazines.
- Slightly less than half of those surveyed people buy jewelry once a year.
- Preferences divided equally for the benefit of the quality of performance and the low price.
- A quarter of the respondents indicated that they choose jewelry according to its visual appearance.
- Two-thirds of respondents believe that the jewelry - a profitable investment. It can be concluded that the hypotheses from the beginning of the work are confirmed:
- The economic crisis reduces income; subsequently jewelry demand drops.
- The economic crisis increased demand for precious metals.
- The level of jewelry demand will rise during economic crisis if the offered goods in precious metals presented, and potential consumers see investment of their savings is in this product - the only way to save the accumulated funds.
- Even a small change in income will affect demand for luxury goods. Reducing consumption is now expressed in the refusal of the population to major shopping and luxury goods. The reasons for this are not waiting for lower prices but lack of money. This leads to an overall reduction in demand and, consequently, a reduction in production.

## Bibliography

1. Federal Law "On Precious Metals and Precious Stones" (in red. July 24, 2007).
2. Government Decree of May 15, 1999 537 "On the order of harmonization of the establishment of the State Fund of Precious Metals and Precious Stones of the Russian Federation."
3. Banking legislation of the Russian Federation Collection of federal legislation on banking law. Moscow, publishing house "Economy" in 2008.
4. Instruction of the Central Bank of the Russian Federation № 50 dated November 1, 1996 "Regulations on credit institutions committing transactions with precious metals in the Russian Federation and the procedure for conducting banking transactions with precious metals."
5. E.F. Avdokushin International economic relations - M.: Jurist, 2009.
6. Alexandrov Y.L Market research Consumer goods: Methodical bases of practice, the use of // Yu.L.Aleksandrov, N.N.Tereschenko; Krasnoyar. state. torg.-Econ. Inst. - Krasnoyarsk, 2000. - 320 p.
7. Alekseev I.S. Basics of precious metals, diamonds and jewelry: a tutorial // I.S.Alekseev. - M.: KNORUS 2009.
8. T. Ambler Practical Marketing / T. Ambler. - SPb.: Peter, 2000. - 213 p.
9. Crisis management / ed. A. Hraznova. - M.: INFRA-M, 2011. - 368 p.
10. Balabanov I.T. Precious metals and precious stones: operations on the Russian market. - M.: Finance and Statistics. - 2006. - 288 p.
11. Baldin K.V. Crisis management: macro- and micro-level: Textbook / K.V. Baldin. - M.: Publishing and Trading Corporation "Dashkov I. K", 2011. - 316 p.
12. Bachilo S.V. Esinova I.V., Mishin L.A., 2009. Direct Marketing: Ucheb. Allowance. Moscow: Dashkov I.K.
13. Borodulin L.P. International economic organizations: Textbook. Manual // Borodulin L.P., Kudryashov I.A., Yurga V.A. - M.: Ekonomist, 2010.
14. Voronina L.A., Ratner S.V. An innovative way of development of the Russian economy // Finance and Credit. - 2006. - №12. - p.40-46.
15. Competitive T. Voronov of Russia's position in the global investment market // // T. Voronov Ekonomist. 2008-№9.- with. 38-44.
16. Dronova N.D. Jewellery: Directory - Encyclopedia // N.D.Dronova. - M.: Economics, 2007. - 98 p.
17. Dumoulin I.I. World Trade Organisation. - M.: Economics, 2010.
18. Evsenko O.S. Investments in the questions and answers. [Text]: Textbook TC Welby, Prospect 2008 - 256 p.

