HACETTEPE UNIVERSITY INSTITUTE OF POPULATION STUDIES

Demography Program

FUTURE POPULATION AND DEVELOPMENT CHALLENGES OF NORTH ANATOLIA REGION

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Demography Program

FUTURE POPULATION AND DEVELOPMENT CHALLENGES OF NORTH ANATOLIA REGION

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ANKARA, SEPTEMBER 2014

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I dedicate this thesis to my mother and father

for their constant support and unconditional love.

I love you dearly.

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ABSTRACT

Future Population and Development Challenges of North Anatolia Region

The demographic compositions of the provinces of Kastamonu, Çankırı and Sinop, which have embodied significant number of populations since the beginning of the Turkish Republic, have started to change with the effects of out migration and low fertility levels. Intense migratory movements directed towards metropolises in Turkey, which started in the 1950's, have occurred in the region as well and thus the productive population and dynamism of the region have decreased with time. Through the abandonment of the fertility encouraging (pro-natalist) policies, with the effects of ever-decreasing fertility rates since the 1980's, the decreased population brings about the ageing problem. Rural ageing, which is emphasized with the effects of rural flight, constitutes a significant problem in the region. North Anatolia Region has the highest elderly dependency ratios among other NUTS 2 regions in Turkey. The decline and/or changing composition of a population initially affects the economic structure as well as social and urban structures of the region. TR82 Region with its stationary population and unindustrialized economic outlook partially maintains the features of a traditional society.

The purpose of this study is to investigate the future population structure of TR82 Region, which is consisted of Kastamonu, Çankırı and Sinop provinces, based on the structure of the current population and thus make some inferences regarding development. The structure and features of the future population were acquired by deterministic population projections built upon, three different scenarios, namely; low, medium and high variants. With these findings, three challenges appear in North Anatolia Region: Employment, agricultural production and urbanization. The study also provides some policy proposals towards reducing the effects of these challenges.

Key Words: North Anatolia Region, TR82, Population and Development, Population Projection

ÖZET

Kuzey Anadolu Bölgesi'nin Gelecekteki Nüfus ve Kalkınma Sorunları

Cumhuriyetin başından itibaren önemli sayıda nüfusları bünyesinde barındırmış Kastamonu, Çankırı ve Sinop illeri, zaman içinde gözlemlenen dışarıya göçün ve düşük doğurganlık seviyelerinin etkisiyle demografik anlamda değişmeye başlamıştır. Türkiye'de içgöçlerin başladığı 1950'li yıllardan itibaren başta kent merkezleri ve büyükşehirlere yönelen yoğun göçler, bölgede de yaşanmış, sonuç olarak bölgenin üretken nüfusu ve dinamizmi zamanla azalmıştır. Doğurganlığı teşvik eden (pro-natalist) politikaların terkedilmesiyle birlikte özellikle 1980'li yıllardan bu yana sürekli düşen doğurganlık düzeylerinin de etkisiyle azalan nüfus, beraberinde yaşlanma problemini de getirmiştir. Kırsal nüfusun boşalması ile etkisi daha fazla görülen kırsal yaşlılık, bölgede önemli bir problem oluşturmaktadır. Türkiye'de yer alan Düzey 2 bölgeleri arasında yaşlı bağımlılık oranlarının en fazla olduğu yer Kuzey Anadolu Bölgesi'dir. Nüfusun azalması ve/veya kompozisyonunun değişmesi başta ekonomik yapı olmak üzere sosyal ve kentsel yapıyı da etkilemektedir. Dinamik olmayan nüfus yapısı ve sanayileşmemiş ekonomik görünümüyle TR82 (Kuzey Anadolu) Bölgesi geleneksel toplum özelliklerini kısmen de olsa muhafaza etmektedir.

Bu çalışmanın amacı Kastamonu, Çankırı ve Sinop illerinden oluşan TR82 (Kuzey Anadolu) Bölgesi'nin mevcut nüfus yapısından yola çıkarak gelecekteki nüfus yapısını araştırmak ve buradan hareketle bazı kalkınma çıkarımlarında bulunmaktır. Düşük, orta ve yüksek varyantlarla üç farklı senaryoya göre kurgulanan deterministik nüfus projeksiyonları ile bölgenin gelecekte sahip olacağı nüfusun yapısı ve özellikleri elde edilmiştir. Buradan hareketle gelecekte Kuzey Anadolu Bölgesi'nde üç temel sorun ortaya çıkacaktır: İstihdam sorunu, tarımsal üretim sorunu ve kentleşme sorunu. Çalışma, bu sorunların gelecekteki etkisinin azaltılmasına yönelik bazı politika önerileri de sunmaktadır.

Anahtar Kelimeler: Kuzey Anadolu Bölgesi, TR82, Nüfus ve Kalkınma, Nüfus Projeksiyonu

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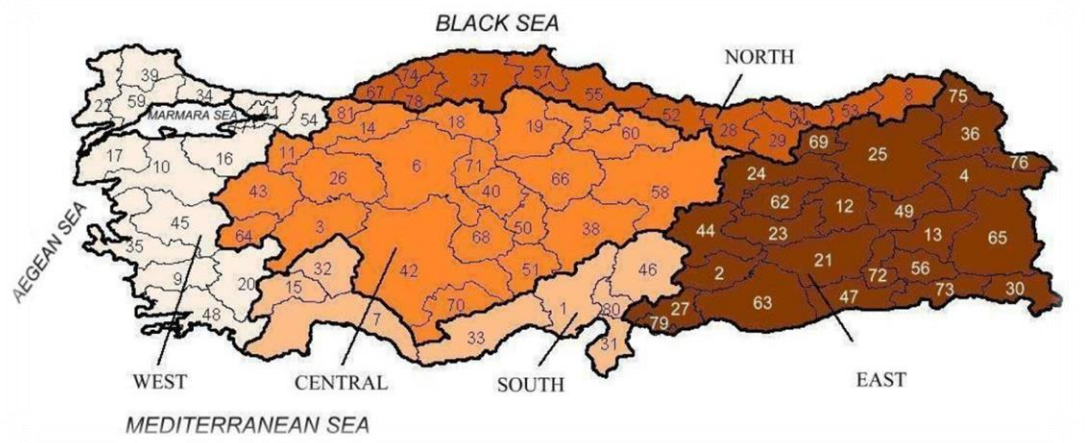
LIST OF ABBREVIATIONS

ABPRS	Address Based Population Registration System
ASFR	Age Specific Fertility Rate
AVG	Average
CBR	Crude Birth Rate
CDR	Crude Death Rate
DESA	United Nations Department of Economic and Social Affairs
GDP	Gross Domestic Product
HIPS	Hacettepe University Institute of Population Studies
IEDC	International Economic Development Council
IIASA	International Institute for Applied Systems Analysis
IMR	Infant Mortality Rate
LFP	Labor Force Participation
NRDS	National Rural Development Strategy
NUTS	Nomenclature of Units for Territorial Statistics
OIZ	Organized Industrial Zone
PRB	Population Reference Bureau
SIS	State Institute of Statistics (Now Turkish Statistical Institute, TurkStat)
SPO	State Planning Organization (Now Ministry of Development)
TFR	Total Fertility Rate
TR	Turkish Republic
TR82	North Anatolia Region of Turkey, comprises Kastamonu, Çankırı and Sinop
TurkStat	Turkish Statistical Institute (Former State Institute of Statistics, SIS)
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
WB	World Bank

REGIONS AND MAPS OF TURKEY

Map 1: Five Demographic Regions of Turkey

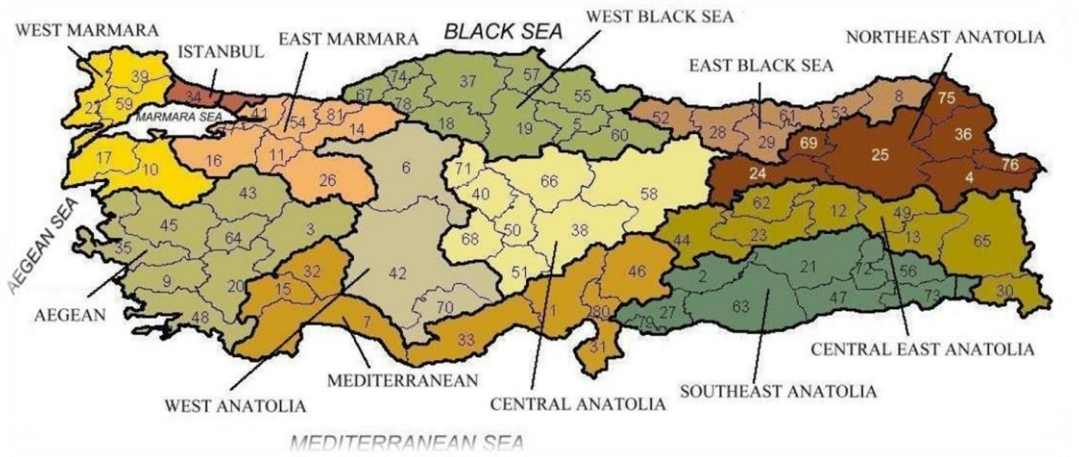


Source: (HIPS, 2009a)

Regions and Provinces

01 WEST	**02 SOUTH**	**03 CENTRAL**	**04 NORTH**	**05 EAST**
09 Aydın	01 Adana	03 Afyon	08 Artvin	02 Adıyaman
10 Balıkesir	07 Antalya	05 Amasya	28 Giresun	04 Ağrı
16 Bursa	15 Burdur	06 Ankara	29 Gümüşhane	12Bingöl
17 Çanakkale	31 Hatay	11 Bilecik	37 Kastamonu	13 Bitlis
20 Denizli	32 Isparta	14 Bolu	52 Ordu	21 Diyarbakır
22 Edirne	33 İçel	18 Çankırı	53 Rize	23 Elazığ
34 İstanbul	46 K. Maraş	19 Çorum	55 Samsun	24 Erzincan
35 İzmir	80 Osmaniye	26 Eskişehir	57 Sinop	25 Erzurum
39 Kırklareli		38 Kayseri	61 Trabzon	27 Gaziantep
41 Kocaeli		40 Kırşehir	67 Zonguldak	30 Hakkari
45 Manisa		42 Konya	74 Bartın	36 Kars
48 Muğla		43Kütahya	78 Karabük	44 Malatya
54 Sakarya		50 Nevşehir		47 Mardin
59 Tekirdağ		51 Niğde		49 Muş
77 Yalova		58 Sivas		56 Siirt
		60 Tokat		62 Tunceli
		64 Uşak		63 Şanlıurfa
		66 Yozgat		65 Van
		68 Aksaray		69 Bayburt
		70 Karaman		72 Batman
		71 Kırıkkale		73 Şırnak
		81 Düzce		75 Ardahan
				76 Iğdır
				79 Kilis

Map 2: 12 (NUTS 1) Regions of Turkey



Source: (HIPS, 2009a)

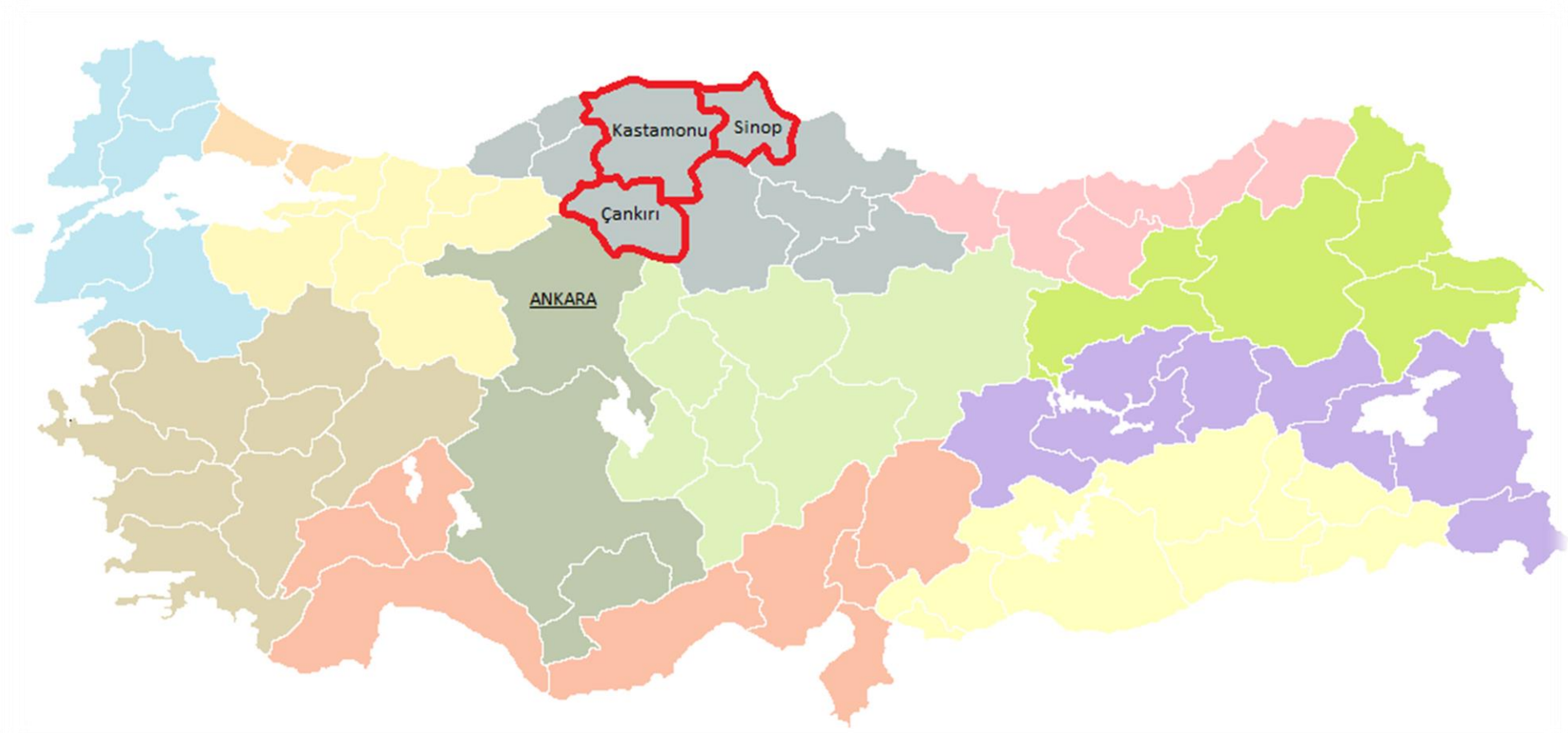
Regions and Provinces

01 İSTANBUL	**04 EAST MARMARA**	**06 MEDITERRANEAN**	**08 WEST BLACK SEA**	**10 NORTHEAST ANATOLIA**	**12 SOUTHEAST ANATOLIA**
34 İstanbul	11 Bilecik	01 Adana	05 Amasya	04 Ağrı	02 Adıyaman
	14 Bolu	07 Antalya	18 Çankırı	24 Erzincan	21 Diyarbakır
02 WEST MARMARA	16 Bursa	15 Burdur	19 Çorum	25 Erzurum	27 Gaziantep
10 Balıkesir	26 Eskişehir	31 Hatay	37 Kastamonu	36 Kars	47 Mardin
17 Çanakkale	41 Kocaeli	32 Isparta	55 Samsun	69 Bayburt	56 Siirt
22 Edirne	54 Sakarya	33 İçel	57 Sinop	75 Ardahan	63 Şanlıurfa
39 Kırklareli	77 Yalova	46 K. Maraş	60 Tokat	76 Iğdır	72 Batman
59 Tekirdağ	81 Düzce	80 Osmaniye	67 Zonguldak		73 Şırnak
			74 Bartın	**11 CENTRAL EAST ANATOLIA**	79 Kilis
03 AEGEAN	**05 WEST ANATOLIA**	**07 CENTRAL ANATOLIA**	78 Karabük	12Bingöl	
03 Afyon	06 Ankara	38 Kayseri		13 Bitlis	
09 Aydın	42 Konya	40 Kırşehir	**09 EAST BLACK SEA**	23 Elazığ	
20 Denizli	70 Karaman	50 Nevşehir	08 Artvin	30 Hakkari	
35 İzmir		51 Niğde	28 Giresun	44 Malatya	
43Kütahya		58 Sivas	29 Gümüşhane	49 Muş	
45 Manisa		66 Yozgat	52 Ordu	62 Tunceli	
48 Muğla		68 Aksaray	53 Rize	65 Van	
64 Uşak		71 Kırıkkale	61 Trabzon		

Table 1: Regional Distribution between NUTS 1 and NUTS 2 in Turkey

12 Region	**NUTS 1**	**26 Region**	**NUTS 2**
1. Istanbul	TR1	1. İstanbul	TR10
2. West Marmara	TR2	2. Tekirdağ, Edirne, Kırklareli	TR21
		3. Balıkesir, Çanakkale	TR22
3. Aegean	TR3	4. İzmir	TR31
		5. Aydın, Denizli, Muğla	TR32
		6. Kütahya, Manisa, Afyon, Uşak	TR33
4. East Marmara	TR4	7. Bursa, Eskişehir, Bilecik	TR41
		8. Kocaeli, Sakarya, Düzce, Bolu, Yalova	TR42
5. West Anatolia	TR5	9. Ankara	TR51
		10. Konya, Karaman	TR52
6. Mediterranean	TR6	11. Isparta, Antalya, Burdur	TR61
		12. Adana, Mersin	TR62
		13. Hatay, Kahramanmaraş, Osmaniye	TR63
7. Central Anatolia	TR7	14. Nevşehir, Kırıkkale, Aksaray, Niğde, Kırşehir	TR71
		15. Kayseri, Sivas, Yozgat	TR72
8. West Black Sea	TR8	16. Zonguldak, Karabük, Bartın	TR81
		17. Kastamonu, Çankırı, Sinop	TR82
		18. Samsun, Tokat, Amasya, Çorum	TR83
9. East Black Sea	TR9	19. Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	TR90
10. North-east Anatolia	TRA	20. Erzurum, Erzincan, Bayburt	TRA1
		21. Kars, Ağrı, Iğdır, Ardahan	TRA2
11. Central-east Anatolia	TRB	22. Malatya, Elazığ, Bingöl, Tunceli	TRB1
		23. Van, Muş, Bitlis, Hakkâri	TRB2
12. South-east Anatolia	TRC	24. Gaziantep, Adıyaman, Kilis	TRC1
		25. Diyarbakır, Şanlıurfa	TRC2
		26. Mardin, Batman, Şırnak, Siirt	TRC3

Map 3: NUTS 2 Level Regions and TR82 Region in Turkey



Source: Wikipedia

CHAPTER I - INTRODUCTION

The aim of this part is making an introduction to the main concepts and facts that are relevant for the study. For the sake of this, some definitions and insights are provided. This part is crucial to understand the fundamentals of the study.

1.1. INTRODUCTION TO POPULATION AND DEVELOPMENT

1.1.1. Definition of Demography

In a basic way, demography can be defined as a science which deals with populations. Expressions of the population may vary. A population is generally defined as a set of unspecified individual elements meeting a single definition (Caselli, Vallin, & Wunsch, 2006, p. ii). One can assert that every similar living unit may constitute a population such as, kindred people in a society, similar animal groups in a habitat and similar bacteria in a specific culture. Since populations are the main study area of demography, it can be said that especially human, animal and plant populations are significant agents of demography. A comprehensive definition of demography is as follows:

Demography is a science concerned with the analysis of size, distribution, structure, characteristics and processes of a population (Weeks, 1994, p. 25).

Considering the early studies on demography, the foundation and evolution of demography have been developed through human population studies (Graunt, 1939 Org:1665). Most of the other topics can be counted as contemporary. Accordingly, in a human based point of view:

Demography is the scientific study of human population, including its size, distribution, composition, and the factors that determine changes in its size, distribution, and composition. From this definition we can say that demography focuses on five aspects of human population: (1) size, (2) distribution, (3) composition, (4) population dynamics, and (5) socioeconomic determinants and consequences of population change (Siegel & Swanson, 2004, p. 1).

Demography is the social science that studies 1) the size, composition, and distribution of the human population of a given area at a specific point in time; 2) changes in population size and composition; 3) the components of these changes (fertility, mortality, and migration); 4) the factors that affect these components; and 5) the consequences of changes in population size, composition, and distribution, or in the components themselves. Demography may be defined as the scientific study of the size, composition, and distribution of human populations and their changes resulting from fertility, mortality, and migration (Poston & Bouvier, 2010, p. 3).

According to given various definitions, it is clear that:

- Demography is a scientific activity,
- Demography studies populations but mostly human populations,
- Demographic study of human population is mostly related with size, composition and development of populations,
- And finally there are three main factors which affect human population: Fertility, mortality and migration.

Consequently, another but very similar definition is: *"Demography is a scientific activity which mostly studies human populations' size, composition and development through the following vital processes: Fertility, mortality and migration."*

1.1.2. Definition of Development

The concept of development has been started to use after World War II. However, much earlier, economic science dealt with this issue and it was mostly used as "advancement" instead of development. The process that was tried to be conceptualized by both Adam Smith's "material progress" and John Stuart Mill's "economic progress" can be identified as development (Mıhçı, 1996, p. 1).

McNicoll defines economic development as a structural transformation of human society from subsistence economy to urban-industrialism, and to the sustained rise in productivity and income that results. He also asserts that development is commonly taken to mean economic development (McNicoll, 2013, p. 3)

One can consider the development in terms of objectives. New employment opportunities, increasing life quality, increasing production productivity are some of them. According to the International Economic Development Council (IEDC), economic development can also be described as a process that influences growth and restructuring of an economy to enhance the economic well-being of a community. IEDC claims that, economic development encompasses three major areas:

- *Policies that government undertakes to meet broad economic objectives including inflation control, high employment, and sustainable growth.*
- *Policies and programs to provide services including building highways, managing parks, and providing medical access to the disadvantaged.*
- *Policies and programs explicitly directed at improving the business climate through specific efforts, business finance, marketing, neighborhood development, business retention and expansion, technology transfer, real estate development and others* (International Economic Development Council, p. 3).

It can be said that the main objective of economic development is improving the economic and social stance of a community. The definition of the development is varying. Moreover, there isn't any single receipt for it. Communities have their own features and therefore require different solutions. Consequently, it can be implied that each society needs a unique set of challenges to deal with development.

Economic development is a long run process and has many aspects. Sen asserted that economic growth is one aspect of the process of economic development (Sen, 1983). Moreover, one can claim that social-cultural development, infrastructural progression and supportive policies are also important components of economic development. Modernization, westernization, and especially industrialization are other terms people have used when discussing economic development.

It is clear that development is a dynamic process. Since it cannot be understood solely by economic changes, recently, social components have been added to its structure. The purpose of this part is not to separate and argue the different meanings of economic development but to provide a broad view of development and put the population inside it. The author of these lines believed that with its quality and quantity, population is one the most important components of development.

1.1.3. Theories of Development

Evolution of the development can be best understood through the important theories. Indeed theories have shortcomings and receive a lot of criticisms. The purpose of this part is not to discuss all the development theories in depth but to provide a general view of the prominent development theories. Considering the development theories that will be introduced, it is possible to give insights about a relevant study in the field of demography.

Todaro and Smith point out that the post–World War II literature on economic development has been dominated by four[1] major strands of thought: (i) the linear stages of growth model, (ii) theories and patterns of structural change, (iii) the international dependence revolution, and (iv) the neoclassical, free-market counterrevolution (Todaro & Smith, 2011, p. 110).

Rostow's model of the stages of economic development and the Harrod-Domar growth model can be classified in the first group, the linear stages of growth model that have been mentioned in the previous paragraph. Rostow sees development as a series of steps or stages. According to Rostow's model, there are five stages that all countries must pass: (i) traditional society, (ii) preconditions for take-off, (iii) take-off, (iv) drive to maturity and finally (v) age of high mass consumption (for details see Rostow, 1960).

The Harrod-Domar growth model suggests a functional economic relationship in which the growth rate of gross domestic product depends directly on the national net savings rate and inversely on the national capital-output ratio (Todaro & Smith, 2011, p. 112). It can be understood from the model that growth depends on labor and capital. Increasing investments stimulate capital accumulation and therefore generate economic growth (for details see Todaro & Smith, 2011)

1 Another but similar classification could be used which divides development theories into three; i) theories based on classic, neo-classic and Keynesian approaches ii) dependency theories and finally iii) endogenous development theories. Theory of vicious circle (R. Nurkse), symmetric growth theory (J.M. Fleming, P.N. Rodenstein-Rodan, Z. Eckstein), asymmetric growth theory (A. Hirschman, T. Scitovsky), Harrod-Domar model of development (R.F. Harrod and E.D. Domar), model of the stages of economic development (W.W. Rostow), structural change theory (A.G. Fisher and C. Clark), theory of trickle down or dual sector model of development (A.Lewis) and finally the Coale and Hoover Thesis (A.J. Coale and E.M. Hoover) can be regarded as theories based on classic, neo-classic and Keynesian approaches. Moreover, structuralist (R. Prebisch, H.W. Singer) and neo-Marxist Thesis (P. Baran, A. Emmanual, A.G. Frank, S. Amin, P. M. Sweezy, I. Wallerstein) can be considered as dependency theories. Finally, relatively new theories can be identified as endogenous development theories (D. Rodrik, R. Barro, P.M. Romer, R.E. Lucas, G.M. Grossman, E. Helpman).

The Lewis model and patterns of development analysis can be classified in the structural change theory. The Lewis model, sometimes referred as the "dual sector model", draws an economy with two sectors. Namely, traditional subsistence sector (can be considered as agriculture) and a modern (can be regarded as industry) sector. If the modern sector expands, it requires more labor and therefore attracts the surplus labor from the inefficient traditional sector (for details see Lewis, 1954). Briefly, the Lewis model asserts that surplus labor from the traditional agricultural sector is transferred to the modern industrial sector, the growth of which absorbs the surplus labor, promotes industrialization, and stimulates sustained development (Todaro & Smith, 2011, p. 115).

Another structural analysis under the structural change theory is the analysis of patterns of development. This empirical approach suggests a transformation from agriculture to industry and services. According to this study, development shows certain patterns and accordingly, the pattern that an economy will follow depends on its size and structure (for details see Chenery, 1960). For transition from traditional to a modern economic stance, some other components are also required besides capital accumulation, such as changes in the consumer demand, international trade, resource use, urbanization and population (Todaro & Smith, 2011, p. 120).

International dependence revolution covers the neocolonial dependence model, false-paradigm model and dualist development thesis. The neocolonial dependence model was produced through marxian ideas. The model suggests that the existing underdevelopment in developing countries stems from continuing exploitative economic, political, and cultural policies of former colonial rulers (hegemons) toward less developed countries. This study supports the systems dominated by unequal power relationships between the center (the developed countries) and the periphery (the developing countries) (Todaro & Smith, 2011, p. 122). The false-paradigm model states that the existing underdevelopment of some countries stems from wrong guidance of the developed world. Poor advices or misleading development suggestions do not fulfill the real needs of a developing country.

The term dual economy[2] is very popular in the development literature. The dualist development thesis argues that, in all countries, there are inequalities and differences between superior and inferior. In this context, Bonatti and Haiduk purport that development has been associated with the expansion of the modern sector and the shrinkage of the traditional (agricultural) sector. On the other hand, dualism is not confined to the production

2 For other examples see Lewis, 1954; Fei and Ranis, 1964; Hayami and Ruttan, 1971

alone, but often reflects differences in social systems, racial backgrounds, demographic and consumer behaviors and the domestic and foreign sectors (Bonatti & Haiduk, 2010). This dualistic view actually reflects different groups in the society. According to this thesis, the gap between superior and inferior is increasing and the interrelation between superior and inferior does not necessarily pull up the inferior. Moreover, it may push it down further (Todaro & Smith, 2011, p. 125).

Finally the neoclassical, free-market counterrevolution can be seen as a shift towards a free market orientation. With this revolution, the government regulations were reduced and competitive markets were liberalized. The Solow neoclassical growth model can be considered in this context. The Solow model is an exogenous growth model that aims to explain economic growth by regarding capital accumulation, labor growth, and increases in productivity, namely technological progress. It differs from the Harrod-Domar growth model with a second factor which is labor. Moreover, the Solow model considers technological change as an independent variable (for details see Acemoglu, 2009). Briefly, this growth theory suggests that output growth results from one or more of three factors: increases in labor quantity and quality, increases in capital, and improvements in technology (Todaro & Smith, 2011, p. 129).

1.1.4. Population and Development

Population and development is an old concept. Its introduction in the 1950's was inspired by the conjunction of the discovery of underdevelopment and fears aroused by the first phase of the demographic transition (Coussy, 2005, p. 373). Demographic transition[3] can be briefly defined as the transformation in demographic regimes from high to low death and birth rates. Basically, the theory considers this transformation in three phases: In the first phase, there are high birth and death rates, after that there are high birth and low death rates, and finally in the third phase there are low birth and death rates.

According to Furedi, historically, there are three distinct stages regarding the population and development discussions: (i) stage one (1940-1955) focuses on the effects of population growth in the South and sees development tied up with the solution to the population problem, (ii) stage two (1955-1975) pays attention to population control where it

3 Demographic transition theory can be regarded as a derivate of modernization theory of sociology. According to demographic transition theory, all societies inevitably will be transitioned from a stage of high birth and death rates to a stage of both birth and death rates are low (HIPS, 2009b, p. 5)

considered as a prerequisite for development. Finally in stage three, (1975-this day) the link between population and development has diminished in significance (Furedi, 1997, p. 3).

From the mercantilist era to up to the present, population was always regarded as an economic input. As regard to the various beliefs and studies, it can be said that population, especially its growth, is always important for the economies. It is clear that relationships between economics and demography are always established at two levels: At the micro level, for individuals and families, and at the macro level, for the aggregates of population and the labor market (Gesano, 2005, p. 513). According to their stances on the population growth, it is possible to make classifications among analysts' views on macroeconomic consequences of population growth: Pessimists and optimists.

The most popular discussion regarding the population growth is, indeed, held between Malthus and Marx. As the most prominent pessimist, Malthus was the first political economist that emphasized the relations between population and economy. With one of his most prominent essays "*An essay on the principle of population"*, he argued that societies cannot remain without checks (Malthus, 1798). However Marx, as an optimist, argued that the problem is not the population but the capitalist system itself. Marx believed that the problems beneath the social organization caused problems in the society, namely hunger and poverty. The classical discussion between Malthus and Marx is of course valuable but not sufficient for shedding light on the contemporary issues in the 21st century. The objective of this part is not to discuss all the views on the issue in depth but to provide a general view of the population and development discussion.

Furedi classified the most influential views on population and development into eight, where the first six are pessimistic and the last two are optimistic: The developmentalist perspective, the redistributionist perspective, the limited resources perspective, the socio-biological perspective, the "people as a source of instability" perspective, the women and human rights perspective, the "people as problem solvers" perspective and finally the religious pro-natalist perspective (Furedi, 1997, pp. 5-7).

As one of the most influential perspective, the developmentalist perspective basically argues that rapid population growth is an important obstacle on development. The view asserts that resources that will boost development are directed to feeding the growing population instead of productive expenditures. The Coale and Hoover thesis can be best understood in this context. They developed a model stressing that funding the needs of a

society which has a high fertility will reduce the average savings and thus reduce the investment per capita (for details see Coale & Hoover, 1958).

The advocates of the redistributionist perspective argue that high fertility is an outcome of poverty. Because of the lack of economic security, the high children mortality, low status of women and other factors poverty force people to have large families. For some redistributionists, the solution lies in dealing with poverty, especially with the women, through education and reform (for details see Repetto, 1979).

The limited resources perspective represents the classic Malthusian concerns on the nature and therefore resources. This view support the idea that, population growth has serious effects on the environment. The supporters of this view think that environment cannot feed large number of populations and environmental pollution is a natural outcome of population growth. The socio-biological perspective can be considered as a complementary of the limited resources perspective. According to this view, population growth is not just a threat to the environment but also to the human life.

The "people as a source of instability" perspective, asserts that the fertility differences between South and North portray a potential threat. According to this view, the growth of the population may cause some problems on global stability.

Supporters of the women and human rights perspective believe that the exclusion of women from power and access to contraception cause more undesired children. At the International Conference on Population and Development at Cairo in 1994 this view was stressed by the main participants.

The "people as problem solvers" perspective does not consider population growth as a problem. Contrary, it asserts that population growth has positive effects on economic growth. As a contribution to this view, Simon has estimated small but positive elasticities of economic growth with respect to population size (Simon, 1981). The strongest argument that population growth may increase innovation has been made by Boserup. Boserup's findings briefly indicate that increasing population density results with new innovation possibilities (for details see Boserup 1966 and 1981).

Finally, the religious pro-natalist perspective defends that population growth is not a problem. They are in opposition to any kind of interference with the act of reproduction.

It can be understood from the general views on population and development that the main problem is population growth. However, population decline can also affect developmental processes of a country or a specific region. As is going to be expressed in the following sections, TR82 Region's population (see Map 3) has declined 25% between 1985 and 2012. The main determinants of this decline are intense out migration and low fertility levels.

In conclusion, development is linked in various ways to population change. Moreover, population change can also have direct and indirect effects on regional development and on the economy.

1.1.5. Links between Population and Economy

Populations have always been major actors of economic activities. From this point of view, changes in the size and composition of a population would also change the economy of a region. In this study, development is regarded mostly as economic development. Through this, it is believed that potential changes in the population of TR82 Region (see Map 3) would inevitably alter the region's[4] economic structure.

Considering the early studies on population and economy, even the things are a little bit different today, at least population pressure levels are not as pessimistic, it can be said that population is a significant driver of the economy. Population can affect the economy in various channels: A given population's size, age structure, family structure, life expectancy levels and migration structure can literally affect the economic stance of a region.

As pessimist analyst has underlined that high population growth and over population may directly decrease one country's or region's per capita income and per savings. Moreover, these evolvements can directly change one country's or regions economic policy, saving levels and investment decisions. In this respect it can be inferred that not only population growth, but also population decline have significant effects on the economy.

The age structure of a population affects dependency ratios and investment decisions as well. Younger populations need more demographic investments mostly constituted of

4 In this study, "the region" and "region" expressions refer to TR82 Region.

education and health related investments, where older populations need more social infrastructure, services, energy (due to the increase of service usage) and medical care.

Ageing is a striking point for some countries today. Increasing elderly population has many economic implications on pension systems, consumption, savings, production and investment. The most important demographic point for a country or region is of course labor force. The size of the labor force of a given region directly determines its economically active population, efficiency and prosperity. Family structure is also important to determine consumption patterns of an economy. Inward and/or outward migratory movements are crucial for having position in supply and demand shocks in an economy.

Summarizing, as one of the major actors of the economy, population has many channels to affect an economy. It can be asserted that in the short term, a potential change of the population would affect the current economic situation where in the long term it would affect the development of a country.

1.2. INTRODUTION TO POPULATION PROJECTIONS

As Karakaya has asserted, demographic information is crucial for both private and public sectors of societies. Projections of future populations and their characteristics are particularly vital to make efficient decisions for planning in the both sectors (Karakaya, 2009, p. 1).

The very aim of making population projection is to understand the past and future trends of a given population. One can make this assessment at national level, regional level or local level. Siegel and Swanson briefly indicate the purposes of population projections as:

- To raise our understanding of the determinants of population change
- To provide information on possible future scenarios.
- To make decisions (planning) (Siegel & Swanson, 2004).

Population projections depend on certain assumptions such as fertility, mortality and migration. The basic structure of a population projection implies some variants such as low, medium and high variants. Population projections can be classified into two groups:

- Mathematical methods
- Cohort component method

Mathematical methods (formula methods) use basic mathematical formulas and estimate only the total size of population. Component methods require and forecast demographic components which are fertility, mortality and net migration rates; and in some cases, age-sex distribution of these components (Karakaya, 2009, p. 17).

Population projections are applied by some official and non-official institutions in the world. The most comprehensive projections have been presented by the United Nations (UN) since 1950, up to now. These studies were about total population of the world, major areas and regions. There are some other institutions outside the UN; for example World Bank, International Institute for Applied Systems Analysis (IIASA), Population Reference Bureau (PRB) and US Census Bureau. Projections for groups of individual countries have been also compiled by various international regional and national agencies, especially by National Statistical Offices (Karakaya, 2009, p. 4).

For understanding the future population stance of the TR82 Region (see Map 3), this study includes regional level projections made with the cohort component method by three

different migration scenarios. In order to meet the requirements of this approach, there are also fertility and migration projections made. The software used for the projections is Spectrum - DemProj 4. More detailed information about population projections and the methodologies used in this study are discussed in the fourth chapter.

The limitations of the population projections are worth mentioning. Briefly, population projections are estimations showing what happens under certain assumptions about future fertility, mortality and migration. Additionally, these assumptions do not take account of any future developments. In other words, projections do not take account of any future structural change in the policy and economy.

1.3. LITERATURE REVIEW

As discussed in the previous parts, considering the literature on population and development, it can be said that early studies mostly adopted classical arguments for the population problem that Malthus has started (Malthus, 1798). From Malthus and onwards, classical economists have seen population growth as an obstacle to economic development. Like, Boserup some economists saw population growth as an important contributor to the technological change (Boserup, 1966), (Boserup, 1981). In addition to this, some others see population as a neutral factor on development (McNicoll, 2013, p. 8).

The literature on population, development and population projection is huge. There are a number of comprehensive economic studies on national level population and development regarding the high population growth. Some of them are (Mayer, 1953), (Coale & Hoover, 1958), (Jones & Selvaratnam, 1972), (Ominde & Ejiogu, 1972), (Karim, 1985) (Zanamwe, 1989), (Lekganyane-Maleka, 2004). However, regional level population and development studies and regional level population projections can be considered as new in the literature. Since the statistical data is getting more available and accurate day by day, social scientists go through detailed analyses.

In Turkey, it can be said that regional level population projection studies start with DPT's (SPO, State Planning Organization) calculations. Türkyılmaz and Yavuz made a population projection with the cohort-component method for Istanbul (Yavuz & Türkyılmaz, 2009). In this study they investigated the future population prospects of Istanbul. Another article of Yavuz titled "Local Area Population Projections: The Case of Diyarbakır" is important because in this study he has made some developmental inferences as well. In the study, Yavuz has made a population projection with four different migration assumptions by using the cohort component method for Diyarbakır province and for the city center. He also calculated some basic indicators related with education and health areas using city center population projections (Yavuz, 2010).

Karakaya has made population projections for all provinces of Turkey using the cohort component method. His thesis is valuable in various respects. It is the first study producing provincial trail projections with a different software and with a new database (Karakaya, 2009). Furthermore he has analyzed the future prospects of Turkish population.

In the world literature, there are many population projection studies. These studies are sometimes referred to as “small area population projections”, or “special area population projections”. It is seen that these studies are mostly new. Thus, detailed regional level statistical data and modern projection methods are prerequisite for these kind of studies. There are various analyses in the international literature especially in Europe where the regional data is much more available.

Lanzieri calculated NUTS 2 level population projections for 17 of the member states of the European Union. He has produced the projections for 197 NUTS 2 regions up to the year 2031 and evaluated the results in demographic terms (Lanzieri, 2007).

Giannakouris projected NUTS 2 level populations of the European Union. According to his study, 281 NUTS 2 region’s population is projected up to the year of 2030. He has evaluated the results in demographic respects (Giannakouris, 2010).

Hanika produced small area population projections for Austria by its 35 NUTS 3 regions up to the year 2050. The psychology of that paper is quite close to this thesis. However, he hasn’t probed the demographic effects on development (Hanika, 2010).

The Central Statistics Office of Ireland has conducted population projections. One of its last releases has also generated NUTS 2 level population projections for its two regions up to the year 2031 (CSO, 2013).

The General Register Office for Scotland generates yearly population projections for Scottish Areas. A recent study was done by the office up to the year of 2037 (GROS, 2014).

Considering regional level studies on Turkey, it can be said that there aren’t any regional (NUTS-2 or 3 level) studies in the population and development context. This study would be a pioneer for Turkey.

1.4. INTRODUCTION TO THE STUDY

1.4.1. The Nature and the Extent of the Problem

North Anatolia, in technical terms TR82 Region, comprises Kastamonu, Çankırı and Sinop provinces (see Table 1). The region has an interesting population structure. As it will be discussed in chapter three, the population of the region has significantly declined in the recent past due to migratory movements and low fertility levels. Through intense migratory movements, the age structure of the region was negatively affected as well. As of 2013, TR82 is the smallest region among other NUTS 2 regions in terms of total population. Moreover, TR82 region is the only region that has a total population of less than one million. Most significantly, as of 2013, TR82 Region is the oldest region in Turkey. It can be seen in the region that rural[5] to urban migration is slight but still ongoing and there is rural flight in the region. Villages and towns are getting empty day by day. In the rural side of the region, the elderly population shares and dependency ratios are in an increasing trend. Hence, ageing (especially rural ageing) is a challenge for the region. Furthermore, young population shares and dependency ratios are in a decreasing trend in the rural side of the region. Considering the current economic activities and sectoral employment composition of the region, especially in the rural side, rural development strategies became prominent.

Fertility and mortality decline is a natural result of demographic transition. With this transition, a region's population growth rate would start to slowdown. Beside fertility and mortality, another reason that affects a region's population structure is migration. Migratory movements can rapidly and certainly boost or reduce the population. With the light of this basic demographic information, it is quite meaningful to discuss TR82 Region's current and future demographic dynamics. It is also possible to make developmental inferences through this demographic outlook.

It can be observed that the current demographic structure of Turkey is in the last phase of the demographic transition process (Canpolat, 2008, p. 110). It can be asserted that TR82 region is also in the last phase of the transition, however, intense out migration cannot be neglected. Therefore, the combined effects of being in the last phase of the demographic transition and intense migration have decreased the total population of the region

5 In this study, "rural" defines towns and villages.

significantly. It can be seen that the total population of the region has declined 25% between 1985 (994.957) and 2012 (745.525).

As it will be discussed in the following chapters, the region has faced and is still facing a declining population. Furthermore, the population of the region is aged and still ageing. As a result, the demographic dynamism of the region is decreasing and the economy of the region would be inevitably affected through this fact.

1.4.2. The Rural Development Framework

Considering the past, current and future population and development prospects of the region, it can be said that the defined problem can be best understood under the rural development framework. Hence, the rural development framework has risen as a necessary element for the identification of the impacts of the region's future population structure.

Rural development can be defined as the process of improving the quality of life and economic well-being of people living in relatively isolated and sparsely populated areas (Moseley, 2003, p. 5). Similarly, the World Bank defines rural development as a strategy designed to improve the economic and social life of a specific group of people (World Bank, 1975, p. 3). In phsycial, social and cultural respects, rural areas are different from each other. In other words, requirements of the rural areas show contrast. Therefore a standard receipt for all regions is impossible. However, there are some similarities. According to the World Bank, a strategy for rural development should note three points: (i) agriculture, (ii) poverty and (iii) labor, land and capital (World Bank, 1975). Hence, agriculture, poverty and factors of production can be regarded as common elements of rural development.

Themes of the rural development in the world have evolved with the time. Ellis and Biggs introduced mainstream rural development strands from the 1950's to the 2000's. In the 1950's, the main ideas about rural development were related to community development. The 1960's, as the first shift, adopted small farm growth view. The 1970's witnessed integrated rural development and the 1980's faced market liberalisation. The 1990's emphasized rural development by participation and finally in the 2000's poverty reduction is the most prominent idea related with rural development (Ellis & Biggs, 2001, p. 442).

Since the beginning of the Turkish Republic, govenrments have dealt with rural parts of the country. In Turkey, rural development can be analyzed in two different eras: In the

first era, from the beginnig of the republic until the planning era in the 1960's, the main aims are related to solving the agricultural problems, providing food security, creating employment and business opportunities for sub-producers. In this era, since the majority of the population has lived in the rural parts of the country, the policies were state-based. After the introduction of the central planning, with the first national development plan in 1963, the implementation of rural development projecs were launched. The projects were mostly related to the improvement of natural resources and to the elimination of the regional socio-economic disparities.

In 2006, Turkey has adopted a national rural development strategy (NRDS). As a European Union (EU) candidate, Turkey has prepared this strategy as a requirement for the accession to European Union. NRDS was formed on the EU's Instrument for Pre-Accession Assistance Rural Development (IPARD)[6]. Briefly, NRDS has four objectives:

- Economic development and increased job opportunities
- Development of human resources
- Improvement of rural infrastructure services and quality of life
- Protection and improvement of rural environment (SPO, 2006).

Similarly a Rural Development Plan was prepared by the Ministry of Agriculture and Rural Affairs, which aimed to improve and sustain the employment and life amenities of the rural society (MARA, 2010, p. 25). The plan adopted the same objectives underlined by the NRDS. According to the OECD, the problems in the rural areas of Turkey are (OECD, 2011, p.58):

- Poorly educated and low skilled workforce.
- Ineffective institutional structure and lack of efficient farmer organisations.
- Scattered settlement pattern in some regions.
- Insufficient maintanence of phsycial, social and cultural infrastructure.
- The extensity of subsistence agriculture.
- Inadequately diversification of income generating activities.
- High rate of hidden unemployment and low income levels.

6 IPARD's third axis "Development of the Rural Economy" is relevant to this study and has four measures: (i) improvement and development of rural infrastructure (ii) development and diversification of rural economic activities (iii) training and (iv) technical assistance.

- Increasing rural to urban migration.
- Ageing of rural population

In brief, rural development is relatively new for Turkey. The current and future demographic trends in Turkey will shape the rural development policy implementations.

1.4.3. The Purpose and Rationale of the Study

As described in the first part of this section, the region is facing a population problem. This study was intended to investigate the future population change and its future implications in a developmental perspective. For this sake, population projections were generated. The very aim of this study is to predict the future population of the region and then to investigate its implications on employment, agriculture and urbanization. This study provides a macro level assessment on the future population of TR82 Region. Population decline, ageing, rural flight, urbanization, rural labor force problems can be regarded as the expected findings of the study.

It is agreed that demography has an inter-disciplinary spirit. In this sense, like every other human based science, demography has great and deep associations with other sciences such as economics, geography, biology, medicine, history and actuary etc. In this study, the main work items are TR82 Region's current and future populations. With reference to these populations, some economic deductions were made. This study is intended to answer and evaluate the following research questions:

- What would be the future population structure of the region?
- What are the future population challenges of the region?
- What might be the future development challenges of the region?
- What could be the region-specific population and development strategies?

One of the most significant contributions of this study is the determination of the future demographic and socio-economic characteristics of the TR82 Region of Turkey. This study is the first one analyzing a NUTS 2 level region in terms of population and development. Therefore, the study will be a pioneer for Turkey. Thus, it can be said that the results are useful for regional planners in both public and private sectors.

This thesis has five main chapters that are: Introduction, the setting, current situation of North Anatolia, methodology of the population projections and finally, future scenarios foresights and implications.

In this first chapter, an introduction to the study was made by touching upon population and development, population projections, literature review and the purpose. The Introduction chapter is crucial for understanding the fundamentals of the study.

Through the second chapter, the setting will be introduced by referring the geography, history, administrative divisions and political organization, social and cultural features, economy, regional divisions and finally the population of the setting.

With the third chapter, the current situation of the region will be presented by analyzing the region in two sub sections. In the first part, there will be the demographic situation, and in the second part the economic situation of North Anatolia will be discussed.

Chapter four is devoted to provide information on the methodology of the population projections. It will also introduce the data sources, assumptions and software of the projections.

The fifth chapter presents future scenarios, foresights and implications. In the first part of this chapter, population projection outputs will be revealed. In the second part, other future indicators will be presented and finally the last part of this chapter will present findings and conclude the study.