19. Ivanov G.I. Investments: the nature, types, mechanisms of functioning. Text: G.I. Ivanov - Rostov n / D: Phoenix, 2007.
20. Investments in precious metals: Prospects // Jewellery Russia, № 91, 2009. - From. 4-5.
21. Klochkova N.V. Russia's economic development: institutions, infrastructure, innovation, investment [Text]: Scientific Thought, 2010. 360p.
22. Korniyukhina N.B. Sources of investment resources in Russia / NB Korniyukhina // EKO. 2007-№1.-p. 76-85.
23. F. Kotler Principles of Marketing. Moscow: Progress - 2002.
24. F. Kotler Marketing in the Third Millennium: How to create, win and retain market / Kotler - M.: AST Publishing, 2009, 230 p.
25. Milner B. Organization Theory: a textbook. / BZ Milner. - M.: INFRA-M, 2002. - 558 p.
26. Mordovina I.A. Development of the Russian gold market and improve the banks' operations with precious metals. - Kursk: Publishing House of the Regional Financial and Economic Institute of the 2008.
27. Practical Marketing / T. Ambler. - SPb.: Peter, 2000. - 213 p.
28. Rodionova N.V. Crisis management / NV Rodionova.- M.: UNITY-DANA, 2011. - 680 p.
29. Roger C. Gibson, "The formation of the investment portfolio: Management of financial risks" Publisher: Alpina Publisher, 2015, ISBN 978-5-9614-5147-4, 5-9614-0169-3, 978-5-9614-0775-4; 2015
30. Romanov LF Modern jewelry. - M.: 2004.
31. V. Timiryazev jewelry market and its development // // B. Timiriayev commodity market trends. - 2014. - № 3. - p. 15-19.
32. Wells, William Advertising: principles and practice / William Wells, D. Burnett, S. Moriarty. - St. Petersburg, 1999. - 270 p.
33. Prices and pricing Ed. V.E. Esipova: Textbook for Universities, 3rd ed. St. Petersburg: Publishing "Peter", 1999. 464s. ISBN5-8046-0104-0
34. Jewelry manufacture of gold in Russia has declined // Jewellery Russia, № 92, 2009. - p. 4-5.
35. Diamond Jewelry: income elasticity of demand and price. Nepsha V.I., Okoemov Y.K., Tsvetkov N.V., the magazine "Marketing in Russia and abroad" №2 year - 2003
36. O. Galician Gems: Investors Council [electronic resource]. - Access: <http://www.prostobank.ua/depozity>.
37. How to overcome the crisis. Science saving science to risk. Simple Tips. Mikhail Delyagin [electronic resource]. - ISBN 978-5-17-058456-7, 978-5-271-23360-9; 2009
38. Open the base of visitors - [Electronic resource]. -<http://standartgost.ru>

39. A report of the World Gold Council, "Trends in demand for gold in 2012," 03.03.2013. [Electronic resource]. - [Http://uvelir.info/articles/44929/](http://uvelir.info/articles/44929/)
40. Estimation of consumer properties and cost of jewelry - [www.sakhatransneftegas.ru](http://www.sakhatransneftegas.ru)
41. Market gems in Baltic countries [electronic resource]. - Access: <http://www.jewellerynews.ru/process/news.html?id=5606>.
42. Consumer demand for jewelry in the world [http: // World Gold Council \(WGC\)](http://www.wgcouncil.com), 2014, Table 5, RBC.research
43. The Russian jewelry market. Marketing research. Moscow, September, 2007. [http://www.inventica.ru/files/mr\\_003\\_demo.pdf](http://www.inventica.ru/files/mr_003_demo.pdf)
44. Jewelry as a good investment. [Electronic resource]. - 07.05.2014. <http://www.048.ua/article/569668>
45. Shishlo Alex "about the realities and the potential of the Indian jewelry market" 03.03.2011 [electronic resource]. - [Http://uvelir.info/articles/30486/](http://uvelir.info/articles/30486/)
46. <http://www.gks.ru/> (Official website of the Federal State Statistics Service)
47. Official web-site of London bullion metal association - [www.lbma.org.uk](http://www.lbma.org.uk)



# Appendices

## Appendix 1

### Survey: demand for jewelry

Please mark the appropriate response to the questions or write your own version (where necessary). The survey is anonymously.