After the fifth chapter, references part includes the references that have been used in this study in an alphabetical order. References have been reorganized for APA (sixth edition) formatting style. Finally, the appendices are revealed at the end of the thesis. In the Appendix – 1 there are relevant data compiled that have used in the population projections. Lastly in the Appendix – 2, some projection outputs revealed.

CHAPTER II - THE SETTING

This chapter introduces the setting of the study by providing the physical and historical background to the TR82 region (see Map 3) of Turkey. It outlines the geography, history, administrative divisions and political organization, social and cultural features, economy, regional divisions and population.

2.1. GEOGRAPHY

NUTS 1 level TR8 (West Black Sea) Region which placed in the north side of Turkey comprises NUTS 2 level TR81, TR82 and TR83 sub regions (see Map 3).TR82 Region[7] is in the middle of TR8 Region. TR82 Region has borders with Karabük and Bartın (TR81) in the west, Ankara (TR51) and Kırıkkale (TR71) in the south, and Samsun and Çorum (TR83) in the east.

TR82 Region which consists of Kastamonu (TR821, Lat: 41° 22' Long: 33° 47'), Çankırı (TR822, Lat: 40° 36' Long: 33° 37') and Sinop (TR823, Lat: 42° 01' Long: 35° 09') provinces, is placed in the sea side of the Black Sea. The region occupies a total surface area of 26.434 square kilometers. In detail, Kastamonu, Çankırı and Sinop occupy, in turn, 13.152, 7.490 and 5.791 square kilometers. Accordingly, almost half of the region is constituted by Kastamonu. Additionally, the center of the TR82 Region is Kastamonu.

The shape of the region stretches in the Northern east – Southern west direction for approximately 330 kilometers. The east – west and north – south widths of the region are roughly 250 and 260 kilometers, respectively.

The region is very mountainous and the terrain is mostly rugged. There are vast differences in altitude among the provinces, ranging from 50 meters in Sinop and 780 meters in Kastamonu. More than half of the region is covered by forests. In turn, 61,5, 25 and 56 percent of Kastamonu, Çankırı and Sinop is constituted by forests (General Directorate of Forestry, 2013). Therefore, farmlands are narrow in the region. The important rivers of the region are Gökırmak, Devrez and Kızılırmak.

7 In this study, “the region” and “region” expressions refer to TR82 Region.

Only Kastamonu and Sinop provinces have sea coasts with, in turn, 170 and 175 kilometers of coastline. Therefore the maritime climate (generally referred as Black Sea climate) can only be felt in the northern parts of Kastamonu and Sinop. Since the mountain structures (Küre Mountains) lie in the north with a parallel composition to the Black Sea, the middle and south parts have continental climate. The coastline of the region is warmer and rainier than the interior area. The climate is characterized by variations of temperature and rainfall, depending on topography of the region. In the region, summers are relatively chilly and winters are warmer in the coast sides, snowy and colder in the uplands.

Kastamonu includes two important national parks: Ilgaz Mountain (peak 2.587 meters) and Küre Mountains (peak 1.746 meters) National Parks. Sinop has a natural harbor in the furthest north point of Turkey.

2.2. HISTORY

The history of TR82 dates back to the very distant past. It is supposed that the region, especially Kastamonu has 5.000 years of history (Kastamonu Valiliği, 2013). The region has been a prominent settlement for the Hittites, Phrygia, Lydia, Persian, Roman Empire, Seljuk and Ottoman Empires (Sinop Valiliği and Kastamonu Valiliği, 2013). The region was ruled by the Ottoman Empire for almost five centuries. Kastamonu was an important city and a principality capital of Ottoman Empire. Therefore, many traditions that inherited from these civilizations are still being applied in the region. These old traditions have left a lasting impression on the region's architecture, social life, cuisine, handcraft etc. In the Ottoman period, Çankırı and Sinop were sanjaks[8] and were under the administration of Kastamonu. During the Turkish War of Independence, the region became prominent with its bravery and sacrifice (TurkStat, 2011). Kastamonu is also prominent due to its number of martyrs who gave their life in the Independence War and the Gallipoli Campaign (Kastamonu Valiliği, 2013).

After the proclamation of the Turkish Republic in 1923, Kastamonu, Çankırı and Sinop have been established as separate provinces. The Dress Code Revolution[9] was started at Kastamonu by Atatürk on August 23, 1925. Atatürk made his historical speech concerning the "Hat and Dress Revolution" in 1925 at his visit to Kastamonu. In addition, Atatürk made his historical speech and gave the first lecture about the "Alphabet Revolution"[10] in 15 September 1928 at his visit to Sinop (Özdemir C. , 2007).

8 Sanjak is an administrative unit in the Ottoman Empire whose size is between districts and provinces.
9 The Dress Code Revolution declared in 1925 by Atatürk, is related to remove the existing social classes and traditional values in Turkish Society.
10 Sometimes regarded as "Letter Revolution".

2.3. ADMINISTRATIVE DIVISIONS AND POLITICAL ORGANIZATION

Turkey is administratively divided into 81 provinces. These are further subdivided into districts (ilçe), subdivisions (bucak), and villages (köy). The head of the province is the governor, who is appointed by the council of ministers and approved by the president of the republic, and responsible to the central government. The governor, as the chief administrative officer in the province, carries out the policies of the central government, supervises the overall administration of the province, coordinates the activities of the various ministry representatives appointed by the central authority in the capital Ankara, and maintains law and order within his/her jurisdiction (HIPS, 2004).

TR82 has three provinces that are Kastamonu, Çankırı and Sinop. Including central districts (centrums), Kastamonu, Çankırı and Sinop have total 20, 12 and 9 districts, respectively. Moreover, Kastamonu, Çankırı and Sinop have, in turn, 1.070, 366 and 470 villages. In Turkey, after Sivas (1.222) and Şanlıurfa (1.153) provinces, Kastamonu is the third province that has a great number of villages with its 1.070 villages. The number of villages actually indicates rural weight and prominence of a province.

A mayor and a municipal council, elected by the municipal electoral body for a term of five years, administer local government at the municipality level. Every locality with a population of more than 2.000 is entitled to form a municipal administration. Municipalities are expected to provide basic services such as; electricity, water, gas, the building and maintenance of roads, and sewage and garbage disposal facilities within the boundaries of the municipality. Educational and health services are mainly provided by the central government, but municipalities also provide health services for those who are at lower economic and social strata (HIPS, 2004) .

As of 2013, including their centrum municipalities, Kastamonu, Çankırı and Sinop have total 21, 31 and 11 municipalities, respectively. By 2013, each province has been managed by different mayors from different political backgrounds. This fact directly indicates the political diversity and pluralistic democracy in the region.

2.4. SOCIAL AND CULTURAL FEATURES

The region is very colorful in terms of social and cultural life. Kastamonu, Çankırı and Sinop can be regarded as prominent inheritors of many civilizations, notably the Ottoman Empire. Especially in the Ottoman period, Kastamonu became prominent in terms of religion. There were a lot of religious leaders and medreses[11] in the region.

There are modern and traditional life styles in urban and rural areas respectively. The rural culture of the region can be classified as mostly conservative and religionist. With globalization, modern and traditional life styles have started to merge. However through intense migration, traditional wealth has been dissolved day by day. For the inhabitants of city centers daily life is similar to the European small cities. Family structures and relations are very close to the average of Turkey. Family ties are still strong and influential in the formation of values, attitudes, aspirations, and goals. Although laws are considered to be quite liberal on gender equality, patriarchal ideology characterizes the social life in many ways (HIPS, 2004).

The ethnic composition of the region is relatively pure; it is mostly composed of Turks. In the recent years, through UNHCR, some asylum seekers have been settled in Kastamonu and Çankırı that are mostly originated from Middle Eastern countries (UNHCR, 2013).

There is big urban-rural difference in literacy and educational attainment. The education level of the region, especially in the rural side due to migration and high elderly proportion, is not much developed but getting develop by time. Through intense migratory movements in the past, educated individuals were tending to move to developed city centers such as İstanbul, Ankara and İzmir. With new founded universities in the region, it is supposed that the social structure of the region will be more developed in the near future.

11 Medrese was a theological school but dealt with some positive sciences as well, it can be regarded as todays faculty of theology.

2.5. ECONOMY

The economy of TR82 mostly depends on agriculture. Agricultural products, forestry and fishery are prominent sub components of the agricultural sector. Services, commerce and manufacturing are other economic activities in the region (TurkStat, 2011). The composition of urban - rural economy is quite different. In the urban side, shares of service and manufacturing take important places where in the rural side agriculture come to the fore. There is a strong relationship between rural population and agriculture. It can be said that through migration, agricultural activity has been decreased by the time.

TR82 Region is not an industrialized region. It is hard to say that the existing manufacturing industry makes technology intensive production. The existing industry can be regarded as labor intense. Some of the prominent sectors in the industry are forestry, mining, and food and beverage manufacturing (81 İl Durum Raporu, 2012). Besides manufacturing and agriculture, services are developed in the region. Banking, housing, food, transportation and tourism are prominent services in the region.

2.6. REGIONAL DIVISIONS

Turkey has been divided into seven geographic regions due to geographic, climatic and floral differences among the following regions: Marmara, Aegean, Black Sea, Central Anatolia, Eastern Anatolia, Southeastern Anatolia and the Mediterranean Regions. This classification is not very useful for social surveys and research. There is another conventional regional classification that divides Turkey into five regions: West, South, Central, North and East (see Map 1). These five regions are distinguished, reflecting to some extent differences in socioeconomic development levels and demographic conditions within the country. This regional breakdown is frequently used for sampling analysis purposes in social surveys (HIPS, 2009a).

After 2002, Turkey started using NUTS[12] classification under the scope of harmonization studies of European Union. NUTS classification is used only by EU member states (TurkStat, 2013a). According to NUTS classification, Turkey was divided into 12 NUTS 1 Regions, 26 NUTS 2 Regions and 81 NUTS 3 Regions as opposed to 81 provinces. These regions are defined with the idea of:

- Effective data collection on regions to form regional statistics,
- Performing socio-economic analysis of the regions,
- Determining the framework of regional plans/programs/policies,
- Efficient implementation and analysis of regional development policies,
- Establishing statistical databases in line with the EU Regional Statistics System (Saylan & Kıroğlu, 2007).

After the introduction of NUTS classification in Turkey, most of the social and economic studies such as DHS's, Regional Plans and others, were undertaken through NUTS 1 and NUTS 2 level. In this study, analyses and remarks were defined in NUTS 2 and NUTS 3 levels. The regions studied under NUTS classification are summarized via Table 2. TR8 Region comprises TR81, TR82, and TR83 Regions where TR82 Region includes only Kastamonu, Çankırı and Sinop provinces.

12 Nomenclature of territorial units for statistics

Table 2: TR82's position in the NUTS classification

NUTS 1 (12 Regions)	**NUTS 2 (26 Regions)**	**NUTS 3 (81 Regions/Provinces)**
TR8 West Black Sea	TR81	TR811 Zonguldak
		TR812 Karabük
		TR813 Bartın
	TR82	**TR821 Kastamonu**
		TR822 Çankırı
		TR823 Sinop
	TR83	TR831Samsun
		TR832 Tokat
		TR833 Çorum
		TR834 Amasya

2.7. POPULATION

By the end of 2013, the total population of TR82 was 763.570 where the total population of Kastamonu, Çankırı and Sinop are 368.093, 190.909 and 204.568, respectively. TR82 always has a wavy population due to high fertility rates and migration. Historically, population has grown from 1927 and 1985. However, the population of TR82 has been declining since 1985 through migration and through recent low fertility rates. It is important to note that TR82 is the smallest one among other NUTS 2 regions in terms of total population. Similarly, TR82 is the only region that has a total population of fewer than one million.

Considering the population changes in the region, it can be expressed that the average growth rates are positive for urban areas and negative for rural areas. This fact actually indicates the rural flight in the region. Rural flight in the region has been observed since 1960's but it is certain that it has become much more severe in the late 1980's.

Age groups are unbalanced due to migratory movements in the region. Elderly percentages are high and young percentages are low especially in the rural sides of the region. With this fact it can be implied that TR82 is the oldest region in Turkey. Working age population of the region has been seen constant at 65 percent. Examining the past deteriorated sex structure experiences, it can be said that sex ratios have been normalized by the time.

Rural and urban areas are different in terms of dependency ratios. Evaluating the past five years of experience of the region, it can be stated that young dependency ratios have decreased in the urban side, but much more decreased in the rural sides. Accordingly, elderly dependency ratios have been steady in the urban side, but have much more increased in the rural sides.

The average crude birth, crude death, infant mortality and total fertility rates in the region, which are close to the Turkey average, are in a decreasing trend. According to TurkStat average total fertility rate of the region is 1,8 that is well below the replacement level of 2,1.

The region has lost most of her residents due to intense migration. Accessibility problems, lack of employment and other social reasons have pushed and the advantages of living big cities have pulled populations in the region since 1960's. However, urban areas in

the region have remarkably grown by the time. It can be said that the urbanization level of the region's provinces would be almost equal to the Turkey average in the near future.

CHAPTER III - CURRENT SITUATION OF NORTH ANATOLIA

This chapter sets out the current situation of North Anatolia, by analyzing the region into two sub sections. In the first part there will be the demographic situation of North Anatolia discussed and after in the second part there will be the economic situation of North Anatolia discussed. Each part has its own conclusion part at the end.

PART I

DEMOGRAPHIC SITUATION OF NORTH ANATOLIA

3.1. PART I - DEMOGRAPHIC SITUATION OF NORTH ANATOLIA

3.1.1. Total Population

In Turkey, the first population census was taken in 1927. Beginning with the 1935 census, subsequent population censuses were undertaken regularly at 5 year intervals until 1990. After 1990, population censuses were carried out in years ending with zero (HIPS, 2009, p. 7). 2000 is the last census year in Turkey. After 2000, the Turkish Government gave a halt to undertake censuses. Instead, the Turkish Statistical Office has started to work on an address based registration system. In 2007, the new system named as Address Based Population Registration System (ABPRS)[13] has been released. 2007 was the first year that ABPRS data had been available and in this study it was preferred to use ABPRS data ranging from 2008 to 2013. Starting with 1927, every single province, district and village were enumerated with censuses. In this section, total population sizes of provinces have been introduced from past to present. From 1927 to 2000, census data has been imported from national censuses and from 2008 to 2013 registration data has been imported from ABPRS.

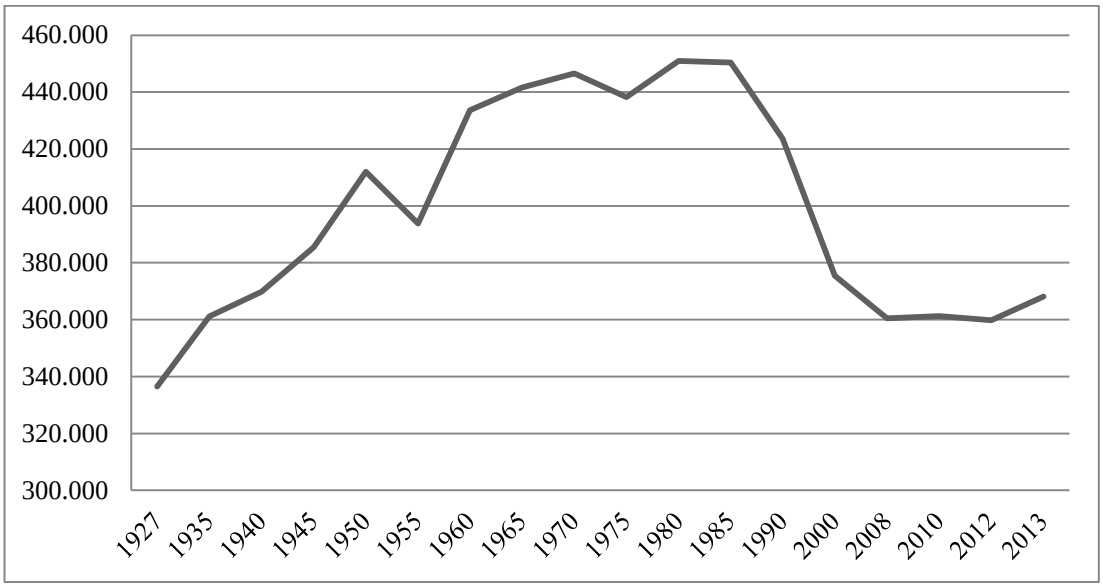
The demographic structure of TR82 is very dynamic. It can be said that demographic change in the region is marked by intense out migration and declining population size. Considering the region's demographic history, in spite of high fertility levels in the past, it can be asserted that intense out migration is the significant determinant of the population. In

13 TurkStat Web Site (ABPRS): http://tuikapp.tuik.gov.tr/adnksdagitapp/adnks.zul [Date accessed: 14.07.2014]

order to make a deeper analysis of the demographic change in the region, a province level investigation would be more accurate and healthier.

Figure 1 illustrates the total population of Kastamonu by years. According to the 1927 census, the total population of Kastamonu was 336.501. Between 1927 and 1950, population growth was significant. In 1953, Kastamonu's Kargı district has been annexed to Çorum province[14]. The loss between 1950 and 1955 stems from this political alteration. After five years of break between 1950 and 1955, the population has continued to increase substantially until 1960. Between 1965 and 1985, there are fluctuations. 1980 is the year in which the population of Kastamonu was its maximum level, 450.946. After 1985, the population started to decline. Besides decreasing total fertility levels, as is going to be expressed in the following sections, the main determinant of this decline is intense out migration. As of 2013, with its 368.093 residents, Kastamonu is experiencing its past in 1935-40's, in the sense of population size.

Figure 1: Total Population of Kastamonu, (1927 - 2013)



Source: (SIS, Population Censuses, 1927-2000) (TurkStat, ABPRS, 2014)

Figure 2 shows the total population of Çankırı by years. According to the first census of 1927, total population of Çankırı was 157.2019. From 1927 to 1975 the population of Çankırı has consistently increased. In 1965, total population of Çankırı was 250.706. Among

14 Kargı District Governorship: http://www.kargi.gov.tr/default_B1.aspx?content=199 [Date accessed: 03.07.2014]

1965 and 2000, although the trend is positive, there are fluctuations. Comparing 2000 to 2008, it seems like there is a structural change. Between 2000 and 2008 the data collection methodology has been changed. This change allowed reaching real numbers of provinces. Before ABPRS, in order to attract more attention to their provinces trough fake high populations, most of the migrants have been returning to their own provinces in census times. ABPRS expresses real registered population and it is quite reliable. Out of this discussion, considering the trend between 1965 and 2013 there is also population decline. Çankırı is about at a 130 km distance to Ankara. This closeness makes the capital an attraction point. Hence, it can be said that the fall down of the population is stemmed from migratory movements from Çankırı to Ankara. As of 2013, the total population of Çankırı is 190.909. Regarding the size of the population, it can be said that Çankırı's current state is equal to its state in 1940-1945.

Figure 2: Total Population of Çankırı, (1927 - 2013)

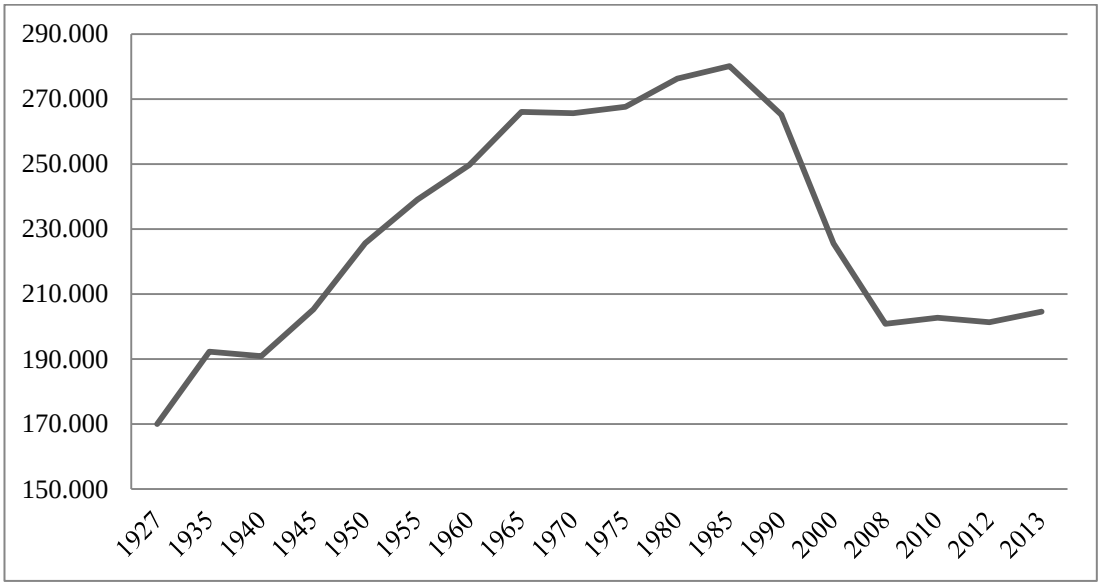
Source: (SIS, Population Censuses, 1927-2000) (TurkStat, ABPRS, 2014)

Figure 3 indicates the total population of Sinop by years. In 1927, the total population of Sinop was 169.965. Between 1927 and 1990, total population of Sinop has significantly increased. Between 1965 and 1990, there are small fluctuations. 1985 is the year which population of Sinop was at its maximum level, 280.140. After 1985, the population started to decline. One can assert that the dissolution of the Soviet Union is an

important reason for the population decline in Sinop. According to Özdemir's hypothesis there was a big out migration after the closing of the United States of America's (USA) radar base in 1985. USA closed the radar base after the dissolution of the Soviet Union which was providing huge amounts of employment to the local people of Sinop (Özdemir C. , 2007, p. 73).

Closing the radar base shaped Sinop's sociologic stance and affected Sinop's population. Like Kastamonu, the main determinant of the declining population in Sinop is also out migration. As of 2013, total population of Sinop is 204.568.

Figure 3: Total Population of Sinop, (1927 - 2013)

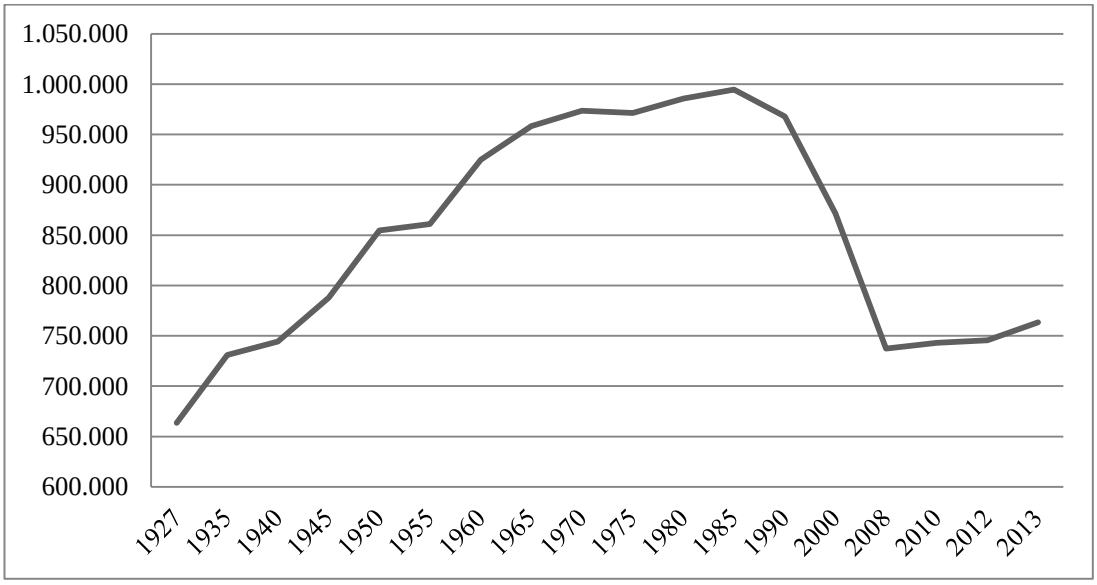


Source: (SIS, Population Censuses, 1927-2000) (TurkStat, ABPRS, 2014)

Figure 4 reflects the sum populations of the three provinces by years. It is obvious that TR82 Region has a wavy population between 1927 and 2008. The population growth trend is positive between 1927 and 1985. It may be remarked that pro-natalist policies that had been implemented from the very beginning of the Turkish Republic to the 1960's had significantly increased the total population of Kastamonu. It can be said that development (economic and social) policies implemented between 1980 and 2000 always encouraged migratory movements towards urban areas. Each province has nearly the same shape on its total population figure. Except recent increases, it can be asserted that population of TR82 has been declining since 1985. As of 2013, TR82 Region has 763.570 residents. This fact

also indicates that TR82 is the smallest among other NUTS 2 regions of Turkey. Another fact is that TR82 is the only region that has a total population less than one million. The destiny of the region's population and future implications for it will be discussed in the fifth section.

Figure 4: Total Population of TR82, (1927 - 2013)



Source: (SIS, Population Censuses, 1927-2000) (TurkStat, ABPRS, 2014)

3.1.2. Population Change

TR82 is an interesting region in the respect of population change. Inspecting and comparing growth rates between provinces, it is clear that negative growth levels were not inherited from the past. According to Table 3, one can divide TR82's and its provinces' past population experiences into four periods. In the first period (1940 – 1970) with the effects of pro-natalist policies, populations have increased. The second period (1970 – 1985) has witnessed a pause on population growth. The third period (1990 – 2008) describes significant declines and population activities throughout migration in provinces. Finally, the last and fourth period (2008 and after) shows that there are relatively stable populations in the region.

Table 3 shows the fact that between 1940 and 1990, apart from small fluctuations, provinces have positive growth levels. Accordingly, migratory movements have started to

affect the region severely since 1985. Intense rural migratory movements in Turkey have started in 1950's (İçduygu, 1998). TR82 Region has met with this phenomenon severely and cumulatively in 1985. These occurrences have also affected the urban – rural balance in the region. The migration composition and urbanization will be discussed in the following Migration and Urbanization part. TR82 Region has reached the maximum growth level in 1950.

It can be inferred from the table that between 1990 and 2000 there were significant population declines both in provinces and therefore in the region. However, one should carefully investigate these fluctuations. As was mentioned, these fluctuations stemmed from the change of the methodology of population calculations. Neglecting the fluctuations and considering the recent experiences of the provinces and of the region it is clear that with its 22 per thousand (2,2 percent) annual growth rate, Çankırı is increasing significantly. The average annual increase of the region is 9‰.

Table 3: Arithmetic Annual Average Growth Rates (1940 - 2013) (‰)[15]

		Kastamonu	Çankırı	Sinop	TR82
I	1940	4,8	7,0	-1,5	3,7
	1945	8,4	14,8	15,1	11,7
	1950	13,8	20,1	19,8	16,9
	1955	-8,9	10,1	11,9	1,4
	1960	20,3	11,7	9,0	14,8
	1965	3,7	7,7	13,1	7,3
	1970	2,2	8,5	-0,3	3,2
II	1975	-3,7	3,1	1,5	-0,5
	1980	5,8	-5,3	6,5	2,9
	1985	-0,3	4,3	2,8	1,8
III	1990	-11,9	11,5	-10,7	-5,3
	2000	-11,4	-3,1	-14,9	-10,0
IV	2008	-5,0	-43,6	-13,7	-19,2
	2010	1,1	8,4	4,9	3,9
	2013	6,3	22,0	3,0	9,2
	AVG	1,7	5,1	3,1	2,8

Source: (SIS, Population Censuses, 1927-2000) (TurkStat, ABPRS, 2014)

In Table 4, arithmetic annual average growth rates have been calculated for urban and rural areas. According to the table, it can be seen that urban and rural growth rates are

15 Arithmetic annual average growth rates were calculated through the formula:
=(following year - initial year)/number of years/ initial year*1000

substantially different. Alike Table 3, Table 4 also proves the fact that 1990 was a milestone year. After 1990, especially rural population growth levels have sharply declined. Checking the average amounts of the growth levels, it can be said that urban population has grown while rural population has decreased for over approximately 70 years. This phenomenon through migration is called "*rural flight*" or "*rural exodus*". Rural flight is the migratory movement of population from rural areas into urban areas. Considering the urban areas in this respect, urbanization is a natural result. There are various factors triggering the rural flight. According to Perz, these factors include the penetration of capital into agriculture, employment growth in urban industries, commerce and natural increase in rural populations (Perz, 2000, p. 844).

Table 4: Arithmetic Growth Rates in Urban and Rural (1940 - 2013) (‰)[16]

	Kastamonu		Çankırı		Sinop		TR82	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1940	2,3	5,1	-3,0	7,9	-3,7	-1,3	-0,2	4,1
1945	20,3	7,0	113,6	6,2	19,5	14,8	40,1	8,8
1950	9,6	14,3	4,6	22,2	28,5	19,1	11,8	17,6
1955	18,0	-12,2	40,5	6,4	40,6	9,4	28,7	-1,7
1960	42,2	17,1	71,5	3,2	79,5	1,9	58,6	9,1
1965	22,3	0,7	27,4	3,9	50,6	7,9	30,5	3,5
1970	44,5	-5,3	45,8	0,6	43,7	-7,7	44,7	-4,5
1975	13,4	-7,6	32,4	-4,4	32,2	-5,0	23,8	-6,1
1980	27,6	0,4	22,0	-13,7	13,4	4,7	22,1	-2,2
1985	45,5	-13,2	43,8	-10,2	45,6	-8,4	45,0	-11,1
1990	43,1	-32,4	69,5	-15,8	44,7	-29,3	51,5	-27,3
2000	17,0	-26,7	24,0	-21,8	17,3	-30,5	19,4	-26,5
2008	7,3	-15,7	-30,3	-58,1	0,1	-25,0	-7,2	-30,3
2010	29,4	-28,5	15,3	-2,2	29,1	-19,8	25,5	-20,7
2013	20,5	-10,3	28,0	12,5	8,0	-2,7	19,3	-3,3
AVG	24,2	-7,2	33,7	-4,2	29,9	-4,8	27,6	-6,0

Source: (SIS, Population Censuses, 1927-2000) (TurkStat, ABPRS, 2014)

3.1.3. Population Structure

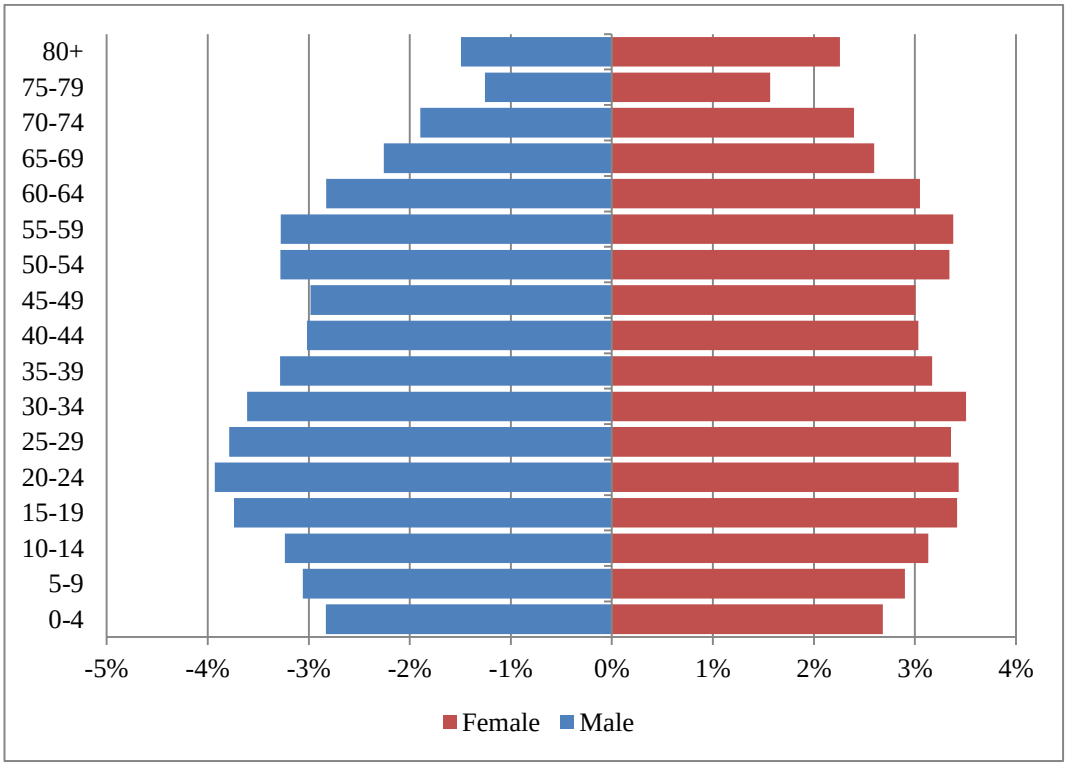
16 Arithmetic annual average growth rates were calculated through the formula:
=(following year - initial year)/number of years/ initial year*1000

Age and sex composition are so important to the nature and functioning of societies and communities that population pyramids – graphs depicting the numbers or percentages of males and females in each age group – are instructive starting points for population investigations. Such pyramids not only show the absolute or relative size of each age group, but potentially reveal much about history of a population and its future prospects (Rowland, 2003, p. 77). In order to analyze the age and sex structure of TR82; population pyramids Figure 5, Figure 6, Figure 7, Figure 8 and Figure 9 have been created.

3.1.3.1. Age Structure

Figure 5 reveals the age and sex composition of Kastamonu, as of 2013. The bottom of the pyramid indicates that after the 1990's, there is a decreasing fertility trend. This decreasing trend is quite normal compared to Turkey's overall modern fertility trend (HIPS, 2009, p. 64). The upper part of the pyramid shows an increasing cohort pressure on ageing. Especially women in the 80+ age group look very striking. Considering the 15 – 64 working age (dynamic) population and its generations, it can be said that there is a migratory gap between the 40 – 44 and 45 – 49 age groups. It can be seen that the 20 – 24 age group is the most crowded one. The reason why the 15 – 19 and 20 – 24 age groups look bigger is literally reflecting the university student population in the city. As of 2012, there are 9.563 undergraduate level students in the Kastamonu University (ÖSYM, 2012).

Figure 5: Population Pyramid of Kastamonu, 2013 (%)

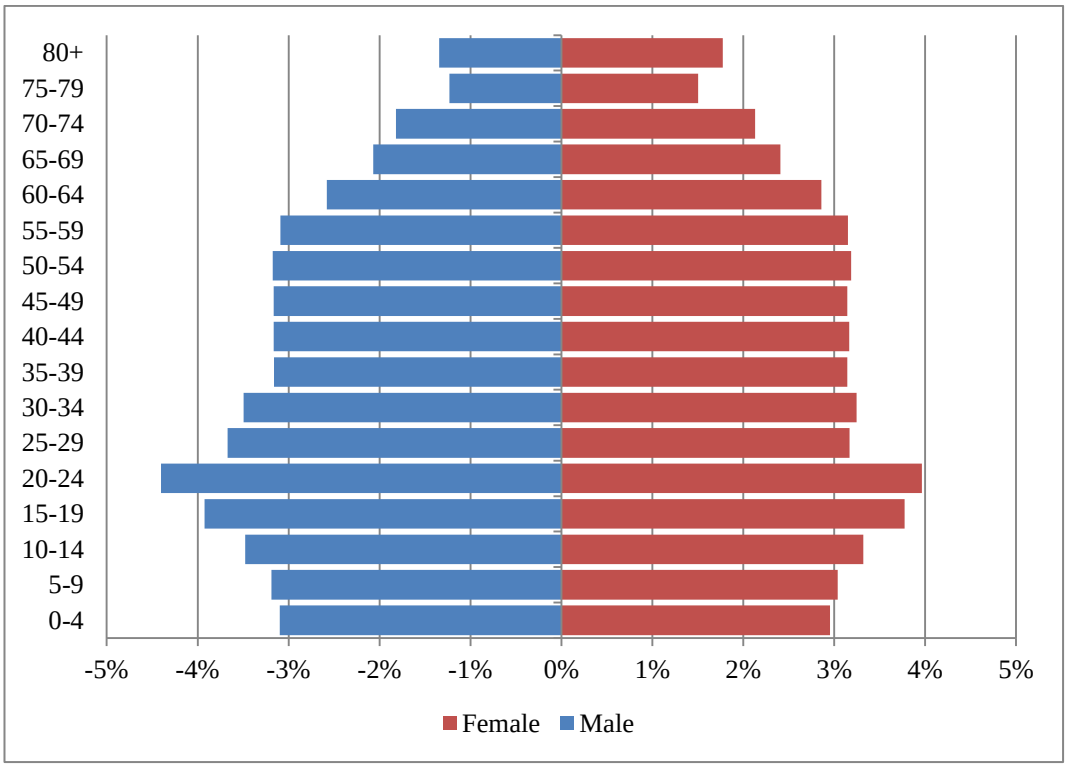


Source: (TurkStat, ABPRS, 2014)

Mobility levels are very high in Çankırı due to the fact that the city is very close to the capital, Ankara. There are a lot of families who shuttle back and forth between the two

cities. As a distinction from Kastamonu and Sinop, elder generations are fewer in Çankırı. According to the Figure 6, fertility levels are in a decreasing trend but look more stable for the past ten years period. There are remarkable surfeits in the 15 – 19 and 20 – 24 age groups for both sexes. These surfeits can be best explained by both the student potential of the university and the employment opportunities in newly established industries. As of 2012, there are 6.991 undergraduate level students in the Çankırı Karatekin University (ÖSYM, 2012). Like Kastamonu, there is no glaring abnormality in Çankırı from the point of sex ratio.

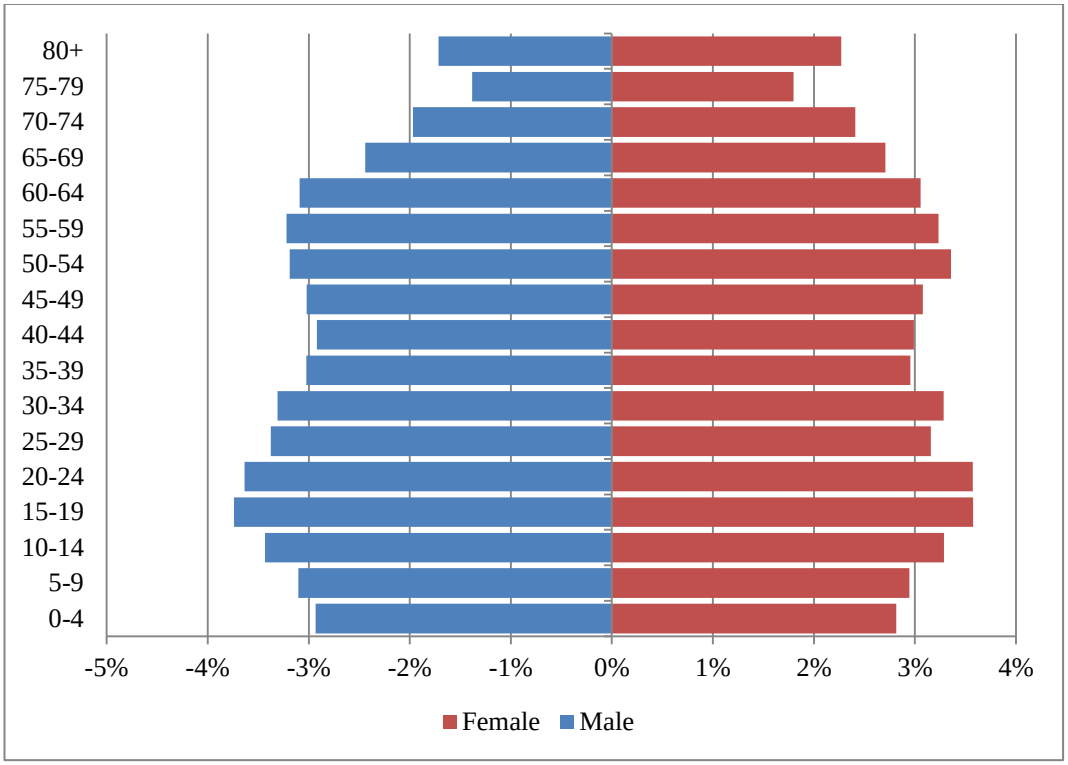
Figure 6: Population Pyramid of Çankırı, 2013 (%)



Source: (TurkStat, ABPRS, 2014)

Figure 7 states the current population structure of Sinop. In the pyramid, it is easy to see that fertility levels in Sinop are also in a declining trend. There is an indentation between the 35 – 39 and 45 - 49 age groups. Sinop's age structure reveals the fact that Sinop is still attracting retirees. The 15 – 19 age group indicates the students and the young population who haven't migrated yet. As of 2012 there are 4.160 undergraduate level students in the Sinop University (ÖSYM, 2012). 80+ men and women populations are also eye catching.

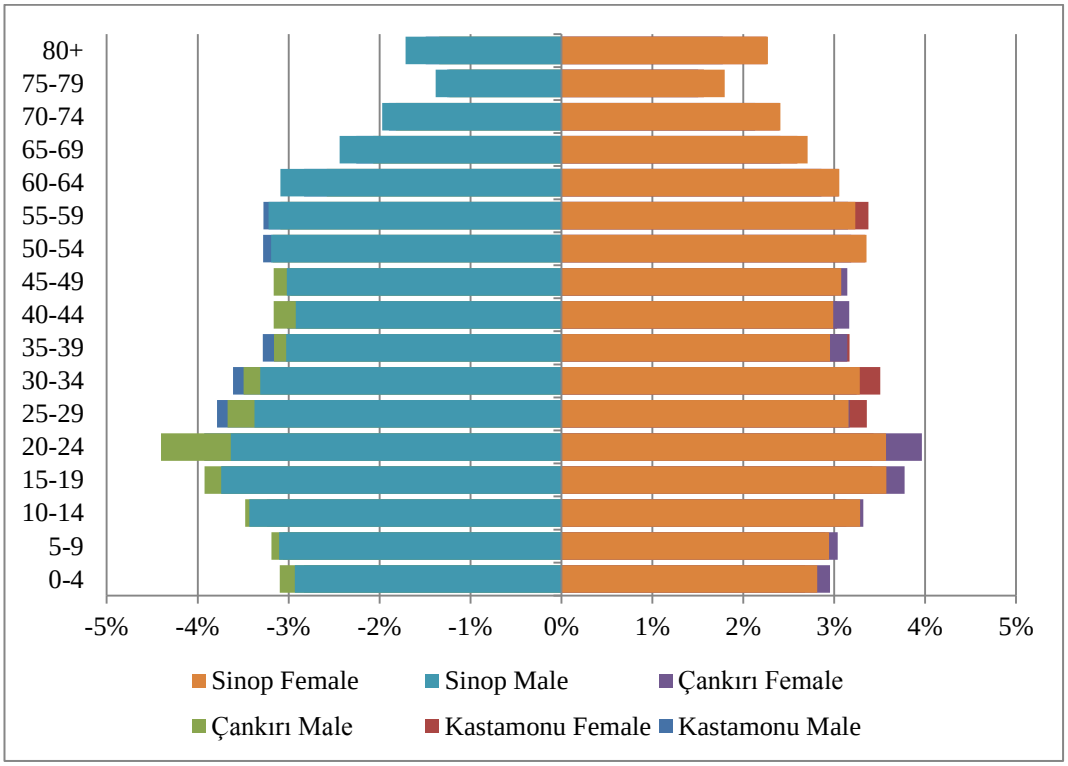
Figure 7: Population Pyramid of Sinop, 2013 (%)



Source: (TurkStat, ABPRS, 2014)

Age and sex structures of TR82 cities look relatively close to each other. Figure 9 illustrates a comparative framework. According to the figure, one can imply that Sinop, somehow, represents TR82 average well. It covers nearly every age groups and sexes. However Çankırı differentiates well in respect of 20 – 24 age group. This difference stems from increasing student populations, new investments and thus new migrant workers to the city.

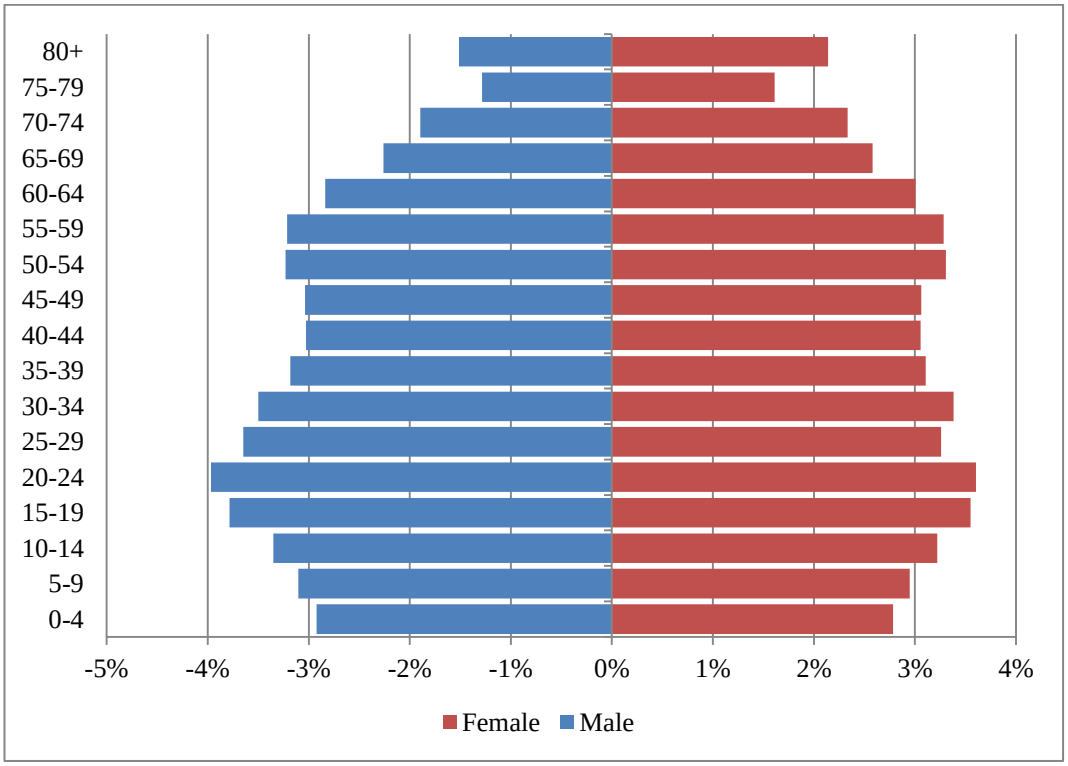
Figure 8: Comparative Population Pyramid of Kastamonu, Çankırı, Sinop 2013 (%)



Source: (TurkStat, ABPRS, 2014)

In conclusion, by interpreting the Figure 9, it is quite obvious that age groups are unbalanced in TR82. Irregularities and unbalanced shapes are mostly stemmed from past and ongoing intense out migration. The fertility trend is downwardly and the working age population (15 – 64) looks contracted. Elderly percentages, especially for women, seem striking. Student populations are very important in the region. The most crowded age group is the 20 – 24 age group. Young students have rejuvenated the region as well as created a demand economy in the region. The student population of the region is growing year by year and indicating an important issue to deal with.

Figure 9: Population Pyramid of TR82, 2013 (%)

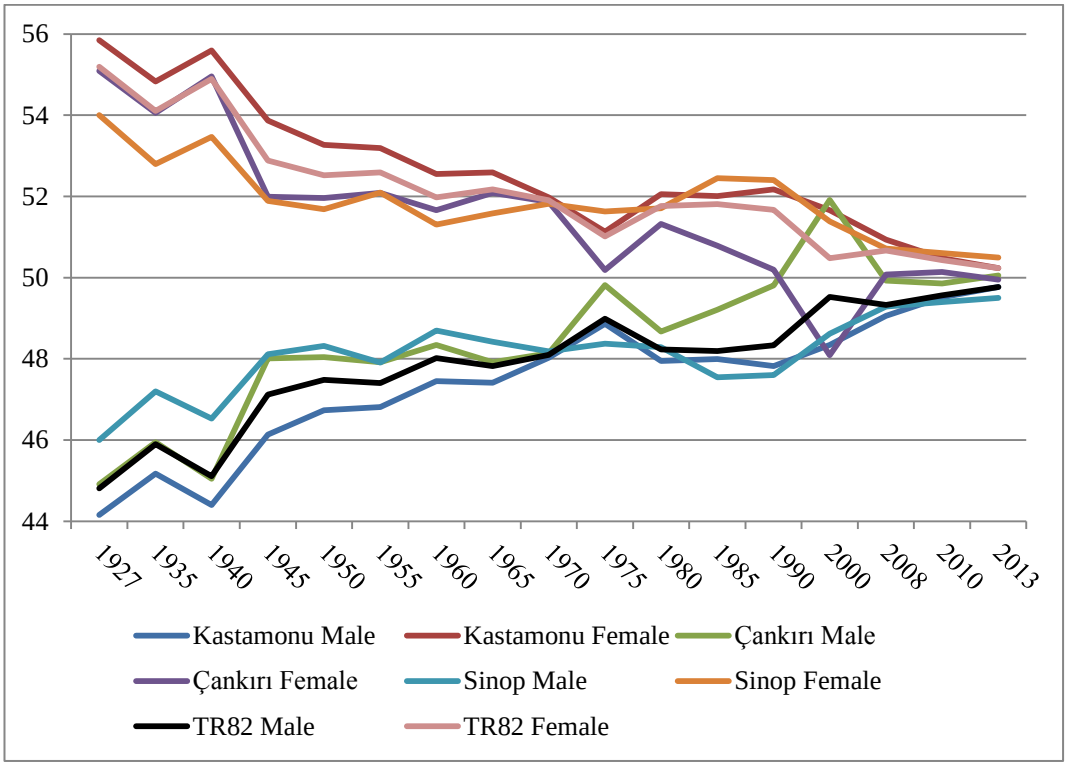


Source: (TurkStat, ABPRS, 2014)

3.1.3.2. Sex Structure

Sex structure is as important as age structure. In order to investigate one region's sex structure, the percentage distribution of both sexes and sex ratio would be a proper instrument. Figure 10 presents the percentage sex distribution of Kastamonu, Çankırı, Sinop and TR82 average. According to the figure it can be implied that the men share has newly started to turn to a normal level, 50%. The black line shows the men average of TR82. It can be implied that this imbalance between women and men is mostly due to out migration. Most men have migrated out of their country for different purposes in the given period.

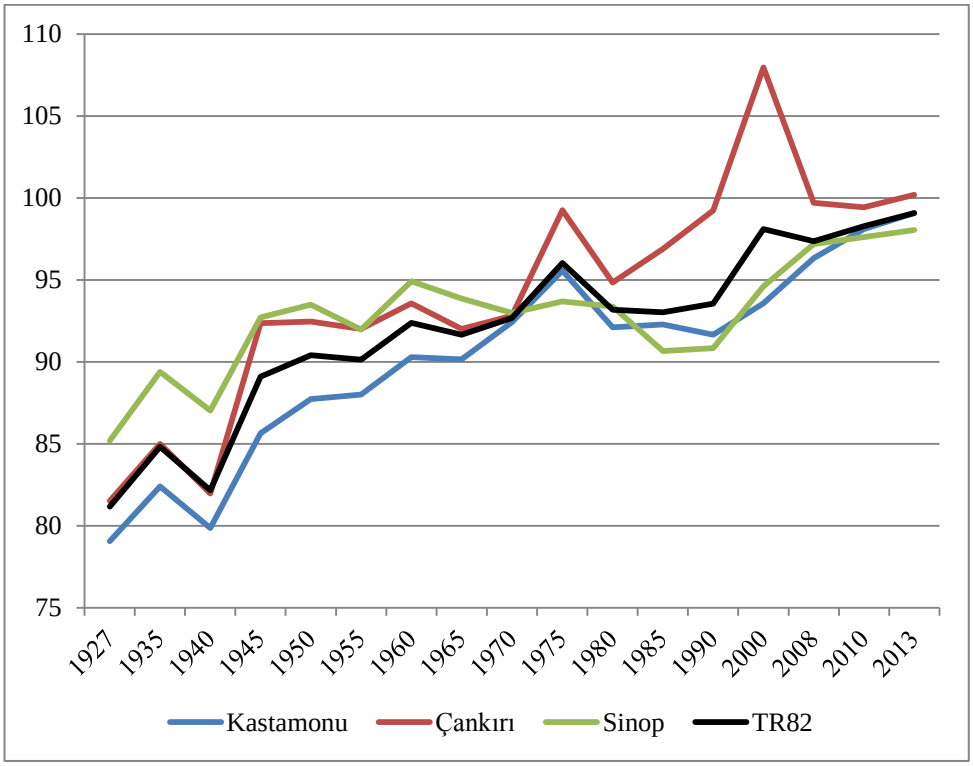
Figure 10: Percentage Distribution of Sexes by Years (%)



Source: (SIS, Population Censuses, 1927-2000) (TurkStat, ABPRS, 2014)

With the support of Figure 10, according to the sex ratio graph of the region provided by Figure 11, it may be said that in the 1927 – 2013 period, after a while of fluctuations, sex ratios have turned to normal.

Figure 11: Sex Ratios in the Region (1927 – 2013)



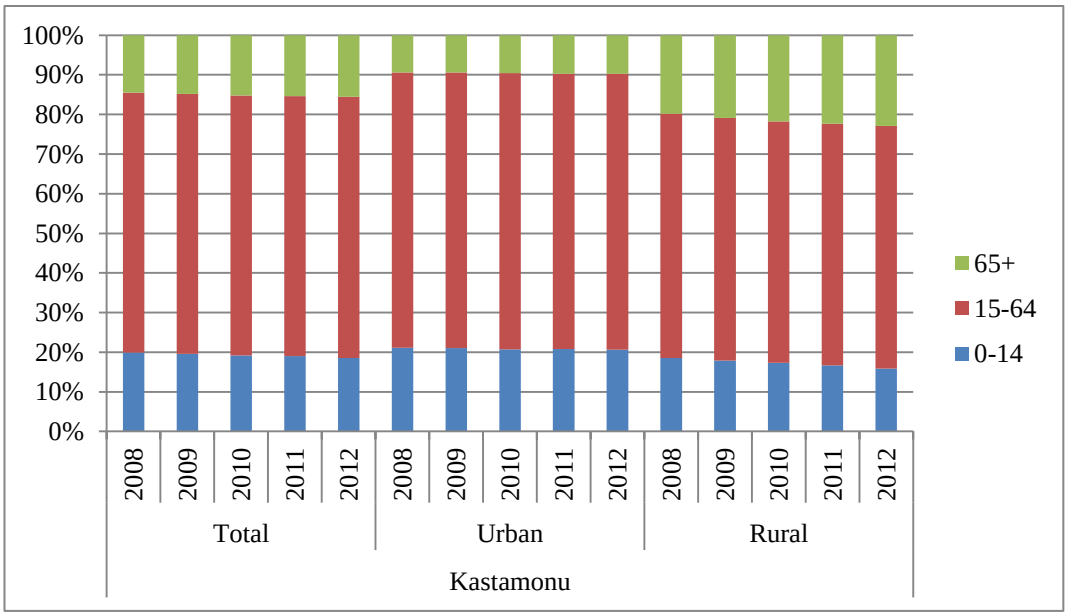
Source: (SIS, Population Censuses, 1927-2000) (TurkStat, ABPRS, 2014)

3.1.3.3. Age groups

Investigating strategic age groups in the region is crucial for making developmental inferences. For this sake, Figure 12, Figure 13, Figure 14 and Figure 15 are created for, in turn, Kastamonu, Çankırı, Sinop and TR82. Checking Figure 12, it can be implied from the figure that urban and rural percentages are different in Kastamonu in terms of age group percentages. Without difficulty, it can be seen that by years, in the urban area the 65+ age group is below 10% and stable but in the rural area it is over 20% and in an increasing trend. Accordingly, the 0-14 age group in the urban area is nearly equal to 20% and almost stable, however in the rural area it is below 20% and in a decreasing trend. Comparing economically dynamic population sizes, namely the 15-64 working age group, in Kastamonu, it is clear that the rural places in Kastamonu are not much more active than the urban places are, by years. In conclusion, it may be said that the most serious fact is rural ageing in Kastamonu in the sense of demography and economics. For the total populations

by years, the average of the 0-14, 15-64 and 65+ age group percentages are, 19%, 66% and 15%, respectively.

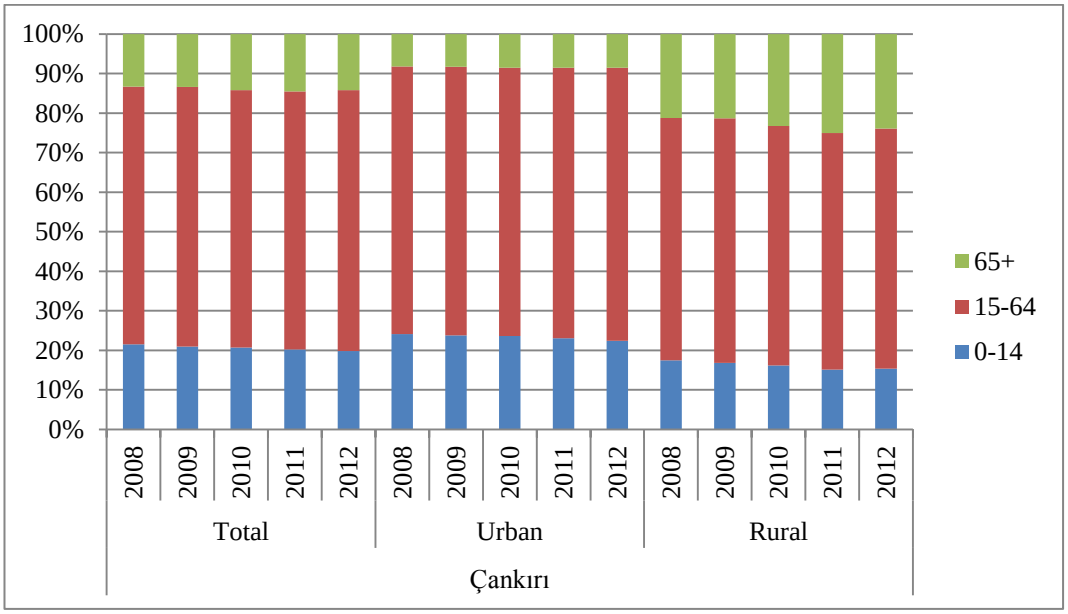
Figure 12: Percentages of Age Groups in Kastamonu (2008 -2012)



Source: (TurkStat, ABPRS, 2014)

Figure 13, draws the recent and past experiences of the age group stance of Çankırı. It can be said that rural age groups have been floating since 2008. In the rural area, Çankırı's 65+ age group is also in an increasing trend but not steady. The 0-14 age group in the rural area has started to decrease. Rural ageing looks like a problem for Çankırı as well. For the total populations by years, the average of the 0-14, 15-64 and 65+ age group percentages are, 21%, 65% and 14%, respectively.

Figure 13: Percentages of Age Groups in Çankırı (2008 -2012)

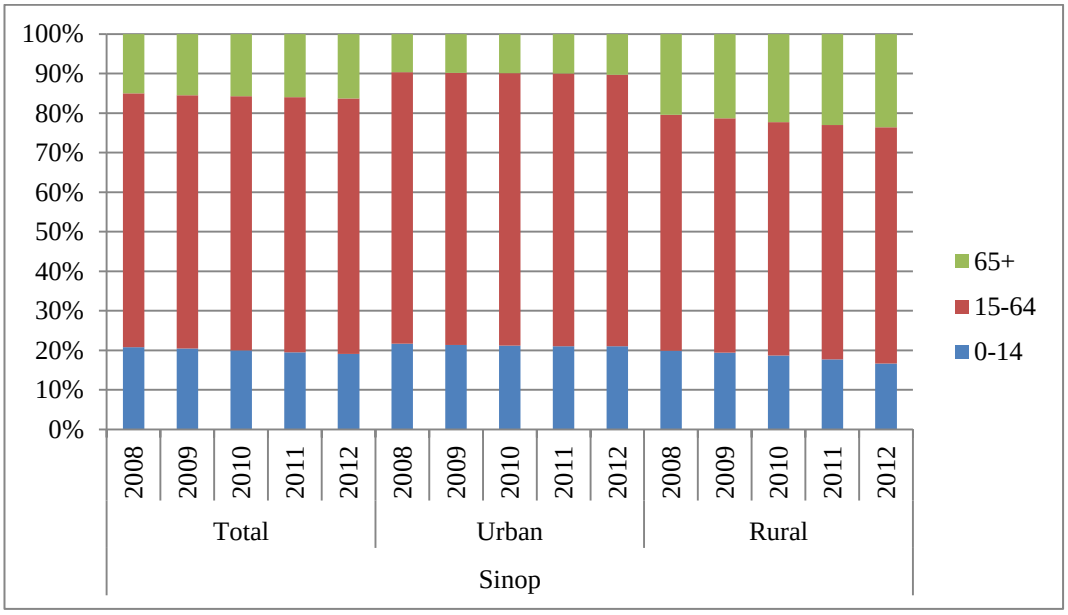


Source: (TurkStat, ABPRS, 2014)

Figure 14 has been created for Sinop. Like Çankırı, rural ageing has been a striking problem for Sinop since 2008. The 65+ age group's share has been increasing while the 0-14 age group's share has been decreasing in rural Sinop. For the total populations by years, the average 0-14, 15-64 and 65+ age group percentages are, 20%, 64% and 16%, in turn.

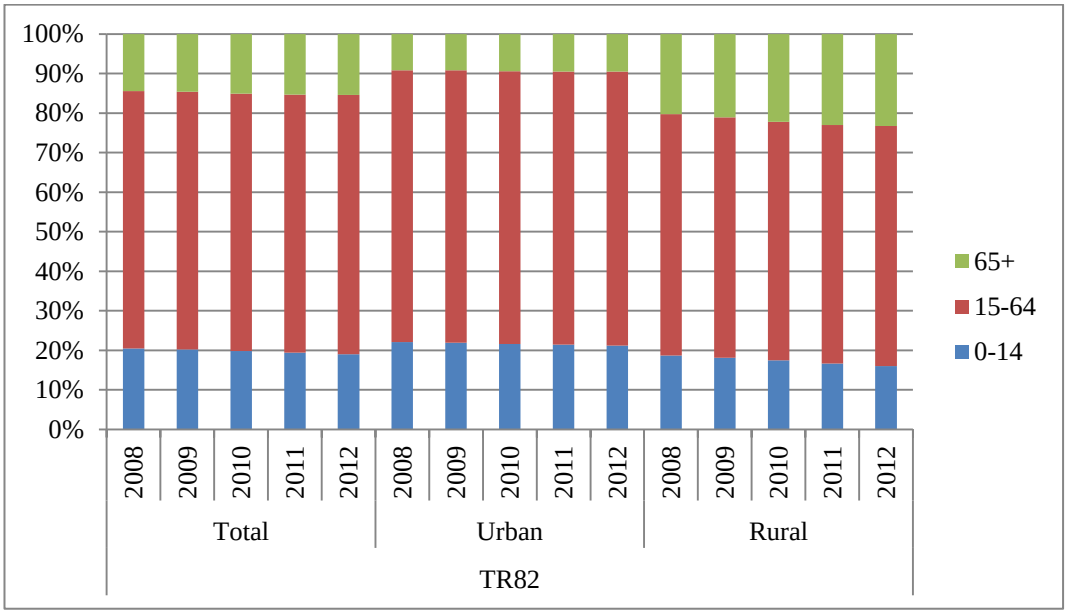
Summarizing, Figure 15 shows sum trends of the provinces. According to the figure, in the urban and rural areas of TR82, the 0-14 age group is in a steady and decreasing trend, respectively. However, the 65+ age group is in a constant and increasing trend for urban and rural areas of TR82. Consequently, the average of the 0-14, 15-64 and 65+ age group percentages are, 20%, 65% and 15%, in turn. Like many other European countries, rural TR82 has started to experience rural ageing.

Figure 14: Percentages of Age Groups in Sinop (2008 -2012)



Source: (TurkStat, ABPRS, 2014)

Figure 15: Percentages of Age Groups in TR82 (2008 -2012)



Source: (TurkStat, ABPRS, 2014)

Some important elderly indicators have been showed with Table 5. According to the table it can be said that TR82 Region declares its championship among all indicators. The maximum percentage of elderly population is in TR82 with 15,4%. Similarly, the peak of the

elderly dependency ratio has been observed in TR82 with its significantly high value of 23,5%. Finally the lowest elderly support ratio[17] has been recorded in TR82 with 4,3. As a result, ageing is a very important point for TR82 Region. TR82 Region is the oldest and most fragile one among other regions in Turkey. Accordingly, values of TR82 are far away from Turkey average. By this, in a demographic way, TR82 can be considered as an outlier in other studies. The significance of this study, unfortunately, is fueled by these facts.

Table 5: Elderly Indicators in Turkey, 2012

Region Code	Provinces	Percentage Share of Elderly Population	Elderly Dependency Ratio	Elderly Support Ratio
TR82	Kastamonu, Çankırı, Sinop	15,4	23,5	4,3
TR22	Balıkesir, Çanakkale	12,5	17,9	5,6
TR90	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	11,7	17,3	5,8
TR83	Samsun, Tokat, Çorum, Amasya	10,7	15,9	6,3
TR81	Zonguldak, Karabük, Bartın	10,2	14,5	6,9
TR32	Aydın, Denizli, Muğla	10,1	14,5	6,9
TR33	Manisa, Afyon, Kütahya, Uşak	9,9	14,4	7,0
TR21	Tekirdağ, Edirne, Kırklareli	9,3	12,9	7,7
TR31	İzmir	9,1	12,7	7,9
TR71	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir	8,8	13,3	7,5
TR72	Kayseri, Sivas, Yozgat	8,5	12,9	7,8
TR41	Bursa, Eskişehir, Bilecik	8,3	11,8	8,5
TRA1	Erzurum, Erzincan, Bayburt	8,2	12,6	7,9
TRB1	Malatya, Elazığ, Bingöl, Tunceli	8,0	12,0	8,3
TR61	Antalya, Isparta, Burdur	7,9	11,4	8,8
TR52	Konya, Karaman	7,9	11,9	8,4
TR42	Kocaeli, Sakarya, Düzce, Bolu, Yalova	7,6	10,9	9,2
TR51	Ankara	7,1	9,9	10,1
TR62	Adana, Mersin	6,6	9,8	10,2
TR63	Hatay, Kahramanmaraş, Osmaniye	6,3	9,8	10,2
TR10	İstanbul	5,7	8,1	12,3
TRA2	Ağrı, Kars, Iğdır, Ardahan	5,4	9,0	11,1
TRC1	Gaziantep, Adıyaman, Kilis	5,2	8,5	11,8
TRC3	Mardin, Batman, Şırnak, Siirt	4,0	7,1	14,2
TRC2	Şanlıurfa, Diyarbakır	3,8	6,6	15,2
TRB2	Van, Muş, Bitlis, Hakkari	3,4	5,8	17,4
TR	Average	8,1	12,1	9,1

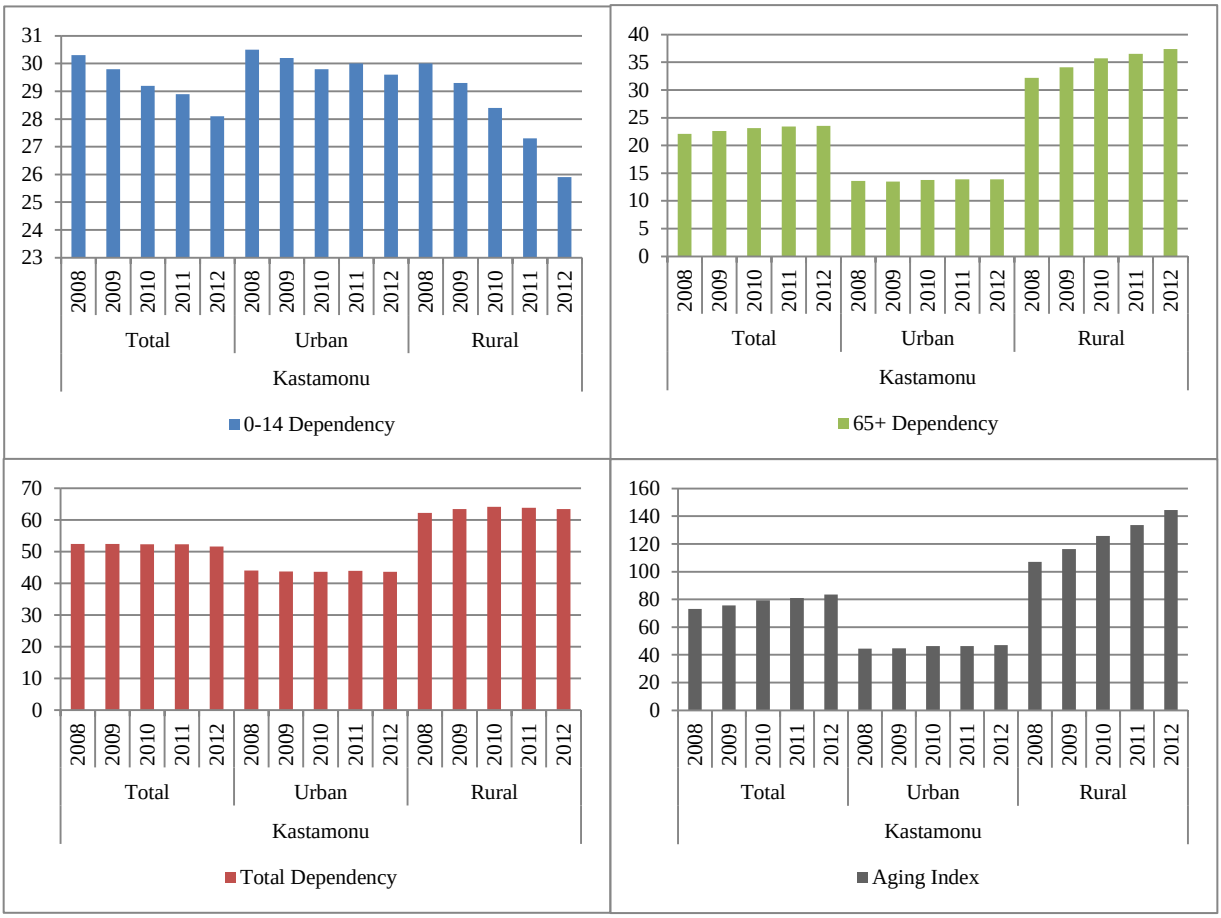
Source: (TurkStat, Regional Statistics, 2014)

17 Elderly support ratio defines the number of people age 15-64 per one older person aged 65 or older. This ratio describes the burden placed on the working population the non-working elderly population.

3.1.3.4. Age dependencies

Figure 16 represents young, elderly and total dependency ratios and the ageing index for Kastamonu. Looking on the upper left, urban and rural young dependency ratios have fallen with time. According to the upper right, elderly dependencies have increased. Total dependency ratios are constant and their average is about 52%. The ageing index is in a constant trend in the urban area but in the rural area it is in an increasing trend.

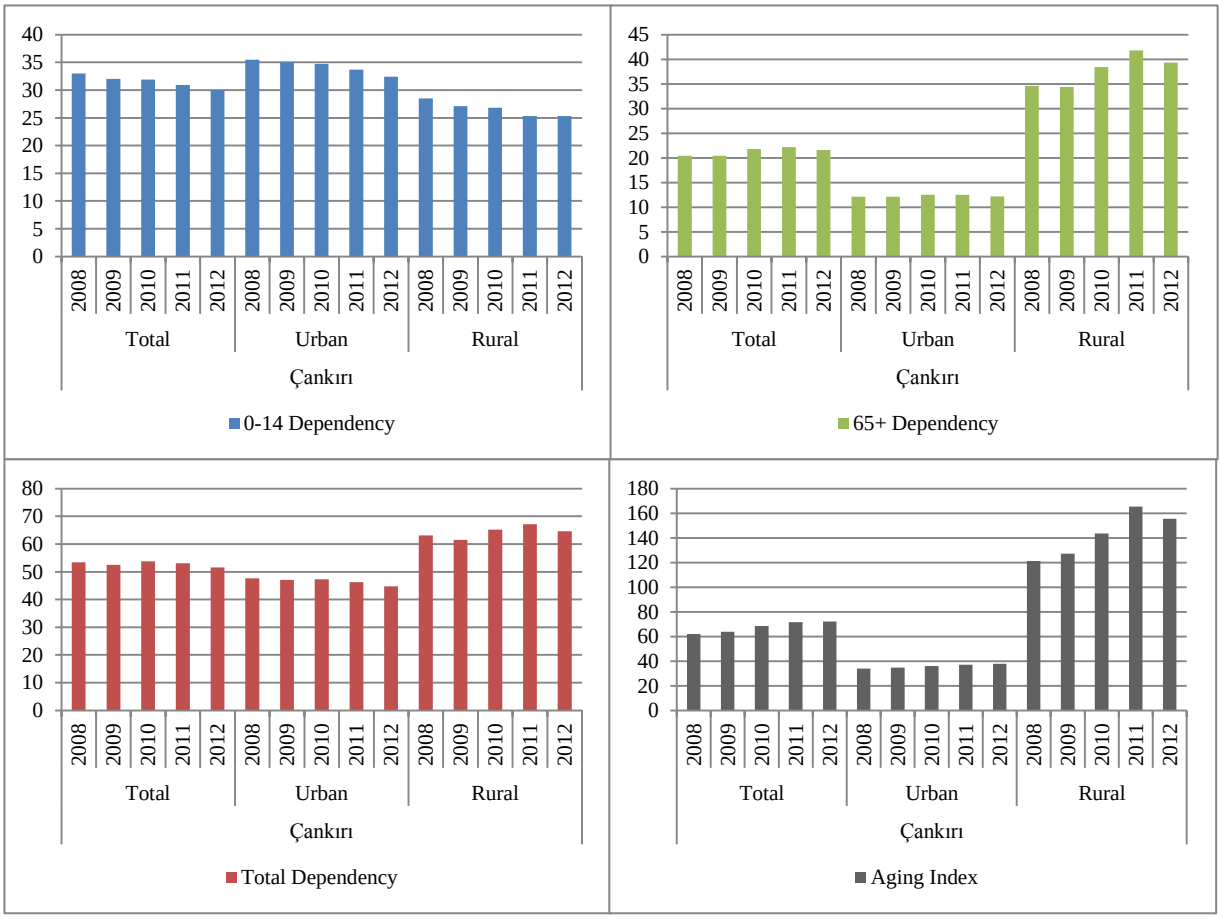
Figure 16: Dependency Ratios and Ageing Index in Kastamonu



Source: (TurkStat, Address Based Population Registration System, 2014)

Figure 17 summarizes dependency ratios and the ageing index for Çankırı. According to the figures, it can be seen that young dependencies are falling down while elderly dependencies are rising. In the urban area, total dependency ratios are slightly decreasing but in the rural area it is increasing. The ageing index is also in an increasing trend in the rural area.

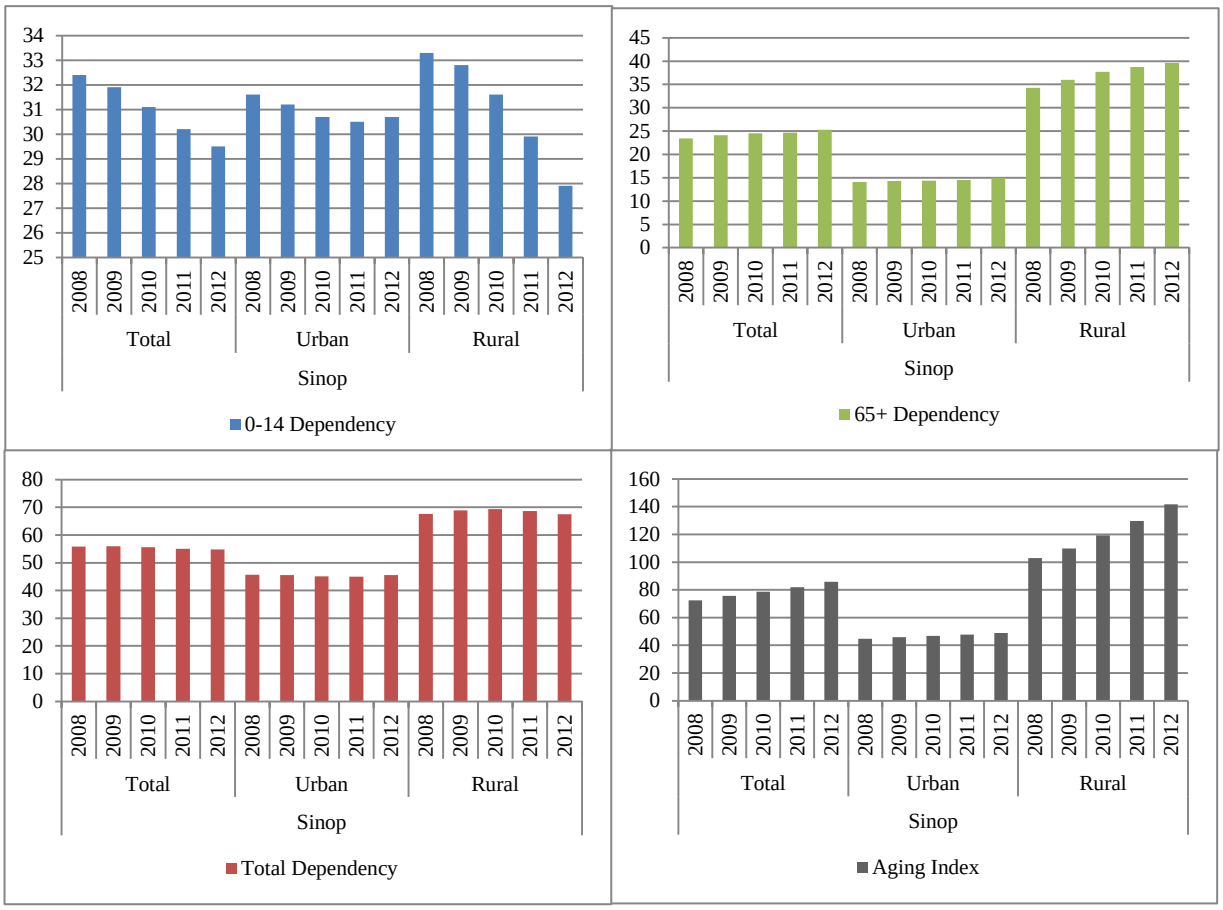
Figure 17: Dependency Ratios and Ageing Index in Çankırı



Source: (TurkStat, Address Based Population Registration System, 2014)

Dependency ratios and the ageing index of Sinop have been revealed by Figure 18. In the figure, like Kastamonu and Çankırı, urban and rural young dependency ratios are in a falling trend. Urban elderly dependency and the ageing index look constant but rural elderly dependency and the ageing index is in a positive trend. The average total dependency is 53% in Sinop.

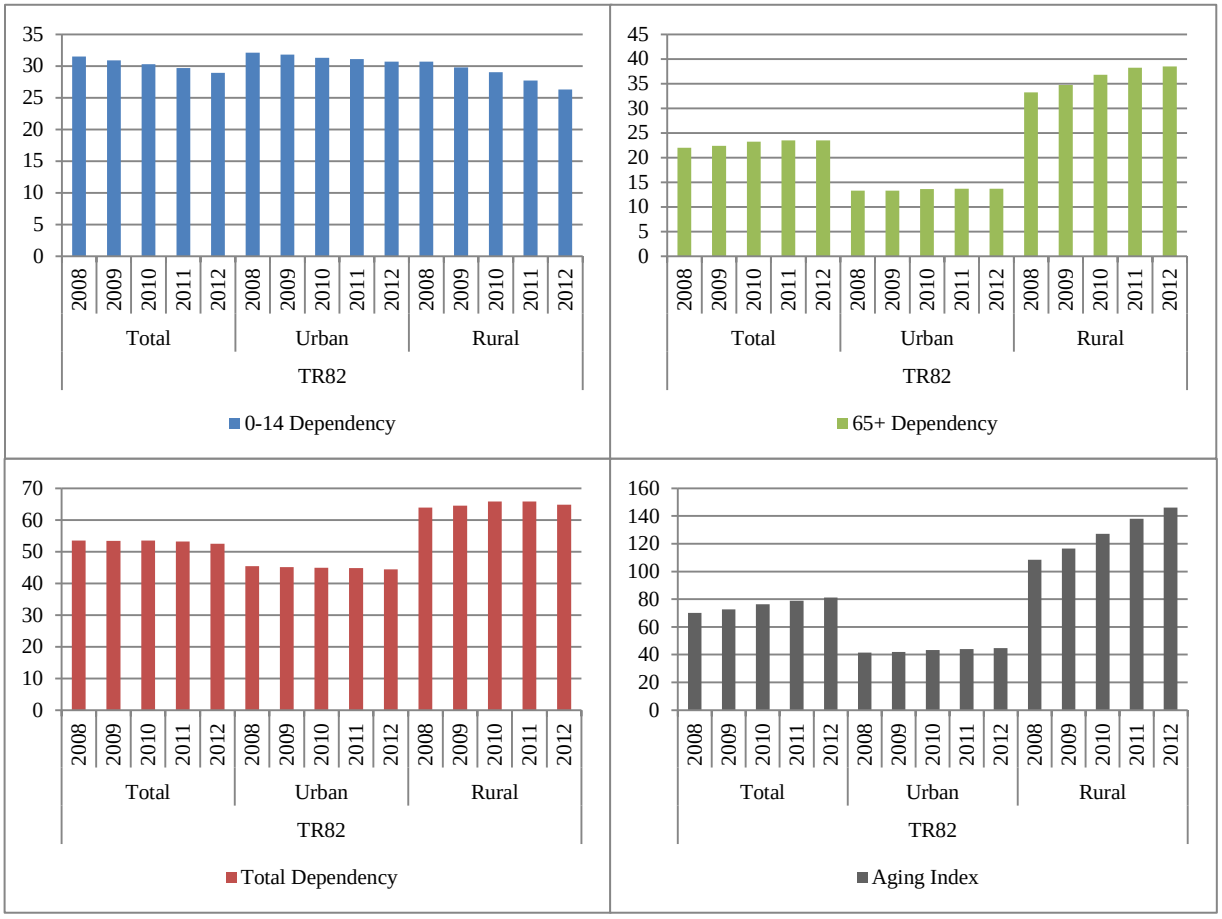
Figure 18: Dependency Ratios and Ageing Index in Sinop



Source: (TurkStat, Address Based Population Registration System, 2014)

Figure 19 summarizes age dependencies and the ageing index for the region. It is clear that each province has more or less the same features from the point of dependency ratios and age index. It can be said that urban sides have less dependency burden. Additionally young dependencies are in a decreasing trend. However in the rural areas of the region there are serious jumps in terms of elderly dependencies. As a result, rural ageing is a very important topic for the region.

Figure 19: Dependency Ratios and Ageing Index in TR82



Source: (TurkStat, Address Based Population Registration System, 2014)

3.1.4. Demographic Indicators

3.1.4.1. Crude Birth and Death Rates (CDR and CBR)

Crude rates are basic and useful demographic indicators. For the first sight, before discussing total fertility rates (TFR) and infant mortality rates (IMR), Table 6 and Table 7 have been prepared. By looking at Table 6, it can be said that crude birth rate (CBR) levels are in a decreasing trend for all provinces, TR82 and Turkey. Decreasing levels of CBR directly indicate decreasing total fertility levels. It can be inferred that the number of children preference has diminished with time. Compared to Turkey, the region's CBR levels are low.

Table 6: Crude Birth Rates in the Region and Turkey (‰)[18]

CBR					
	2009	2010	2011	2012	2013
Kastamonu	12,4	12,0	11,5	11,7	11,3
Çankırı	13,7	13,7	13,2	12,4	11,8
Sinop	13,2	12,4	12,0	12,3	11,3
TR82	12,9	12,5	12,1	12,0	11,4
Turkey	17,7	17,1	16,7	17,0	16,7

Source: (TurkStat, Birth Statistics, 2014)

18 Crude birth rates can be calculated as: Total number of live births/ Total population*1000

It can be observed from Table 7 that crude death rates (CDR) are in a floating structure but generally in a downward trend in the region. There are huge divergences between Turkey and the region. Crude death rates are very high in the region. This fact actually stems from the age structure of the region. As of 2012, 23,3% of the region is composed by elderly population who are 65 or more years old.

Table 7: Crude Death Rates in the Region and Turkey (‰)[19]

CDR					
	2009	2010	2011	2012	2013
Kastamonu	9,8	9,0	9,9	9,7	9,0
Çankırı	8,1	8,6	8,3	8,0	7,7
Sinop	9,1	9,0	9,4	9,4	8,9
TR82	9,2	8,9	9,4	9,2	8,7
Turkey	5,1	5,0	5,0	5,0	4,9

Source: (TurkStat, Death Statistics, 2014)

19 Crude death rates can be calculated as: Total number of deaths/ Total population * 1000

3.1.4.2. Infant Mortality Rate (IMR)

Another basic demographic indicator is Infant Mortality Rate (IMR)[20]. Most of the development and health studies use IMR as an important indicator due to its comparability and reliability. IMR can easily be affected by economic, social, cultural and medical changes in a given region. Considering the Table 8, it is clear that IMR levels have decreased by the time. It can also be inferred that first level medical conditions of the region have improved with time. The reason why the values are varying by the scope of province or region is most probably the economic, social cultural and medical differentials between provinces and regions. As of 2013, IMR levels are below Turkey average in the region.

Table 8: Infant Mortality Rates in the Region and Turkey (‰)[21]

IMR					
	2009	2010	2011	2012	2013
Kastamonu	11,9	11,5	7,5	11,2	8,9
Çankırı	11,9	10,2	7,7	9,2	10,2
Sinop	14,7	14,0	13,2	12,2	9,5
TR82	12,6	11,8	9,1	11,0	9,4
Turkey	13,7	12,0	11,7	11,6	10,8

Source: (TurkStat, Death Statistics, 2014), (TurkStat, Birth Statistics, 2014)

20 Human Development Report of United Nations defines IMR as follows: "Probability of dying between birth and exactly age 1, expressed per 1,000 live births." (UNDP, 2013)

21 Infant mortality rate can be calculated as: Number of infant deaths/The total number of live births*1000

3.1.4.3. Total Fertility Rate (TFR)

Total fertility rate (TFR) is the conventional fertility measure and the average number of children that would be born to a woman if she experienced the current age specific fertility rates over her lifetime (Kronenberg and Kuckshinrichs, 2010). In the past, between 1980 and 2000, TFR values have been calculated from censuses in Turkey. After 2007 with the introduction of the Address based population registration system (ABPRS), TFR values have started to being calculated from the registration data. In addition to all these, Hacettepe University Institute of Population Studies (HIPS) has made quinquennial demographic and health surveys (DHS) since 1968. In Turkey, the most reliable, systematic, comparable and old ones are HIPS' TFR calculations. 2008 DHS is the first DHS that made NUTS – 1 level TFR data available. Before 2008 DHS[22], HIPS could provide 5 regions (See Map 1) and metropolitan level TFR calculations. One should agree that the scope and methodology of these three groups are different. For deep and detailed research, using these data in a date order may mislead the study. In this study, via averages of Table 9, these different groups of data have been used for proving the fact that TFR levels of the region have fallen down with time.

According to Table 9, it may be asserted that fertility levels have fallen down by years. There may be a lot of contributors to this fact: increase of schooling rates of women, employment increase in non-agricultural sectors of women, increase of average first marriage age, increase of contraception use, urbanization and family transition may affect total fertility rates (Ministry of Development, 2013). The specific determinants of decreasing fertility are not the purpose of this study. Therefore by taking into consideration TR82's past demographic adventure, it is suggested that the main contributors of these fallen TFR levels in the region are urbanization and out migration (see 3.1.5. Migration and Urbanization).

22 In the study, it is agreed that region and province level TFR values are the same for 1998 and 2003 DHS's. However, provincial degradation of TFR calculations of 2008 DHS has been made by the author by weighting them through 2000 census data for reaching more realistic values.

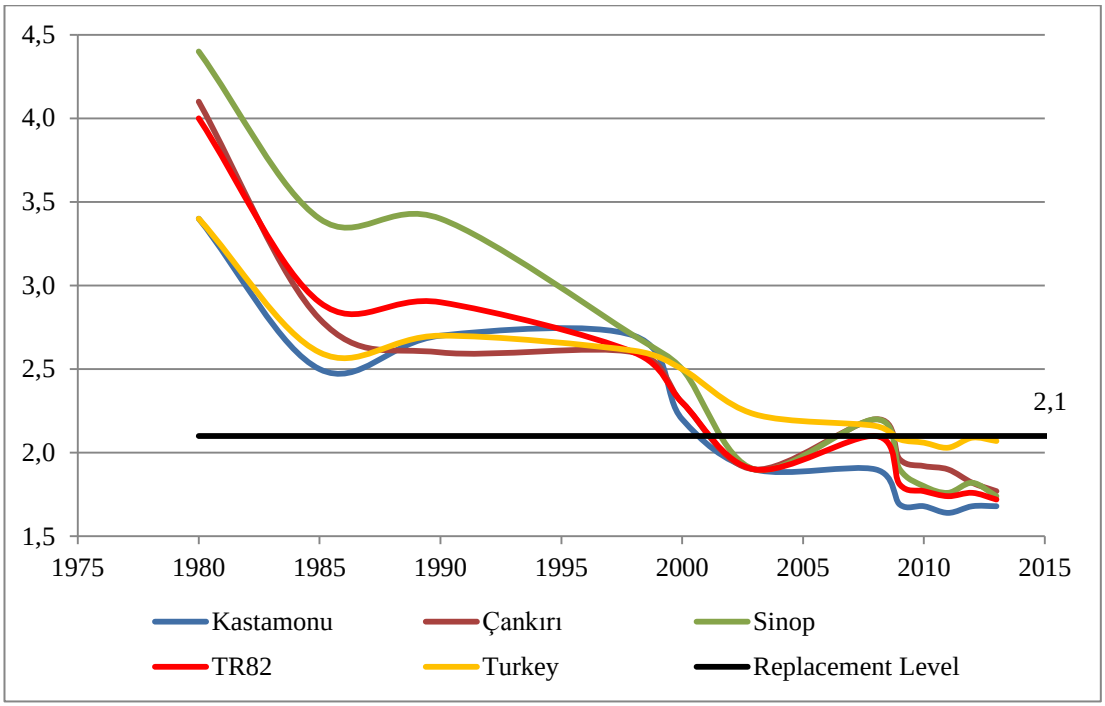
Figure 20 expresses a combined TFR trend for the region. On the contrary to the 1980 – 2003 period, it can be inferred that after 2003, TFR trend looks more stable and is in a decreasing trend. With 2003, TFR levels in the region have fallen under the replacement level which is 2,1.

Table 9: TFR Calculations in the Region (1980 – 2013)

		Kastamonu	Çankırı	Sinop	TR82	Turkey
SIS - Census	1980	3,4	4,1	4,4	4,0	3,4
	1985	2,5	2,8	3,4	2,9	2,6
	1990	2,7	2,6	3,4	2,9	2,7
	2000	2,2	2,3	2,5	2,3	2,5
	AVG	2,7	3,0	3,4	3,0	2,8
HIPS - DHS	1998	2,7	2,6	2,7	2,6	2,6
	2003	1,9	1,9	1,9	1,9	2,2
	2008	1,9	2,2	2,2	2,1	2,2
	AVG	2,2	2,2	2,3	2,2	2,3
TurkStat - ABPRS	2009	1,69	1,96	1,9	1,81	2,08
	2010	1,68	1,92	1,8	1,77	2,06
	2011	1,64	1,9	1,76	1,74	2,03
	2012	1,68	1,82	1,82	1,76	2,09
	2013	1,68	1,77	1,74	1,72	2,07
	AVG	1,7	1,9	1,8	1,8	2,1

Source: (SIS, 2004), (HIPS, 2009a), (TurkStat, Birth Statistics, 2014)

Figure 20: TFR trends in the Region (1980 – 2013)[23]



Source**:** (SIS, 2004), (HIPS, 2009a), (TurkStat, Birth Statistics, 2014)

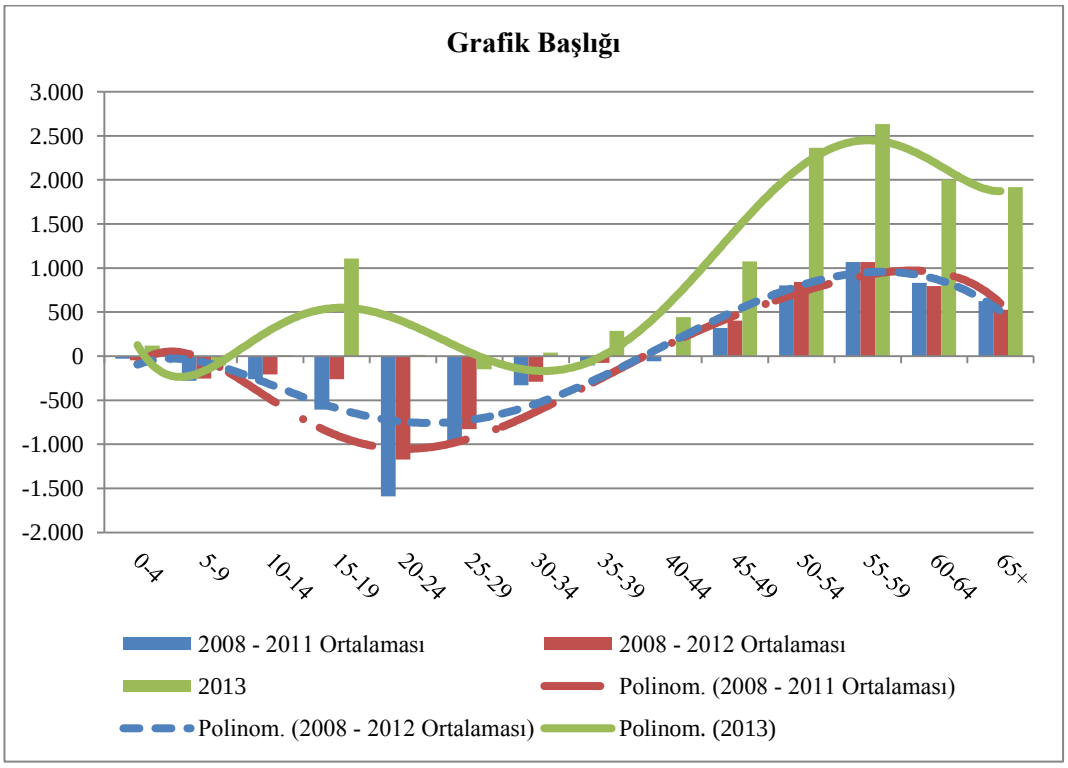
3.1.5. Migration and Urbanization

International migration refers to residential moves across national boundaries; internal migration refers to residential moves between communities within the same country (e.g. cities, towns or villages) while local migration consists of residential moves within a community such as a city, town or village. The principal concern in the study of all three types of migration is permanent movement, commonly defined as a relocation of a person's usual place of residence lasting at least six or twelve months (Rowland, 2003 p. 386). In this study, only internal and local migration types have been noted. Figure 21 examines recent net migratory movements and trends in the region. According to the figure, it can be implied that the region is notably a young sender and elder receiver one. Looking at their ages, it can be referred that most of the young migrants are students or potential migrant workers while

23 It should be stressed that only SIS and TurkStat have produced province level TFR values. HIPS produced five region level TFR values in the 1998, 2003 and 2008 DHS. Additionally, 2008 DHS provides NUTS 1 level TFR values. The figure briefly summarizes the Table 9.

most of the elderly people are retirees. Green bars show the most recent data as of 2013. With the 2013 data it is shown by the figure that the region has started to receive over 1.000 persons (mostly students) who are in the 15-19 age group.