**1.** At which products do you usually pay attention when it is advertisement in magazines?

- Perfumery
- Cars
- Jewelry
- Accessories
- Cosmetics

**2.** Do you have desire to buy a piece of jewelry not only because of advertising?

- Yes
- No

**3.** How often do you buy jewelry?

- Several times a year
- 1 time per year
- 1 time per quarter
- Once in 3 - 4 years

**4.** Which manufacturers for jewelry do you prefer?

- Domestic
- Foreign

**5.** What are the factors you choose jewelry in stores?

- A wide range
- High quality
- Pleasant environment
- Polite staff
- Low price

**6.** Depending on the completeness, which jewelry do you prefer?

- Single
- As a complement

**7.** Based on which criteria do you choose jewelry:

- Appearance
- Size

- Fashion line
- Price
- Construction
- Weight
- The presence of the insertion of stones
- Other

**8.** Do you consider jewelry as one of the options for investment?

- Yes
- No

**9.** Your age:

- 10-18 years
- 19-30 years
- 31-50 years
- Over 51 years.

**10.** Your average monthly income per 1 person:

- Up to 21,000 rubles.
- 21001-37500 rubles
- More than 37 501 rubles

Comparison table, compiled based on the results of the survey.

№	Question	Number of respondents	Respondents %
1	At which products do you usually pay attention when it is advertisement in magazines? - Perfumery - Cars - Jewelry - Accessories - Cosmetics	14 27 34 14 11	14 27 34 14 11
2	Do you have desire to buy a piece of jewelry not only because of advertising? - Yes - No	71 29	71 29
3	How often do you buy jewelry? - Several times a year - 1 time per year - 1 time per quarter - Once in 3 - 4 years	28 42 24 6	28 42 24 6
4	Which manufacturers for jewelry do you prefer? - Domestic - Foreign	58 42	58 42
5	What are the factors you choose jewelry in stores? - A wide range - High quality - Pleasant environment - Polite staff -Low price	25 30 7 9 29	25 30 7 9 29
6	Depending on the completeness, which jewelry do you prefer?		

	- Single	93	93
	- As a complement	7	7
7	Based on which criteria do you choose jewelry:		
	- Appearance	25	25
	- Size	17	17
	- Fashion line	6	6
	- Price	21	21
	- Construction	15	15
	- Weight	3	3
	- The presence of the insertion of stones	13	13
	- Other	-	-
8	Do you consider jewelry as one of the options for investment?		
	- Yes	62	62
	- No	38	38
<b>Information about respondents</b>			
1	Your average monthly income per 1 person:		
	- Up to 21,000 rubles.	9	9
	- 21001-37500 rubles	71	71
	- More than 37 501 rubles	20	20
2	Your age:		
	- 10-18 years	14	14
	- 19-30 years	54	54
	- 31-50 years	25	25
	- Over 51 years	7	7

## Appendix 3

There are data which characterize the dynamics of demand depending on the price:

<u>y - demand</u>	<u>x - price</u>
35,4	18,1
36,2	17,4
36,8	17,1
37,1	16,8
37,7	16,3
37,9	16,1

Investigate further behavior of demand, if prices continue to fall.

Solving similar problems basically consists of four consecutive and at the same time interconnected stages: analysis of the initial information, thus determining the trends of the system behavior; choice of mathematical forms; solution of the system; analysis of the solutions of the system, therefore, discussion for specific conclusions and recommendations.

**Step 1:** Analysis of the data. Analysis of the data gives evidence that the demand increases and price decreases. The level of growth for demand is about 7.1%, and the decline in prices - 11.0%.

So, with lower prices demand increases, the rate of decline in prices higher than the increase in demand

**Step 2:** Selecting the connection., this dependence is inversely proportional,  $y = a + \frac{b}{x}$ ,

Where

$y$  - demand;

$x$  - the price;

$a$  and  $b$  - the parameters of the system;

**Step 3:** The solution of the system. Write a system of standard equations:

$$\begin{cases} \sum y = na + b \sum \frac{1}{x} \\ \sum y \frac{1}{x} = a \sum \frac{1}{x} + b \sum \frac{1}{x^2} \end{cases} \quad (1)$$

To solve the system (1) we create a supporting table.