Figure 21: Net Migratory Movements in the Region (2008 – 2013)

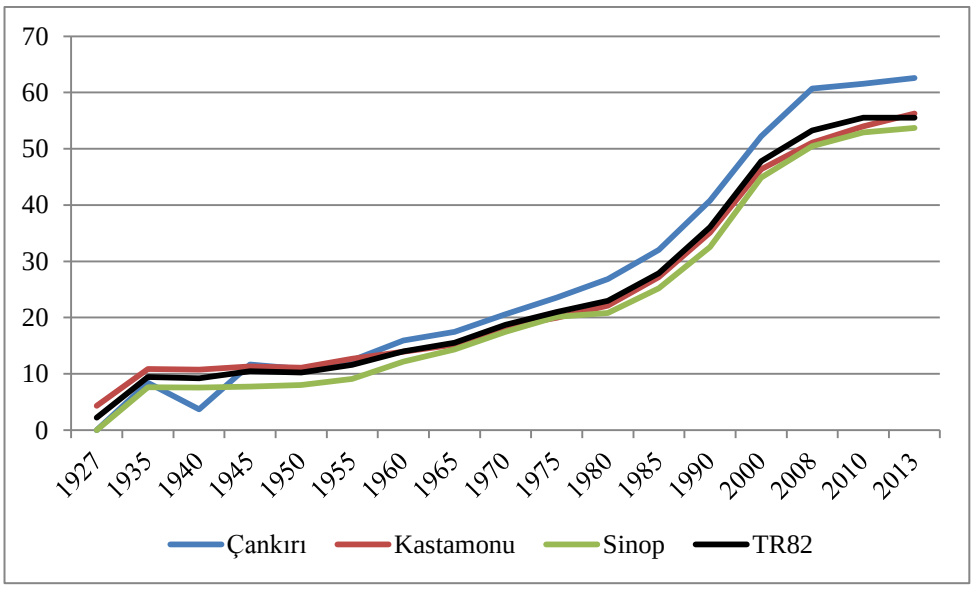


Source: (TurkStat, ABPRS, 2014)

In a simple way, urbanization can be defined as physical growth of the cities. Nowadays, urbanization is mostly shaped by intense migration. Fertility levels have also continued their effects on urban growth. Urbanization can be simply calculated through urban population divided by total population for a given place.

Figure 22 shows urban population percentages of the region. In reference to the figure it is obvious that urban population growth looks like exponential growth rate figures. That actually means intense migratory movements to the cities and/or urban areas. It can be implied that between 1927 and 2013, economic policies shaped social structure through migration and urbanization. The scope of this study does not include the deep investigation of urbanization.

Figure 22: Urbanization in the Region (1927 – 2013)



Source: Source: (SIS, Population Censuses, 1927-2000), (TurkStat, ABPRS, 2014)

3.1.6. Conclusion

TR82 Region and its provinces are currently fragile in terms of population. This fragility will continue in the near future. Neglecting the recent slightly increases, the total population has been shrinking due to migratory movements, low birth and high death rates. Through intense migratory movements, the population structure has also been affected negatively. In the region, there are no problems in terms of sex structure. Because of the contraction of the working age population, low fertility levels and ageing have emerged as important issues. As of 2013, TR82 region is the oldest region in Turkey. In the urban side, shares and dependencies of young and elder population are not very eye catching. However, the same cannot be said for rural areas. In the rural side, the elderly population shares and dependency ratios are in a raising trend while the young population shares and dependency ratios are in a downward trend. With recent developments in the health services, infant mortality rates in the region are now below the Turkey average. Total fertility levels are below reproductive level in the region. Intrinsic growth may cover this decrease but in the near future the region will face significant declines in the population growth. Rural – urban imbalances and raising divergence look also as striking challenges with ongoing rural migration (rural flight). In the recent years, former migrants are tending to turn back to their countries and that fact underlines an elderly immigration to the region. To sum up, the main problems that the region does face and will face in the near future are:

- Population decline
- Distorted age structure
- Ageing (Especially rural ageing)
- High rural elderly dependency
- Low fertility
- Rural flight
- Urbanization

CHAPTER III

CURRENT SITUATION OF NORTH ANATOLIA

PART II

ECONOMIC SITUATION OF NORTH ANATOLIA

3.2. PART 2 - ECONOMIC SITUATION OF NORTH ANATOLIA

3.2.1. Introduction

TR82 Region is comprised of Kastamonu, Çankırı and Sinop provinces. Although these provinces have different economic structures, their general outlooks are close in a general respect. In order to provide a comprehensive economic outlook of the region it is possible to investigate the provinces separately.

The economy of Kastamonu is mostly based on forestry and agriculture. It is hard to mention intense industrialization in Kastamonu. However the presence of the existing industry is mostly placed in the city center and Tosya district. There are two organized industrial zones (OIZ) in Kastamonu. Kastamonu OIZ is nearly full and Tosya OIZ is newly established and still developing. The lead industrial sectors in Kastamonu are: Food and beverage production, furniture production, mining and textile. Business life is mostly placed in the city center. As of 2012, there are 8.895 workers in the registered firms. The main economic potential of Kastamonu is, due to its rich forests and reserves, forestry and mining (81 İl Durum Raporu, 2012, p. 253).

Çankırı draws a manufacturing, agriculture and mining based economic portrait. As of 2012 there are 5.262 workers in the registered firms. Industrial facilities lay in the city center, Korgun, Şabanözü, Çerkeş, Ilgaz and Kurşunlu districts. The lead industrial sectors in Çankırı are: Food and beverage production, mining and metal working. The main economic potential of Çankırı is food and beverage production and mining (81 İl Durum Raporu, 2012, p. 114). There are four industrial organized zones in Çankırı. Two of them (Şabanözü and

Korgun OIZ's) are full and very efficient. Çerkeş and Yakınkent OIZ's are relatively new and therefore will be efficient in the near future.

Sinop has huge geographic disadvantages in terms of its location. Sinop is far away from the inner-market, has weak connections to surrounding provinces and has weak seaways due to having no harbor. Like Kastamonu, it is hard to speak of industry in Sinop. The economy of Sinop is mostly based on agriculture, forestry, tourism and manufacturing sectors. Mining, textile and furniture production are main industrial activities. Boyabat province is one of the important industrial production centers in Sinop. There are 4.203 workers employed in registered firms in Sinop, as of 2012 (81 İl Durum Raporu, 2012, p. 380). Green housing has emerged as a valuable economic activity in Sinop. Important economic potentials of Sinop are fisheries, agriculture, forestry, mining and tourism.

Briefly, TR82 draws a non-industrialized region composition with its existing labor intensive economic activities and sectors. Consequently, accessibility problems and hardship in the transportation and daily life have let the region naive[24]. Economic agents are mostly comprised of small and medium sized enterprises in the region. Considering the high industrialization period of Turkey from 1980 up to now, it can be said that migratory movements from the region to developing regions are understandable.

It is widely recognized that Lewis model can be considered a pioneering model of rural urban migration. In this framework, the backward rural sector is the supplier of cheap labor to the advanced industrial sector. It seems that the Lewis model has some suitable implications for the near past of TR82 Region (see 1.1.3. Theories of Development). It is not possible to say, however, that the region will be developed solely through industrialization in the future.

3.2.2. Socio Economic Stance

In Turkey, like many other developing countries, regions are differing in social, cultural and economic terms. In order to order provinces in a developmental sense, there are some indexes generated by various institutions. These indexes include many social and

24 Less developed and far from self-sufficiency.

economic variables for a healthier comparison (Özgür & Güler, 2003, p. 75). In this part, some indexes have been investigated for an economic clarification and classification. The first study, which determines the development ranking of regions, was carried out in 1996 by Ministry of Development of Turkey, former State Planning Organization (SPO). However, the first study does not include provincial level comparison. The second (Dinçer, Özaslan, & Kavasoğlu, 2003) and third (SPO, İllerin Sosyo-Ekonomik Gelişmişlik Sıralaması, 2011) development ranking studies of the Ministry of Development, have made comparisons between provinces. According to the 2003 and 2011 studies, ranks of TR82 provinces over 81 provinces in Turkey have been summarized below, in the Table 10. One should say that the methodology between these two studies is not the same. There are different number of variables between studies. However assessing the ranks among the provinces of TR82 for each study, it is clear that the order has not changed by the time. According to the 2003 and 2011 study, Kastamonu is the most developed and Çankırı is the least developed city of TR82 Region.

Table 10: Socio-Economic Development Ranks in the Region

	2004	2011
Kastamonu	51	47
Çankırı	59	54
Sinop	57	51

Source: (Dinçer, Özaslan, & Kavasoğlu, 2003) (SPO, İllerin Sosyo-Ekonomik Gelişmişlik Sıralaması, 2011)

In the literature, there are various socio-economic development rank studies for Turkey. Some of them are, (Yıldız, Sivri, & Berber, 2012), (Özgür & Güler, 2003) and (Eraydın, Gül, Çevik, & Demir, 2012). Summarizing, almost every study has found that Kastamonu, Çankırı and Sinop provinces are less developed provinces, in a socio-economic perspective. Generally, Eastern Regions in Turkey are less developed. According to the studies, in some respects TR82 draws Eastern characteristics among others. As a conclusion, it can be said that TR82 is a region like “the east in the west”. This fact is stemmed from accessibility problems mostly sourced by rugged and mountainous terrain, agriculture based economy and late industrialization. Development determinants have strong correlations

between each other. It is not included in this study to examine regional development determinants.

3.2.3. Economic Indicators

Investigating the current economic outlook of the region, it is logical to go deeper in the economic indicators. This section provides important economic indicators and some comments on them for shedding light to the general economic structure of the region.

3.2.3.1. Gross Value Added

Gross Domestic Product (GDP), Gross National Product (GNP) and Gross Value Added (GVA) are important indicators for region to region or region to country comparison. GVA calculates the contribution to the economy of each individual producer, industry or sector in the region. Region level GVA calculations are available only after 2003 and until 2011 in Turkey. Despite the fact that these numbers are not contemporary, they can be used as an important tool. Table 11 shows GVA, for TR82 and Turkey by years. GVA per capita levels are in an increasing trend for both TR82 and Turkey. It can be implied from the table that average the TR82/Turkey percentage is 72,3 which means a more than one quarter gap in TR82 compare to Turkey average. In order to understand the regional economy in a comprehensive way one should also check the sectoral structure of a given region.

Table 11: Gross Value Added Per Capita, Turkish Liras (TL)

	2007	2008	2009	2010	2011	AVG
TR82	7.756	8.551	8.758	9.930	11.057	9.210
Turkey	10.744	12.020	12.000	13.406	15.500	12.734
TR82/Turkey (%)	72,2	71,1	73,0	74,1	71,3	72,3

Source: (TurkStat, Regional Statistics National Accounts 2004-2011, 2014)

3.2.3.2. Sectoral Shares in Gross Value Added

Table 12 represents sectoral percentages of shares of GVA in between 2004 and 2011. From the table it can be said that there is a decreasing trend in the agricultural shares in TR82 and Turkey. Industrial shares are fluctuating while the share of the services growing.

In the developing economies it is expected that agricultural shares would decrease and industry and services shares would increase thereafter. Except the industrial structure, this statement looks correct for both TR82 Region and Turkey. The floating structure of industry shares of the TR82 and Turkey may stem from various determinants such as foreign dependency, uncertainties in the economy and intrinsic problems of the production.

There are certain links between agricultural production and rural population. Since the population of the region, especially in rural terms, is in a shrinking trend, it can be implied that out migration can be one of the main drivers of this phenomenon. According to the table it can be seen that the economy of TR82 Region is mostly agriculture based and less industrialized. The services sector is in a developing structure. The region is well below of the Turkey average in terms of industry and services. Additionally agricultural shares of the region are still well higher than Turkey averages.

Table 12: Sectoral Shares in Gross Value Added (% Shares)

		2004	2005	2006	2007	2008	2009	2010	2011	AVG
TR82	Agriculture	26,1	24,5	21,9	21,4	21,8	22,0	22,6	23,1	22,9
	Industry	18,7	19,5	22,3	20,4	19,3	18,5	20,4	20,1	19,9
	Services	55,1	55,9	55,7	58,2	58,9	59,5	57,1	56,9	57,2
TR	Agriculture	10,7	10,6	9,4	8,5	8,5	9,1	9,5	9,0	9,4
	Industry	28,0	28,0	28,2	27,8	27,2	25,3	26,4	27,5	27,3
	Services	61,3	61,3	62,4	63,7	64,3	65,6	64,1	63,5	63,3

Source: (TurkStat, Regional Statistics, 2014)

3.2.3.3. Labor Market Indicators

Among other economic measures, labor market indicators depict humanitarian aspects of the economy. Table 13 shows main labor market measures of the provinces. By looking at the labor force participation (LFP) figures, it can be seen that total labor force participation is in a wavy structure in all three provinces. The final year, 2013, portrays a decline in the labor force for all provinces. Considering the averages it can be seen that LFP is higher in Kastamonu and Sinop compared to Çankırı. The global financial crisis' effects can be observed from the unemployment rates in 2009. Unemployment rates in the region seem stable. Employment rates of the provinces are fluctuating. Especially in 2013, low employment rates are eye catching.

Table 13: Labor Force Participation, Unemployment and Employment Rates in the provinces of TR82 (%)

	Labor Force Participation			Unemployment Rate			Employment Rate		
	Kastamonu	Çankırı	Sinop	Kastamonu	Çankırı	Sinop	Kastamonu	Çankırı	Sinop
2008	55,8	48,4	53,9	5,3	7,7	6,9	52,8	44,7	50,1
2009	51,7	50,3	52,5	7,3	9,5	10,4	47,9	45,5	47,0
2010	56,3	51,3	56,5	6,4	9,1	8,7	52,7	46,6	51,6
2011	61,7	53,7	59,4	5,3	6,3	5,5	58,4	50,3	56,1
2012	56,0	49,2	55,0	5,3	6,0	5,3	53,0	46,2	52,1
2013	47,2	45,5	46,4	6,2	6,8	6,2	44,2	42,4	43,5
AVG	54,8	49,7	54,0	6,0	7,6	7,2	51,5	46,0	50,1

Source: (TurkStat, Labor Force Indicators, 2014)

Table 14 presents sex specific LFP, unemployment and employment rates by years. According to the table, it is clear that male, female and total LFP have a floating structure in the region from 2008 to 2012. That actually draws an unstable economic view with an unstable labor market. Turkey can be viewed as an emerging economy. Labor intensive production is very common in the rural, less populated and less developed sides of Turkey. That's why wages tend to be low, most of the jobs do not require skilled labor. In order to compete against other regions with basic production like conventional agriculture and textile, most of the industry tends to choose labor intensive production. Labor intensive production

is very fragile due to the amount of the labor. In this kind of production style, most of the costs are composed of wages and a possible external shock damages first employers and/or their wages. Looking to Table 14, unemployment rates are also fluctuating, however, in the last two years they look more stable and low. According to the employment rates, it can be asserted that over half of the population is employed.

Table 14: Labor Force Participation, Unemployment and Employment Rates in TR82 (%)

	LFP			Unemployment			Employment Rate		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
2008	37,5	70,0	53,3	7,0	6,5	6,7	34,9	65,5	49,8
2009	36,0	67,9	51,5	10,6	8,8	9,4	32,1	61,9	46,7
2010	41,7	69,7	55,3	10,5	6,8	8,3	37,3	65,0	50,8
2011	45,8	73,9	59,5	6,4	5,3	5,7	42,8	70,0	56,0
2012	41,0	69,1	54,5	6,4	5,1	5,6	38,3	65,6	51,5
AVG	40,4	70,1	54,8	8,2	6,5	7,1	37,1	65,6	51,0

Source: (TurkStat, Labor Force Indicators, 2014)

Sectoral shares are important indicators to examine sub components of a given economy. According to Table 15, it is clear that the agricultural sector is the lead sector in terms of employment. However, the agricultural sector hasn't been promising with its floating composition. As was mentioned before, agriculture employment is mostly composed of rural inhabitants and potential migratory movements may effect agricultural production and employment. Table 15 also indicates that the employment structure of the industry and services are not stable as well. As of 2012, nearly half of the employment is working in the agricultural sector, almost one third of is working in the services sector and about 15 percent of the employment is working in the industry sector. This composition is directly related with the education structure of the population. It is inferable from the table that the education level is not very high in the region.

Table 15: Sectoral Shares of the Employment in TR82 (%)

	Agriculture	Industry	Services
2009	42,9	17,4	39,8
2010	48,8	15,3	35,9
2011	53,7	13,3	33,0
2012	47,7	15,7	36,6
AVG	48,3	15,4	36,3

Source: (TurkStat, Labor Force Indicators, 2014)

3.2.3.4. Education Level

Table 16 summarizes the education level in the region. The table shows the fact that the region does not have a well-educated population. Most of the well and high educated individuals tend to migrate to metropolises to find suitable jobs and for better lives. Another reason why education indicators look not very developed is rural population composition. It is known that eligible population who has the opportunity to migrate would generally migrate. Especially in the rural side, residual population is generally composed of the elderly, disabled and those who do not have the opportunity of migration.

Table 16: Education Level in the Region, as of 2012, (%)

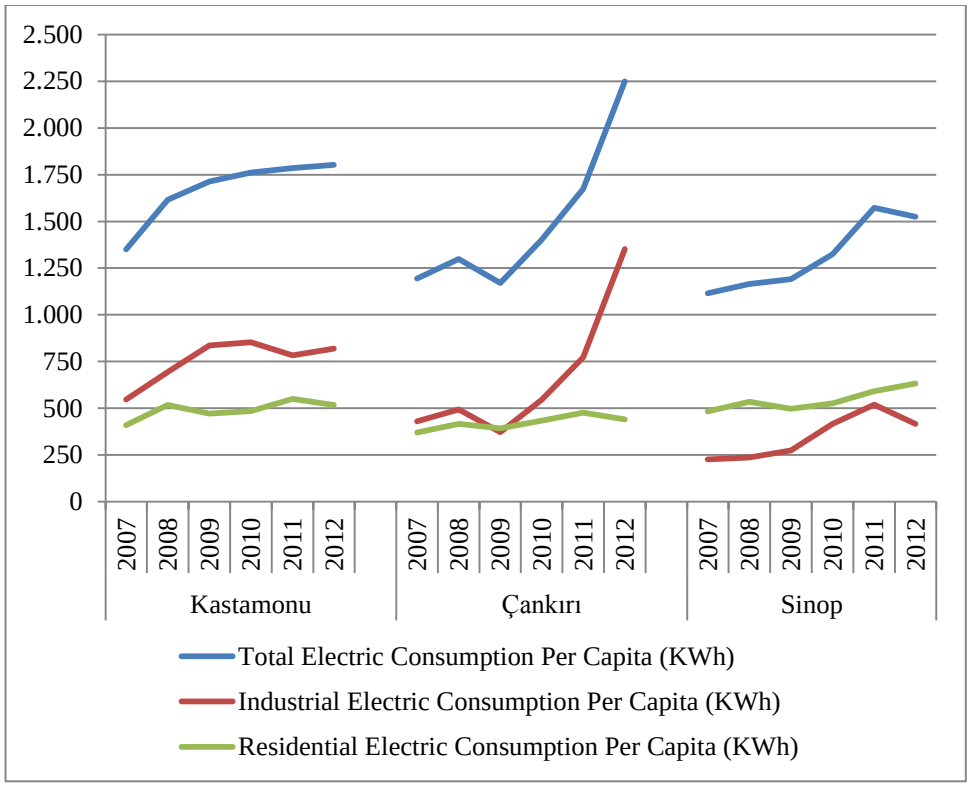
	Kastamonu	Çankırı	Sinop	TR82	Turkey
Illiterate	8,4	5,8	5,6	7	4,1
No school completed	18,3	17,2	19,4	18,3	20,7
Primary school	29,8	27,7	30,6	29,5	22,4
Primary education	16,6	17,7	17,9	17,2	18,7
Junior high school and vocational school	3,7	4,7	3,6	3,9	4,2
High school or vocational school at the same level	15,1	18,4	13,8	15,6	17,8
Higher education	6,6	6,7	7,3	6,8	8,7
Master's degree	0,3	0,4	0,3	0,3	0,6
PhD degree	0,1	0,1	0,1	0,1	0,2
Unknown	1,2	1,3	1,5	1,3	2,6
Total	100	100	100	100	100

Source: (TurkStat, Regional Statistics, 2014)

3.2.3.5. Electric Consumption

Electric consumption data can also give hints regarding economic stance of a region. Figure 23 illustrates industrial, residential and total electric consumption per capita data of the region by years. According to the figure, without small fluctuations, electric consumption has increased in all of the provinces. The main driver of this increase is industrial electric consumption. Çankırı looks very striking in the point of industrial electric consumption. To sum up, electric consumption per capita is in an increasing trend and the main determinant of the increase is industrial use of electric.

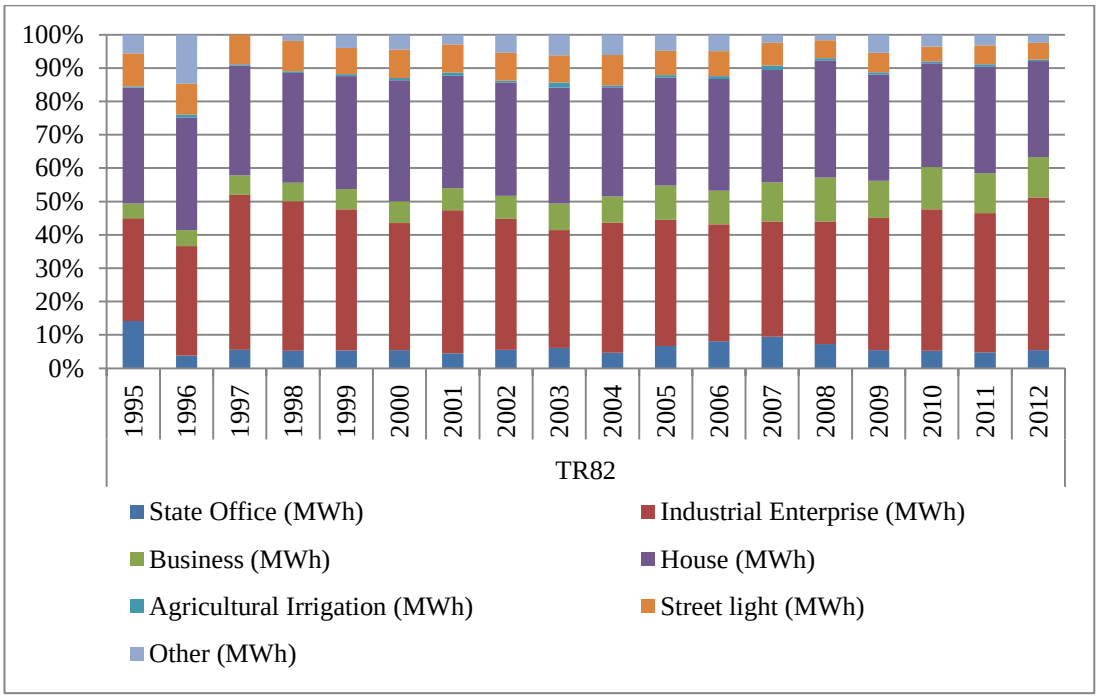
Figure 23: Electric Consumption Per Capita in the Region, KWh



Source: (TurkStat, Regional Statistics, 2014)

Figure 24 summarizes past electric consumption composition in TR82. According to the figure, it is obvious that electric consumption of businesses and industrial enterprises has increased by the time. House level electric consumption has small fluctuations but it can be said that it is almost constant. Hence it can be asserted that industrial investments and production are in an increasing trend in the region, regarding the positive trends in the industrial electric consumption.

Figure 24: Electric Consumption Composition in the Region



Source: (TurkStat, Regional Statistics, 2014)

3.2.4. Social Security

The relationship between demography and social security is very crucial. In the first part of this chapter (see 3.1.6. Conclusion), it is stressed that TR82 is the eldest region in Turkey. This fact actually has affected social security indicators as well.

Table 17 portrays the current social security stance of the region. Active / Passive ratio shows how many insurant supports a retiree. These values are very low in the region and look very fragile. Crudely, TR82 Region actually has the same symptoms as aged Western Europe. However, there are important differences. Labor force participation and shadow economy are not at the desirable levels in the region. A potential raise in the labor force may positively affect active / passive ratio. Moreover, fighting against undeclared work may also positively affect current low levels.

Table 17: Current Social Security Structure in the Region, as of 2014

	Social Insurant (Active)	Retirees (Passive)	Active / Passive Ratio
Kastamonu	81.108	67.531	1,20
Çankırı	39.477	32.212	1,23
Sinop	42.609	46.831	0,91
TR82	163.194	146.574	1,11
Turkey	18.965.687	10.030.818	1,89

Source: (SGK, 2014)

3.2.5. Conclusion

TR82 Region is not an industrialized region. The region's economy is mostly based on agriculture, food and beverage manufacturing, mining and forestry. Labor intensive production in the region, hasn't been able to absorb labor surplus since the early periods of the Turkish Republic. That fact actually has promoted emigration from the region to other metropolises and industrialized regions with the support of inward oriented and import substitution industrialization applications. It can be emphasized that most of the time, industrial policy applications have supported out migration in Turkey.

According to various socio-economic indexes, it can be deduced that TR82 region is economically and socially underdeveloped due to many reasons: Low public and private investments, accessibility problems and no rural development policy until the 2000's have left the region underdeveloped. One can see that out migration is a natural consequence. Gross value added (GVA) values are well below from the Turkey average. The GVA composition indicates that TR82 Region is mostly based on agriculture, while industry and service sector shares are well below Turkey average. Labor force participation levels are normal but not very high. Unemployment is not a problem for the region due to insufficiency of labor supply. The education level of the region is considerably low. With the new established universities, it is believed that this fate will turn to tide. Social security seems very fragile in the region. The region is not in the state of self-sufficiency in terms of financing its own retirees. This means the region is a burden on the central pension system. In the near future, with the severe levels of ageing population, this problem is going to be a significant and striking challenge for the region. In the near future, the region will face the following economic issues:

- Insufficient labor supply
- Insufficient skilled labor force
- Social security gap
- Regional (especially rural) development applications

CHAPTER IV - METHODOLOGY OF THE POPULATION PROJECTIONS

The purpose of this chapter is providing information on the methodology of the population projections. Introducing the data sources, assumptions and software of the projections are relevant for understanding the logic of the empirical findings of the study.

4.1. INTRODUCTION

Population projections are estimates of total size or composition of populations in the future (OECD, 2001). With this basic definition, it can be understood that population projection is an estimation process. However, in depth, projections and estimations, even forecasts, are different things. Briefly, projections require a set of assumptions about the future based on past trends where estimations are indirect measures of present or past condition that can be directly measured. Lastly, forecasts are most probable scenarios of the future based on explicitly stated assumptions.

In the literature, there is a broad agreement on the fact that one of the main usage areas of population projections is planning processes. In the following part, some prominent sources mentioning on purposes of projections will be introduced.

Population projections show how the size, age and sex structure of the population will change when the predicted developments would occur during a defined period. Therefore, population projections make major contributions to the preparation of desired development plans, whether on national or local level. Implementing studies connected with population projections, especially in future labor force planning, infrastructure work, education, health and environmental decision making process are relevant to set true goals (Yavuz, 2011, p. 2). As Karakaya mentioned, projections of future populations and their characteristics are particularly vital to make efficient decisions for planning in both public and private sectors (Karakaya, 2009, p. 1). According to Yüceşahin and KC, population estimates are most widely used to produce demographic analyses and these estimates are important for states, counties, provinces, and other places to plan what types of services to offer and the future structure of populations (Yüceşahin & KC, 2012, p. 2).

Population projections are useful for a variety of purposes, most commonly as a basis for planning. For example, assessing a nation's or region's needs for new jobs, teachers, schools, doctors, nurses, urban housing, or food requires knowledge of the number of people who will be requiring services. Thus, population projections serve as the starting point for most projections of future need (Stover & Kirmeyer, 2007, p. 6).

Population projections and estimates make an important contribution to the activities of governments, organizations and businesses. They serve as a basis for allocating funds or determining major expenditure, and they are in an aid to understanding the nature of ongoing changes and their implications (Rowland, 2003, p. 433).

With reference to fertility, mortality and migration population projections predict the future size and composition of populations. According to Alkema et al. population projections are used for many purposes, including predicting the demand for food, water, education, medical services, labor markets, pension systems, and future impact on the environment (Alkema, et al., 2010, p. 1).

It is certain that population projections are crucial tools for future planning processes. Moreover, population projections are important tools for predicting the past or future activities of populations. Basically, past projections are called retrospective and future projections are called prospective population projections. Since population is the most important component of a given society; rulers, administers, policy makers and even private business leaders always tend to know how much population or how many potential customers they are going to have in the future. Usually, this curiosity has deep politic and economic concerns. Especially in modern times, these kind of social data and research activities, in turn, are mostly used and produced by private businesses for estimating and evaluating their potential future profits.

By following Siegel and Swanson, population projection producers can be classified into three parts: International, national and subnational producers. The most prominent international population projections have been produced by the United Nations (UN) since 1958, the World Bank (WB) since 1978 and the U.S. Census Bureau since 1985. Some other agencies also make international population projections. The Population Reference Bureau (PRB), the International Institute for Applied Systems Analysis (IIASA), the Statistical

Office of the European Communities (EUROSTAT) produce national population projections by age and sex (generally three scenarios: low, medium and high variant) for the countries of the European Union and the countries of the European Free Trade Association every 3 to 5 years. Academic demographic centers (e.g., Australian National University), private-sector entities (e.g., The Futures Group), and other specialized institutions (e.g., U.S. National Research Council) also conduct research on population projections (Siegel & Swanson, 2004, p. 564).

Moreover some government institutions also produce national level population projections. The most prominent national producer is U.S. Census Bureau. In Turkey, these national population projections have produced by TurkStat.

Furthermore, according to Siegel and Swanson, some government agencies, research institutes, and private businesses produce subnational population projections. In the United States, for example, the U.S. Census Bureau makes projections for states; most state governments (or their designees) make projections for counties in their states (and for the state as a whole); and many local and regional governments make projections for cities, census tracts, block groups, and other small areas (Siegel & Swanson, 2004, p. 564).

Turkey met with development plans in the 1960's. The first comprehensive population projection was made for the First Five Year Development Plan that was prepared by the State Planning Organization (SPO) in Turkey (Berksan, 1969). Afterwards, many other population projections were made by various institutions. The most recent study regarding population projections in Turkey is Karakaya's M.A. thesis (Karakaya, 2009). In his study, Karakaya made national, regional and local level, cohort-component based, mid ranged, one scenario population projections for Turkey. Beside this study, the official statistical institution of Turkey (TurkStat) published their recent population projection for the 2013 – 2075 period.[25]

As stated by Karakaya projections may be generated for the total population of nations, geographical subdivisions, specific localities, and also for residence classes such as rural and urban population. Population projections may also be made for different social and economic subgroups of the population or demographic aggregates (Karakaya, 2009, p. 15).

25 TurkStat Population Projections, 2013 – 2075 http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=15844 [Date Accessed 11.07.2014]

Briefly, population projections can be generated at national, regional and local levels. In this study, the planning and policymaking path has been followed and regional level population projections have been made to investigate the future demographic structure of the region and therefore making developmental inferences.

Another difference between population projections is the time range. Karakaya points out a time range classification: Short, middle and long range projections expand, in turn, to 10, 10 to 25 and over 25 years (Karakaya, 2009, p. 5). This study can be regarded as a long range projection from 2008 to 2050, which has a projection of 42 years.

There are many methods for population projections. The main difference is on whether they adopt mathematical or cohort-component methodology. Briefly, mathematical methods that are based on two or more censuses can be arithmetic, geometric and exponential while those based on three or more censuses can be logistic and polynomial. Mathematical methods are easy to apply, however, they have a lot of limitations:

- Mathematical techniques are not very explanatory.
- They do not provide any detailed information on sex and age structures.
- They assume a main pattern for each region, but the regions are different in demographic terms.

Cohort-component projections include every demographic dynamic, which are fertility, mortality and migration. The data requirements of cohort-component projections will be discussed in the following part.

4.2. DATA SOURCES

According to Yavuz and Türkyılmaz there are four main inputs required for a population projection based on the cohort-component method (Yavuz & Türkyılmaz, 2009, p. 149):

i. First year population
ii. Fertility
iii. Mortality
iv. Migration

These inputs have sub components as well. The following part gives detailed information about the inputs:

4.2.1. First year population

First year population is the population of the base year that can be discriminated through urban and rural, sex and single or five years age groups. In this study, 2008 Address Based Population Registration System (ABPRS) results were adopted as the first year population. Beyond 2008, there are 2009, 2010, 2011, 2012 and 2013 ABPRS data already available. The reason why the projection has been started from 2008 is stemmed from the wish to measure the reliability of the projection for the already experienced 5 years, from 2008 to 2013. In this study, the urban and rural populations are classified in sex and 5 years age groups specific. There are 17 different 5 years age groups, that start with 0 – 4 and end with 80+. Sex and 5 years age groups specific ABPRS data is available for the province level on TurkStat's web page[26]. However, the web page doesn't offer urban-rural discriminated data. One may claim this kind of specific data seperately from TurkStat's online info service with small charges.[27] 2008 ABPRS results of Kastamonu, Çankırı and Sinop's urban-rural,

26 Address Based Population Registration System (ABPRS) Results: http://tuikapp.tuik.gov.tr/adnksdagitapp/adnks.zul?dil=2 [Date Accessed 12.07.2014]
27 TurkStat info service: info@tuik.gov.tr

sex and 5 years age groups separated data was claimed from TurkStat info service and is attached at the end of the study (please see Appendix – 1 tables a, b and c).

4.2.2. Fertility

One of the main drivers of the population change is fertility. Fertility levels and behaviors determine the future composition and trends of a given population. There are three different sub-components of fertility: Age specific fertility rate (ASFR), total fertility rate (TFR) and sex ratio at birth. Only a specific group of population, the 15-49 age group females, can experience childbearing. ASFR specifies the future trends of fertility and constitutes the TFR (Karakaya, 2009, p. 36). The initial age specific fertility rates for 2008 and TR8 Black Sea region have been calculated by Hacettepe University Institute of Population Studies (HIPS). In this study, it is agreed that the calculated ASFR values are valid for each province in TR82. For the projection, the 2050 final year ASFR values for the region are imported from World Population Prospects: The 2012 Revision excel sheet.[28] TFR values are estimated using 1980, 1985, 1990 and 2000 censuses undertook by the State Institute of Statistics (SIS, Censuses, 1927-2000) and 1998, 2003 and 2008 TNSA calculations provided by HIPS (please see Appendix – 1 tables d and e).

4.2.3. Mortality

Like fertility, another important input is mortality. For population projections, life expectancies for both sexes and a life table pattern are required. In this study life expectancy levels of TR82 are adopted from life expectancy levels of the Turkey average as of 2008. 2050 life expectancy levels are adopted from 2011 Germany life expectancy at birth values. Life expectancy at birth data is imported from the World Bank data.[29] For the life table

28 World Population Prospects: The 2012 Revision:
http://esa.un.org/wpp/Excel-Data/EXCEL_FILES/2_Fertility/WPP2012_FERT_F07_AGE_SPECIFIC_FERTILITY.XLS [Date Accessed: 12.07.2014]
29 World Bank Life Expectancy at Birth Data,
Males: http://data.worldbank.org/indicator/SP.DYN.LE00.MA.IN [Date Accessed 14.08.2013]
Females: http://data.worldbank.org/indicator/SP.DYN.LE00.FE.IN [Date Accessed 14.08.2013]

pattern, in respect of the low IMR levels in the region, Coale-Demeny West life table is preferred (please see Appendix – 1 table f).

4.2.4. Migration and Urbanization

Migratory movements and percentages are calculated through ABPRS migration data[30]. From 2008 to 2012, net migration values are used for expressing the total migration for both sexes. Age structure of the migration is also calculated as percentages. Urbanization data is calculated from ABPRS data as well. Except the first year population, in every input group, there are linear or exponential estimations (please see Appendix – 1 table g).

The details and assumptions will be discussed in the following section. In conclusion, the main data sources of this study are:

- Address Based Population Registration System (ABPRS)
- Population Censuses undertaken by SIS
- Hacettepe University Institute of Population Studies (HIPS)
- World Population Prospects: The 2012 Revision, UN DESA
- World Bank

30 Address Based Population Registration System (ABPRS) Results: http://tuikapp.tuik.gov.tr/adnksdagitapp/adnks.zul?dil=2 [Date Accessed 12.07.2014]

4.3. SUBSTANTIAL ASSUMPTIONS

In order to make comprehensive and healthier analyses, almost every scientific research assumes some facts. In this study, especially in the population projection section, there are some important assumptions made. They will be introduced the same input order as the ones in the data sources section. The substantial assumptions of the population projections are as follows:

4.3.1. First year population

Most of the relevant population data was imported from General Population Censuses and ABPRS. For the population projections, it was adopted to start the projections from 2008. The final year of the projections is 2050. Primarily, it is assumed that urban-rural level, sex and five years age groups classified data is correct and there is no need for any statistical correction for any provinces. It is known that statistical correction decreases the data quality of a research. With the help of well-developed and recorded population data through ABPRS, the quality of the demographic data is above a defined benchmark in Turkey.

4.3.2. Fertility

Fertility is a key driver of the size and composition of the population. Fertility decline has been a primary determinant of population aging and projected levels of fertility have important implications on the age structure of future populations, including the pace of population aging (Alkema, et al., 2010, p. 1).

There are three different assumptions on the age specific fertility rate (ASFR), total fertility rate (TFR) and sex ratio at birth. For ASFR, it is assumed that as of 2008, each province in TR82 Region has the same age specific fertility rates that the TR8 Region (West Black Sea) has. 2008 ASFR data for TR8 Region has been calculated by HIPS. Moreover,

2050 ASFR data has been imported from World Population Prospects: The 2012 Revision. It is assumed that in 2050, each province will experience the ASFR values that Turkey would face. Briefly, 2050 would be the year which TR82 provinces have the same ASFR values as Turkey has. Between 2008 and 2050, the linear interpolation method has been used for gradual changes with time in the age groups (see Appendix – 1 table d).

TFR values have been created through 1980, 1985, 1990 and 2000 census data provided by TurkStat and 1998, 2003 and 2008 Demographic and Health Surveys that have been estimated by HIPS. For TR82 provinces (Kastamonu, Çankırı and Sinop), it is assumed that census based TFR estimations are correct and there is no need for statistical correction or weighting. In the 1998 DHS, TFR values were estimated only in the five regions level (see Map 1) and in urban-rural level. 5 regions level and urban-rural level data is also available in 2003 DHS. Besides 5 regions and urban-rural level data, with the institutionalization of the NUTS system, 2008 DHS provides NUTS 1 level TFR data. For 1998, 2003 and 2008, five regions "North" TFR calculations were used as a proxy for each province in TR82. After these proxy choices, there is a hypothetic 2000 DHS estimated through 1998 and 2003 DHS. The hypothetic 2000 DHS is 60 percent composed of 1998 DHS and 40 percent of 2003 DHS values. In order to utilize the census data of 2000, a factor is created through the TFR from 2000 census data divided by hypothetic 2000 DHS's TFR value. Finally this factor is used for weighting 2008 DHS' TFR values. This operation was done for each province of TR82. By this operation it can be seen that beyond the DHS data, census data was also utilized. A summary table of the methodology is provided below for a brief explanation of this process (see Table 18).

Table 18: Total Fertility Rate Calculation for the Region

	1	2	3	4	5	6	
					0,6*2+0,4*3	1/5	6*4
	TFR from Census	TFR from DHS			2000 DHS	Factor	Weighted 2008 TFR
	2000	1998	2003	2008			
Kastamonu	2,20000	2,68000	1,94000	2,08000	2,38400	0,92282	1,91946
Çankırı	2,30000	2,56000	1,86000	2,20000	2,28000	1,00877	2,21930
Sinop	2,50000	2,68000	1,94000	2,08000	2,38400	1,04866	2,18121

Source: (HIPS, 1999), (HIPS, 2004), (HIPS, 2009a), (SIS, 2004).

With this calculation, the initial year (2008) TFR level is made available for use. After acquiring the initial year TFR values, there are two different thresholds set. Regarding the decreasing fertility trend in Turkey, a pessimistic viewpoint is adopted to be more realistic.[31] Table 19 summarizes the future TFR assumptions for the region. It is adopted that Kastamonu, Çankırı and Sinop will experience 1,51, 1,95 and 1,72 TFR values, respectively in 2023. Additionally, it is assumed that Kastamonu, Çankırı and Sinop, will face very low TFR values such as, in turn, 1,4, 1,7 and 1,55 by 2050. The TFR growth rates are different between 2008 – 2023 and 2023 – 2050 period. In the latter, the growth rate is lower than the first one. Intervals are estimated with the exponential interpolation method (see Appendix – 1 table e).

Table 19: Province Level Future TFR Assumptions

	2008	2023	2050
Kastamonu	1,92	1,51	1,40
Çankırı	2,22	1,95	1,70
Sinop	2,18	1,72	1,55

(HIPS, 1999), (HIPS, 2004), (HIPS, 2009a), (SIS, 2004).

Sex ratio at birth defines male births per female births. Sex ratio at birth was assumed constant at 105 for each province and each year between 2008 and 2050. According to this assumption it is accepted that there will be no structural changes in the birth pattern of each province and sex (see Appendix – 1 table f).

4.3.3. Mortality

Mortality input has two sub components which are life expectancy levels for males and females and a life table pattern for the mortality behavior. In this study, life expectancy levels are imported from the World Bank data set. It is assumed that the imported data is correct and perfectly reflects the truth. The core of the assumption on the life expectancy

31 Karakaya assumed more pessimistic TFR values for the region that TFR of Kastamonu will be 1,40 and TFR of Çankırı and Sinop will be 1,90 in 2023 (Karakaya, 2009). In this study a linear reduction was implemented for the benchmark years namely 2023 and 2050. It is believed that defined benchmarks are consistent with the past TFR dynamics of the region.

suggests that in 2008, TR82 Region has experienced Turkey's average life expectancy at birth levels of 2008. In addition, the region will face Germany's 2011 situation in 2050 for both sexes.[32] There is a linear interpolation method used for interpolation between 2008 and 2050 for both sexes. From 2008 to 2050, life expectancy at birth for males will rise to 78 years from 71 years and for females it will rise to 83 years from 75 years. For the life table pattern, in the respect of the low IMR levels in the region, the Coale-Demeny West life table is preferred. Considering the average IMR is about 11 per thousand, it is suggested that the most suitable pattern for TR82 is the Coale-Demeny West life table.

4.3.4. Migration and Urbanization

4.3.4.1. Migration Scenarios

Net migration numbers are calculated through the difference of immigration and emigration[33] numbers. Immigration and emigration statistics have been imported from 2008, 2009, 2010, 2011 and 2012 ABPRS results. The richness of population projections stem from their unique bodies. Every single population projection brings the population to a defined point. In this case, the importance of the scenarios comes to fore. With sufficient and satisfactory assumptions, each scenario tries to develop a given population to an unknown future. As a conclusion, scenarios make population projections more real and valuable. In this study, three different scenarios have been created. Briefly they are:

i. Scenario 1
ii. Scenario 2
iii. Scenario 3

32 Selecting Germany as a proxy for the future life expectancy at birth levels of the region may seem inappropriate. However, according to the World Bank, as of 2011, 21 percent of the population of Germany is in the age group of 65+. Considering the current trends and demographic dynamism of the region, it is very likely that the region will approach this proportion by 2050. Germany is one of the ageing countries in the world. Moreover, it is counted as a developed one. Hence, believing that the region will develop economically and socially towards 2050 and using Coale-Demeny West life tables for the region, the low infant mortality levels make Germany a good future example.

33 Immigration and emigration are used as local migration terms. Immigration refers inward migration to TR82 and emigration refers to out migration from TR82.

It is regarded as crucial to change the assumptions of each scenario. The best idea in this way is to change only migratory assumptions since other demographic inputs are relatively stable. Briefly, in the scenarios only migratory assumptions differ. Each scenario has the base of real net migration pattern for both sexes between 2008 and 2012. In the year of 2013, the average of these five years has been used (see Appendix – 1, g). The main logic of the migration scenarios is based on defining a final year migration value for 2050 and making linear interpolation for the years in between. In the Scenario 1, Scenario 2 and Scenario 3, it is assumed that TR82 region has respectively, -3.000, zero and 3.000 migrants in total[34]. In each scenario, the total numbers of migrants were portioned through the total population share of each province. In 2050, it is assumed that the number of female and male migrants would be equal. Accordingly, through the Scenario 1, it can be said that Çankırı sends 358 (716/2) male and 358 (716/2) female migrants in 2050 (see Table 20). In the following part, the scenarios will be introduced.

Table 20: Province and Scenario Specific Migrant Portions

			Assumed Total Migrants in 2050		
	2008 Population	Percentage Share	Scenario 1	Scenario 2	Scenario 3
Kastamonu	360.424	48,9	-1.467	0	1.467
Çankırı	176.093	23,9	-716	0	716
Sinop	200.791	27,2	-817	0	817
TR82	737.308	100	-3.000	0	3.000

4.3.4.1.1. Scenario 1

Investigating the near history, it is obvious that TR82 Region is a migrant sender region. By this fact, stressing the severe out migration in the future, there is a pessimistic scenario created and titled as Scenario 1. In the Scenario 1, the base year pattern of net migration is imported from real ABPRS data (see Appendix – 1, g). It was assumed that the region will send 3.000 migrants in 2050. Proportioning this amount, it is also assumed that Kastamonu, Çankırı and Sinop, in turn, will send 1.467, 716 and 817 migrants. The values

34 The number 3.000 was derived from region's past experiences. From 1927 to 2013 the average annual population change of the region (TR82) is +3.031. Therefore this figure was used for the scenarios by rounding it.

between 2013 and 2050 are calculated with the linear interpolation method (see Appendix – 1 table h part a.).

4.3.4.1.2. Scenario 2

Like the Scenario 1, Scenario 2 is also constructed on the real migration data provided by ABPRS (see Appendix – 1, g). According to this scenario, it is assumed that TR82 Region will not witness any migratory movements either inward or outward in 2050. In this case, intense migratory movements will be reduced to zero. As of 2050, each province will have 0 migration. The values between 2013 and 2050 were calculated with linear interpolation method (see Appendix – 1 table h part b.).

4.3.4.1.3. Scenario 3

In order to calculate the maximum inward migration potential of the region there is an optimistic scenario created and titled as Scenario 3. In the Scenario 3, it was assumed that the region will receive 3.000 migrants in 2050. Proportioning this amount, through the populations of each province, it is calculated that Kastamonu, Çankırı and Sinop, in turn, will receive 1.467, 716 and 817 migrants. The values between 2013 and 2050 are calculated with the linear interpolation method (see Appendix – 1 table h part c.).

The pattern of migration was calculated from the age specific net migration statistics provided by ABPRS. For the period of 2008 – 2012, a real migration pattern is adopted for both sexes (see Appendix – 1 table i parts a and b). After 2012, from 2013 to 2050 the average of 2008 – 2050 period is adopted for each age group. The software that is used for the population projection requires age pattern of migration to 80+. However, the age pattern of the migration that ABPRS provides is only through 65+. In the software there is a normalization facility used for filling the 70 – 74, 75 – 79 and 80+ age groups.

4.3.4.1. Urbanization

Urbanization values are calculated simply by dividing the total urban population to the total (urban plus rural) population and then multiplying them with one hundred for 2008, 2009 and 2010 for each province. After obtaining urban population percentages through this operation, the logarithmic differences are calculated between 2008 – 2009, 2009 – 2010 and 2008 – 2010 separately for each province. The averages of these logarithmic differences are used as a constant growth rate for provinces. By using these growth rates, linear interpolation has been applied between 2008 and 2023. With this methodology, Turkey will reach almost 85 percent urban population in 2023, in average terms, which is very likely. Comparing with this information, it is assumed that Kastamonu and Sinop will have 85 percent urban population in 2050.[35] Then, the linear interpolation method was used between 2023 and 2050 for Kastamonu and Sinop. For Çankırı, things are a little bit different. The growth rate that was calculated from the beginning (through logarithmic differences between 2008 – 2009, 2009 – 2010 and 2008 – 2010) is smaller.[36] Regarding this smallness, the growth rate was applied to Çankırı from 2008 to end 2050. Unlike others there is no interception between 2008 and 2050 trend in Çankırı and urban population in Çankırı will reach 77,8 percent in 2050 (see Appendix – 1 table j).

35 It is very likely for the urbanization percentages of the region to increase. Besides rural flight, migration to the urban areas from different regions has significant effects on this.

36 Calculated growth rates for Kastamonu, Çankırı and Sinop are 0,027, 0,007 and 0,023 respectively.

4.4. SOFTWARE

There are many population projection software available for public use. Beyond this, a lot of social scientist develop their own population projection macros through well-known and common used software. Some prominent population projection software are: FIVFIV[37], PADIS-INT[38], PDE[39] and Spectrum[40].

In this study, for making population projections, Spectrum software's version 4.66 has been used. Spectrum is a user friendly policy modelling program. The interface of the program is quite easy and the software interacts perfectly with other software such as Microsoft Office Excel. Spectrum[41] is a Windows based system and has seven components:

- DemProj: Demography
- FamPlan: Family Planning
- LiST: Lives Saved Tool (Child Survival)
- AIM: AIDS Impact Model
- Goals: Cost and impact of HIV Intervention
- Resource Needs Module: Costs of implementing an HIV/AIDS program
- RAPID: Resources for the Awareness of Population Impacts on Development

Each component has user friendly interfaces and very easy to use. For the population projections of this study, the DemProj module of the program has been used. DemProj is a demographic model in the Spectrum system which is used for making population projections for countries or regions. DemProj needs demographic information such as the number of people by age and sex in the base year, current year data and future assumptions about the total fertility rate, the age distribution of fertility, life expectancy at birth by sex, the most appropriate model life table, and the magnitude and pattern of international migration for population projections (Stover & Kirmeyer, 2007, p. 6).

37 HPN Technologies FIVFIV Population Projection Software: http://www.hpntech.com/fivfiv/ [Date Accessed: 12.07.2014]
38 PADIS-INT Population Projection Software: http://www.padis-int.org/ [Date Accessed: 12.07.2014]
39 PDE Population Projection Software by IIASA: http://webarchive.iiasa.ac.at/Research/POP/pub/software/pde/ [Date Accessed: 12.07.2014]
40 Spectrum System: http://futuresgroup.com/resources/software_models/spectrum [Date Accessed: 12.07.2014]
41 For details see Stover and Kirmeyer, 2007.

CHAPTER V - FUTURE SCENARIOS, FORESIGHTS AND IMPLICATIONS

After the introduction of the methodology of the population projections in the previous chapter, this chapter provides future scenarios, foresights and implications. The chapter has three parts. In the first part, projection outputs will be examined for Kastamonu, Çankırı, Sinop and TR82 under different scenarios[42]: Scenario 1, Scenario 2 and Scenario 3, respectively. In the second part, in future demographic indicators, other projection outputs will be introduced such as sex ratio, dependency ratios, median age, urban and rural populations. Finally, the last part presents the findings of the study and concludes the study through some foresights and implications on employment, agricultural production and urbanization.

5.1. PROJECTION OUTPUTS

As introduced in the fourth chapter, this study has used a population projection with the cohort-component method and the projections were generated by Spectrum software's DemProj module. According to the base data and assumptions, there are three projections created in response to three different scenarios for each province. It is important to stress again, in province level, that these scenarios differ only in the respect of migration. Other inputs are the same. In response to the low variant, medium variant and high variant projections, in turn, Scenario 1, Scenario 2 and Scenario 3 were generated.

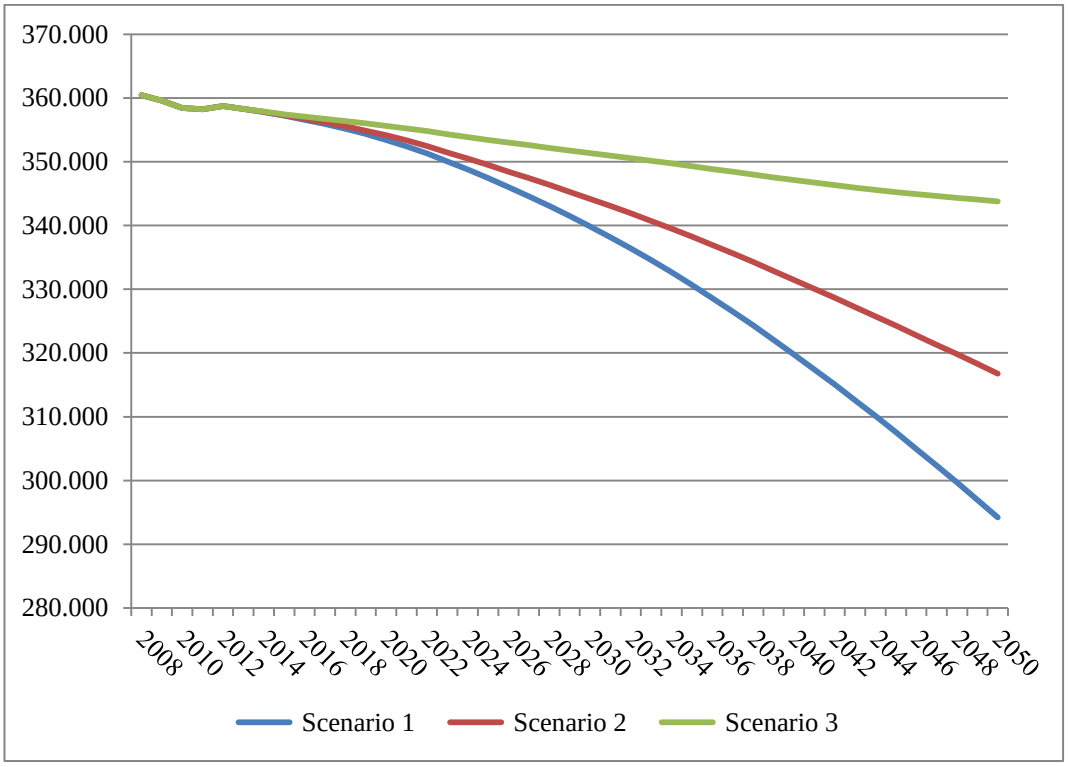
It is also crucial to emphasize that these population projections only reflect the future state of the region without any structural change. New industrial establishments, new branches in the university or new settlements, in turn, directly indicate new workers, students and therefore a population change. It is also assumed that, under the obligation of not being able to measure new developments dynamically, there will be no huge differences in the region in terms of investments.

42 Population projections are generated by different scenarios. In this study, one should consider the Scenario 2 as the closer scenario to the real life.

5.1.1. Population Projections of Kastamonu

Figure 25 represents the population projections of Kastamonu. According to the figure, the population of Kastamonu will inevitably decline. As it was mentioned in chapter three, the aged population proportion in Kastamonu is high. Hence, the older population structure combined with low fertility rates will let Kastamonu shrink in the near future. 2015 will be a breaking point for Kastamonu. After 2015, scenarios will start to evoke the differences on the total population. According to Scenario 1, Scenario 2 and Scenario 3, the total population of Kastamonu will be 350.070, 351.478 and 354.336 in the year of 2023, respectively. Moreover, in the year of 2050, regarding Scenario 1, Scenario 2 and Scenario 3, the total population of Kastamonu will be, in turn, 294.201, 316.776 and 343.793 (see Appendix – 2, table a).

Figure 25: Population Projections of Kastamonu



Most importantly, the age structure of the Kastamonu will change with time. Table 21 indicates that, except small differences, all scenarios have parallel meanings. 0 – 4, 5 – 14 and 15- 24 age groups, that constitute the young population, will decrease with time. It seems that working age population will be constant but considering the specific ages in this group, it can be inferred that there will be conglomerations to the high ages, namely to the 50+, and the effects will be apparent later on. Considering the 65 and over age group it is clear that the elderly proportion of Kastamonu will increase significantly. The remarks of Scenario 1, Scenario and Scenario seem very close to each other. The proportion of reproductive women which is indicated as percentages of females in-between the 15-49 age group will also decrease eventually. Summarizing, Table 21 proves that an aged future awaits Kastamonu.

Table 21: Future Selected Age Groups of Kastamonu, 3 Different Scenarios, (%)

		2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
0-4	Scenario 1	6,1	6,3	5,8	5,4	5,1	4,9	4,7	4,5	4,3	4,2
	Scenario 2	6,1	6,3	5,8	5,3	5,0	4,8	4,6	4,4	4,1	4,0
	Scenario 3	6,1	6,3	5,8	5,3	5,0	4,7	4,4	4,2	4,0	3,9
5-14	Scenario 1	13,8	12,5	12,2	12,0	11,1	10,5	10,1	9,8	9,5	9,4
	Scenario 2	13,8	12,5	12,2	12,0	11,0	10,4	9,9	9,6	9,2	9,0
	Scenario 3	13,8	12,5	12,2	12,0	11,0	10,3	9,7	9,3	8,8	8,6
15-24	Scenario 1	15,3	14,8	14,0	12,9	12,7	12,5	11,7	11,1	10,7	10,5
	Scenario 2	15,3	14,8	14,1	12,9	12,7	12,5	11,5	10,8	10,4	10,2
	Scenario 3	15,3	14,8	14,0	12,8	12,6	12,3	11,4	10,6	10,1	9,9
15-64	Scenario 1	65,6	66,3	66,3	65,7	65,7	65,9	65,9	65,4	64,2	63,8
	Scenario 2	65,6	66,3	66,4	65,7	65,8	66,0	66,0	65,5	64,4	64,0
	Scenario 3	65,6	66,3	66,3	65,7	65,8	66,1	66,2	65,8	64,6	64,2
65 and over	Scenario 1	14,5	14,9	15,7	17,0	18,1	18,7	19,3	20,3	22,0	22,6
	Scenario 2	14,5	14,9	15,7	17,0	18,1	18,8	19,5	20,6	22,4	23,0
	Scenario 3	14,5	14,9	15,7	17,0	18,2	18,9	19,7	20,8	22,7	23,3
Females 15-49	Scenario 1	47,7	46,4	46,6	46,3	46,4	45,4	44,8	43,7	42,0	41,3
	Scenario 2	47,7	46,4	46,6	46,3	46,4	45,4	44,7	43,7	42,0	41,3
	Scenario 3	47,7	46,4	46,6	46,3	46,3	45,3	44,7	43,4	41,4	40,7

5.1.2. Population Projections of Çankırı

Figure 26 illustrates future population prospects of Çankırı. Unlike Kastamonu, the total population of Çankırı will increase. There are two breaking points in the figure. All scenarios portray that the population will increase until 2018. After 2018, according to the Scenario 1, total population growth rate will start to decrease, however, considering the Scenario 2 and Scenario 3, the total population of Çankırı will increase in the nearly same growth rates until 2035. In the second breaking point in 2034, Scenario 2 and Scenario 3 will differ regarding the growth rate. In any case, and even in the worst case, it is quite clear that the total population of Çankırı will increase until 2035. Relatively high total fertility rates and immigration will let the population of Çankırı increase. It is also important to see that Scenario 2 and Scenario 3 walk arm in arm until the year of 2034. According to scenarios, total population of Çankırı will be 200.666, 203.359 and 202.756 in the year of 2023 and in the year of 2050, the total population of Çankırı will be, in turn, 199.378, 215.695 and 223.678 (see Appendix – 2, table a).

Figure 26: Population Projections of Çankırı

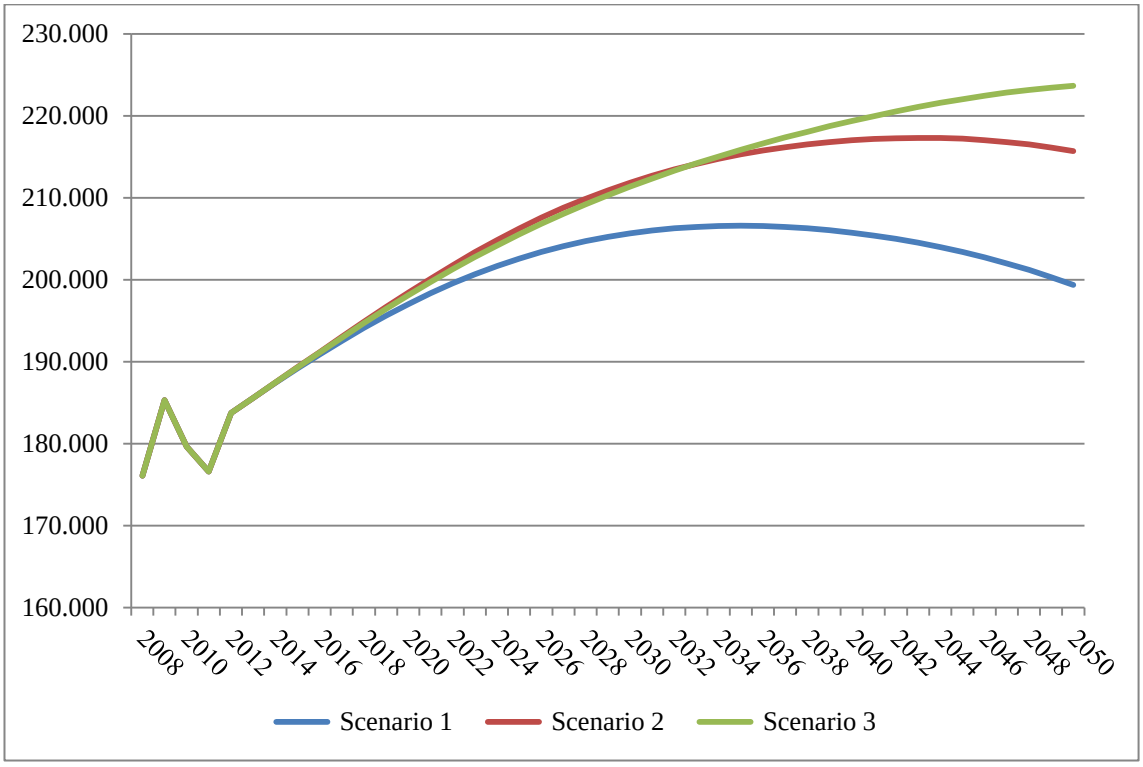


Table 22 shows the future age groups of Çankırı. According to the projection outputs the young population in the 0 – 4 and 5 - 14 age groups will decrease in time. The 15 – 24 age group will fluctuate but eventually decrease. It can be said that scenarios differ on the progress of fluctuating for this age group. Consequently it can be asserted that the young population will decrease softly until 2050. The share of working age population of Çankırı will decrease with time, except some small fluctuations. Like Kastamonu, there will be conglomerations to the high ages in the 15 – 64 age group and the effects will be observable in the following years. Moreover, considering all scenarios, the elderly population proportion will excess 20 percent by 2050. The proportion of reproductive women, which is indicated as percentages of female in-between the 15-49 age group, will also decrease eventually.

Table 22: Future Selected Age Groups of Çankırı, 3 Different Scenarios, (%)

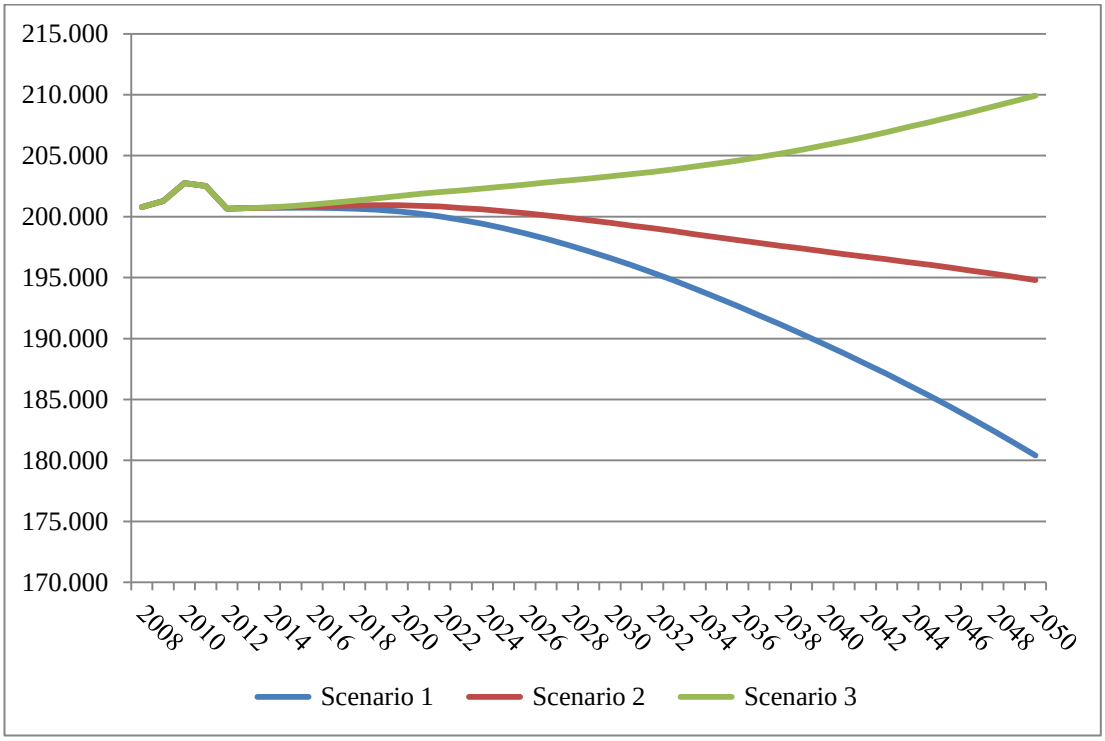
		2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
0-4	Scenario 1	6,7	7,2	7,0	6,6	6,0	5,6	5,5	5,5	5,4	5,4
	Scenario 2	6,7	7,2	7,0	6,5	5,9	5,5	5,3	5,3	5,2	5,1
	Scenario 3	6,7	7,2	7,0	6,5	5,9	5,5	5,3	5,2	5,1	5,0
5-14	Scenario 1	14,8	13,0	12,9	13,5	13,1	12,3	11,6	11,2	11,1	11,2
	Scenario 2	14,8	13,0	12,9	13,3	12,8	12,0	11,1	10,7	10,6	10,6
	Scenario 3	14,8	13,0	12,9	13,4	12,9	12,0	11,1	10,5	10,3	10,3
15-24	Scenario 1	16,1	15,9	13,8	12,1	12,3	13,1	13,0	12,4	11,8	11,6
	Scenario 2	16,1	15,9	13,7	12,0	12,1	12,8	12,5	11,9	11,2	11,0
	Scenario 3	16,1	15,9	13,8	12,0	12,1	12,8	12,4	11,7	10,9	10,7
15-64	Scenario 1	65,2	66,4	65,9	64,7	64,5	64,5	64,3	64,0	63,2	62,8
	Scenario 2	65,2	66,4	66,0	64,8	64,7	64,6	64,3	63,8	62,9	62,4
	Scenario 3	65,2	66,4	65,9	64,8	64,7	64,7	64,5	64,0	63,1	62,6
65 and over	Scenario 1	13,3	13,5	14,2	15,3	16,4	17,6	18,7	19,4	20,2	20,6
	Scenario 2	13,3	13,5	14,2	15,3	16,6	18,0	19,3	20,3	21,4	21,9
	Scenario 3	13,3	13,5	14,2	15,3	16,6	17,9	19,2	20,3	21,5	22,1
Females 15-49	Scenario 1	48,2	47,5	46,4	44,9	44,6	44,7	44,6	43,4	42,4	42,3
	Scenario 2	48,2	47,5	46,3	44,7	44,2	44,0	43,6	42,1	40,8	40,6
	Scenario 3	48,2	47,5	46,3	44,7	44,2	43,9	43,4	41,8	40,3	39,9

Summarizing, Table 22 indicates that Çankırı will have a relatively stable population structure in the near future. Decrease in the young population shares and increase in the elderly population shares seem important for the future Çankırı.

5.1.3. Population Projections of Sinop

Figure 27 demonstrates population projections of Sinop. It can be understood from the figure that the progress of the total population of Sinop will be different in terms of scenarios. Late 2010's indicate a breaking point for the projections. According to Scenario 1, Scenario 2 and Scenario 3, the 2023 and 2050 population of Sinop will be 199.737, 200.713, 202.161 and 180.394, 194.791, 209.911 respectively. Comparing with Kastamonu and Çankırı, total population differences among the scenarios are not much higher.

Figure 27: Population Projections of Sinop



Analyzing Table 23, it can be said that young age groups, which are 0 – 4, 5 – 14 and 15 – 24 will shrink slowly in time. The working age proportion will increase slightly and remain nearly stable but as stressed in Kastamonu and Çankırı, there will be conglomerations to the high ages in the 15 – 64 age group and the effects will be visible in the following years. By looking at aged population proportions, it can be clearly said that 65 and over age groups percentage will increase and therefore Sinop will age in time. Finally, it is also explicit that the share of procreative women will decrease in time.

Table 23: Future Selected Age Groups of Sinop, 3 Different Scenarios, (%)

		2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
0-4	Scenario 1	6,1	7,0	6,5	6,1	5,8	5,5	5,4	5,3	5,2	5,1
	Scenario 2	6,1	7,0	6,5	6,1	5,7	5,4	5,2	5,1	4,9	4,8
	Scenario 3	6,1	7,0	6,5	6,1	5,6	5,3	5,1	4,9	4,7	4,5
5-14	Scenario 1	14,7	12,9	13,0	13,5	12,7	12,0	11,3	10,9	10,7	10,7
	Scenario 2	14,7	12,9	13,0	13,5	12,7	11,9	11,2	10,7	10,4	10,3
	Scenario 3	14,7	12,9	13,0	13,5	12,6	11,8	11,1	10,5	10,1	10,0
15-24	Scenario 1	16,1	15,2	14,4	12,9	13,1	13,7	13,0	12,2	11,6	11,4
	Scenario 2	16,1	15,2	14,4	12,9	13,2	13,7	12,9	12,1	11,4	11,1
	Scenario 3	16,1	15,2	14,4	12,9	13,0	13,5	12,7	11,9	11,1	10,9
15-64	Scenario 1	64,2	64,9	64,6	64,0	64,6	65,4	65,9	65,9	65,0	64,7
	Scenario 2	64,2	64,9	64,7	64,0	64,8	65,7	66,4	66,5	65,8	65,6
	Scenario 3	64,2	64,9	64,7	64,1	64,8	65,7	66,4	66,6	66,0	65,8
65 and over	Scenario 1	15,0	15,3	15,9	16,4	17,0	17,2	17,4	17,9	19,1	19,5
	Scenario 2	15,0	15,3	15,9	16,4	16,8	17,0	17,2	17,7	18,9	19,3
	Scenario 3	15,0	15,3	15,9	16,4	16,9	17,1	17,5	18,0	19,2	19,7
Females 15-49	Scenario 1	47,2	45,7	46,2	46,0	47,3	47,6	48,1	47,1	45,7	45,2
	Scenario 2	47,2	45,7	46,2	45,9	47,1	47,2	47,3	45,8	44,0	43,2
	Scenario 3	47,2	45,7	46,1	45,6	46,4	46,1	45,8	44,0	41,8	40,9

5.1.3. Population Projections of TR82

As discussed in the previous titles, the total population of Kastamonu, Çankırı and Sinop vary under different scenarios. Figure 28 shows combined population prospects of Kastamonu, Çankırı and Sinop, namely TR82 with three different scenarios. As can be understood from the figure, Scenario 1 expresses a population decline after 2021. According to Scenario 1, the total population of TR82 in 2023 and 2050 will be 75.473and 673.973, respectively. Scenario 2 draws a stable population until 2027 where 2023 and 2050 populations will be 755.550 and 727.262. Finally, Scenario 3 predicts that the total population of TR82 will increase. With regard to the figure, total population of TR82 will be 759.253 in 2023 and will be 777.383 in 2050.

Figure 28: Population Projections of TR82

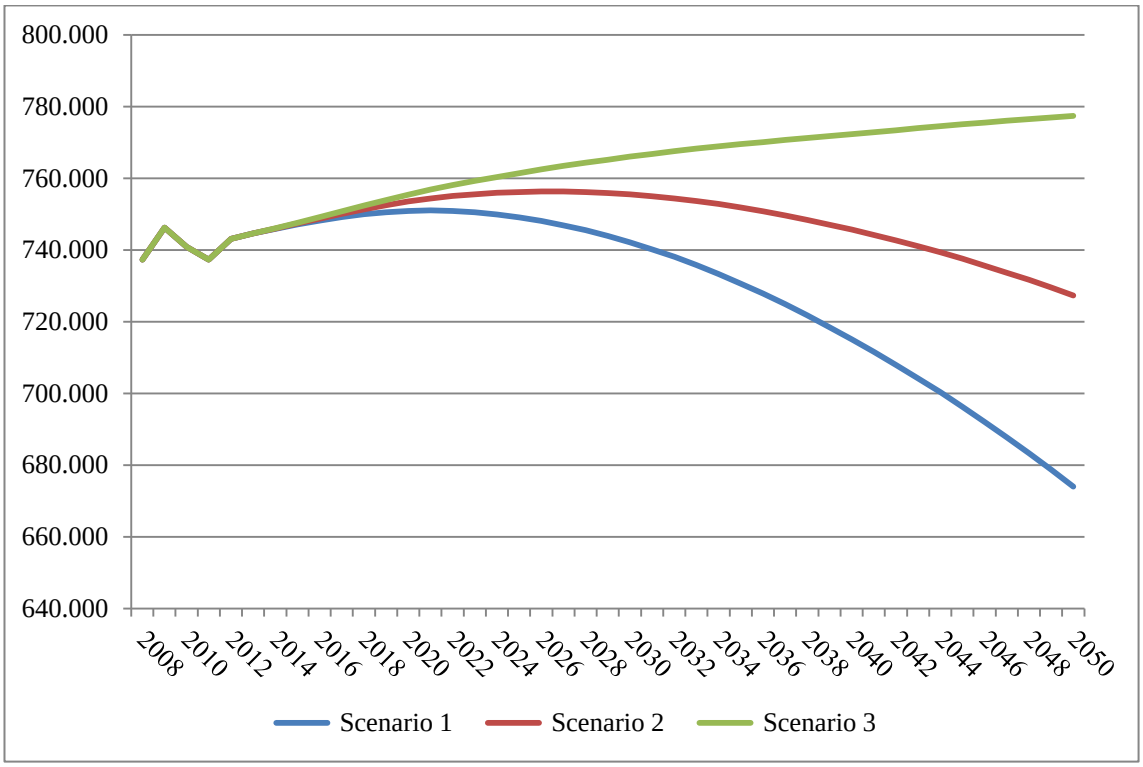


Table 24 shows future age groups of TR82. Briefly, the table states that TR82 Region will face a loss in the share of young population, as indicated by 0 – 4, 5 – 14 and 15 – 24 age groups, and will age. Ageing seems very striking for the region. As indicated via Table 5 in chapter three, TR82 region is the oldest region among other NUTS-2 level region (see 3.1.3.3. Age groups). It can be inferred that this fact will be valid for the future as well. Finally, the share of active population will remain nearly the same and slightly decrease eventually. However, as emphasized in the previous titles, there will be conglomerations to the high ages in the 15 – 64 age group. Hence, one should carefully read this indicator. Lastly, the share of reproductive women will decrease in the region with time.

Table 24: Future Selected Age Groups of TR82, 3 Different Scenarios, (%)

		2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
0-4	Scenario 1	6,2	6,7	6,3	5,9	5,5	5,2	5,1	5,0	4,9	4,8
	Scenario 2	6,2	6,7	6,3	5,9	5,4	5,2	5,0	4,8	4,6	4,5
	Scenario 3	6,2	6,7	6,3	5,8	5,4	5,1	4,8	4,7	4,5	4,4
5-14	Scenario 1	14,3	12,7	12,6	12,8	12,1	11,4	10,9	10,5	10,3	10,3
	Scenario 2	14,3	12,7	12,6	12,7	12,0	11,2	10,6	10,2	9,9	9,8
	Scenario 3	14,3	12,7	12,6	12,7	11,9	11,2	10,5	10,0	9,6	9,5
15-24	Scenario 1	15,7	15,2	14,1	12,7	12,7	13,0	12,4	11,7	11,2	11,1
	Scenario 2	15,7	15,2	14,1	12,7	12,7	12,9	12,2	11,5	10,9	10,7
	Scenario 3	15,7	15,2	14,0	12,6	12,6	12,8	12,0	11,3	10,6	10,4
15-64	Scenario 1	65,1	65,9	65,8	64,9	65,1	65,4	65,4	65,1	64,1	63,7
	Scenario 2	65,1	65,9	65,8	65,0	65,2	65,5	65,6	65,3	64,3	63,9
	Scenario 3	65,1	65,9	65,8	65,0	65,2	65,6	65,8	65,5	64,5	64,2
65 and over	Scenario 1	14,4	14,6	15,3	16,4	17,3	18,0	18,6	19,4	20,7	21,2
	Scenario 2	14,4	14,6	15,3	16,4	17,4	18,1	18,8	19,7	21,2	21,7
	Scenario 3	14,4	14,6	15,3	16,4	17,4	18,1	18,9	19,9	21,4	22,0
Females 15-49	Scenario 1	47,7	46,5	46,4	45,8	46,1	45,8	45,6	44,5	43,1	42,7
	Scenario 2	47,7	46,5	46,4	45,8	45,9	45,4	45,1	43,8	42,2	41,6
	Scenario 3	47,7	46,5	46,4	45,7	45,8	45,2	44,6	43,1	41,2	40,5

5.2. FUTURE DEMOGRAPHIC INDICATORS

In addition to total population and age groups, Spectrum software's DemProj module (see 4.4. SOFTWARE for details) also produces some further demographic indicators such as sex ratio, dependency ratios, median age, urban and rural populations. In this part, these future demographic indicators will be introduced for Kastamonu, Çankırı, Sinop and TR82, again under different scenarios. Table 25, Table 26, Table 27 and Table 28 were generated for this purpose.

5.2.1. Future Demographic Indicators of Kastamonu

Table 25 shows future demographic indicators of Kastamonu, namely: Sex ratio, dependency ratio, median age, urban population and urban population percentage, and finally rural population and rural population percentage. It should be said that urban and rural percentages are assumed and therefore shouldn't be considered as outputs. These indicators were generated in three different scenarios.

According to the table all scenarios indicate stable sex ratios for years. Scenario 1 and Scenario 2 produced closer sex ratios. It can be seen that, with the results of Scenario 2, sex ratios will be normalized by approaching 105. Dependency ratios measure the pressure on the productive population. The dependent part of this ratio comprises 0 – 14 age group and 65+ age group. Table 25 shows that, for each scenario, dependency ratios will increase with time. The ratios which are about 0,52 in 2008 will increase to approximately 0,56 in 2050.

Through the projections, different scenarios produced nearly the same median ages for Kastamonu. Consequently, the median ages will increase over the time. Scenario 2 reveals that median age of Kastamonu is 35 as of 2008; however it will increase and be 39 and 46 in 2023 and 2050 respectively. In regard to the urbanization assumptions in the software, it is believed that the urban population percentages of Kastamonu will be in turn, 72,2% and 85% in 2023 and 2050. Naturally, different scenarios reflect the same percentages but populations differ in each scenario. As a result, the urban population will increase and

rural population of Kastamonu will decrease eventually. According to Scenario 2, total urban (rural) population of Kastamonu will be 253.767 (97.711) and 269.260 (47.516) in 2023 and 2050, respectively.

5.2.2. Future Demographic Indicators of Çankırı

Table 26 presents some future indicators of Çankırı. Like Kastamonu, scenarios are close to each other. Sex ratios look alike in 2023 and in 2050. Dependency ratios will be in a wavy form and increase. Until 2043, dependency ratios will be stable but after on they will start to increase. As of 2050, Scenario 2 shows that sex ratio of Çankırı will be 0,60. The median age will fluctuate between 34 and 37 until 2023 then change towards 2050. In 2050 the median age of Çankırı will be 42, 44 and 45 for Scenario 1, Scenario 2 and Scenario 3, respectively.

In the urbanization assumption, it is believed that the urban population percentages of Çankırı will be in turn, 66,8% and 77,8% in 2023 and 2050 (for the logic of this calculation see 4.3.4.1. Urbanization). Different scenarios reflect the same percentages but urban and rural residents differ in each scenario. Consequently, the urban population will increase and rural population of Çankırı will decrease. According to Scenario 2, total urban (rural) population of Çankırı will be 135.844 (67.515) and 167.811 (47.884) in 2023 and 2050, respectively.

Table 25: Future Demographic Indicators of Kastamonu

Kastamonu		2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
Sex Ratio	Scenario 1	96,3	98,2	99,8	101,1	102,2	102,9	103,5	104,0	104,2	104,2
	Scenario 2	96,3	98,2	100,0	101,6	103,1	104,0	104,7	105,0	105,0	104,8
	Scenario 3	96,3	98,2	99,8	101,1	102,0	102,6	102,9	102,9	102,5	102,2
Dependency Ratio	Scenario 1	0,52	0,51	0,51	0,52	0,52	0,52	0,52	0,53	0,56	0,57
	Scenario 2	0,52	0,51	0,51	0,52	0,52	0,51	0,52	0,53	0,55	0,56
	Scenario 3	0,52	0,51	0,51	0,52	0,52	0,51	0,51	0,52	0,55	0,56
Median Age	Scenario 1	35	37	38	39	40	41	43	44	45	46
	Scenario 2	35	37	38	39	40	41	43	44	46	46
	Scenario 3	35	37	38	39	40	42	43	45	46	47
Urban Population	Scenario 1	184.228	208.170	231.217	252.751	255.933	257.282	257.182	255.385	252.033	250.071
	Scenario 2	184.228	208.170	231.472	253.767	258.382	262.015	265.075	267.326	268.959	269.260
	Scenario 3	184.228	208.170	231.989	255.831	262.722	269.266	275.952	282.642	289.578	292.224
Rural Population	Scenario 1	176.196	150.126	123.955	97.319	87.141	77.285	67.133	57.204	47.650	44.130
	Scenario 2	176.196	150.126	124.092	97.711	87.975	78.707	69.194	59.878	50.850	47.516
	Scenario 3	176.196	150.126	124.369	98.505	89.452	80.885	72.033	63.309	54.748	51.569
Percent Urban	Scenario 1	51,1	58,1	65,1	72,2	74,6	76,9	79,3	81,7	84,1	85,0
	Scenario 2	51,1	58,1	65,1	72,2	74,6	76,9	79,3	81,7	84,1	85,0
	Scenario 3	51,1	58,1	65,1	72,2	74,6	76,9	79,3	81,7	84,1	85,0
Percent Rural	Scenario 1	48,9	41,9	34,9	27,8	25,4	23,1	20,7	18,3	15,9	15,0
	Scenario 2	48,9	41,9	34,9	27,8	25,4	23,1	20,7	18,3	15,9	15,0
	Scenario 3	48,9	41,9	34,9	27,8	25,4	23,1	20,7	18,3	15,9	15,0

Table 26: Future Demographic Indicators of Çankırı

Çankırı		2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
Sex Ratio	Scenario 1	99,7	100,6	101,3	101,8	102,2	102,3	102,3	102,2	102,0	101,9
	Scenario 2	99,7	100,6	101,4	102,1	102,5	102,7	102,7	102,5	102,1	102,0
	Scenario 3	99,7	100,6	101,3	101,8	102,1	102,1	102,0	101,7	101,4	101,2
Dependency Ratio	Scenario 1	0,53	0,51	0,52	0,55	0,55	0,55	0,55	0,56	0,58	0,59
	Scenario 2	0,53	0,51	0,52	0,54	0,55	0,55	0,55	0,57	0,59	0,60
	Scenario 3	0,53	0,51	0,52	0,54	0,55	0,55	0,55	0,56	0,59	0,60
Median Age	Scenario 1	34	35	36	37	39	40	41	42	42	42
	Scenario 2	34	35	36	37	39	41	42	43	44	44
	Scenario 3	34	35	36	37	39	41	42	44	44	45
Urban Population	Scenario 1	106.949	116.548	125.795	134.045	141.042	146.370	150.367	153.390	154.919	155.116
	Scenario 2	106.949	116.548	126.276	135.844	144.600	151.827	157.837	162.985	166.712	167.811
	Scenario 3	106.949	116.548	126.169	135.441	144.140	151.864	158.961	165.802	171.831	174.021
Rural Population	Scenario 1	69.144	69.038	68.333	66.621	63.663	60.076	55.898	51.130	46.274	44.262
	Scenario 2	69.144	69.038	68.594	67.515	65.269	62.315	58.674	54.328	49.797	47.884
	Scenario 3	69.144	69.038	68.536	67.315	65.062	62.331	59.093	55.267	51.326	49.656
Percent Urban	Scenario 1	60,7	62,8	64,8	66,8	68,9	70,9	72,9	75,0	77,0	77,8
	Scenario 2	60,7	62,8	64,8	66,8	68,9	70,9	72,9	75,0	77,0	77,8
	Scenario 3	60,7	62,8	64,8	66,8	68,9	70,9	72,9	75,0	77,0	77,8
Percent Rural	Scenario 1	39,3	37,2	35,2	33,2	31,1	29,1	27,1	25,0	23,0	22,2
	Scenario 2	39,3	37,2	35,2	33,2	31,1	29,1	27,1	25,0	23,0	22,2
	Scenario 3	39,3	37,2	35,2	33,2	31,1	29,1	27,1	25,0	23,0	22,2

5.2.3. Future Demographic Indicators of Sinop

Table 27 reveals future prospects of Sinop population. With respect to the different scenarios, sex ratios seem close to each other. Like Kastamonu, sex ratios will be normalized by approaching 105 over time. Dependency ratios will follow a relatively stable path in Sinop. Scenarios are close to each other. According to Scenario 1, Scenario 2 and Scenario 3, the dependency ratio in Sinop will be 0,55 in 2023 and in turn be 0,55, 0,53 and 0,52 in 2050.

Median ages are in an increasing trend in Sinop. As of 2008, the median age of Sinop is 35, 37 in 2023 and 43 in 2050. It can be seen that scenarios are almost similar. With the urbanization assumptions, it is predicted that the urban population percentages of Sinop will be in turn, 68,2% and 85% in 2023 and 2050. Scenario 1, Scenario 2 and Scenario 3 reflect the same percentages but populations differ in each scenario. In conclusion, the urban population will increase and rural population of Sinop will decrease. Regarding Scenario 2, total urban (rural) population of Sinop will be 142.538 (57.375) and 165.572 (29.219) in 2023 and 2050, respectively.

Table 27: Future Demographic Indicators of Sinop

Sinop		2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
Sex Ratio	Scenario 1	97,2	98,7	100,3	101,7	102,7	103,2	103,3	103,1	102,4	102,0
	Scenario 2	97,2	98,7	100,5	102,3	103,7	104,7	105,2	105,4	105,1	104,8
	Scenario 3	97,2	98,7	100,3	101,7	102,7	103,4	103,9	104,2	104,4	104,4
Dependency Ratio	Scenario 1	0,56	0,54	0,55	0,56	0,55	0,53	0,52	0,52	0,54	0,55
	Scenario 2	0,56	0,54	0,55	0,56	0,54	0,52	0,51	0,50	0,52	0,53
	Scenario 3	0,56	0,54	0,55	0,56	0,54	0,52	0,51	0,50	0,51	0,52
Median Age	Scenario 1	35	36	36	37	38	39	40	41	42	43
	Scenario 2	35	36	36	37	38	39	40	41	42	43
	Scenario 3	35	36	36	37	38	39	40	42	43	43
Urban Population	Scenario 1	101.383	113.193	125.007	136.221	140.958	144.904	148.150	150.795	152.896	153.335
	Scenario 2	101.383	113.193	125.173	136.886	142.538	147.912	153.147	158.374	163.683	165.572
	Scenario 3	101.383	113.193	125.421	137.874	144.705	151.697	159.009	166.791	175.171	178.425
Rural Population	Scenario 1	99.408	87.503	75.646	63.516	56.739	49.859	43.011	36.296	29.557	27.059
	Scenario 2	99.408	87.503	75.747	63.827	57.375	50.894	44.462	38.120	31.643	29.219
	Scenario 3	99.408	87.503	75.897	64.287	58.248	52.197	46.164	40.146	33.864	31.487
Percent Urban	Scenario 1	50,5	56,4	62,3	68,2	71,3	74,4	77,5	80,6	83,8	85,0
	Scenario 2	50,5	56,4	62,3	68,2	71,3	74,4	77,5	80,6	83,8	85,0
	Scenario 3	50,5	56,4	62,3	68,2	71,3	74,4	77,5	80,6	83,8	85,0
Percent Rural	Scenario 1	49,5	43,6	37,7	31,8	28,7	25,6	22,5	19,4	16,2	15,0
	Scenario 2	49,5	43,6	37,7	31,8	28,7	25,6	22,5	19,4	16,2	15,0
	Scenario 3	49,5	43,6	37,7	31,8	28,7	25,6	22,5	19,4	16,2	15,0

5.2.4. Future Demographic Indicators of TR82

Table 28 demonstrates combined demographic indicators of Kastamonu, Çankırı and Sinop as TR82 Region. According to the table it can be seen that sex ratios will be normalized by approaching 105 towards 2050.

Regarding the dependency ratios, scenarios draw nearly the same picture. The region's dependency ratios will fluctuate until 2048 and slightly increase after on. It can be observed that Scenario 2 and Scenario 3 seem alike but Scenario 1 differs. Dependency ratios will be 0,57 for Scenario 1 and 0,56 for the Scenario 2 and Scenario 3 in 2050.

The median age of the region will slightly increase from 35 to 38 in 2023. After 2023, scenarios will be nearly the same. The median age of the region will be 44 for Scenario 1 and Scenario 2 and be 45for Scenario 3 in 2050.

As emphasized in the previous parts, urban and rural percentages are assumed and therefore shouldn't be considered as outputs. These indicators were generated through different scenarios. The urban and rural percentages are combined shares of Kastamonu, Çankırı and Sinop. According to outputs of Scenario 2 in Table 28, like in each province of the region, the urban population will increase and the rural population decrease, namely, as of 2023 the total urban population will increase to 526.497and the total rural population will decrease to 229.053. Additionally, the total urban population will increase to 602.643 and total rural population will be 124.619 in 2050.

Table 28: Future Demographic Indicators of TR82

TR82		2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
Sex Ratio	Scenario 1	97,4	99,0	100,3	101,5	102,3	102,8	103,1	103,2	103,1	102,9
	Scenario 2	97,4	99,0	100,5	101,9	103,1	103,8	104,2	104,4	104,1	103,9
	Scenario 3	97,4	99,0	100,3	101,4	102,2	102,7	102,9	102,9	102,7	102,5
Dependency Ratio	Scenario 1	0,54	0,52	0,52	0,54	0,54	0,53	0,53	0,54	0,56	0,57
	Scenario 2	0,54	0,52	0,52	0,54	0,53	0,53	0,52	0,53	0,56	0,56
	Scenario 3	0,54	0,52	0,52	0,54	0,53	0,52	0,52	0,53	0,55	0,56
Median Age	Scenario 1	35	36	37	38	39	40	41	42	43	44
	Scenario 2	35	36	37	38	39	40	42	43	44	44
	Scenario 3	35	36	37	38	39	41	42	44	44	45
Urban Population	Scenario 1	392.560	437.911	482.019	523.017	537.933	548.556	555.699	559.570	559.848	558.522
	Scenario 2	392.560	437.911	482.921	526.497	545.520	561.754	576.059	588.685	599.354	602.643
	Scenario 3	392.560	437.911	483.579	529.146	551.567	572.827	593.922	615.235	636.580	644.670
Rural Population	Scenario 1	344.748	306.667	267.934	227.456	207.543	187.220	166.042	144.630	123.481	115.451
	Scenario 2	344.748	306.667	268.433	229.053	210.619	191.916	172.330	152.326	132.290	124.619
	Scenario 3	344.748	306.667	268.802	230.107	212.762	195.413	177.290	158.722	139.938	132.712
Percent Urban	Scenario 1	53,2	58,8	64,3	69,7	72,2	74,6	77,0	79,5	81,9	82,9
	Scenario 2	53,2	58,8	64,3	69,7	72,1	74,5	77,0	79,4	81,9	82,9
	Scenario 3	53,2	58,8	64,3	69,7	72,2	74,6	77,0	79,5	82,0	82,9
Percent Rural	Pessimistic	46,8	41,2	35,7	30,3	27,8	25,4	23,0	20,5	18,1	17,1
	Most Probable	46,8	41,2	35,7	30,3	27,9	25,5	23,0	20,6	18,1	17,1
	Optimistic	46,8	41,2	35,7	30,3	27,8	25,4	23,0	20,5	18,0	17,1

5.3. FINDINGS AND CONCLUSION OF THE STUDY

This study investigated the future population prospects of the TR82 Region and its effects on employment, agriculture and urbanization. Future population outputs are based on deterministic population projections with three different migration scenarios generated by the cohort-component method for the period: 2008 – 2050.

Population projections depend on fertility, mortality and migration assumptions. Considering the events in the unknown future is very hard and nearly impossible to reflect them in a scenario. Therefore, it can be said that the main limitation of this study is assuming that there won't be any structural changes in the future. However it is certain that there will be significant changes in the economy of the region that will inevitably affect its demographic structure. It is possible that current and upcoming investments will alter the current situation of the region and invalidate the projection outputs. Real investments in the OIZ's (especially the tire factory which is under construction in Çankırı's Yakınkent OIZ at the time of this study), ease in the transportation and most importantly the nuclear power plant that will be located in Sinop may cause significant population movement in the region and thus may deteriorate the results of the projections.

Another limitation of the study is related to the data used for the projections. One should have produced the population projections for urban and rural areas. Due to lack of urban and rural level fertility, mortality and migration data, it was not impossible at the time of this study. For this reason, the projections of this study were produced in a general sense that comprises both urban and rural level. This necessity breaks the link between theory and practice. Not being able to observe the real urban and rural population dynamics hinders theoretical inferences for the region. Nevertheless, it is obvious that the economic structure of the region is dualistic. Through its demographic and economic features, the urban and rural parts of the region give significant clues about this fact.[43]

The study starts with an introduction chapter where the relevant information was provided. After the presentation of the setting in the second chapter, the third chapter analyzed the current demographic and economic structure of the region. The fourth chapter

43 The author of these lines believes that it will be possible to produce separate (urban and rural level) projections in the future through the development of detailed data. Thus, it will be possible to connect the link between theory and practice.

is devoted to the methodology of the population projections and finally, the last and fifth chapter reveals the outputs and findings.