**For solutions of  $a$  and  $b$**

N <sup>o</sup>	y	x	$\frac{1}{x}$	$y\frac{1}{x}$	$x^2$	$\frac{1}{x^2}$	$x \cdot y$	$y^2$
1	35,4	18,1	0,055	1,96	327,61	0,003	640,74	1253,16
2	36,2	17,4	0,057	2,08	302,76	0,003	629,88	1310,44
3	36,8	17,1	0,058	2,15	292,41	0,003	629,28	1354,24
4	37,1	16,8	0,060	2,21	282,24	0,004	623,28	1376,41
5	37,7	16,3	0,061	2,31	265,69	0,004	614,51	1421,29
6	37,9	16,1	0,062	2,35	259,21	0,004	610,19	1436,41
$\Sigma$	221,1	101,8	0,353	13,06	1729,9	0,021	3747,9	8151,95

Based on the data from the table , prepare the standard system of equations in terms of numbers

$$\begin{cases} 221,1 = 6a + 0,353b \\ 13,06 = 0,353a + 0,021b, \end{cases}$$

Solving the system, we have:

$$y = 18,61 + \frac{310}{x}.$$

In order to predict possible changes in demand, we calculate the quantitative characteristics of the demand on the basis of the resulting function

$$y_{t_1} = 18,61 + \frac{310}{18,1} = 18,61 + 17,13 = 35,74;$$

$$y_{t_2} = 36,43; y_{t_3} = 36,74;$$

$$y_{t_4} = 37,04; y_{t_5} = 37,63; y_{t_6} = 37,86.$$

Thus, demand is increasing. The growth rate is 6.0%, i.e. the growth rate is lower by 1.0% compared with the predetermined demand function.

In this case, the correlation coefficient  $r = 0,84$ ;  $D_r = 70.6\%$

**Conclusion.** Increased demand from 36.43 to 37.86 units, i.e., 6.0% is suitable at 70.6%.

In 29.4% output relative decreases in demand.

**Example 2:** There are data characterizing the sequence of changes in demand (y) depends on two factors: x (Price), z (the saturation of the consumer market).

$$\begin{array}{ll} y_{(\text{demand})} & \{29,4; 29,9; 30,1; 30,4; 30,9; 31,4\}; \\ x_{(\text{price})} & \{28,3; 31,2; 33,5; 36,4; 37,5; 38,8\}; \\ z_{(\text{saturation})} & \{84,5; 85,6; 86,9; 87,8; 89,5; 90,8\}. \end{array}$$

The data tells us that demand increases, the growth rate is 6.8%. Increase prices, as well as the saturation of the consumer market, although market saturation does not exceed 100%.

It is required to evaluate the behavior of demand in the future.

There is reason to believe that this relationship is directly proportional to the nature of the following:  $y = a + bx - cz$

Create system of equations:

$$\begin{cases} \sum y = na + b \sum x - c \sum z \\ \sum xy = a \sum x + b \sum x^2 - c \sum xz \\ \sum xyz = a \sum xz + b \sum zx^2 - c \sum xz^2 \end{cases}$$

To solve the system I create a table.

Then write a standard system of equations in terms of numbers:

$$\begin{cases} 182,1 = 6a + 205,7b - 525,1z \\ 6256,88 = 205,7a + 7133,23b - 18048,43c \\ 549273,38 = 18048,43a + 627410,01b - 1584539,83c \end{cases} \begin{array}{l} : 6 \\ : 205,7 \\ : 18048,43 \end{array}$$

We get:

$$\begin{cases} 30,35 = a + 34,2833b - 87,5166c & (1) \\ 30,4175 = a + 34,6778b - 27,7415c & (2) \\ 30,4333 = a + 34,7625b - 87,79993c & (3) \end{cases}$$

(2) - (1)  
(2) - (3)

$$\begin{cases} 0,10675 = 0,3945b - 0,2249c & : 0,3945 \\ -0,0158 = -0,0847b + 0,578c & : -0,0847 \end{cases}$$

$$\begin{cases} 0,1711 = b - 0,5701c \\ 0,1865 = b - 0,6729c \end{cases}$$

We get:  $c = -0,18$ ;  $b = 0,16$ ;  $a = 29,3$ .

We have:  $y = 29,3 + 0,16 + 0,18z$ .