As stressed in the introduction section, the main objective of this study is to answer the questions below:

- What would be the future population structure of the region?
- What are the future population challenges of the region?
- What might be the future development challenges of the region?
- What could be the region-specific population and development strategies?

5.3.1. Findings

The main findings of the study are related with the size and age composition of the future population of the TR82 Region. As revealed in the first section of this chapter, population projections provided insights about the future population trends of the region.

According to the projection outputs, Kastamonu will inevitably shrink in the future. Namely, to Scenario 1, Scenario 2 and Scenario 3, the total population of Kastamonu will be 350.070, 351.478 and 354.336 in the year of 2023, respectively. Moreover, in the year of 2050 regarding Scenario 1, Scenario 2 and Scenario 3, the total population of Kastamonu will be, in turn, 294.201, 316.776 and 343.793.

The results of different scenarios also indicate that the share of the young age groups will decrease with time. The working age population will remain constant but there will be conglomerations to the high ages, e.g. 50+, 60+ and the effects of these conglomerations can be seen later than 2050. The elderly proportion of the Kastamonu population will increase remarkably (up to 23,3%) and this points out an aged future outlook for the province. Moreover, the proportion of reproductive women will also decrease with time. Sex ratios of Kastamonu will be normal by approaching 105 in the future. Outputs show that for each scenario, dependency ratios will increase with time. The ratios which are about 0,52 in 2008 will increase to approximately 0,56 in 2050. The median ages will increase over time and to Scenario 2 it will be 39 and 46 in 2023 and 2050 respectively. According to Scenario 2, the

total urban (rural) population of Kastamonu will be 253.767 (97.711) and 269.260 (47.516) in 2023 and 2050, respectively.

Unlike Kastamonu, the total population of Çankırı will increase. According to Scenario 1, Scenario 2 and Scenario 3, in turn, the total of Çankırı will be 200.666, 203.359 and 202.756 in 2013 and be 199.378, 215.695, 223.678 in 2050. In any scenario, and even in Scenario 1, it is clear that the total population of Çankırı will increase until 2035. Relatively high total fertility rates and immigration will let the population of Çankırı increase.

The young population of Çankırı will decrease softly until 2050. Working age population shares of Çankırı will slightly decrease and become approximately 62 percent by 2050. Again, there will be conglomerations to the higher ages in the 15-64 age group and the effects will be observable in the following years. The proportion of reproductive women will decrease with time. Like Kastamonu, scenarios are close to each other. Sex ratios will be around 101. Dependency ratios will increase in the province. The median age of Çankırı will be 42, 44 and 45 by 2050 for Scenario 1, Scenario 2 and Scenario 3, respectively. According to Scenario 2, the total urban (rural) population of Çankırı will be 135.844 (67.515) and 167.811 (47.884) in 2023 and 2050, respectively.

Apart from Scenario 3, other scenarios claim that Sinop will shrink as well. According to Scenario 1, Scenario 2 and Scenario 3 results, by 2023 and 2050, population of Sinop will be 199.737, 200.713, 202.161 and 180.394, 194.791, 209.912 respectively. Furthermore, comparing with Kastamonu and Çankırı, total population differences among the scenarios are not much higher.

The share of young age groups in Sinop will shrink slowly in time. The working age proportion will remain nearly stable but as stressed in Kastamonu and Çankırı, there will be conglomerations to the high ages in the 15 – 64 age group. 65 and over age group percentages will increase and therefore, Sinop will age in time. Finally, like Kastamonu and Çankırı, the share of procreative women will decrease in time. Sex ratios in the province will be normalized by approaching 105 over time. According to Scenario 1, Scenario 2 and Scenario 3, the dependency ratio in Sinop will be 0,56 in 2023 and in turn be 0,55, 0,53 and 0,52 in 2050. The median age will increase and be 37 in 2023 and be 43 in 2050. Like Kastamonu and Çankırı, the urban population will increase and the rural population of Sinop

will decrease. Regarding Scenario 2, the total urban (rural) population of Sinop will be 136.886 (63.827) and 165.572 (29.219) in 2023 and 2050, respectively.

The total population of Kastamonu, Çankırı and Sinop vary under different scenarios. Summarizing, according to the Scenario 1, the total population of TR82 in 2023 and 2050 will be 750.473 and 673.973, respectively. Scenario 2 draws a relatively stable population where 2023 and 2050 populations will be 755.550 and 727.262 Finally, Scenario 3 predicts that the total population of TR82 will increase. Total population of TR82 will be 759.253 in 2023 and will be 777.383 in 2050.

In the near future, TR82 Region will face a loss in the share of young population, as indicated by 0 – 4, 5 – 14 and 15 – 24 age groups, and therefore the region will age. Ageing seems very striking for the region. TR82 region is the oldest region among other NUTS-2 level regions. It can be inferred that this fact will be valid for the future as well. It is very well known that Turkey is ageing as well (Canpolat, 2008, p. 130). Moreover, the region has already witnessed the demographic destiny that Turkey will face in thirty to forty years. Consequently, the policies that will be implemented in the region will shed light on the future ageing policies in Turkey.

The share of active population in the region will remain high. However, as emphasized in the previous titles, there will be conglomerations to the high ages in the 15 – 64 age group. The share of reproductive women will decrease in the region with time. Outputs also show that sex ratios in the region will be normalized by approaching 105 towards 2023. Moreover, after 2023, especially in Scenario 2 and Scenario 3, sex ratios in the region will increase. Dependency ratios will be 0,57 for Scenario 1 and be 0,56 for Scenario 2 and Scenario 3 in 2050. The median age of the region will slightly increase from 35 to 38 in 2023. Furthermore, the median age of the region will be 44 for Scenario 1 and Scenario 2 and 45 for Scenario 3 in 2050.

Finally, according to the outputs of Scenario 2, like in each province of the region, the urban population will increase and the rural population will decrease, namely, as of 2023 the total urban population will increase to 526.497 and the total rural population will decrease to 229.053. Additionally, the total urban population will increase to 602.643 and total rural population will be 124.619 in 2050.

According to the current situation and findings of the study the present and future population challenges of the region are and will be:

- Population decline
- Distorted age structure
- Rural flight
- Ageing (Especially rural ageing)
- High rural elderly dependency
- Low fertility

5.3.2. Conclusion and Policy Implications

With reference to the population challenges, it is clear that there are further challenges ahead. Concordantly, the main development challenges of the region will be on:

- Employment
- Agriculture
- Urbanization

The active population share of the TR82 region will be around 63% in the future and this fact directly indicates that the duration of the window of opportunity[44] is very extensive. Consequently, this opportunity should be utilized by creating enough employment. Otherwise, this opportunity may become a threat through the increasing unemployment. Furthermore, both the quantity and quality of the working age population are important as well. Educational investments on the region's population will be crucial for utilizing this potential.

According to a report of the Turkish Employment Agency, the most important problem of the labor market of the region has been regarded as the shortage of qualified personnel (İŞKUR, 2011). This problem is more severe especially in the manufacturing industry. The same report has also indicated that current employees in the region are mostly unqualified. Through the new founded universities and their vocational schools, this problem can be solved in the future by implementing appropriate policies. The organization of the programs of these schools should consider the sectoral labor requirements of the region. Most importantly, educational and economic institutions of the region should collaborate on determining the sectoral labor requirements and thus shape the academic programs together.

It is believed that the student population and therefore the demand that they create will increase the economic activity in the region. This is true but one should not neglect the purpose of the education. More importantly, the main point should be keeping the graduates and employing them in the region. The region does not have the luxury to export its trained

44 The window of opportunity can be defined as a particular period when the active population (15-65) of a community is most crowded. For more details on this point see (TÜSİAD, 1999).

and skilled labor force to other regions. Rather, it should attract more skilled workers to utilize the opportunities awaiting the region.

Through the new real investments it can be implied that there will be significant job opportunities in the region. Namely, a big rubber factory investment owned by a Japanese-Turkish joint enterprise in Çankırı's Yakınkent OIZ is under construction. It is estimated that the construction will be finished by the end of 2014 and thus the production in the factory will start by the midyear of 2015. It is thought that the factory will employ more than 2.000 workers if it operates in a full capacity. Furthermore, there is a big mining investment in Kastamonu. A Turkish mining company decided to utilize the copper potential of Kastamonu by employing more than 500 workers. The investment is ongoing.

It is certain that real investments will change the region in many respects. With miscellaneous dimensions, there are significant new investments still being made in the region. By considering the families of the workers, employment and its positive effects on the regional economy become more significant.

At the same time, important infrastructure investments are being made in the region by the government. Ilgaz Tunnel, which will connect Kastamonu and Sinop to Ankara through Çankırı is very important for the region and is expected to be in service by the end of 2014. It is certain that the tunnel will increase the accessibility of the provinces. Furthermore, increased transportation through the tunnel will also raise the importance of İnebolu Harbor of Kastamonu and thus the trade volume of the region will increase. Ease in the transportation will also increase the mobility of the population. Therefore it can be said that employment opportunities will be increasing in the region.

Sinop Airport was opened in 2008 and renovated in 2013. Kastamonu Airport was opened in 2013. Both airports have daily flights to Istanbul and ease the transportation and accessibility of the region. The frequency of flights is also important for the region. More flights mean more airport services and thus more workers. Therefore, it can be impelled that besides increasing ground transportation by the tunnel, increasing capacity of the airlines will also increase the region's job opportunities in the future.

It can be said that, apart from other positive effects, the transportation infrastructure has significant effects on the tourism. Easy and fast transportation to the region can automatically increase the number of tourists and overnight stays.

The climate, nature and treasures of the region make many different touristic activities possible: Winter, health, religious, sea and eco-tourism are some prominent ones. It can be observed that each season can be utilized by different touristic activities in the region. There are two active ski centers in the Ilgaz Mountain. Ilgaz Mountain is also a national park protected by the government through the Directorate of Nature Conservation and National Parks. There are thermal springs in the Kurşunlu district of Çankırı and they are very popular among older tourists. Kastamonu is very popular in terms of its historical and religious places. There are many historical mosques, medreses and places in the city. Especially in the summer, Sinop is very attractive with its beaches and untouched shores. Cruise tourism is getting popular year by year. Considering the three provinces, Kastamonu, Çankırı and Sinop together, it can be said that the region has a great potential of eco-tourism. Eco-tourism has deep roots with rural development and can affect the rural economy of the region very easily.

The only five-star hotel is placed in the peak of the Ilgaz Mountain and attracts many tourists from Ankara and Istanbul in the season. Moreover there is a four-star hotel in the Abana district of Kastamonu and there are in total nine three-star hotels in region where two are in Kastamonu, one is in Çankırı and six are in Sinop. The hotels run in nearly full capacity and sometimes they cannot meet the demand. Accordingly, the capacity of the accommodation needs to be improved by new investments and capacity increases. Therefore it can be understood that tourism has a great potential on employment as well. Training of the tourism workers and keeping them in the region is very important for utilizing the benefits of this opportunity.

The second nuclear power plant of Turkey will be located in Sinop. It is projected that the plant will be open by 2023. It can be asserted that the plant will also create a demand economy in the region and can be beneficial for both producers and workers of the region. Plant and dwelling construction activities will require skilled and unskilled labor force.

Nuclear base workers' service demand will also increase the supplementary services and this will provide a significant number of employment opportunities for the local people.[45]

Summarizing, there will be significant employment opportunities in the region. However, in order to utilize these opportunities domestically, the education and specialization levels of the region's population should be increased. More skilled labor force will guarantee more domestic employment increases. Hence, education of the region's population is very important.

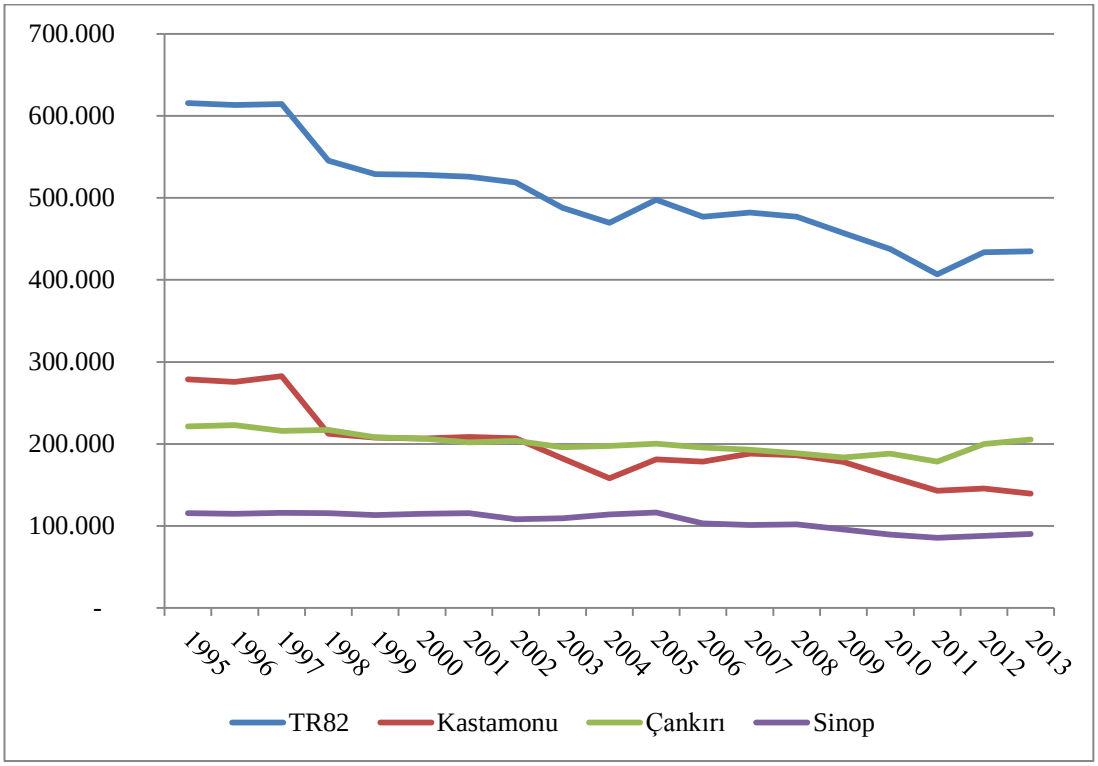
In the region, economic supports and incentives are very common and briefly, their aims mostly focus on boosting and fostering the regional economic development. More recently, the regional development agency (KUZKA), small and medium enterprises development organization (KOSGEB), agriculture and rural development support institution (TKDK) and some other ministerial funds (e.g. the new incentive system of the Ministry of Economy, the investment support program on technology products of Ministry of Science, Industry and Technology) have started to give grants, credits or privileges for the investors, especially for those who tend to make productive investments and/or innovations that will create employment opportunities for the local labor force. It is very important for these institutions to consider their funding strategies through the facts that have been mentioned above.

TR82 can be regarded as a non-industrialized region. The region's economy is mostly agriculture based. Considering the sectoral contribution to the gross value added in the region, agriculture is in the second place after services (%57,2) with its 22,9% share and industry is in the last and third place with its 19,9 percent contribution as of 2011. The agriculture share of the region is well higher than the Turkey average. Thus, it can be inferred that agricultural activities are the most important part of the rural economic life in the region. From this point of view, rural flight would directly affect the agricultural production of the region.

45 Considering Sinop's past experiences related to the US radar base, it is very likely that this nuclear base will affect the economy of the region positively. However, environmental concerns cannot be neglected. The Fukushima Daiichi nuclear disaster which happened in Japan in 2011, has increased the environmental awareness and worries on nuclear power in the world. Hence, the costs, risks and benefits of this investment should be assessed carefully and decisions should be taken in a participative sense by involving the local inhabitants.

Agricultural land can be used as a proxy for agricultural production and thus, Figure 29 is valuable in many respects. First of all, the figure indicates a dramatic shift on the total cultivated agricultural area in the past two decades. Considering the economic structure of the region, it is seen that agriculture has an important place in production. It can be inferred that agricultural production has decreased over time and this shift has a strong relationship with the rural population decline. If the current trends continue, the region will face more severe losses in the agricultural production.

Figure 29: Total Cultivated Area in TR82 Region by Years, (ha[46])



Source: (TurkStat, Regional Statistics, 2014)

It is agreed that, there are strong ties with the agricultural employment and rural population intensity. Since the agriculture is the most prominent source of the economic life in rural areas, policy makers and planners should not neglect rural level employment policies.

46 Ha: Hectare is mostly used for the measurement of land. 1 hectare equals to 10,000 square meters.

Through the rural development strategy and plan of the government (NRDS) (MARA, 2010), rural development can be regarded as new in Turkey. In the region, rural population is melting and therefore rural development policies become even more prominent. The careful and proper implementation of rural policies is crucial for both the present and the future of the region. Most importantly, regional level population policies are important needs.

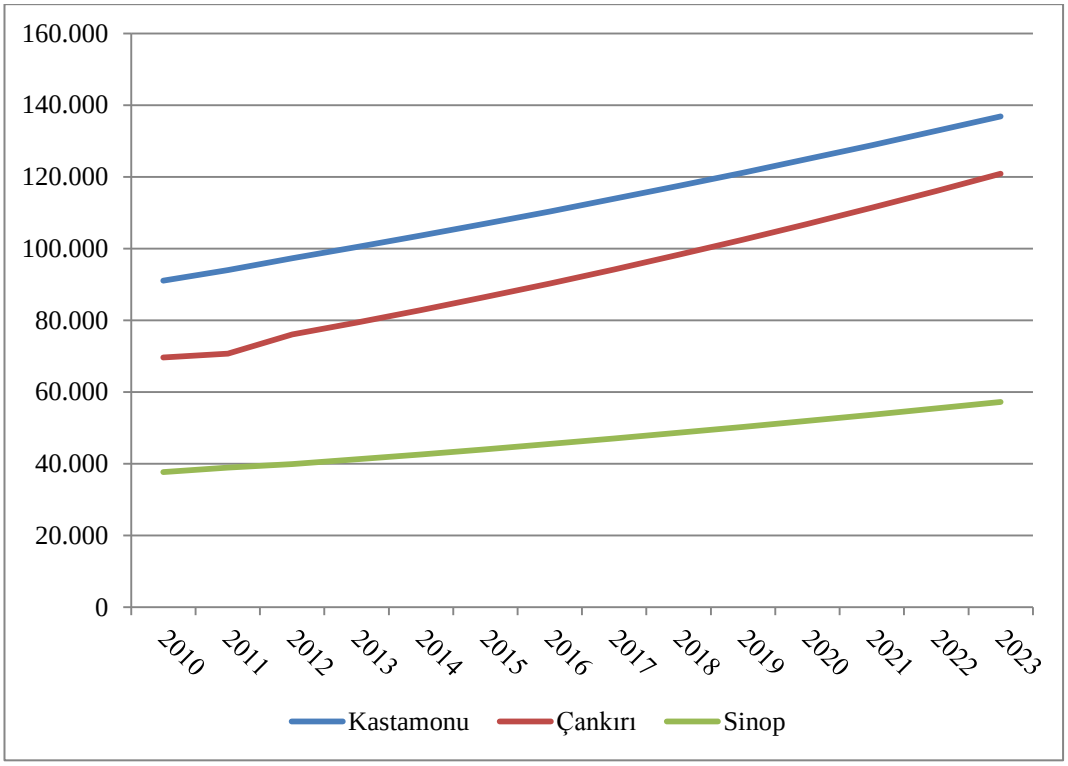
For the compensation of the rural flight in the region there may be population replacements in the future. For rural ageing, nursing centers would be important needs and thus be significant public investments in the future. Another interesting fact will be related with the working age population. As emphasized recurrently, conglomerations to the high ages in the working age population imply the phenomenon of utilizing the ageing workforce. This fact will be on the agenda of the future employment strategies in the region.

Urban regions will maintain a considerable growth rate. Through the province level urbanization assumptions, outputs indicate that in the region overall, 69,7% and 82,9% residents will live in urban areas in 2023 and 2050 respectively. Therefore, urban policies will become as vital as rural policies.

Apart from urbanization assumptions that have been used in the projections, it is possible to calculate the future city populations by using the ratio technique. The ratio technique is very useful for calculating population data for a sub-area from a larger geographic area. While using this technique, the time range should be reasonable and thus short due to the hardship of guessing the unknown developments in the far future.

Briefly, there are two basic methods: (i) constant share growth and (ii) extrapolation. Through the data that was acquired from Scenario 2's province level data by using the constant share growth method, city populations in the region will increase. Figure 30 presents future trends of the city populations in the region. The figure indicates that Kastamonu, Çankırı and Sinop city centers will have 136.892, 120.897 and 57.257 residents in 2023, respectively (see Appendix – 2 table c). Kastamonu and Çankırı have higher city population growth rates than Sinop.

Figure 30: City Populations in the Region by Years[47]



According to the results, housing demand and consumer goods demand will increase. Consequently, urban planning will be important in the future of the region. Policies regarding the public zones, transportation and environmental issues will be more substantial than they are in today.

47 City populations are acquired by the following way: First, the observed past share growths of the city populations in the total population have been calculated between 1990-2000 and 2000-2010. After using the arithmetic average of this past share growth rates, future city populations have been calculated by using this average as a constant growth rate on the projection outputs of the Scenario 2.

5.3.3. Further Research

In this study, NUTS 2 level future population and development challenges were investigated for the first time by producing population projections with the cohort-component method and revealing the demographic effects on employment, agriculture and urbanization. It is possible to go deeper in the research in terms of population and development studies.

First of all, it is possible to produce different population projections with different scenarios. As mentioned in the thesis, each scenario tries to develop a given population to an unknown future. Accordingly, for predicting, at least, approaching to the truth will be possible by population projections with different scenarios. New investments, ease in the accessibility and other developments can constitute new migration scenarios and thus different population projections.

In this study, differing scenarios were adopted only in migration level assumptions. However, fertility and mortality are also very dynamic processes as well and naturally differing from province to province. Hence, enriching the scenarios with different fertility and mortality assumptions may be possible for future population projections.

Due to limited data, this study investigated only the general future outlook of the population of the provinces. Moreover, with development of rural and urban level detailed data (fertility, mortality and migration), discriminating the demographic behavior between city centers and rural areas will be possible and this will make an important contribution to the regional development plans.

This study intended to investigate the future population of the region with a macro level assessment. However, micro level assessments (i.e. individual, family and household) on the population are crucial needs. Field surveys, interviews and area studies are important for reinforcing micro level analyses not only in the urban but especially in the rural areas.

The term development covers a wide area and future studies can go deeper by investigating different features of the population. It is possible to calculate some developmental indicators related to education and health just like Yavuz has done (Yavuz, 2011). Through the estimated student populations in the primary, secondary and high schools

it is possible to predict the future student composition of the provinces. Moreover, this assessment can also be taken a step forward by estimating the future playschool and college student population of the provinces. Patient per hospital, caregiver, nurse and per doctor are interesting and important indicators related to health. Furthermore, GDP, GVA, tax, expenditure and vehicles (etc.) per capita are some other possible indicators to calculate and compare with other provinces or regions.

Finally, rural and urban level poverty, gender studies, ageing and elderly care are some other topics that can be included in regional level population and development studies. It can be said that population and development challenges of the region will go on being in different forms.

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APPENDICES

Appendix – 1

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a) Urban-rural, sex and 5 years age groups specified population data of Kastamonu, 2008 ABPRS results

Kastamonu	Total			Urban			Rural		
Age Groups	Total	Male	Female	Total	Male	Female	Total	Male	Female
0-4	22.022	11.319	10.703	12.540	6.466	6.074	9.482	4.853	4.629
5-9	23.815	12.110	11.705	12.877	6.502	6.375	10.938	5.608	5.330
10-14	25.754	13.151	12.603	13.543	6.917	6.626	12.211	6.234	5.977
15-19	27.657	14.061	13.596	14.133	7.129	7.004	13.524	6.932	6.592
20-24	27.528	13.569	13.959	16.064	8.041	8.023	11.464	5.528	5.936
25-29	27.508	13.899	13.609	16.712	8.258	8.454	10.796	5.641	5.155
30-34	24.342	12.375	11.967	14.979	7.577	7.402	9.363	4.798	4.565
35-39	22.942	11.345	11.597	13.391	6.618	6.773	9.551	4.727	4.824
40-44	22.157	11.102	11.055	12.625	6.263	6.362	9.532	4.839	4.693
45-49	23.136	11.428	11.708	12.647	6.282	6.365	10.489	5.146	5.343
50-54	22.770	11.222	11.548	11.417	5.734	5.683	11.353	5.488	5.865
55-59	20.515	9.879	10.636	9.019	4.487	4.532	11.496	5.392	6.104
60-64	17.995	8.391	9.604	6.934	3.183	3.751	11.061	5.208	5.853
65-69	17.364	7.820	9.544	5.916	2.571	3.345	11.448	5.249	6.199
70-74	12.671	5.787	6.884	4.173	1.789	2.384	8.498	3.998	4.500
75-79	13.455	6.032	7.423	4.194	1.687	2.507	9.261	4.345	4.916
80+	8.793	3.342	5.451	3.064	1.052	2.012	5.729	2.290	3.439
Total	360.424	176.832	183.592	184.228	90.556	93.672	176.196	86.276	89.920

Source: TurkStat

b) Urban-rural, sex and 5 years age groups specified population data of Çankırı, 2008 ABPRS results

Çankırı	Total			Urban			Rural		
Age Groups	Total	Male	Female	Total	Male	Female	Total	Male	Female
0-4	11.815	6.068	5.747	7.939	4.083	3.856	3.876	1.985	1.891
5-9	12.570	6.376	6.194	8.561	4.349	4.212	4.009	2.027	1.982
10-14	13.460	6.871	6.589	9.251	4.798	4.453	4.209	2.073	2.136
15-19	14.196	7.349	6.847	9.105	4.753	4.352	5.091	2.596	2.495
20-24	14.098	7.719	6.379	9.660	5.314	4.346	4.438	2.405	2.033
25-29	13.335	7.010	6.325	9.268	4.795	4.473	4.067	2.215	1.852
30-34	11.979	5.937	6.042	8.484	4.148	4.336	3.495	1.789	1.706
35-39	11.721	5.877	5.844	8.101	4.057	4.044	3.620	1.820	1.800
40-44	11.272	5.621	5.651	7.404	3.721	3.683	3.868	1.900	1.968
45-49	10.662	5.248	5.414	6.803	3.413	3.390	3.859	1.835	2.024
50-54	10.275	5.064	5.211	5.803	2.927	2.876	4.472	2.137	2.335
55-59	9.192	4.354	4.838	4.453	2.171	2.282	4.739	2.183	2.556
60-64	8.094	3.714	4.380	3.358	1.571	1.787	4.736	2.143	2.593
65-69	7.922	3.670	4.252	2.921	1.320	1.601	5.001	2.350	2.651
70-74	6.017	2.780	3.237	2.277	990	1.287	3.740	1.790	1.950
75-79	5.643	2.602	3.041	2.047	877	1.170	3.596	1.725	1.871
80+	3.842	1.654	2.188	1.514	584	930	2.328	1.070	1.258
Total	176.093	87.914	88.179	106.949	53.871	53.078	69.144	34.043	35.101

Source: TurkStat

c) Urban-rural, sex and 5 years age groups specified population data of Sinop, 2008 ABPRS results

Sinop	Total			Urban			Rural		
Age Groups	Total	Male	Female	Total	Male	Female	Total	Male	Female
0-4	12.150	6.333	5.817	6.466	3.374	3.092	5.684	2.959	2.725
5-9	13.888	7.100	6.788	7.348	3.727	3.621	6.540	3.373	3.167
10-14	15.699	7.972	7.727	8.149	4.122	4.027	7.550	3.850	3.700
15-19	17.331	8.689	8.642	8.970	4.454	4.516	8.361	4.235	4.126
20-24	15.023	7.521	7.502	8.110	4.069	4.041	6.913	3.452	3.461
25-29	13.944	7.019	6.925	8.275	4.039	4.236	5.669	2.980	2.689
30-34	12.333	6.248	6.085	7.605	3.771	3.834	4.728	2.477	2.251
35-39	12.305	5.986	6.319	7.475	3.586	3.889	4.830	2.400	2.430
40-44	12.263	6.088	6.175	7.363	3.606	3.757	4.900	2.482	2.418
45-49	12.427	6.055	6.372	7.158	3.548	3.610	5.269	2.507	2.762
50-54	11.712	5.842	5.870	5.972	3.085	2.887	5.740	2.757	2.983
55-59	11.362	5.665	5.697	4.878	2.467	2.411	6.484	3.198	3.286
60-64	10.192	4.770	5.422	3.773	1.756	2.017	6.419	3.014	3.405
65-69	9.573	4.353	5.220	3.379	1.440	1.939	6.194	2.913	3.281
70-74	7.681	3.448	4.233	2.484	1.127	1.357	5.197	2.321	2.876
75-79	7.342	3.510	3.832	2.164	932	1.232	5.178	2.578	2.600
80+	5.566	2.362	3.204	1.814	704	1.110	3.752	1.658	2.094
Total	200.791	98.961	101.830	101.383	49.807	51.576	99.408	49.154	50.254

Source: TurkStat

d) ASFR estimation for TR82, 5 years interval, 2008 – 2050

	2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
15-19	5,7	5,4	5,0	4,7	4,3	4,0	3,6	3,3	2,9	2,8
20-24	36,7	34,6	32,6	30,5	28,5	26,4	24,4	22,3	20,2	19,4
25-29	32,5	32,9	33,4	33,8	34,3	34,7	35,2	35,6	36,1	36,2
30-34	17,7	19,1	20,5	21,9	23,3	24,7	26,1	27,5	28,9	29,4
35-39	5,5	6,1	6,7	7,4	8,0	8,6	9,3	9,9	10,6	10,8
40-44	1,9	1,8	1,8	1,7	1,6	1,6	1,5	1,4	1,3	1,3
45-49	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Source: HIPS, World Population Prospects: The 2012 Revision[48]

48 World Population Prospects: The 2012 Revision: http://esa.un.org/wpp/Excel-Data/EXCEL_FILES/2_Fertility/WPP2012_FERT_F07_AGE_SPECIFIC_FERTILITY.XLS [Date Accessed: 14.08.2013]

e) TFR estimations for provinces, 5 years interval 2008 - 2050

	2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
Kastamonu	1,91946	1,77214	1,63612	1,51342	1,49172	1,47032	1,44923	1,42844	1,40796	1,40000
Çankırı	2,21930	2,12633	2,03726	1,95298	1,90332	1,85492	1,80776	1,76179	1,71699	1,70000
Sinop	2,18121	2,01379	1,85923	1,71980	1,68695	1,65472	1,62311	1,59210	1,56169	1,55000

Source: Source: (HIPS, 1999), (HIPS, 2004), (HIPS, 2009a), (SIS, 2004).

f) Life expectancy calculations for sexes by years, 2008 – 2050

	2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
Male	71,0	71,8	72,7	73,5	74,3	75,2	76,0	76,8	77,7	78,0
Female	75,0	76,0	76,9	77,9	78,8	79,8	80,7	81,7	82,6	83,0

Source: World Bank

g) Net migration in the region by sexes, 2008 – 2012

	2008	2009	2010	2011	2012	2013
	ADNKS					Average
Kastamonu Female	230	-1018	-919	-846	-195	-550
Kastamonu Male	542	-505	-692	387	602	67
Kastamonu Total	772	-1523	-1611	-459	407	-483
Çankırı Female	506	3616	-2978	-1542	2765	473
Çankırı Male	562	4719	-3444	-2198	3676	663
Çankırı Total	1068	8335	-6422	-3740	6441	1136
Sinop Female	193	-227	217	-443	-1103	-273
Sinop Male	634	231	843	-137	-991	116
Sinop Total	827	4	1060	-580	-2094	-157
TR82 Female	929	2371	-3680	-2831	1467	-349
TR82 Male	1738	4445	-3293	-1948	3287	846
TR82 Total	2667	6816	-6973	-4779	4754	497

Source: ABPRS

h) Migration scenarios

a. Scenario 1

Scenario 1	2008	2009	2010	2011	2012	2013	2018	2023	2028	2033	2038	2043	2048	2050
	ABPRS					Average[49]								
Kastamonu Female	230	-1.018	-919	-846	-195	-550	-574	-599	-624	-649	-674	-699	-723	-733
Kastamonu Male	542	-505	-692	387	602	67	-41	-149	-258	-366	-474	-582	-690	-733
Kastamonu Total	772	-1.523	-1.611	-459	407	-483	-616	-749	-882	-1.015	-1.148	-1.280	-1.413	-1.467
Çankırı Female	506	3.616	-2.978	-1.542	2.765	473	361	249	136	24	-88	-201	-313	-358
Çankırı Male	562	4.719	-3.444	-2.198	3.676	663	525	387	249	111	-27	-165	-303	-358
Çankırı Total	1.068	8.335	-6.422	-3.740	6.441	1.136	886	636	385	135	-115	-366	-616	-716
Sinop Female	193	-227	217	-443	-1.103	-273	-291	-309	-328	-346	-364	-383	-401	-409
Sinop Male	634	231	843	-137	-991	116	45	-26	-97	-168	-238	-309	-380	-409
Sinop Total	827	4	1.060	-580	-2.094	-157	-246	-335	-424	-514	-603	-692	-781	-817
TR82 Female	929	2.371	-3.680	-2.831	1.467	-349	-504	-660	-816	-971	-1.127	-1.282	-1.438	-1.500
TR82 Male	1.738	4.445	-3.293	-1.948	3.287	846	529	212	-105	-422	-739	-1.056	-1.373	-1.500
TR82 Total	2.667	6.816	-6.973	-4.779	4.754	497	24	-448	-921	-1.393	-1.866	-2.338	-2.811	-3.000

Source: ABPRS

49 Average indicates the average number of real 2008, 2009, 2010, 2011 and 2012 net migration values imported from ABPRS results.

b. Scenario 2

Scenario 2	2008	2009	2010	2011	2012	2013	2018	2023	2028	2033	2038	2043	2048	2050
	ABPRS					Average[50]								
Kastamonu Female	230	-1018	-919	-846	-195	-550	-550	-550	-448	-346	-244	-143	-41	0
Kastamonu Male	542	-505	-692	387	602	67	67	67	55	42	30	17	5	0
Kastamonu Total	772	-1523	-1611	-459	407	-483	-483	-483	-394	-304	-215	-125	-36	0
Çankırı Female	506	3616	-2978	-1542	2765	473	473	473	385	298	210	123	35	0
Çankırı Male	562	4719	-3444	-2198	3676	663	663	663	540	417	295	172	49	0
Çankırı Total	1068	8335	-6422	-3740	6441	1136	1136	1136	926	715	505	295	84	0
Sinop Female	193	-227	217	-443	-1103	-273	-273	-273	-222	-172	-121	-71	-20	0
Sinop Male	634	231	843	-137	-991	116	116	116	95	73	52	30	9	0
Sinop Total	827	4	1060	-580	-2094	-157	-157	-157	-128	-99	-70	-41	-12	0
TR82 Female	929	2371	-3680	-2831	1467	-349	-350	-350	-285	-220	-156	-91	-26	0
TR82 Male	1738	4445	-3293	-1948	3287	846	846	846	689	533	376	219	63	0
TR82 Total	2667	6816	-6973	-4779	4754	497	496	496	404	312	220	129	37	0

Source: ABPRS

50 Average indicates the average number of real 2008, 2009, 2010, 2011 and 2012 net migration values imported from ABPRS results.

c. Scenario 3

Scenario 3	2008	2009	2010	2011	2012	2013	2018	2023	2028	2033	2038	2043	2048	2050
	ABPRS					Average[51]								
Kastamonu Female	230	-1018	-919	-846	-195	-550	-376	-203	-30	144	317	491	664	733
Kastamonu Male	542	-505	-692	387	602	67	157	247	337	427	517	607	697	733
Kastamonu Total	772	-1523	-1611	-459	407	-483	-219	44	307	571	834	1098	1361	1467
Çankırı Female	506	3616	-2978	-1542	2765	473	458	442	427	411	396	380	364	358
Çankırı Male	562	4719	-3444	-2198	3676	663	622	581	539	498	457	416	375	358
Çankırı Total	1068	8335	-6422	-3740	6441	1136	1080	1023	966	909	853	796	739	716
Sinop Female	193	-227	217	-443	-1103	-273	-181	-89	4	96	188	280	372	409
Sinop Male	634	231	843	-137	-991	116	156	195	235	274	314	353	393	409
Sinop Total	827	4	1060	-580	-2094	-157	-25	107	238	370	501	633	764	817
TR82 Female	929	2371	-3680	-2831	1467	-349	-99	151	401	651	900	1150	1400	1500
TR82 Male	1738	4445	-3293	-1948	3287	846	934	1023	1111	1199	1288	1376	1465	1500
TR82 Total	2667	6816	-6973	-4779	4754	497	835	1173	1512	1850	2188	2526	2865	3000

Source: ABPRS

51 Average indicates the average number of real 2008, 2009, 2010, 2011 and 2012 net migration values imported from ABPRS results.

i) Net female migration age percentages, 2008 – 2012

a. Female migration age pattern percentages

Kastamonu Female Migration Pattern						
	2008	2009	2010	2011	2012	AVG
0-4	13,0	0,2	7,7	-1,7	37,4	11,3
5-9	-16,5	0,6	3,8	0,0	54,4	8,4
10-14	9,6	10,0	3,0	10,3	62,1	19,0
15-19	-112,2	23,6	17,8	30,3	-117,4	-31,6
20-24	-231,7	36,6	64,1	60,0	5,1	-13,2
25-29	-37,4	16,7	33,3	41,1	123,6	35,5
30-34	-29,6	7,0	10,9	9,2	53,3	10,2
35-39	6,1	10,1	7,3	4,8	34,9	12,6
40-44	24,3	8,4	6,5	1,2	43,6	16,8
45-49	67,0	3,3	-1,2	-4,3	-13,8	10,2
50-54	123,9	-7,1	-12,7	-8,5	-55,9	7,9
55-59	110,0	-12,1	-18,0	-22,5	-110,3	-10,6
60-64	80,4	-4,5	-17,5	-16,9	-55,4	-2,8
65+	93,0	7,1	-5,1	-3,2	38,5	26,1
Total	100	100	100	100	100	100

Çankırı Female Migration Pattern						
	2008	2009	2010	2011	2012	AVG
0-4	-8,9	5,0	6,1	6,9	3,9	2,6
5-9	-23,5	4,0	7,8	11,1	5,2	0,9
10-14	-14,2	5,9	6,0	10,6	7,2	3,1
15-19	-31,8	6,9	3,0	1,9	14,8	-1,1
20-24	-44,7	7,4	17,2	3,2	9,4	-1,5
25-29	-5,9	5,9	15,0	11,9	5,4	6,5
30-34	-11,3	4,9	10,9	12,0	5,3	4,4
35-39	-10,9	8,2	9,7	9,1	5,4	4,3
40-44	17,6	7,3	8,6	11,3	8,3	10,6
45-49	35,8	8,5	6,3	10,9	12,7	14,8
50-54	59,5	10,2	4,9	2,4	8,2	17,0
55-59	59,7	8,8	0,7	0,3	6,9	15,3
60-64	33,0	7,4	0,5	-0,6	4,0	8,9
65+	45,7	9,7	3,4	9,1	3,3	14,2
Total	100	100	100	100	100	100

Sinop Female Migration Pattern						
	2008	2009	2010	2011	2012	AVG
0-4	16,6	-41,0	6,5	4,1	4,5	-1,9
5-9	-6,2	3,5	6,5	-8,6	10,9	1,2
10-14	-30,1	-0,4	29,0	8,8	8,3	3,1
15-19	-135,2	81,5	-71,9	59,8	24,9	-8,2
20-24	-161,7	177,1	-127,6	113,8	28,8	6,1
25-29	-20,2	29,1	-32,7	20,5	20,3	3,4
30-34	30,6	-7,5	0,9	-0,7	11,5	7,0
35-39	-1,6	5,3	-5,5	-1,6	6,3	0,6
40-44	6,7	-11,9	3,2	3,2	1,5	0,6
45-49	54,4	-15,9	35,9	-12,2	-1,0	12,3
50-54	86,0	-34,4	84,3	-24,2	-7,1	21,0
55-59	102,6	-41,9	88,5	-41,5	-10,7	19,4
60-64	79,3	-30,8	60,4	-28,7	-4,4	15,2
65+	78,8	-12,8	22,6	7,2	6,1	20,4
Total	100	100	100	100	100	100

Source: ABPRS

b. Male migration age pattern percentages

Kastamonu Male Migration Pattern						
	2008	2009	2010	2011	2012	AVG
0-4	6,6	-3,8	4,0	-8,3	-20,3	-4,3
5-9	-21,6	11,1	1,9	-12,9	-19,8	-8,3
10-14	-3,5	23,6	11,4	-14,7	-16,3	0,1
15-19	-31,2	38,2	11,1	42,1	73,8	26,8
20-24	-64,2	56,8	80,2	47,3	33,9	30,8
25-29	-41,5	19,6	46,0	-86,3	-9,8	-14,4
30-34	-16,1	5,5	31,4	-13,7	-20,1	-2,6
35-39	5,2	14,7	5,1	-4,7	-12,8	1,5
40-44	9,2	14,5	7,8	-15,0	-8,5	1,6
45-49	30,4	0,2	-2,0	2,6	6,3	7,5
50-54	60,3	-12,7	-17,8	23,8	30,4	16,8
55-59	58,1	-26,9	-25,7	55,6	30,1	18,2
60-64	51,1	-22,6	-28,9	53,0	23,1	15,1
65+	57,0	-18,2	-24,4	31,3	10,0	11,1
Total	100	100	100	100	100	100

Çankırı Male Migration Pattern						
	2008	2009	2010	2011	2012	AVG
0-4	-3,9	3,2	6,9	4,6	2,3	2,6
5-9	-34,9	4,5	7,6	10,3	5,1	-1,5
10-14	-18,3	5,7	5,8	10,5	6,0	1,9
15-19	-18,9	10,9	1,3	11,2	16,5	4,2
20-24	-26,0	4,6	11,2	13,5	16,1	3,9
25-29	-11,7	5,5	18,2	17,0	7,0	7,2
30-34	-6,0	7,8	14,1	10,7	4,7	6,3
35-39	-4,1	9,1	10,7	6,4	5,0	5,4
40-44	3,7	8,2	8,1	7,6	5,7	6,7
45-49	26,0	9,7	6,9	7,4	8,5	11,7
50-54	51,8	8,7	5,7	0,8	8,7	15,2
55-59	53,6	8,1	2,5	-1,5	7,0	13,9
60-64	38,3	5,3	0,3	-1,9	4,0	9,2
65+	50,5	8,7	0,6	3,3	3,5	13,3
Total	100	100	100	100	100	100

Sinop Male Migration Pattern						
	2008	2009	2010	2011	2012	AVG
0-4	11,4	16,0	5,0	-9,5	7,4	6,0
5-9	3,0	2,2	4,9	34,3	13,5	11,6
10-14	-5,0	2,6	3,4	51,1	9,7	12,4
15-19	-34,5	-68,4	4,3	73,0	30,9	1,0
20-24	-24,9	-75,3	-8,5	235,0	24,1	30,1
25-29	-11,0	-25,5	-14,2	152,6	15,3	23,4
30-34	8,4	4,3	5,3	18,2	10,1	9,3
35-39	10,6	36,4	5,6	5,8	9,2	13,5
40-44	8,0	6,5	1,3	-4,4	9,3	4,1
45-49	13,1	30,3	13,0	-35,0	-1,3	4,0
50-54	26,8	48,5	17,4	-94,2	-8,0	-1,9
55-59	39,4	49,4	26,9	-159,9	-9,8	-10,8
60-64	27,8	46,3	19,5	-103,6	-10,9	-4,2
65+	27,1	26,8	16,1	-63,5	0,5	1,4
Total	100	100	100	100	100	100

Source: ABPRS

j. Urbanization (Urban population percentages), 2008 – 2050

	2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
Kastamonu	51,1	58,1	65,1	72,2	74,6	76,9	79,3	81,7	84,1	85,0
Çankırı	60,7	62,8	64,8	66,8	68,9	70,9	72,9	75,0	77,0	77,8
Sinop	50,5	56,4	62,3	68,2	71,3	74,4	77,5	80,6	83,8	85,0

Source: ABPRS

Appendix – 2

(Index)

a. Future population projections of Kastamonu, Çankırı and Sinop, total population, 3 scenarios and 5 years interval 2008 - 2050
b. Future population projections of Kastamonu, Çankırı and Sinop, Single Ages, 3 scenarios, 2008 – 2050
c. City Populations of Kastamonu Çankırı and Sinop, 2011 – 2023

a) Future population projections of Kastamonu, Çankırı and Sinop, total population, 3 scenarios and 5 years interval 2008 - 2050

	2008	2013	2018	2023	2028	2033	2038	2043	2048	2050
Kastamonu Scenario 1	360.424	358.296	355.172	350.070	343.074	334.567	324.315	312.589	299.683	294.201
Kastamonu Scenario 2	360.424	358.296	355.563	351.478	346.357	340.721	334.268	327.204	319.809	316.776
Kastamonu Scenario 3	360.424	358.296	356.358	354.336	352.174	350.151	347.985	345.951	344.325	343.793
Çankırı Scenario 1	176.093	185.586	194.127	200.666	204.705	206.446	206.264	204.521	201.193	199.378
Çankırı Scenario 2	176.093	185.586	194.871	203.359	209.869	214.142	216.511	217.313	216.509	215.695
Çankırı Scenario 3	176.093	185.586	194.705	202.756	209.202	214.195	218.054	221.070	223.158	223.678
Sinop Scenario 1	200.791	200.696	200.653	199.737	197.697	194.763	191.161	187.090	182.454	180.394
Sinop Scenario 2	200.791	200.696	200.919	200.713	199.912	198.806	197.609	196.494	195.326	194.791
Sinop Scenario 3	200.791	200.696	201.318	202.161	202.953	203.893	205.173	206.937	209.034	209.912
TR82 Scenario 1	737.308	744.578	749.952	750.473	745.476	735.776	721.740	704.200	683.330	673.973
TR82 Scenario 2	737.308	744.578	751.353	755.550	756.138	753.669	748.388	741.011	731.644	727.262
TR82 Scenario 3	737.308	744.578	752.381	759.253	764.329	768.239	771.212	773.958	776.517	777.383

b) Future population projections of Kastamonu, Çankırı and Sinop, Single Ages, 3 scenarios, 2008 – 2050