So:

$$\begin{aligned} y_{t(1)} &= 29,3 + 0,16 + 0,18 = 29,64; \\ y_{t(2)} &= 29,3 + 0,16 \cdot 2 + 0,18 \cdot 2 = 29,98; \\ y_{t(3)} &= 30,32; & y_{t(4)} &= 30,66 \\ y_{t(5)} &= 31,0; & y_{t(6)} &= 31,34. \end{aligned}$$

Thus, demand function increases from 29.64 to 31.34, i.e. 5.7%. In this case, the multiple correlation coefficient  $R_{y(x,z)} = 0,91$ ;  $D_R = 82,8\%$ .

**Conclusion.** Given the incomplete saturation of the consumer market with rising prices, an increase in output will go up by 5.7%. This conclusion is adequate to the level of 82.8%.



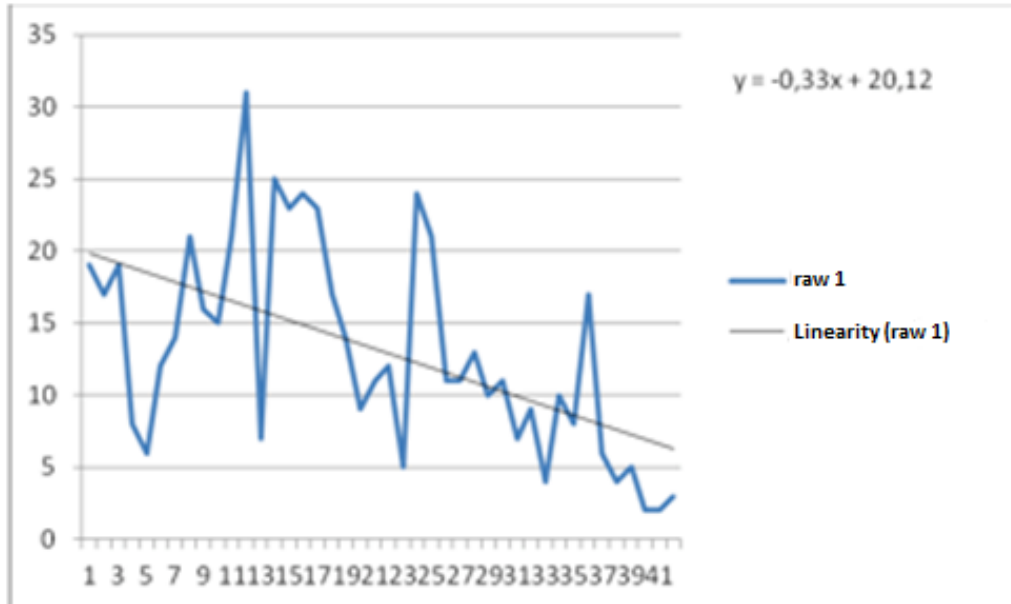
**Forecast for demand for jewelry of Sergiev Posad ,category B (from 2500 to 5000 rubles.)**

January 2012	19
February2012	17
March2012	19
April 2012	8
May 2012	6
June 2012	12
July 2012	14
August 2012	21
September 2012	16
October2012	15
November 2012	21
December2012	31
January2013	7
February 2013	25
March2013	23
April 2013	24
May 2013	23
June 2013	17
July 2013	14
August 2013	9
September 2013	11
October2013	12
November 2013	5
December2013	24
January2014	21
February 2014	11
March2014	11
April 2014	13
May2014	10
June2014	11
July 2014	7
August 2014	9
September 2014	4
October2014	10
November 2014	8
December2014	17
January2015	6
February 2015	4
March2015	5
April 2015	2
May2015	2
June 2015	3

Building an application package via Excel chart and then select by the right-click the line of the resulting statistics, choose a function to describe the raw data and set "box" to show the equation on the chart.

To the resulting equation instead of t (time) we substitute the value of the months  
Thus, we get the predicted value of the demand.

In our case, the construction of a linear function, obtain the schedule



There is equation:  $y = -0,33 \cdot x + 20,12$

Substitute for x (t "time") the number of the next month, that is 43, we get:

$$y = -0,33 \cdot 43 + 20,12 = 5,93$$

Rounding and get a predicted value of 6.