Kastamonu, Scenario 1 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	4.420	4.406	4.402	4.398	4.395	4.600	4.684	4.767	4.845
2009	4.904	4.410	4.405	4.402	4.399	4.393	4.593	4.673	4.751
2010	4.736	4.870	4.386	4.383	4.380	4.380	4.379	4.583	4.664
2011	4.565	4.719	4.862	4.380	4.376	4.372	4.371	4.371	4.572
2012	4.412	4.514	4.676	4.820	4.339	4.329	4.324	4.331	4.331
2013	4.342	4.387	4.497	4.660	4.804	4.325	4.318	4.315	4.321
2014	4.271	4.317	4.370	4.481	4.645	4.790	4.314	4.310	4.306
2015	4.202	4.247	4.301	4.355	4.466	4.631	4.780	4.306	4.301
2016	4.134	4.179	4.231	4.285	4.340	4.452	4.621	4.772	4.297
2017	4.068	4.111	4.163	4.215	4.270	4.327	4.443	4.614	4.764
2018	4.001	4.045	4.096	4.148	4.201	4.258	4.318	4.436	4.605
2019	3.931	3.979	4.030	4.081	4.133	4.188	4.249	4.311	4.428
2020	3.859	3.910	3.964	4.015	4.066	4.121	4.180	4.243	4.304
2021	3.785	3.839	3.895	3.949	4.001	4.054	4.113	4.174	4.236
2022	3.708	3.765	3.824	3.880	3.935	3.989	4.047	4.107	4.167
2023	3.635	3.688	3.750	3.809	3.867	3.924	3.982	4.042	4.101
2024	3.598	3.616	3.674	3.736	3.796	3.855	3.917	3.977	4.036
2025	3.557	3.579	3.601	3.660	3.722	3.785	3.849	3.912	3.971
2026	3.512	3.538	3.565	3.587	3.646	3.712	3.779	3.845	3.907
2027	3.466	3.494	3.524	3.552	3.574	3.636	3.706	3.775	3.840
2028	3.418	3.449	3.480	3.511	3.538	3.564	3.631	3.703	3.770
2029	3.377	3.401	3.435	3.467	3.498	3.528	3.559	3.628	3.698
2030	3.340	3.360	3.387	3.422	3.454	3.488	3.524	3.557	3.623
2031	3.297	3.324	3.347	3.374	3.409	3.444	3.484	3.522	3.553
2032	3.250	3.281	3.310	3.334	3.362	3.400	3.441	3.482	3.518
2033	3.200	3.234	3.268	3.297	3.321	3.353	3.396	3.439	3.478
2034	3.154	3.184	3.221	3.255	3.285	3.312	3.349	3.395	3.436
2035	3.112	3.139	3.171	3.209	3.243	3.276	3.309	3.349	3.392
2036	3.068	3.097	3.126	3.159	3.196	3.235	3.274	3.309	3.346
2037	3.022	3.053	3.084	3.114	3.147	3.188	3.233	3.274	3.307
2038	2.976	3.007	3.040	3.072	3.102	3.139	3.187	3.233	3.272
2039	2.929	2.962	2.995	3.028	3.060	3.094	3.138	3.187	3.231
2040	2.881	2.914	2.949	2.983	3.016	3.052	3.093	3.139	3.186
2041	2.835	2.867	2.902	2.937	2.971	3.009	3.052	3.094	3.137
2042	2.790	2.821	2.855	2.890	2.926	2.964	3.009	3.053	3.093
2043	2.744	2.776	2.809	2.843	2.879	2.919	2.964	3.011	3.053
2044	2.694	2.731	2.764	2.798	2.832	2.872	2.919	2.967	3.010
2045	2.640	2.680	2.719	2.752	2.786	2.826	2.873	2.922	2.967
2046	2.589	2.626	2.669	2.707	2.741	2.780	2.827	2.876	2.922
2047	2.540	2.576	2.615	2.658	2.696	2.735	2.782	2.830	2.877
2048	2.494	2.528	2.564	2.603	2.646	2.691	2.737	2.786	2.831
2049	2.443	2.481	2.516	2.553	2.592	2.641	2.693	2.741	2.787
2050	2.393	2.431	2.470	2.505	2.542	2.587	2.644	2.697	2.743

	9	10	11	12	13	14	15	16	17
2008	4.919	4.989	5.062	5.142	5.233	5.328	5.427	5.513	5.568
2009	4.824	4.891	4.955	5.021	5.093	5.176	5.263	5.354	5.432
2010	4.741	4.810	4.872	4.931	4.996	5.069	5.156	5.247	5.332
2011	4.648	4.718	4.781	4.839	4.899	4.966	5.046	5.137	5.230
2012	4.524	4.587	4.645	4.709	4.790	4.894	5.017	5.152	5.282
2013	4.317	4.502	4.558	4.614	4.684	4.779	4.901	5.042	5.189
2014	4.307	4.295	4.473	4.527	4.589	4.672	4.785	4.925	5.079
2015	4.292	4.285	4.266	4.442	4.501	4.577	4.679	4.809	4.961
2016	4.287	4.270	4.257	4.235	4.416	4.489	4.583	4.702	4.845
2017	4.284	4.266	4.242	4.225	4.209	4.404	4.495	4.605	4.737
2018	4.750	4.262	4.237	4.210	4.199	4.196	4.409	4.516	4.640
2019	4.592	4.729	4.234	4.206	4.184	4.186	4.201	4.430	4.550
2020	4.415	4.571	4.700	4.202	4.179	4.171	4.190	4.222	4.463
2021	4.291	4.394	4.543	4.668	4.176	4.165	4.174	4.211	4.254
2022	4.223	4.270	4.366	4.511	4.641	4.162	4.168	4.194	4.242
2023	4.155	4.203	4.242	4.334	4.483	4.627	4.164	4.187	4.225
2024	4.089	4.135	4.174	4.210	4.307	4.469	4.629	4.183	4.218
2025	4.024	4.069	4.106	4.142	4.182	4.291	4.470	4.646	4.212
2026	3.960	4.004	4.040	4.074	4.114	4.167	4.292	4.487	4.675
2027	3.896	3.940	3.975	4.008	4.046	4.098	4.167	4.309	4.515
2028	3.829	3.876	3.911	3.943	3.979	4.030	4.098	4.184	4.337
2029	3.759	3.809	3.847	3.878	3.914	3.963	4.029	4.114	4.211
2030	3.687	3.740	3.780	3.814	3.849	3.897	3.962	4.044	4.141
2031	3.613	3.668	3.711	3.747	3.785	3.832	3.896	3.977	4.070
2032	3.542	3.593	3.639	3.678	3.718	3.767	3.830	3.910	4.002
2033	3.508	3.523	3.565	3.606	3.648	3.699	3.765	3.844	3.934
2034	3.469	3.489	3.495	3.532	3.576	3.630	3.697	3.778	3.867
2035	3.427	3.450	3.460	3.461	3.501	3.557	3.626	3.709	3.800
2036	3.383	3.408	3.421	3.427	3.431	3.482	3.553	3.638	3.731
2037	3.337	3.364	3.379	3.388	3.396	3.411	3.478	3.564	3.659
2038	3.298	3.318	3.336	3.345	3.357	3.376	3.406	3.488	3.585
2039	3.263	3.279	3.290	3.302	3.314	3.336	3.371	3.416	3.508
2040	3.223	3.245	3.251	3.256	3.270	3.293	3.331	3.380	3.436
2041	3.178	3.204	3.216	3.217	3.224	3.249	3.287	3.339	3.399
2042	3.129	3.159	3.176	3.182	3.185	3.203	3.243	3.295	3.357
2043	3.086	3.111	3.131	3.142	3.150	3.163	3.196	3.250	3.312
2044	3.045	3.068	3.083	3.097	3.109	3.128	3.155	3.202	3.266
2045	3.003	3.028	3.039	3.049	3.064	3.087	3.120	3.162	3.218
2046	2.960	2.985	2.999	3.005	3.016	3.041	3.078	3.125	3.176
2047	2.916	2.942	2.957	2.965	2.972	2.992	3.032	3.083	3.139
2048	2.870	2.898	2.914	2.922	2.931	2.948	2.983	3.036	3.096
2049	2.825	2.853	2.870	2.879	2.889	2.907	2.938	2.986	3.049
2050	2.781	2.807	2.824	2.835	2.845	2.864	2.897	2.941	2.998

	18	19	20	21	22	23	24	25	26
2008	5.583	5.566	5.529	5.493	5.478	5.496	5.533	5.579	5.601
2009	5.476	5.476	5.444	5.391	5.348	5.336	5.370	5.429	5.498
2010	5.383	5.381	5.324	5.236	5.145	5.091	5.099	5.169	5.266
2011	5.312	5.355	5.344	5.278	5.179	5.072	4.997	4.981	5.028
2012	5.386	5.451	5.462	5.418	5.323	5.197	5.067	4.971	4.933
2013	5.325	5.428	5.487	5.492	5.440	5.334	5.194	5.047	4.934
2014	5.232	5.365	5.462	5.515	5.513	5.450	5.330	5.173	5.010
2015	5.121	5.271	5.399	5.489	5.535	5.522	5.445	5.309	5.136
2016	5.002	5.159	5.304	5.425	5.507	5.542	5.516	5.424	5.271
2017	4.885	5.040	5.191	5.328	5.442	5.514	5.536	5.494	5.386
2018	4.776	4.922	5.070	5.214	5.344	5.447	5.506	5.513	5.456
2019	4.678	4.812	4.951	5.092	5.229	5.348	5.439	5.483	5.476
2020	4.588	4.713	4.840	4.972	5.106	5.232	5.339	5.416	5.446
2021	4.500	4.622	4.740	4.860	4.984	5.108	5.222	5.316	5.379
2022	4.290	4.533	4.648	4.759	4.871	4.985	5.097	5.198	5.279
2023	4.278	4.322	4.558	4.665	4.768	4.871	4.974	5.073	5.161
2024	4.260	4.309	4.346	4.574	4.674	4.767	4.858	4.949	5.036
2025	4.252	4.290	4.331	4.361	4.581	4.671	4.754	4.834	4.913
2026	4.245	4.281	4.311	4.345	4.367	4.578	4.658	4.729	4.797
2027	4.707	4.273	4.301	4.324	4.350	4.363	4.563	4.632	4.693
2028	4.547	4.734	4.293	4.312	4.327	4.344	4.347	4.538	4.596
2029	4.368	4.573	4.752	4.303	4.314	4.320	4.328	4.321	4.501
2030	4.241	4.393	4.590	4.761	4.303	4.306	4.303	4.301	4.285
2031	4.170	4.265	4.409	4.598	4.760	4.294	4.288	4.276	4.265
2032	4.099	4.194	4.280	4.415	4.595	4.749	4.275	4.261	4.240
2033	4.029	4.121	4.207	4.285	4.412	4.584	4.729	4.248	4.225
2034	3.961	4.051	4.134	4.211	4.280	4.399	4.563	4.701	4.211
2035	3.893	3.981	4.062	4.136	4.205	4.266	4.377	4.534	4.665
2036	3.825	3.913	3.991	4.063	4.128	4.189	4.244	4.348	4.498
2037	3.755	3.844	3.922	3.991	4.054	4.112	4.166	4.214	4.312
2038	3.683	3.773	3.852	3.920	3.981	4.036	4.088	4.136	4.178
2039	3.608	3.699	3.780	3.849	3.908	3.962	4.011	4.057	4.100
2040	3.530	3.623	3.705	3.775	3.836	3.888	3.936	3.981	4.021
2041	3.456	3.544	3.627	3.699	3.761	3.814	3.862	3.905	3.945
2042	3.418	3.470	3.548	3.620	3.683	3.738	3.787	3.830	3.869
2043	3.376	3.431	3.472	3.539	3.603	3.660	3.710	3.755	3.794
2044	3.330	3.387	3.432	3.462	3.521	3.578	3.630	3.678	3.719
2045	3.283	3.341	3.387	3.421	3.442	3.495	3.548	3.598	3.642
2046	3.234	3.293	3.339	3.375	3.400	3.415	3.464	3.515	3.562
2047	3.192	3.243	3.290	3.326	3.352	3.371	3.383	3.430	3.480
2048	3.154	3.199	3.239	3.275	3.302	3.322	3.338	3.349	3.395
2049	3.110	3.160	3.194	3.222	3.250	3.271	3.289	3.304	3.314
2050	3.062	3.115	3.154	3.176	3.196	3.217	3.236	3.254	3.269

	27	28	29	30	31	32	33	34	35
2008	5.568	5.460	5.300	5.120	4.956	4.824	4.743	4.700	4.670
2009	5.540	5.521	5.422	5.268	5.093	4.933	4.802	4.718	4.670
2010	5.367	5.430	5.423	5.331	5.185	5.020	4.870	4.750	4.676
2011	5.111	5.216	5.303	5.330	5.273	5.155	5.006	4.860	4.737
2012	4.961	5.036	5.143	5.237	5.272	5.222	5.109	4.963	4.820
2013	4.883	4.908	4.989	5.107	5.213	5.257	5.211	5.098	4.949
2014	4.884	4.831	4.861	4.953	5.083	5.198	5.246	5.199	5.083
2015	4.960	4.832	4.785	4.827	4.930	5.068	5.187	5.234	5.185
2016	5.087	4.909	4.787	4.750	4.803	4.915	5.058	5.175	5.219
2017	5.223	5.036	4.864	4.753	4.728	4.789	4.905	5.046	5.160
2018	5.338	5.172	4.992	4.830	4.730	4.713	4.779	4.894	5.032
2019	5.408	5.288	5.128	4.958	4.808	4.716	4.703	4.768	4.879
2020	5.428	5.359	5.244	5.095	4.936	4.794	4.706	4.692	4.753
2021	5.399	5.379	5.316	5.211	5.073	4.922	4.784	4.695	4.678
2022	5.332	5.351	5.337	5.283	5.189	5.059	4.912	4.772	4.681
2023	5.233	5.284	5.309	5.305	5.261	5.175	5.048	4.900	4.758
2024	5.116	5.186	5.243	5.277	5.283	5.247	5.165	5.037	4.886
2025	4.991	5.070	5.145	5.212	5.256	5.269	5.237	5.153	5.022
2026	4.868	4.946	5.029	5.114	5.190	5.242	5.259	5.225	5.139
2027	4.753	4.823	4.906	4.999	5.093	5.177	5.232	5.247	5.211
2028	4.649	4.708	4.784	4.876	4.978	5.080	5.167	5.220	5.232
2029	4.552	4.605	4.669	4.754	4.855	4.965	5.070	5.155	5.205
2030	4.458	4.508	4.566	4.640	4.734	4.842	4.955	5.058	5.140
2031	4.242	4.415	4.470	4.537	4.620	4.721	4.832	4.944	5.043
2032	4.223	4.199	4.377	4.442	4.518	4.608	4.711	4.821	4.929
2033	4.198	4.181	4.163	4.349	4.423	4.505	4.598	4.700	4.806
2034	4.183	4.157	4.145	4.135	4.330	4.411	4.496	4.587	4.685
2035	4.170	4.142	4.121	4.118	4.117	4.318	4.401	4.484	4.572
2036	4.624	4.130	4.107	4.094	4.099	4.105	4.308	4.390	4.470
2037	4.457	4.584	4.095	4.081	4.076	4.087	4.095	4.297	4.375
2038	4.272	4.418	4.549	4.069	4.063	4.064	4.077	4.084	4.283
2039	4.138	4.233	4.384	4.523	4.051	4.051	4.054	4.066	4.069
2040	4.061	4.100	4.200	4.358	4.505	4.040	4.041	4.043	4.052
2041	3.983	4.023	4.067	4.175	4.341	4.493	4.030	4.030	4.028
2042	3.906	3.945	3.991	4.043	4.157	4.329	4.483	4.019	4.015
2043	3.831	3.870	3.914	3.967	4.026	4.146	4.319	4.472	4.004
2044	3.757	3.795	3.839	3.890	3.950	4.014	4.136	4.308	4.457
2045	3.682	3.721	3.764	3.815	3.873	3.938	4.004	4.124	4.292
2046	3.605	3.647	3.691	3.741	3.799	3.862	3.928	3.993	4.109
2047	3.526	3.571	3.618	3.668	3.725	3.787	3.852	3.917	3.978
2048	3.444	3.492	3.542	3.595	3.652	3.714	3.778	3.841	3.902
2049	3.359	3.411	3.464	3.520	3.579	3.641	3.704	3.766	3.825
2050	3.279	3.327	3.383	3.442	3.504	3.568	3.632	3.692	3.751

	36	37	38	39	40	41	42	43	44
2008	4.634	4.595	4.547	4.496	4.443	4.404	4.396	4.428	4.487
2009	4.634	4.593	4.550	4.502	4.451	4.399	4.362	4.356	4.390
2010	4.638	4.609	4.570	4.527	4.474	4.419	4.365	4.328	4.326
2011	4.660	4.620	4.590	4.550	4.505	4.451	4.395	4.341	4.308
2012	4.700	4.627	4.588	4.556	4.513	4.466	4.411	4.358	4.311
2013	4.803	4.681	4.606	4.565	4.532	4.487	4.438	4.383	4.331
2014	4.932	4.784	4.660	4.584	4.541	4.505	4.460	4.410	4.356
2015	5.066	4.912	4.763	4.638	4.559	4.515	4.478	4.432	4.383
2016	5.167	5.046	4.891	4.740	4.613	4.533	4.487	4.449	4.404
2017	5.202	5.148	5.025	4.868	4.715	4.587	4.505	4.459	4.422
2018	5.143	5.182	5.126	5.001	4.843	4.689	4.559	4.477	4.431
2019	5.014	5.123	5.160	5.102	4.976	4.816	4.660	4.530	4.449
2020	4.862	4.994	5.101	5.136	5.077	4.949	4.788	4.631	4.502
2021	4.736	4.842	4.973	5.077	5.111	5.049	4.920	4.759	4.603
2022	4.661	4.716	4.821	4.949	5.052	5.083	5.020	4.891	4.730
2023	4.663	4.641	4.695	4.797	4.924	5.025	5.054	4.991	4.862
2024	4.741	4.644	4.619	4.671	4.772	4.896	4.996	5.025	4.962
2025	4.868	4.721	4.622	4.596	4.646	4.745	4.867	4.966	4.995
2026	5.005	4.848	4.699	4.598	4.571	4.619	4.716	4.838	4.937
2027	5.121	4.984	4.826	4.675	4.573	4.544	4.591	4.687	4.809
2028	5.193	5.100	4.962	4.802	4.649	4.546	4.515	4.561	4.658
2029	5.214	5.172	5.077	4.937	4.776	4.622	4.517	4.485	4.532
2030	5.187	5.193	5.149	5.053	4.911	4.748	4.593	4.488	4.456
2031	5.122	5.166	5.170	5.124	5.027	4.883	4.719	4.563	4.458
2032	5.025	5.101	5.143	5.145	5.098	4.998	4.854	4.689	4.534
2033	4.911	5.004	5.078	5.118	5.119	5.069	4.969	4.824	4.659
2034	4.788	4.890	4.981	5.053	5.092	5.090	5.039	4.938	4.794
2035	4.667	4.767	4.867	4.956	5.026	5.063	5.060	5.009	4.908
2036	4.554	4.646	4.744	4.842	4.929	4.998	5.033	5.030	4.978
2037	4.452	4.533	4.623	4.719	4.815	4.901	4.968	5.002	4.999
2038	4.357	4.431	4.509	4.598	4.692	4.786	4.871	4.937	4.971
2039	4.264	4.336	4.407	4.484	4.571	4.664	4.756	4.840	4.906
2040	4.051	4.243	4.312	4.382	4.457	4.542	4.633	4.725	4.809
2041	4.033	4.030	4.219	4.287	4.355	4.429	4.512	4.602	4.694
2042	4.010	4.012	4.006	4.194	4.260	4.326	4.398	4.481	4.572
2043	3.997	3.989	3.988	3.981	4.167	4.231	4.296	4.368	4.450
2044	3.985	3.975	3.965	3.963	3.954	4.138	4.201	4.265	4.337
2045	4.438	3.963	3.951	3.939	3.935	3.925	4.108	4.170	4.234
2046	4.273	4.415	3.939	3.925	3.912	3.907	3.895	4.077	4.139
2047	4.090	4.251	4.391	3.913	3.898	3.883	3.876	3.864	4.046
2048	3.959	4.068	4.227	4.364	3.886	3.869	3.852	3.845	3.833
2049	3.883	3.936	4.043	4.200	4.336	3.856	3.838	3.821	3.814
2050	3.806	3.860	3.911	4.017	4.172	4.307	3.825	3.807	3.789

	45	46	47	48	49	50	51	52	53
2008	4.554	4.611	4.651	4.665	4.656	4.642	4.623	4.580	4.509
2009	4.453	4.524	4.585	4.630	4.649	4.645	4.636	4.622	4.583
2010	4.365	4.433	4.509	4.577	4.628	4.655	4.659	4.657	4.647
2011	4.310	4.355	4.426	4.506	4.575	4.627	4.654	4.661	4.664
2012	4.286	4.296	4.349	4.428	4.516	4.592	4.652	4.685	4.697
2013	4.285	4.261	4.273	4.325	4.403	4.487	4.561	4.619	4.653
2014	4.305	4.261	4.238	4.249	4.300	4.375	4.457	4.528	4.586
2015	4.330	4.281	4.238	4.214	4.224	4.272	4.344	4.424	4.496
2016	4.357	4.305	4.257	4.214	4.189	4.196	4.241	4.311	4.391
2017	4.378	4.332	4.282	4.233	4.188	4.161	4.165	4.208	4.279
2018	4.396	4.353	4.308	4.257	4.207	4.160	4.130	4.132	4.176
2019	4.404	4.370	4.329	4.284	4.231	4.178	4.128	4.097	4.100
2020	4.422	4.379	4.346	4.304	4.257	4.202	4.146	4.094	4.064
2021	4.475	4.397	4.355	4.321	4.277	4.227	4.169	4.112	4.061
2022	4.576	4.450	4.372	4.329	4.293	4.247	4.194	4.134	4.078
2023	4.702	4.550	4.425	4.346	4.302	4.263	4.213	4.159	4.100
2024	4.834	4.676	4.525	4.399	4.318	4.270	4.229	4.177	4.124
2025	4.934	4.807	4.650	4.498	4.370	4.287	4.236	4.192	4.141
2026	4.967	4.907	4.781	4.623	4.469	4.338	4.252	4.199	4.156
2027	4.908	4.940	4.880	4.754	4.594	4.436	4.302	4.214	4.162
2028	4.781	4.881	4.913	4.852	4.723	4.560	4.399	4.263	4.176
2029	4.629	4.753	4.854	4.884	4.821	4.689	4.522	4.360	4.225
2030	4.504	4.602	4.727	4.826	4.853	4.786	4.650	4.482	4.321
2031	4.428	4.477	4.576	4.698	4.794	4.818	4.746	4.609	4.442
2032	4.430	4.402	4.451	4.548	4.667	4.759	4.778	4.704	4.568
2033	4.505	4.403	4.375	4.423	4.516	4.631	4.719	4.735	4.662
2034	4.631	4.478	4.376	4.347	4.391	4.481	4.591	4.676	4.693
2035	4.764	4.603	4.451	4.348	4.315	4.356	4.441	4.548	4.633
2036	4.878	4.736	4.575	4.422	4.316	4.279	4.315	4.397	4.505
2037	4.948	4.850	4.708	4.545	4.389	4.280	4.239	4.272	4.354
2038	4.969	4.920	4.821	4.678	4.512	4.352	4.238	4.195	4.229
2039	4.941	4.940	4.891	4.791	4.644	4.474	4.310	4.194	4.151
2040	4.876	4.912	4.910	4.860	4.756	4.605	4.431	4.265	4.149
2041	4.779	4.846	4.882	4.879	4.825	4.717	4.561	4.385	4.219
2042	4.664	4.749	4.817	4.851	4.844	4.785	4.672	4.514	4.339
2043	4.541	4.635	4.720	4.785	4.816	4.803	4.739	4.624	4.467
2044	4.420	4.512	4.605	4.688	4.750	4.775	4.757	4.690	4.575
2045	4.307	4.391	4.483	4.574	4.653	4.709	4.728	4.708	4.641
2046	4.204	4.277	4.361	4.451	4.538	4.611	4.662	4.678	4.658
2047	4.108	4.174	4.248	4.330	4.415	4.496	4.564	4.612	4.628
2048	4.015	4.079	4.145	4.216	4.294	4.374	4.449	4.514	4.561
2049	3.802	3.986	4.049	4.113	4.180	4.252	4.326	4.398	4.463
2050	3.783	3.773	3.956	4.017	4.077	4.138	4.204	4.275	4.348

	54	55	56	57	58	59	60	61	62
2008	4.417	4.317	4.216	4.108	3.995	3.880	3.749	3.623	3.543
2009	4.517	4.428	4.332	4.232	4.122	4.003	3.881	3.742	3.607
2010	4.611	4.546	4.457	4.361	4.261	4.150	4.031	3.907	3.764
2011	4.663	4.638	4.582	4.501	4.406	4.302	4.185	4.059	3.927
2012	4.704	4.705	4.681	4.624	4.539	4.437	4.324	4.198	4.059
2013	4.667	4.677	4.680	4.657	4.599	4.510	4.403	4.285	4.152
2014	4.622	4.639	4.652	4.656	4.631	4.569	4.475	4.363	4.239
2015	4.556	4.595	4.615	4.628	4.630	4.601	4.534	4.434	4.316
2016	4.466	4.529	4.571	4.591	4.602	4.600	4.565	4.493	4.386
2017	4.361	4.439	4.504	4.547	4.565	4.572	4.564	4.524	4.444
2018	4.249	4.335	4.415	4.481	4.522	4.536	4.537	4.524	4.476
2019	4.146	4.223	4.311	4.392	4.457	4.493	4.501	4.496	4.475
2020	4.070	4.120	4.200	4.289	4.368	4.428	4.459	4.461	4.449
2021	4.034	4.044	4.098	4.178	4.266	4.340	4.395	4.419	4.414
2022	4.031	4.008	4.022	4.077	4.156	4.239	4.308	4.356	4.373
2023	4.047	4.005	3.985	4.001	4.055	4.130	4.208	4.270	4.311
2024	4.069	4.021	3.982	3.965	3.980	4.030	4.099	4.171	4.226
2025	4.092	4.041	3.997	3.961	3.943	3.955	4.000	4.064	4.128
2026	4.109	4.064	4.018	3.976	3.940	3.919	3.926	3.966	4.022
2027	4.123	4.081	4.040	3.996	3.955	3.915	3.890	3.893	3.925
2028	4.128	4.094	4.056	4.018	3.974	3.930	3.886	3.857	3.853
2029	4.142	4.099	4.069	4.034	3.996	3.950	3.901	3.854	3.818
2030	4.190	4.112	4.074	4.047	4.012	3.971	3.921	3.869	3.815
2031	4.285	4.160	4.087	4.051	4.024	3.986	3.942	3.888	3.830
2032	4.405	4.254	4.134	4.063	4.028	3.998	3.957	3.909	3.849
2033	4.530	4.373	4.227	4.110	4.040	4.002	3.969	3.924	3.870
2034	4.624	4.497	4.345	4.202	4.086	4.014	3.972	3.935	3.885
2035	4.653	4.590	4.468	4.319	4.178	4.060	3.984	3.939	3.896
2036	4.593	4.619	4.560	4.441	4.294	4.150	4.029	3.950	3.899
2037	4.465	4.558	4.588	4.533	4.415	4.265	4.119	3.995	3.911
2038	4.315	4.431	4.528	4.561	4.505	4.385	4.233	4.084	3.954
2039	4.189	4.280	4.401	4.500	4.533	4.475	4.352	4.197	4.043
2040	4.111	4.154	4.250	4.374	4.473	4.503	4.441	4.315	4.155
2041	4.109	4.076	4.125	4.224	4.347	4.443	4.469	4.404	4.272
2042	4.178	4.073	4.047	4.098	4.198	4.317	4.409	4.431	4.360
2043	4.296	4.142	4.043	4.020	4.073	4.169	4.284	4.372	4.387
2044	4.423	4.259	4.111	4.016	3.995	4.044	4.137	4.248	4.329
2045	4.531	4.385	4.227	4.083	3.990	3.967	4.013	4.101	4.206
2046	4.596	4.492	4.352	4.198	4.056	3.962	3.935	3.978	4.060
2047	4.612	4.556	4.458	4.322	4.170	4.027	3.930	3.901	3.938
2048	4.582	4.572	4.522	4.428	4.293	4.140	3.995	3.895	3.861
2049	4.515	4.542	4.538	4.491	4.398	4.262	4.107	3.959	3.856
2050	4.417	4.474	4.507	4.507	4.461	4.366	4.228	4.070	3.919

	63	64	65	66	67	68	69	70	71
2008	3.527	3.552	3.609	3.641	3.583	3.399	3.132	2.816	2.544
2009	3.518	3.490	3.502	3.545	3.562	3.493	3.303	3.032	2.717
2010	3.624	3.525	3.486	3.485	3.512	3.511	3.424	3.218	2.934
2011	3.774	3.622	3.511	3.457	3.439	3.449	3.432	3.330	3.113
2012	3.914	3.746	3.577	3.447	3.376	3.345	3.346	3.322	3.216
2013	4.005	3.846	3.665	3.482	3.340	3.262	3.229	3.229	3.205
2014	4.096	3.936	3.764	3.568	3.374	3.227	3.149	3.116	3.116
2015	4.182	4.026	3.852	3.665	3.459	3.261	3.115	3.039	3.007
2016	4.258	4.111	3.941	3.752	3.554	3.343	3.148	3.007	2.933
2017	4.328	4.186	4.024	3.839	3.639	3.437	3.229	3.039	2.903
2018	4.385	4.255	4.099	3.922	3.725	3.520	3.320	3.119	2.935
2019	4.416	4.312	4.167	3.995	3.806	3.605	3.402	3.208	3.013
2020	4.416	4.343	4.223	4.062	3.878	3.684	3.485	3.289	3.101
2021	4.391	4.344	4.254	4.117	3.944	3.755	3.563	3.371	3.181
2022	4.357	4.318	4.254	4.148	3.999	3.820	3.633	3.447	3.261
2023	4.317	4.286	4.230	4.149	4.029	3.874	3.697	3.516	3.337
2024	4.255	4.246	4.198	4.125	4.030	3.904	3.751	3.580	3.404
2025	4.172	4.186	4.159	4.094	4.007	3.905	3.780	3.632	3.467
2026	4.075	4.103	4.100	4.056	3.976	3.883	3.782	3.662	3.519
2027	3.971	4.008	4.019	3.998	3.940	3.854	3.762	3.665	3.550
2028	3.875	3.905	3.925	3.918	3.882	3.818	3.733	3.646	3.555
2029	3.803	3.811	3.824	3.825	3.804	3.762	3.699	3.620	3.538
2030	3.769	3.740	3.731	3.726	3.714	3.686	3.645	3.587	3.514
2031	3.766	3.707	3.661	3.634	3.616	3.597	3.571	3.535	3.483
2032	3.781	3.704	3.629	3.566	3.526	3.501	3.484	3.464	3.434
2033	3.801	3.719	3.626	3.534	3.459	3.413	3.391	3.381	3.365
2034	3.821	3.738	3.641	3.532	3.428	3.348	3.306	3.290	3.285
2035	3.836	3.759	3.660	3.546	3.425	3.317	3.242	3.207	3.198
2036	3.847	3.773	3.680	3.565	3.440	3.315	3.212	3.146	3.118
2037	3.850	3.784	3.694	3.585	3.458	3.330	3.211	3.117	3.059
2038	3.861	3.787	3.705	3.599	3.478	3.348	3.226	3.116	3.032
2039	3.904	3.798	3.707	3.609	3.491	3.368	3.244	3.132	3.033
2040	3.992	3.841	3.718	3.611	3.501	3.381	3.263	3.151	3.049
2041	4.103	3.927	3.761	3.622	3.503	3.390	3.277	3.170	3.068
2042	4.220	4.038	3.846	3.664	3.514	3.393	3.286	3.184	3.088
2043	4.307	4.153	3.955	3.748	3.555	3.403	3.289	3.194	3.102
2044	4.334	4.239	4.070	3.856	3.638	3.444	3.299	3.196	3.113
2045	4.276	4.266	4.155	3.969	3.745	3.526	3.339	3.207	3.116
2046	4.154	4.209	4.181	4.053	3.856	3.631	3.420	3.247	3.127
2047	4.010	4.088	4.125	4.080	3.940	3.741	3.524	3.328	3.167
2048	3.889	3.946	4.006	4.024	3.966	3.824	3.633	3.430	3.247
2049	3.812	3.825	3.865	3.906	3.911	3.850	3.715	3.538	3.349
2050	3.806	3.749	3.745	3.767	3.795	3.796	3.741	3.619	3.456

	72	73	74	75	76	77	78	79	80+
2008	2.388	2.399	2.524	2.463	2.575	2.701	2.817	2.899	8.793
2009	2.444	2.284	2.283	2.389	2.317	2.407	2.508	2.596	10.108
2010	2.611	2.333	2.169	2.156	2.242	2.164	2.238	2.320	10.961
2011	2.823	2.498	2.222	2.053	2.026	2.096	2.013	2.072	11.450
2012	2.998	2.709	2.386	2.109	1.935	1.898	1.951	1.864	11.654
2013	3.099	2.880	2.591	2.270	1.993	1.815	1.766	1.803	11.642
2014	3.089	2.978	2.756	2.466	2.146	1.870	1.690	1.634	11.584
2015	3.004	2.970	2.850	2.624	2.333	2.015	1.743	1.565	11.392
2016	2.900	2.889	2.844	2.715	2.484	2.193	1.880	1.615	11.176
2017	2.830	2.791	2.768	2.711	2.572	2.337	2.047	1.744	11.051
2018	2.801	2.724	2.676	2.640	2.570	2.422	2.184	1.901	11.074
2019	2.834	2.698	2.613	2.553	2.504	2.421	2.265	2.030	11.251
2020	2.910	2.731	2.590	2.495	2.423	2.360	2.266	2.107	11.534
2021	2.997	2.806	2.622	2.474	2.369	2.285	2.211	2.109	11.861
2022	3.074	2.890	2.695	2.506	2.350	2.236	2.141	2.059	12.157
2023	3.154	2.967	2.778	2.578	2.383	2.219	2.096	1.996	12.380
2024	3.228	3.044	2.853	2.658	2.452	2.251	2.082	1.955	12.522
2025	3.295	3.118	2.929	2.731	2.530	2.318	2.113	1.943	12.617
2026	3.357	3.184	3.001	2.806	2.601	2.393	2.177	1.973	12.702
2027	3.410	3.246	3.067	2.877	2.674	2.463	2.250	2.035	12.818
2028	3.442	3.299	3.129	2.942	2.744	2.534	2.318	2.105	12.990
2029	3.448	3.332	3.182	3.004	2.809	2.603	2.387	2.170	13.219
2030	3.434	3.341	3.216	3.057	2.870	2.666	2.454	2.237	13.492
2031	3.411	3.328	3.226	3.091	2.923	2.726	2.516	2.302	13.804
2032	3.383	3.308	3.215	3.103	2.957	2.778	2.574	2.362	14.150
2033	3.337	3.283	3.198	3.095	2.971	2.814	2.626	2.419	14.526
2034	3.272	3.240	3.176	3.081	2.965	2.828	2.661	2.470	14.923
2035	3.195	3.178	3.136	3.060	2.953	2.825	2.677	2.505	15.329
2036	3.112	3.105	3.078	3.024	2.936	2.815	2.676	2.522	15.735
2037	3.035	3.026	3.009	2.970	2.902	2.800	2.668	2.522	16.119
2038	2.979	2.952	2.934	2.905	2.852	2.770	2.656	2.518	16.476
2039	2.954	2.899	2.864	2.834	2.792	2.724	2.630	2.508	16.804
2040	2.956	2.877	2.814	2.768	2.725	2.668	2.588	2.485	17.099
2041	2.973	2.880	2.794	2.722	2.664	2.606	2.537	2.447	17.356
2042	2.993	2.898	2.799	2.704	2.621	2.549	2.479	2.401	17.567
2043	3.014	2.919	2.818	2.710	2.605	2.509	2.426	2.348	17.725
2044	3.029	2.941	2.840	2.730	2.613	2.496	2.390	2.300	17.835
2045	3.040	2.956	2.862	2.753	2.634	2.506	2.379	2.267	17.902
2046	3.044	2.968	2.878	2.776	2.658	2.527	2.390	2.258	17.946
2047	3.056	2.973	2.891	2.793	2.681	2.552	2.412	2.270	17.997
2048	3.097	2.987	2.898	2.807	2.700	2.577	2.438	2.293	18.075
2049	3.176	3.027	2.912	2.815	2.714	2.595	2.463	2.319	18.183
2050	3.277	3.106	2.953	2.830	2.723	2.611	2.482	2.345	18.324

Kastamonu, Scenario 2 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	4.420	4.406	4.402	4.398	4.395	4.600	4.684	4.767	4.845
2009	4.904	4.410	4.405	4.402	4.399	4.393	4.593	4.673	4.751
2010	4.736	4.870	4.386	4.383	4.380	4.380	4.379	4.583	4.664
2011	4.565	4.719	4.862	4.380	4.376	4.372	4.371	4.371	4.572
2012	4.412	4.514	4.676	4.820	4.339	4.329	4.324	4.331	4.331
2013	4.342	4.387	4.497	4.660	4.804	4.325	4.318	4.315	4.321
2014	4.271	4.317	4.370	4.481	4.644	4.790	4.314	4.309	4.306
2015	4.202	4.247	4.300	4.355	4.466	4.630	4.779	4.305	4.300
2016	4.135	4.179	4.230	4.285	4.339	4.452	4.619	4.770	4.296
2017	4.068	4.111	4.162	4.215	4.270	4.325	4.441	4.611	4.761
2018	4.001	4.045	4.095	4.147	4.200	4.256	4.315	4.432	4.601
2019	3.932	3.979	4.029	4.080	4.132	4.186	4.245	4.306	4.423
2020	3.860	3.910	3.963	4.014	4.065	4.118	4.175	4.237	4.297
2021	3.785	3.839	3.894	3.948	3.999	4.051	4.108	4.167	4.227
2022	3.708	3.764	3.823	3.879	3.933	3.986	4.041	4.099	4.158
2023	3.635	3.688	3.749	3.808	3.865	3.920	3.975	4.033	4.090
2024	3.599	3.616	3.673	3.734	3.794	3.852	3.910	3.967	4.024
2025	3.558	3.580	3.601	3.659	3.721	3.781	3.842	3.902	3.959
2026	3.515	3.540	3.566	3.588	3.646	3.709	3.772	3.835	3.894
2027	3.470	3.498	3.527	3.554	3.576	3.635	3.700	3.765	3.827
2028	3.423	3.454	3.485	3.515	3.542	3.565	3.626	3.693	3.758
2029	3.383	3.408	3.442	3.473	3.503	3.531	3.556	3.620	3.686
2030	3.348	3.368	3.396	3.430	3.462	3.493	3.523	3.550	3.613
2031	3.306	3.334	3.357	3.386	3.420	3.453	3.486	3.518	3.544
2032	3.260	3.293	3.323	3.347	3.376	3.411	3.446	3.480	3.511
2033	3.211	3.247	3.283	3.314	3.338	3.367	3.404	3.441	3.474
2034	3.166	3.199	3.238	3.274	3.305	3.330	3.361	3.399	3.435
2035	3.124	3.154	3.190	3.230	3.266	3.297	3.324	3.356	3.394
2036	3.081	3.114	3.146	3.182	3.222	3.258	3.292	3.320	3.351
2037	3.036	3.071	3.106	3.139	3.175	3.215	3.253	3.288	3.315
2038	2.991	3.027	3.063	3.099	3.132	3.169	3.210	3.249	3.283
2039	2.945	2.982	3.020	3.057	3.093	3.126	3.164	3.207	3.245
2040	2.899	2.937	2.976	3.014	3.051	3.087	3.122	3.161	3.203
2041	2.855	2.891	2.931	2.971	3.009	3.046	3.084	3.119	3.157
2042	2.811	2.848	2.886	2.926	2.966	3.005	3.043	3.081	3.116
2043	2.769	2.805	2.843	2.882	2.922	2.962	3.002	3.041	3.078
2044	2.721	2.763	2.801	2.839	2.878	2.919	2.960	3.000	3.038
2045	2.671	2.716	2.759	2.797	2.836	2.875	2.917	2.958	2.997
2046	2.624	2.666	2.713	2.756	2.795	2.834	2.873	2.915	2.956
2047	2.581	2.620	2.664	2.711	2.754	2.793	2.832	2.872	2.914
2048	2.539	2.577	2.618	2.662	2.709	2.753	2.792	2.831	2.871
2049	2.495	2.536	2.576	2.617	2.661	2.708	2.752	2.791	2.830
2050	2.451	2.493	2.536	2.575	2.616	2.660	2.708	2.751	2.790

	9	10	11	12	13	14	15	16	17
2008	4.919	4.989	5.062	5.142	5.233	5.328	5.427	5.513	5.568
2009	4.824	4.891	4.955	5.021	5.093	5.176	5.263	5.354	5.432
2010	4.741	4.810	4.872	4.931	4.996	5.069	5.156	5.247	5.332
2011	4.648	4.718	4.781	4.839	4.899	4.966	5.046	5.137	5.230
2012	4.524	4.587	4.645	4.709	4.790	4.894	5.017	5.152	5.282
2013	4.317	4.502	4.558	4.614	4.684	4.779	4.901	5.042	5.189
2014	4.307	4.295	4.473	4.527	4.589	4.673	4.786	4.925	5.080
2015	4.291	4.285	4.266	4.442	4.502	4.578	4.680	4.811	4.963
2016	4.286	4.269	4.256	4.235	4.417	4.491	4.585	4.705	4.849
2017	4.281	4.264	4.241	4.225	4.210	4.406	4.498	4.610	4.743
2018	4.746	4.259	4.235	4.210	4.201	4.199	4.414	4.524	4.649
2019	4.587	4.724	4.231	4.204	4.185	4.190	4.207	4.439	4.562
2020	4.408	4.565	4.696	4.200	4.179	4.174	4.197	4.232	4.477
2021	4.283	4.387	4.536	4.665	4.175	4.169	4.182	4.223	4.271
2022	4.213	4.261	4.358	4.506	4.640	4.165	4.176	4.207	4.261
2023	4.143	4.191	4.232	4.327	4.481	4.629	4.172	4.202	4.246
2024	4.076	4.123	4.164	4.203	4.304	4.471	4.636	4.197	4.239
2025	4.011	4.056	4.096	4.136	4.180	4.294	4.478	4.660	4.232
2026	3.946	3.991	4.031	4.069	4.114	4.170	4.300	4.500	4.694
2027	3.882	3.928	3.967	4.005	4.048	4.105	4.177	4.322	4.533
2028	3.815	3.864	3.904	3.942	3.984	4.039	4.111	4.198	4.354
2029	3.746	3.798	3.841	3.880	3.922	3.976	4.045	4.131	4.228
2030	3.676	3.730	3.777	3.818	3.862	3.914	3.982	4.064	4.160
2031	3.603	3.660	3.710	3.755	3.801	3.854	3.920	4.000	4.091
2032	3.534	3.588	3.641	3.689	3.738	3.794	3.859	3.937	4.026
2033	3.502	3.520	3.570	3.621	3.673	3.731	3.798	3.875	3.961
2034	3.466	3.489	3.503	3.551	3.606	3.667	3.736	3.814	3.898
2035	3.427	3.454	3.473	3.486	3.537	3.600	3.671	3.750	3.835
2036	3.387	3.416	3.439	3.457	3.473	3.532	3.604	3.684	3.770
2037	3.344	3.376	3.401	3.424	3.445	3.467	3.535	3.616	3.703
2038	3.309	3.334	3.363	3.388	3.412	3.440	3.471	3.547	3.634
2039	3.277	3.300	3.323	3.350	3.377	3.408	3.443	3.481	3.562
2040	3.240	3.269	3.289	3.311	3.341	3.373	3.410	3.452	3.495
2041	3.198	3.233	3.259	3.278	3.302	3.337	3.375	3.419	3.465
2042	3.153	3.191	3.224	3.250	3.271	3.299	3.339	3.383	3.430
2043	3.112	3.147	3.184	3.215	3.243	3.267	3.301	3.345	3.392
2044	3.075	3.107	3.140	3.177	3.210	3.241	3.269	3.306	3.354
2045	3.035	3.071	3.102	3.134	3.172	3.207	3.242	3.273	3.313
2046	2.995	3.032	3.066	3.097	3.130	3.170	3.208	3.245	3.278
2047	2.954	2.992	3.028	3.062	3.094	3.129	3.170	3.210	3.249
2048	2.912	2.952	2.990	3.026	3.060	3.092	3.129	3.171	3.213
2049	2.870	2.911	2.951	2.988	3.024	3.059	3.092	3.129	3.172
2050	2.830	2.870	2.911	2.950	2.988	3.024	3.059	3.092	3.129

	18	19	20	21	22	23	24	25	26
2008	5.583	5.566	5.529	5.493	5.478	5.496	5.533	5.579	5.601
2009	5.476	5.476	5.444	5.391	5.348	5.336	5.370	5.429	5.498
2010	5.383	5.381	5.324	5.236	5.145	5.091	5.099	5.169	5.266
2011	5.312	5.355	5.344	5.278	5.179	5.072	4.997	4.981	5.028
2012	5.386	5.451	5.462	5.418	5.323	5.197	5.067	4.971	4.933
2013	5.325	5.428	5.487	5.492	5.440	5.334	5.194	5.047	4.934
2014	5.233	5.367	5.463	5.516	5.514	5.452	5.331	5.174	5.010
2015	5.123	5.274	5.402	5.493	5.539	5.526	5.448	5.311	5.136
2016	5.007	5.165	5.310	5.432	5.516	5.550	5.522	5.428	5.273
2017	4.893	5.049	5.201	5.340	5.455	5.527	5.547	5.502	5.391
2018	4.787	4.935	5.085	5.232	5.363	5.467	5.524	5.527	5.465
2019	4.693	4.829	4.971	5.116	5.255	5.375	5.464	5.504	5.490
2020	4.606	4.735	4.865	5.002	5.139	5.267	5.372	5.444	5.467
2021	4.522	4.648	4.771	4.896	5.025	5.151	5.264	5.353	5.407
2022	4.315	4.564	4.685	4.802	4.920	5.037	5.148	5.244	5.316
2023	4.306	4.358	4.601	4.716	4.826	4.932	5.035	5.129	5.208
2024	4.289	4.347	4.393	4.631	4.739	4.838	4.930	5.016	5.094
2025	4.280	4.328	4.381	4.422	4.653	4.750	4.836	4.912	4.982
2026	4.272	4.318	4.361	4.409	4.443	4.664	4.748	4.819	4.879
2027	4.731	4.308	4.349	4.387	4.429	4.454	4.662	4.732	4.788
2028	4.569	4.766	4.338	4.375	4.407	4.439	4.452	4.646	4.702
2029	4.389	4.602	4.795	4.363	4.394	4.417	4.437	4.437	4.617
2030	4.261	4.420	4.630	4.818	4.381	4.403	4.415	4.423	4.410
2031	4.191	4.291	4.446	4.652	4.835	4.389	4.401	4.401	4.397
2032	4.121	4.220	4.316	4.467	4.667	4.843	4.388	4.388	4.377
2033	4.054	4.148	4.243	4.336	4.482	4.675	4.841	4.375	4.365
2034	3.988	4.079	4.170	4.261	4.350	4.489	4.673	4.829	4.353
2035	3.923	4.012	4.100	4.187	4.275	4.356	4.488	4.662	4.808
2036	3.858	3.945	4.031	4.116	4.199	4.281	4.355	4.477	4.642
2037	3.791	3.879	3.963	4.045	4.127	4.205	4.279	4.345	4.459
2038	3.723	3.810	3.895	3.976	4.056	4.132	4.204	4.270	4.328
2039	3.651	3.740	3.825	3.907	3.986	4.060	4.131	4.195	4.254
2040	3.578	3.667	3.753	3.836	3.915	3.990	4.059	4.123	4.181
2041	3.510	3.592	3.679	3.763	3.843	3.919	3.988	4.051	4.110
2042	3.478	3.522	3.603	3.688	3.769	3.846	3.918	3.982	4.040
2043	3.441	3.488	3.531	3.610	3.693	3.772	3.845	3.912	3.971
2044	3.402	3.450	3.496	3.537	3.615	3.695	3.771	3.840	3.903
2045	3.361	3.409	3.456	3.501	3.541	3.616	3.694	3.766	3.832
2046	3.319	3.367	3.414	3.460	3.503	3.542	3.615	3.690	3.759
2047	3.283	3.323	3.370	3.416	3.462	3.504	3.540	3.612	3.685
2048	3.251	3.285	3.324	3.371	3.417	3.461	3.503	3.538	3.608
2049	3.213	3.252	3.285	3.324	3.371	3.416	3.460	3.501	3.535
2050	3.171	3.212	3.251	3.284	3.323	3.370	3.415	3.459	3.499

	27	28	29	30	31	32	33	34	35
2008	5.568	5.460	5.300	5.120	4.956	4.824	4.743	4.700	4.670
2009	5.540	5.521	5.422	5.268	5.093	4.933	4.802	4.718	4.670
2010	5.367	5.430	5.423	5.331	5.185	5.020	4.870	4.750	4.676
2011	5.111	5.216	5.303	5.330	5.273	5.155	5.006	4.860	4.737
2012	4.961	5.036	5.143	5.237	5.272	5.222	5.109	4.963	4.820
2013	4.883	4.908	4.989	5.107	5.213	5.257	5.211	5.098	4.949
2014	4.884	4.830	4.861	4.953	5.083	5.197	5.246	5.200	5.083
2015	4.960	4.831	4.783	4.826	4.929	5.068	5.187	5.234	5.185
2016	5.086	4.907	4.784	4.748	4.802	4.915	5.058	5.175	5.220
2017	5.223	5.033	4.860	4.749	4.725	4.788	4.905	5.046	5.161
2018	5.341	5.170	4.987	4.825	4.726	4.710	4.777	4.894	5.032
2019	5.415	5.288	5.123	4.951	4.801	4.712	4.700	4.767	4.880
2020	5.440	5.362	5.241	5.088	4.928	4.787	4.702	4.690	4.753
2021	5.417	5.387	5.315	5.206	5.065	4.914	4.777	4.691	4.677
2022	5.357	5.364	5.340	5.280	5.182	5.051	4.904	4.767	4.678
2023	5.266	5.304	5.318	5.305	5.257	5.168	5.041	4.894	4.754
2024	5.160	5.215	5.260	5.284	5.283	5.243	5.159	5.031	4.881
2025	5.048	5.111	5.172	5.227	5.262	5.269	5.233	5.149	5.018
2026	4.938	5.001	5.070	5.141	5.206	5.249	5.260	5.224	5.136
2027	4.837	4.894	4.962	5.040	5.121	5.194	5.241	5.251	5.212
2028	4.747	4.794	4.855	4.933	5.021	5.109	5.186	5.232	5.239
2029	4.663	4.705	4.757	4.828	4.914	5.009	5.101	5.177	5.221
2030	4.580	4.623	4.671	4.731	4.810	4.903	5.002	5.093	5.166
2031	4.374	4.543	4.590	4.646	4.715	4.800	4.896	4.994	5.083
2032	4.363	4.339	4.511	4.566	4.630	4.705	4.793	4.889	4.985
2033	4.345	4.330	4.309	4.489	4.552	4.621	4.698	4.786	4.880
2034	4.335	4.313	4.302	4.288	4.475	4.543	4.614	4.692	4.778
2035	4.325	4.305	4.287	4.282	4.275	4.466	4.537	4.608	4.684
2036	4.781	4.297	4.281	4.268	4.270	4.267	4.461	4.531	4.600
2037	4.618	4.755	4.274	4.263	4.257	4.262	4.262	4.455	4.524
2038	4.436	4.593	4.733	4.258	4.252	4.250	4.257	4.257	4.448
2039	4.307	4.414	4.574	4.718	4.248	4.246	4.245	4.252	4.251
2040	4.235	4.287	4.395	4.560	4.709	4.242	4.241	4.240	4.246
2041	4.163	4.217	4.270	4.383	4.551	4.703	4.238	4.237	4.235
2042	4.094	4.147	4.202	4.259	4.375	4.546	4.699	4.234	4.232
2043	4.026	4.079	4.134	4.192	4.252	4.370	4.542	4.694	4.229
2044	3.959	4.013	4.068	4.125	4.185	4.247	4.367	4.538	4.690
2045	3.892	3.948	4.003	4.060	4.119	4.181	4.244	4.363	4.534
2046	3.824	3.883	3.940	3.997	4.056	4.116	4.179	4.241	4.359
2047	3.753	3.817	3.877	3.935	3.993	4.053	4.113	4.176	4.238
2048	3.680	3.748	3.812	3.873	3.932	3.991	4.050	4.111	4.173
2049	3.605	3.677	3.745	3.809	3.871	3.930	3.989	4.048	4.108
2050	3.534	3.603	3.675	3.743	3.808	3.869	3.928	3.987	4.046

	36	37	38	39	40	41	42	43	44
2008	4.634	4.595	4.547	4.496	4.443	4.404	4.396	4.428	4.487
2009	4.634	4.593	4.550	4.502	4.451	4.399	4.362	4.356	4.390
2010	4.638	4.609	4.570	4.527	4.474	4.419	4.365	4.328	4.326
2011	4.660	4.620	4.590	4.550	4.505	4.451	4.395	4.341	4.308
2012	4.700	4.627	4.588	4.556	4.513	4.466	4.411	4.358	4.311
2013	4.803	4.681	4.606	4.565	4.532	4.487	4.438	4.383	4.331
2014	4.932	4.784	4.660	4.584	4.541	4.506	4.460	4.411	4.356
2015	5.066	4.913	4.763	4.638	4.560	4.515	4.478	4.432	4.384
2016	5.168	5.047	4.892	4.741	4.614	4.534	4.488	4.451	4.406
2017	5.203	5.149	5.026	4.870	4.717	4.589	4.507	4.461	4.424
2018	5.144	5.184	5.128	5.004	4.846	4.692	4.562	4.480	4.434
2019	5.016	5.126	5.163	5.106	4.980	4.820	4.665	4.535	4.454
2020	4.864	4.998	5.105	5.141	5.082	4.955	4.793	4.637	4.508
2021	4.737	4.846	4.977	5.083	5.117	5.056	4.927	4.766	4.611
2022	4.661	4.719	4.826	4.956	5.060	5.092	5.029	4.900	4.740
2023	4.662	4.643	4.700	4.804	4.932	5.034	5.065	5.002	4.874
2024	4.739	4.645	4.624	4.679	4.782	4.908	5.008	5.038	4.976
2025	4.866	4.722	4.627	4.605	4.658	4.759	4.883	4.983	5.013
2026	5.004	4.850	4.704	4.608	4.584	4.636	4.735	4.859	4.959
2027	5.122	4.988	4.833	4.686	4.588	4.563	4.613	4.712	4.836
2028	5.198	5.107	4.971	4.815	4.667	4.568	4.541	4.590	4.690
2029	5.226	5.184	5.091	4.954	4.796	4.647	4.546	4.519	4.569
2030	5.208	5.212	5.168	5.074	4.936	4.777	4.626	4.526	4.499
2031	5.154	5.195	5.197	5.152	5.057	4.917	4.757	4.606	4.507
2032	5.072	5.142	5.180	5.182	5.135	5.039	4.898	4.738	4.588
2033	4.974	5.060	5.128	5.166	5.166	5.118	5.021	4.880	4.720
2034	4.870	4.962	5.047	5.114	5.150	5.149	5.101	5.003	4.862
2035	4.768	4.859	4.950	5.033	5.100	5.135	5.133	5.083	4.986
2036	4.674	4.758	4.847	4.937	5.020	5.085	5.119	5.116	5.067
2037	4.592	4.665	4.747	4.835	4.925	5.006	5.070	5.103	5.101
2038	4.516	4.583	4.655	4.736	4.823	4.912	4.992	5.055	5.089
2039	4.441	4.507	4.573	4.644	4.725	4.811	4.898	4.978	5.042
2040	4.244	4.433	4.498	4.564	4.634	4.713	4.799	4.886	4.965
2041	4.240	4.236	4.425	4.489	4.554	4.624	4.702	4.787	4.874
2042	4.229	4.233	4.229	4.417	4.481	4.544	4.613	4.691	4.776
2043	4.226	4.223	4.226	4.222	4.409	4.472	4.535	4.603	4.681
2044	4.224	4.221	4.217	4.220	4.214	4.401	4.463	4.526	4.594
2045	4.685	4.219	4.215	4.211	4.213	4.207	4.393	4.455	4.517
2046	4.529	4.680	4.214	4.210	4.205	4.207	4.201	4.385	4.447
2047	4.356	4.525	4.675	4.209	4.205	4.199	4.201	4.194	4.379
2048	4.235	4.352	4.521	4.671	4.205	4.200	4.194	4.195	4.188
2049	4.170	4.232	4.349	4.518	4.667	4.201	4.195	4.189	4.190
2050	4.106	4.168	4.229	4.346	4.514	4.663	4.197	4.191	4.185

	45	46	47	48	49	50	51	52	53
2008	4.554	4.611	4.651	4.665	4.656	4.642	4.623	4.580	4.509
2009	4.453	4.524	4.585	4.630	4.649	4.645	4.636	4.622	4.583
2010	4.365	4.433	4.509	4.577	4.628	4.655	4.659	4.657	4.647
2011	4.310	4.355	4.426	4.506	4.575	4.627	4.654	4.661	4.664
2012	4.286	4.296	4.349	4.428	4.516	4.592	4.652	4.685	4.697
2013	4.285	4.261	4.273	4.325	4.403	4.487	4.561	4.619	4.653
2014	4.305	4.261	4.239	4.250	4.300	4.376	4.457	4.529	4.587
2015	4.331	4.282	4.239	4.216	4.226	4.274	4.346	4.426	4.498
2016	4.359	4.307	4.259	4.216	4.192	4.199	4.245	4.316	4.396
2017	4.381	4.335	4.285	4.237	4.193	4.166	4.171	4.216	4.287
2018	4.399	4.357	4.313	4.263	4.213	4.167	4.139	4.143	4.188
2019	4.410	4.376	4.335	4.291	4.239	4.188	4.140	4.110	4.115
2020	4.429	4.387	4.354	4.313	4.268	4.214	4.161	4.112	4.083
2021	4.484	4.406	4.365	4.333	4.290	4.243	4.188	4.134	4.086
2022	4.587	4.461	4.385	4.343	4.310	4.266	4.217	4.160	4.107
2023	4.715	4.564	4.440	4.363	4.321	4.285	4.239	4.189	4.134
2024	4.850	4.693	4.543	4.419	4.341	4.297	4.260	4.213	4.164
2025	4.953	4.828	4.672	4.522	4.397	4.318	4.272	4.233	4.188
2026	4.991	4.931	4.807	4.652	4.501	4.374	4.293	4.246	4.209
2027	4.937	4.970	4.911	4.787	4.630	4.478	4.350	4.268	4.222
2028	4.815	4.917	4.950	4.891	4.766	4.608	4.454	4.325	4.245
2029	4.669	4.795	4.898	4.930	4.870	4.744	4.584	4.430	4.302
2030	4.550	4.651	4.777	4.879	4.910	4.849	4.721	4.560	4.407
2031	4.481	4.533	4.634	4.760	4.860	4.889	4.826	4.697	4.537
2032	4.489	4.464	4.517	4.617	4.741	4.839	4.867	4.802	4.674
2033	4.571	4.473	4.449	4.501	4.600	4.722	4.818	4.844	4.780
2034	4.704	4.555	4.458	4.433	4.484	4.581	4.701	4.796	4.822
2035	4.846	4.688	4.541	4.443	4.417	4.466	4.562	4.680	4.774
2036	4.970	4.831	4.674	4.526	4.427	4.400	4.448	4.542	4.660
2037	5.052	4.956	4.817	4.659	4.511	4.411	4.383	4.429	4.522
2038	5.087	5.038	4.942	4.803	4.644	4.495	4.394	4.364	4.410
2039	5.075	5.073	5.025	4.928	4.788	4.628	4.478	4.376	4.346
2040	5.029	5.062	5.060	5.011	4.913	4.772	4.612	4.460	4.358
2041	4.953	5.016	5.050	5.047	4.997	4.898	4.755	4.594	4.443
2042	4.863	4.942	5.005	5.037	5.033	4.982	4.881	4.738	4.577
2043	4.766	4.852	4.931	4.993	5.024	5.018	4.966	4.864	4.721
2044	4.671	4.756	4.841	4.919	4.980	5.010	5.003	4.949	4.847
2045	4.585	4.662	4.746	4.831	4.907	4.967	4.995	4.987	4.932
2046	4.509	4.576	4.653	4.736	4.820	4.895	4.953	4.980	4.971
2047	4.440	4.501	4.568	4.644	4.726	4.808	4.882	4.939	4.964
2048	4.372	4.433	4.494	4.559	4.634	4.715	4.796	4.869	4.924
2049	4.183	4.366	4.426	4.486	4.551	4.624	4.704	4.783	4.854
2050	4.185	4.177	4.359	4.418	4.477	4.541	4.614	4.692	4.770

	54	55	56	57	58	59	60	61	62
2008	4.417	4.317	4.216	4.108	3.995	3.880	3.749	3.623	3.543
2009	4.517	4.428	4.332	4.232	4.122	4.003	3.881	3.742	3.607
2010	4.611	4.546	4.457	4.361	4.261	4.150	4.031	3.907	3.764
2011	4.663	4.638	4.582	4.501	4.406	4.302	4.185	4.059	3.927
2012	4.704	4.705	4.681	4.624	4.539	4.437	4.324	4.198	4.059
2013	4.667	4.677	4.680	4.657	4.599	4.510	4.403	4.285	4.152
2014	4.623	4.640	4.652	4.657	4.632	4.570	4.475	4.364	4.240
2015	4.559	4.598	4.617	4.630	4.632	4.603	4.536	4.436	4.318
2016	4.471	4.534	4.575	4.595	4.606	4.604	4.569	4.496	4.390
2017	4.370	4.447	4.512	4.554	4.572	4.579	4.571	4.530	4.450
2018	4.261	4.347	4.426	4.492	4.532	4.546	4.547	4.533	4.484
2019	4.163	4.240	4.327	4.407	4.471	4.507	4.515	4.509	4.488
2020	4.091	4.142	4.221	4.310	4.388	4.447	4.477	4.479	4.466
2021	4.060	4.071	4.125	4.205	4.292	4.365	4.418	4.442	4.436
2022	4.062	4.041	4.055	4.110	4.188	4.270	4.338	4.385	4.401
2023	4.085	4.044	4.025	4.041	4.094	4.168	4.244	4.306	4.345
2024	4.112	4.066	4.028	4.011	4.026	4.075	4.143	4.213	4.267
2025	4.141	4.093	4.050	4.014	3.996	4.007	4.050	4.113	4.176
2026	4.166	4.123	4.077	4.036	3.998	3.977	3.983	4.022	4.077
2027	4.187	4.147	4.107	4.063	4.020	3.980	3.954	3.955	3.987
2028	4.201	4.169	4.131	4.092	4.047	4.001	3.957	3.927	3.922
2029	4.224	4.182	4.153	4.116	4.076	4.028	3.978	3.930	3.894
2030	4.281	4.205	4.166	4.137	4.100	4.057	4.005	3.952	3.897
2031	4.386	4.263	4.189	4.151	4.120	4.080	4.034	3.978	3.919
2032	4.516	4.367	4.246	4.173	4.134	4.101	4.057	4.006	3.946
2033	4.653	4.497	4.350	4.230	4.156	4.114	4.077	4.029	3.974
2034	4.758	4.633	4.480	4.333	4.212	4.136	4.090	4.050	3.997
2035	4.801	4.739	4.615	4.462	4.315	4.191	4.111	4.062	4.017
2036	4.754	4.781	4.720	4.596	4.442	4.293	4.167	4.084	4.030
2037	4.640	4.735	4.762	4.700	4.575	4.419	4.267	4.138	4.051
2038	4.504	4.622	4.716	4.742	4.679	4.552	4.393	4.238	4.105
2039	4.392	4.486	4.603	4.696	4.720	4.654	4.524	4.363	4.205
2040	4.329	4.375	4.468	4.584	4.674	4.695	4.626	4.493	4.328
2041	4.341	4.312	4.358	4.450	4.563	4.650	4.667	4.595	4.458
2042	4.426	4.324	4.295	4.340	4.429	4.539	4.622	4.635	4.559
2043	4.559	4.408	4.307	4.277	4.319	4.406	4.512	4.591	4.600
2044	4.703	4.542	4.391	4.289	4.257	4.297	4.379	4.481	4.556
2045	4.830	4.685	4.523	4.371	4.268	4.234	4.271	4.350	4.448
2046	4.915	4.811	4.666	4.503	4.350	4.245	4.209	4.242	4.317
2047	4.954	4.897	4.792	4.645	4.481	4.326	4.219	4.180	4.211
2048	4.948	4.936	4.877	4.770	4.622	4.456	4.300	4.191	4.149
2049	4.908	4.930	4.915	4.854	4.746	4.596	4.429	4.271	4.160
2050	4.839	4.890	4.910	4.893	4.830	4.720	4.568	4.399	4.239

	63	64	65	66	67	68	69	70	71
2008	3.527	3.552	3.609	3.641	3.583	3.399	3.132	2.816	2.544
2009	3.518	3.490	3.502	3.545	3.562	3.493	3.303	3.032	2.717
2010	3.624	3.525	3.486	3.485	3.512	3.511	3.424	3.218	2.934
2011	3.774	3.622	3.511	3.457	3.439	3.449	3.432	3.330	3.113
2012	3.914	3.746	3.577	3.447	3.376	3.345	3.346	3.322	3.216
2013	4.005	3.846	3.665	3.482	3.340	3.262	3.229	3.229	3.205
2014	4.097	3.937	3.764	3.569	3.375	3.228	3.149	3.117	3.116
2015	4.184	4.028	3.854	3.667	3.461	3.263	3.117	3.040	3.008
2016	4.261	4.115	3.945	3.756	3.559	3.348	3.152	3.010	2.935
2017	4.334	4.192	4.031	3.846	3.646	3.444	3.235	3.044	2.906
2018	4.394	4.264	4.108	3.932	3.736	3.531	3.331	3.127	2.941
2019	4.429	4.325	4.180	4.009	3.821	3.620	3.416	3.221	3.022
2020	4.433	4.360	4.240	4.080	3.897	3.704	3.504	3.305	3.114
2021	4.412	4.365	4.276	4.141	3.969	3.780	3.587	3.392	3.198
2022	4.384	4.345	4.282	4.177	4.029	3.851	3.663	3.474	3.283
2023	4.349	4.318	4.264	4.184	4.065	3.911	3.733	3.549	3.364
2024	4.295	4.286	4.238	4.167	4.074	3.949	3.794	3.619	3.438
2025	4.219	4.233	4.208	4.145	4.060	3.960	3.833	3.680	3.508
2026	4.129	4.158	4.157	4.116	4.040	3.949	3.846	3.720	3.569
2027	4.033	4.071	4.085	4.069	4.015	3.932	3.838	3.735	3.610
2028	3.944	3.977	4.001	4.000	3.970	3.909	3.823	3.729	3.626
2029	3.880	3.890	3.909	3.918	3.904	3.867	3.803	3.716	3.622
2030	3.853	3.828	3.825	3.830	3.827	3.805	3.764	3.699	3.612
2031	3.857	3.802	3.765	3.749	3.742	3.731	3.706	3.663	3.596
2032	3.879	3.807	3.741	3.692	3.664	3.650	3.635	3.608	3.563
2033	3.906	3.830	3.748	3.670	3.610	3.576	3.558	3.541	3.511
2034	3.935	3.858	3.772	3.678	3.591	3.525	3.488	3.467	3.448
2035	3.958	3.887	3.800	3.703	3.601	3.509	3.440	3.400	3.377
2036	3.978	3.910	3.830	3.733	3.628	3.521	3.426	3.355	3.313
2037	3.991	3.931	3.854	3.764	3.660	3.549	3.439	3.343	3.270
2038	4.012	3.944	3.876	3.790	3.692	3.582	3.470	3.358	3.260
2039	4.066	3.966	3.890	3.813	3.720	3.617	3.504	3.390	3.276
2040	4.165	4.021	3.913	3.828	3.744	3.645	3.540	3.425	3.308
2041	4.289	4.119	3.968	3.853	3.761	3.671	3.570	3.462	3.344
2042	4.418	4.243	4.067	3.909	3.787	3.690	3.597	3.493	3.382
2043	4.518	4.371	4.190	4.008	3.844	3.718	3.617	3.521	3.413
2044	4.559	4.472	4.319	4.132	3.945	3.777	3.646	3.543	3.442
2045	4.516	4.513	4.419	4.260	4.068	3.877	3.706	3.573	3.465
2046	4.409	4.471	4.462	4.362	4.197	4.001	3.807	3.632	3.495
2047	4.281	4.367	4.422	4.405	4.300	4.131	3.931	3.733	3.555
2048	4.176	4.241	4.320	4.368	4.345	4.234	4.061	3.857	3.656
2049	4.115	4.137	4.196	4.269	4.311	4.281	4.164	3.987	3.779
2050	4.126	4.078	4.095	4.149	4.215	4.249	4.213	4.090	3.907

	72	73	74	75	76	77	78	79	80+
2008	2.388	2.399	2.524	2.463	2.575	2.701	2.817	2.899	8.793
2009	2.444	2.284	2.283	2.389	2.317	2.407	2.508	2.596	10.108
2010	2.611	2.333	2.169	2.156	2.242	2.164	2.238	2.320	10.961
2011	2.823	2.498	2.222	2.053	2.026	2.096	2.013	2.072	11.450
2012	2.998	2.709	2.386	2.109	1.935	1.898	1.951	1.864	11.654
2013	3.099	2.880	2.591	2.270	1.993	1.815	1.766	1.803	11.642
2014	3.089	2.977	2.756	2.466	2.146	1.870	1.690	1.634	11.584
2015	3.004	2.969	2.850	2.624	2.333	2.015	1.743	1.565	11.393
2016	2.901	2.889	2.844	2.715	2.484	2.193	1.880	1.616	11.177
2017	2.831	2.791	2.768	2.710	2.572	2.336	2.048	1.744	11.052
2018	2.805	2.726	2.676	2.640	2.569	2.421	2.184	1.902	11.077
2019	2.840	2.701	2.614	2.553	2.503	2.420	2.265	2.030	11.254
2020	2.919	2.736	2.592	2.495	2.422	2.360	2.266	2.107	11.538
2021	3.010	2.814	2.627	2.476	2.369	2.285	2.211	2.109	11.867
2022	3.092	2.902	2.703	2.510	2.352	2.236	2.141	2.060	12.164
2023	3.175	2.983	2.789	2.584	2.386	2.221	2.097	1.997	12.387
2024	3.255	3.065	2.867	2.667	2.457	2.254	2.084	1.956	12.530
2025	3.328	3.143	2.947	2.744	2.538	2.323	2.117	1.945	12.628
2026	3.397	3.214	3.023	2.822	2.612	2.401	2.183	1.977	12.716
2027	3.458	3.283	3.094	2.897	2.689	2.474	2.259	2.042	12.835
2028	3.499	3.343	3.162	2.966	2.762	2.548	2.329	2.114	13.011
2029	3.517	3.385	3.222	3.033	2.830	2.620	2.401	2.182	13.245
2030	3.514	3.403	3.263	3.092	2.896	2.687	2.471	2.251	13.526
2031	3.506	3.402	3.282	3.134	2.954	2.751	2.536	2.319	13.846
2032	3.492	3.396	3.283	3.154	2.996	2.808	2.599	2.382	14.203
2033	3.462	3.384	3.279	3.157	3.018	2.850	2.656	2.443	14.590
2034	3.413	3.356	3.269	3.154	3.022	2.873	2.698	2.499	15.001
2035	3.352	3.310	3.244	3.146	3.021	2.879	2.721	2.540	15.423
2036	3.285	3.252	3.200	3.123	3.016	2.880	2.729	2.564	15.849
2037	3.223	3.188	3.145	3.083	2.995	2.877	2.732	2.574	16.258
2038	3.183	3.129	3.084	3.032	2.958	2.859	2.731	2.579	16.644
2039	3.174	3.092	3.029	2.974	2.911	2.826	2.717	2.580	17.007
2040	3.191	3.084	2.994	2.922	2.857	2.782	2.686	2.568	17.342
2041	3.224	3.102	2.988	2.890	2.809	2.733	2.647	2.542	17.646
2042	3.261	3.135	3.007	2.885	2.779	2.688	2.602	2.506	17.908
2043	3.298	3.172	3.040	2.905	2.776	2.661	2.561	2.465	18.122
2044	3.330	3.210	3.078	2.939	2.797	2.661	2.537	2.429	18.292
2045	3.359	3.242	3.115	2.976	2.832	2.682	2.538	2.407	18.423
2046	3.382	3.271	3.147	3.014	2.869	2.717	2.561	2.410	18.535
2047	3.413	3.294	3.176	3.046	2.907	2.755	2.596	2.434	18.657
2048	3.473	3.326	3.200	3.076	2.940	2.793	2.634	2.469	18.809
2049	3.573	3.385	3.232	3.100	2.969	2.826	2.673	2.507	18.994
2050	3.694	3.484	3.291	3.132	2.994	2.857	2.706	2.546	19.216

Kastamonu, Scenario 3 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	4.420	4.406	4.402	4.398	4.395	4.600	4.684	4.767	4.845
2009	4.904	4.410	4.405	4.402	4.399	4.393	4.593	4.673	4.751
2010	4.736	4.870	4.386	4.383	4.380	4.380	4.379	4.583	4.664
2011	4.565	4.719	4.862	4.380	4.376	4.372	4.371	4.371	4.572
2012	4.412	4.514	4.676	4.820	4.339	4.329	4.324	4.331	4.331
2013	4.342	4.387	4.497	4.660	4.804	4.325	4.318	4.315	4.321
2014	4.271	4.318	4.371	4.482	4.645	4.790	4.314	4.310	4.306
2015	4.204	4.249	4.302	4.356	4.467	4.632	4.780	4.305	4.300
2016	4.138	4.183	4.234	4.288	4.343	4.455	4.621	4.771	4.296
2017	4.073	4.118	4.169	4.221	4.276	4.331	4.445	4.613	4.762
2018	4.008	4.054	4.105	4.156	4.209	4.264	4.321	4.436	4.604
2019	3.939	3.989	4.042	4.093	4.145	4.198	4.254	4.313	4.428
2020	3.868	3.922	3.978	4.031	4.082	4.135	4.188	4.247	4.305
2021	3.794	3.852	3.911	3.968	4.021	4.072	4.125	4.181	4.239
2022	3.716	3.778	3.842	3.902	3.959	4.011	4.063	4.118	4.173
2023	3.643	3.702	3.769	3.833	3.893	3.950	4.002	4.056	4.110
2024	3.606	3.630	3.694	3.761	3.825	3.885	3.941	3.995	4.048
2025	3.564	3.594	3.622	3.686	3.754	3.817	3.877	3.934	3.988
2026	3.518	3.552	3.587	3.615	3.680	3.747	3.809	3.869	3.927
2027	3.472	3.508	3.546	3.581	3.610	3.673	3.739	3.802	3.863
2028	3.423	3.462	3.502	3.541	3.576	3.603	3.665	3.731	3.795
2029	3.382	3.415	3.457	3.498	3.536	3.570	3.596	3.658	3.725
2030	3.346	3.374	3.410	3.453	3.494	3.531	3.562	3.589	3.652
2031	3.304	3.339	3.371	3.407	3.451	3.489	3.524	3.555	3.583
2032	3.258	3.298	3.336	3.368	3.405	3.446	3.482	3.517	3.550
2033	3.210	3.253	3.296	3.335	3.367	3.401	3.439	3.476	3.512
2034	3.168	3.206	3.252	3.295	3.334	3.363	3.394	3.433	3.470
2035	3.129	3.165	3.206	3.252	3.295	3.331	3.357	3.388	3.428
2036	3.090	3.127	3.164	3.206	3.252	3.292	3.325	3.350	3.383
2037	3.051	3.088	3.128	3.165	3.207	3.250	3.286	3.318	3.346
2038	3.012	3.050	3.090	3.129	3.167	3.205	3.244	3.280	3.314
2039	2.973	3.012	3.052	3.092	3.132	3.166	3.200	3.238	3.275
2040	2.933	2.973	3.014	3.055	3.095	3.131	3.160	3.194	3.234
2041	2.897	2.935	2.977	3.018	3.059	3.095	3.126	3.155	3.190
2042	2.862	2.899	2.939	2.981	3.022	3.059	3.090	3.120	3.151
2043	2.827	2.864	2.904	2.943	2.986	3.023	3.054	3.084	3.116
2044	2.788	2.830	2.870	2.909	2.949	2.987	3.018	3.048	3.080
2045	2.746	2.792	2.837	2.876	2.916	2.951	2.983	3.013	3.045
2046	2.707	2.751	2.799	2.843	2.883	2.918	2.946	2.977	3.010
2047	2.671	2.713	2.758	2.807	2.851	2.885	2.914	2.941	2.974
2048	2.638	2.678	2.721	2.766	2.815	2.854	2.881	2.908	2.938
2049	2.601	2.645	2.686	2.730	2.775	2.818	2.850	2.876	2.906
2050	2.564	2.609	2.654	2.696	2.739	2.779	2.815	2.845	2.874

	9	10	11	12	13	14	15	16	17
2008	4.919	4.989	5.062	5.142	5.233	5.328	5.427	5.513	5.568
2009	4.824	4.891	4.955	5.021	5.093	5.176	5.263	5.354	5.432
2010	4.741	4.810	4.872	4.931	4.996	5.069	5.156	5.247	5.332
2011	4.648	4.718	4.781	4.839	4.899	4.966	5.046	5.137	5.230
2012	4.524	4.587	4.645	4.709	4.790	4.894	5.017	5.152	5.282
2013	4.317	4.502	4.558	4.614	4.684	4.779	4.901	5.042	5.189
2014	4.307	4.296	4.475	4.529	4.591	4.674	4.786	4.925	5.078
2015	4.292	4.288	4.270	4.447	4.507	4.581	4.681	4.809	4.960
2016	4.287	4.274	4.263	4.244	4.427	4.498	4.589	4.703	4.843
2017	4.284	4.270	4.251	4.239	4.225	4.420	4.506	4.611	4.736
2018	4.750	4.267	4.248	4.229	4.222	4.219	4.427	4.527	4.642
2019	4.593	4.734	4.247	4.228	4.213	4.217	4.227	4.447	4.557
2020	4.417	4.578	4.716	4.229	4.214	4.209	4.225	4.246	4.476
2021	4.295	4.404	4.562	4.699	4.216	4.210	4.217	4.243	4.273
2022	4.229	4.282	4.388	4.546	4.688	4.214	4.218	4.234	4.269
2023	4.164	4.217	4.268	4.375	4.537	4.686	4.222	4.236	4.259
2024	4.102	4.153	4.205	4.257	4.367	4.536	4.694	4.238	4.258
2025	4.040	4.092	4.143	4.195	4.250	4.367	4.544	4.710	4.260
2026	3.980	4.032	4.083	4.135	4.191	4.251	4.375	4.559	4.729
2027	3.920	3.973	4.024	4.077	4.131	4.193	4.260	4.389	4.577
2028	3.856	3.913	3.967	4.020	4.075	4.134	4.201	4.273	4.407
2029	3.790	3.851	3.909	3.964	4.020	4.079	4.143	4.214	4.289
2030	3.720	3.785	3.848	3.908	3.966	4.025	4.088	4.155	4.228
2031	3.647	3.717	3.784	3.849	3.911	3.972	4.033	4.099	4.168
2032	3.579	3.645	3.717	3.786	3.853	3.918	3.980	4.044	4.111
2033	3.546	3.578	3.647	3.721	3.793	3.861	3.927	3.990	4.054
2034	3.508	3.546	3.581	3.653	3.729	3.801	3.870	3.935	3.999
2035	3.468	3.509	3.551	3.589	3.662	3.739	3.810	3.878	3.943
2036	3.425	3.470	3.516	3.560	3.600	3.673	3.747	3.817	3.884
2037	3.382	3.428	3.477	3.527	3.573	3.611	3.682	3.754	3.822
2038	3.345	3.386	3.438	3.490	3.541	3.585	3.620	3.687	3.757
2039	3.313	3.350	3.396	3.453	3.506	3.554	3.594	3.625	3.690
2040	3.276	3.319	3.362	3.413	3.470	3.521	3.564	3.598	3.625
2041	3.234	3.283	3.333	3.380	3.432	3.485	3.530	3.567	3.597
2042	3.191	3.242	3.298	3.353	3.401	3.448	3.494	3.532	3.564
2043	3.152	3.200	3.259	3.320	3.375	3.418	3.457	3.496	3.528
2044	3.118	3.163	3.218	3.283	3.344	3.393	3.427	3.458	3.491
2045	3.083	3.130	3.183	3.244	3.308	3.362	3.403	3.427	3.452
2046	3.048	3.095	3.151	3.210	3.271	3.328	3.372	3.402	3.419
2047	3.013	3.062	3.118	3.180	3.238	3.291	3.337	3.370	3.392
2048	2.978	3.028	3.086	3.149	3.210	3.260	3.301	3.335	3.359
2049	2.943	2.994	3.054	3.119	3.181	3.233	3.269	3.297	3.323
2050	2.911	2.960	3.021	3.088	3.152	3.204	3.242	3.265	3.284

	18	19	20	21	22	23	24	25	26
2008	5.583	5.566	5.529	5.493	5.478	5.496	5.533	5.579	5.601
2009	5.476	5.476	5.444	5.391	5.348	5.336	5.370	5.429	5.498
2010	5.383	5.381	5.324	5.236	5.145	5.091	5.099	5.169	5.266
2011	5.312	5.355	5.344	5.278	5.179	5.072	4.997	4.981	5.028
2012	5.386	5.451	5.462	5.418	5.323	5.197	5.067	4.971	4.933
2013	5.325	5.428	5.487	5.492	5.440	5.334	5.194	5.047	4.934
2014	5.231	5.365	5.462	5.516	5.514	5.452	5.332	5.175	5.011
2015	5.119	5.270	5.399	5.491	5.538	5.526	5.451	5.314	5.141
2016	4.998	5.156	5.303	5.428	5.514	5.551	5.526	5.434	5.282
2017	4.880	5.035	5.189	5.331	5.450	5.527	5.551	5.511	5.404
2018	4.771	4.915	5.066	5.217	5.354	5.464	5.528	5.538	5.482
2019	4.676	4.805	4.946	5.094	5.239	5.368	5.466	5.516	5.511
2020	4.589	4.708	4.835	4.973	5.117	5.254	5.371	5.455	5.491
2021	4.507	4.621	4.738	4.862	4.996	5.132	5.258	5.362	5.433
2022	4.303	4.537	4.649	4.764	4.885	5.012	5.137	5.251	5.342
2023	4.297	4.332	4.564	4.675	4.787	4.902	5.019	5.131	5.232
2024	4.285	4.324	4.359	4.590	4.698	4.804	4.909	5.014	5.115
2025	4.283	4.311	4.350	4.384	4.614	4.716	4.813	4.906	4.999
2026	4.283	4.308	4.336	4.376	4.408	4.632	4.725	4.811	4.893
2027	4.751	4.306	4.332	4.361	4.399	4.426	4.642	4.725	4.800
2028	4.598	4.773	4.330	4.357	4.385	4.419	4.438	4.643	4.716
2029	4.426	4.619	4.796	4.354	4.381	4.405	4.431	4.441	4.636
2030	4.307	4.445	4.640	4.820	4.378	4.402	4.418	4.435	4.436
2031	4.244	4.325	4.466	4.664	4.843	4.399	4.416	4.424	4.432
2032	4.182	4.261	4.345	4.489	4.688	4.865	4.415	4.423	4.423
2033	4.123	4.198	4.281	4.368	4.513	4.709	4.881	4.423	4.424
2034	4.065	4.138	4.217	4.303	4.392	4.536	4.726	4.890	4.426
2035	4.009	4.078	4.155	4.238	4.327	4.415	4.554	4.737	4.894
2036	3.951	4.020	4.095	4.177	4.262	4.350	4.434	4.566	4.744
2037	3.890	3.961	4.036	4.116	4.201	4.286	4.370	4.448	4.574
2038	3.827	3.899	3.976	4.056	4.140	4.225	4.307	4.386	4.458
2039	3.760	3.835	3.913	3.996	4.081	4.165	4.247	4.324	4.398
2040	3.691	3.767	3.848	3.933	4.020	4.106	4.187	4.265	4.338
2041	3.625	3.696	3.779	3.867	3.957	4.046	4.129	4.207	4.281
2042	3.596	3.629	3.707	3.798	3.891	3.983	4.071	4.150	4.225
2043	3.561	3.598	3.639	3.726	3.822	3.918	4.009	4.093	4.170
2044	3.524	3.562	3.608	3.658	3.750	3.849	3.944	4.033	4.114
2045	3.484	3.523	3.571	3.625	3.682	3.778	3.876	3.969	4.056
2046	3.443	3.483	3.531	3.588	3.649	3.710	3.806	3.903	3.995
2047	3.410	3.440	3.489	3.547	3.612	3.678	3.739	3.834	3.930
2048	3.381	3.405	3.446	3.506	3.572	3.641	3.708	3.768	3.863
2049	3.346	3.375	3.410	3.462	3.530	3.601	3.672	3.739	3.799
2050	3.308	3.339	3.379	3.425	3.486	3.560	3.633	3.704	3.772

	27	28	29	30	31	32	33	34	35
2008	5.568	5.460	5.300	5.120	4.956	4.824	4.743	4.700	4.670
2009	5.540	5.521	5.422	5.268	5.093	4.933	4.802	4.718	4.670
2010	5.367	5.430	5.423	5.331	5.185	5.020	4.870	4.750	4.676
2011	5.111	5.216	5.303	5.330	5.273	5.155	5.006	4.860	4.737
2012	4.961	5.036	5.143	5.237	5.272	5.222	5.109	4.963	4.820
2013	4.883	4.908	4.989	5.107	5.213	5.257	5.211	5.098	4.949
2014	4.886	4.832	4.863	4.955	5.084	5.198	5.246	5.200	5.084
2015	4.966	4.838	4.789	4.830	4.933	5.070	5.188	5.236	5.187
2016	5.098	4.919	4.796	4.758	4.809	4.920	5.061	5.178	5.223
2017	5.241	5.054	4.880	4.767	4.738	4.797	4.911	5.051	5.166
2018	5.365	5.198	5.016	4.852	4.748	4.727	4.789	4.902	5.040
2019	5.445	5.325	5.163	4.989	4.834	4.737	4.719	4.781	4.892
2020	5.476	5.407	5.291	5.137	4.972	4.823	4.730	4.712	4.771
2021	5.459	5.441	5.376	5.267	5.121	4.962	4.817	4.723	4.703
2022	5.402	5.425	5.411	5.353	5.252	5.112	4.956	4.810	4.715
2023	5.314	5.371	5.397	5.390	5.339	5.243	5.106	4.950	4.803
2024	5.206	5.285	5.346	5.378	5.376	5.330	5.237	5.100	4.943
2025	5.091	5.180	5.261	5.327	5.365	5.368	5.325	5.232	5.094
2026	4.978	5.067	5.158	5.244	5.316	5.358	5.364	5.320	5.226
2027	4.874	4.956	5.047	5.143	5.234	5.310	5.354	5.359	5.315
2028	4.783	4.855	4.938	5.034	5.134	5.228	5.306	5.350	5.355
2029	4.702	4.766	4.839	4.926	5.026	5.129	5.225	5.303	5.347
2030	4.624	4.687	4.752	4.828	4.919	5.021	5.126	5.222	5.300
2031	4.426	4.611	4.675	4.743	4.822	4.915	5.019	5.124	5.221
2032	4.425	4.416	4.601	4.667	4.738	4.819	4.914	5.017	5.123
2033	4.418	4.417	4.408	4.595	4.663	4.736	4.818	4.913	5.017
2034	4.421	4.412	4.411	4.403	4.593	4.662	4.735	4.818	4.913
2035	4.425	4.417	4.408	4.408	4.401	4.591	4.661	4.735	4.819
2036	4.896	4.423	4.415	4.406	4.407	4.401	4.591	4.662	4.737
2037	4.747	4.896	4.423	4.415	4.406	4.407	4.402	4.593	4.665
2038	4.580	4.750	4.898	4.425	4.416	4.407	4.408	4.404	4.596
2039	4.466	4.585	4.754	4.900	4.427	4.417	4.409	4.410	4.408
2040	4.408	4.473	4.591	4.758	4.903	4.428	4.419	4.412	4.415
2041	4.350	4.417	4.481	4.596	4.761	4.905	4.431	4.422	4.417
2042	4.295	4.362	4.427	4.488	4.601	4.764	4.908	4.435	4.428
2043	4.242	4.310	4.374	4.436	4.493	4.605	4.767	4.912	4.441
2044	4.189	4.258	4.323	4.384	4.442	4.498	4.608	4.772	4.919
2045	4.136	4.208	4.274	4.335	4.391	4.447	4.501	4.613	4.780
2046	4.080	4.157	4.225	4.287	4.343	4.397	4.451	4.507	4.622
2047	4.021	4.103	4.176	4.240	4.296	4.349	4.401	4.458	4.517
2048	3.958	4.046	4.124	4.192	4.250	4.303	4.354	4.408	4.468
2049	3.893	3.986	4.069	4.142	4.204	4.257	4.308	4.362	4.419
2050	3.832	3.923	4.011	4.088	4.154	4.211	4.263	4.316	4.373

	36	37	38	39	40	41	42	43	44
2008	4.634	4.595	4.547	4.496	4.443	4.404	4.396	4.428	4.487
2009	4.634	4.593	4.550	4.502	4.451	4.399	4.362	4.356	4.390
2010	4.638	4.609	4.570	4.527	4.474	4.419	4.365	4.328	4.326
2011	4.660	4.620	4.590	4.550	4.505	4.451	4.395	4.341	4.308
2012	4.700	4.627	4.588	4.556	4.513	4.466	4.411	4.358	4.311
2013	4.803	4.681	4.606	4.565	4.532	4.487	4.438	4.383	4.331
2014	4.933	4.785	4.661	4.585	4.542	4.507	4.461	4.412	4.357
2015	5.068	4.916	4.766	4.641	4.563	4.519	4.482	4.436	4.388
2016	5.172	5.052	4.898	4.747	4.621	4.541	4.495	4.458	4.413
2017	5.209	5.156	5.035	4.880	4.728	4.600	4.519	4.473	4.436
2018	5.153	5.195	5.141	5.018	4.861	4.708	4.579	4.498	4.453
2019	5.028	5.140	5.180	5.125	5.001	4.843	4.689	4.560	4.479
2020	4.881	5.016	5.126	5.165	5.109	4.984	4.825	4.670	4.542
2021	4.762	4.870	5.004	5.113	5.150	5.093	4.967	4.807	4.653
2022	4.694	4.752	4.859	4.992	5.099	5.135	5.077	4.950	4.792
2023	4.707	4.685	4.742	4.848	4.980	5.086	5.121	5.062	4.936
2024	4.795	4.699	4.677	4.732	4.838	4.968	5.073	5.107	5.048
2025	4.936	4.788	4.691	4.668	4.723	4.827	4.956	5.061	5.095
2026	5.088	4.930	4.782	4.684	4.660	4.714	4.817	4.946	5.050
2027	5.221	5.083	4.925	4.776	4.678	4.653	4.706	4.809	4.937
2028	5.311	5.217	5.078	4.920	4.771	4.672	4.646	4.699	4.801
2029	5.352	5.308	5.213	5.074	4.915	4.766	4.666	4.641	4.693
2030	5.344	5.349	5.305	5.210	5.071	4.912	4.762	4.662	4.637
2031	5.298	5.343	5.348	5.304	5.208	5.069	4.909	4.759	4.659
2032	5.220	5.298	5.343	5.348	5.303	5.207	5.067	4.908	4.757
2033	5.123	5.221	5.299	5.343	5.348	5.303	5.207	5.067	4.907
2034	5.018	5.125	5.223	5.301	5.345	5.349	5.304	5.208	5.067
2035	4.915	5.021	5.128	5.226	5.304	5.348	5.352	5.306	5.209
2036	4.822	4.919	5.026	5.133	5.230	5.308	5.351	5.355	5.309
2037	4.741	4.827	4.925	5.031	5.138	5.236	5.313	5.356	5.359
2038	4.669	4.747	4.834	4.932	5.038	5.145	5.242	5.319	5.362
2039	4.602	4.676	4.755	4.842	4.940	5.046	5.153	5.250	5.326
2040	4.414	4.610	4.685	4.764	4.851	4.950	5.056	5.162	5.258
2041	4.422	4.423	4.620	4.696	4.775	4.862	4.961	5.067	5.172
2042	4.425	4.433	4.435	4.632	4.708	4.787	4.875	4.973	5.078
2043	4.437	4.436	4.445	4.448	4.645	4.722	4.801	4.888	4.986
2044	4.451	4.449	4.449	4.459	4.462	4.660	4.737	4.816	4.902
2045	4.929	4.464	4.464	4.465	4.475	4.479	4.677	4.754	4.832
2046	4.791	4.943	4.480	4.480	4.482	4.493	4.497	4.695	4.770
2047	4.634	4.805	4.959	4.497	4.498	4.501	4.512	4.517	4.713
2048	4.530	4.650	4.823	4.977	4.517	4.519	4.522	4.533	4.536
2049	4.481	4.546	4.668	4.842	4.998	4.538	4.541	4.544	4.554
2050	4.434	4.499	4.566	4.689	4.864	5.020	4.562	4.565	4.566

	45	46	47	48	49	50	51	52	53
2008	4.554	4.611	4.651	4.665	4.656	4.642	4.623	4.580	4.509
2009	4.453	4.524	4.585	4.630	4.649	4.645	4.636	4.622	4.583
2010	4.365	4.433	4.509	4.577	4.628	4.655	4.659	4.657	4.647
2011	4.310	4.355	4.426	4.506	4.575	4.627	4.654	4.661	4.664
2012	4.286	4.296	4.349	4.428	4.516	4.592	4.652	4.685	4.697
2013	4.285	4.261	4.273	4.325	4.403	4.487	4.561	4.619	4.653
2014	4.307	4.262	4.239	4.251	4.301	4.377	4.459	4.530	4.588
2015	4.334	4.285	4.242	4.218	4.228	4.277	4.350	4.430	4.502
2016	4.366	4.314	4.265	4.222	4.198	4.206	4.252	4.324	4.404
2017	4.392	4.346	4.295	4.246	4.202	4.176	4.183	4.228	4.299
2018	4.417	4.374	4.328	4.277	4.228	4.182	4.155	4.161	4.206
2019	4.434	4.400	4.357	4.312	4.260	4.209	4.163	4.135	4.140
2020	4.462	4.418	4.384	4.341	4.295	4.243	4.191	4.144	4.116
2021	4.526	4.447	4.404	4.369	4.326	4.280	4.226	4.174	4.127
2022	4.639	4.512	4.433	4.390	4.356	4.312	4.265	4.211	4.158
2023	4.778	4.625	4.499	4.421	4.377	4.342	4.298	4.250	4.196
2024	4.923	4.766	4.614	4.488	4.409	4.366	4.330	4.286	4.238
2025	5.037	4.912	4.755	4.603	4.477	4.399	4.355	4.319	4.274
2026	5.085	5.026	4.902	4.745	4.594	4.468	4.389	4.345	4.309
2027	5.041	5.076	5.017	4.893	4.736	4.585	4.460	4.381	4.336
2028	4.929	5.033	5.067	5.009	4.885	4.729	4.579	4.453	4.374
2029	4.795	4.923	5.026	5.060	5.002	4.879	4.724	4.573	4.447
2030	4.689	4.791	4.918	5.021	5.055	4.998	4.875	4.720	4.569
2031	4.634	4.685	4.787	4.913	5.017	5.052	4.995	4.872	4.716
2032	4.657	4.631	4.683	4.784	4.911	5.015	5.050	4.993	4.869
2033	4.757	4.656	4.630	4.682	4.783	4.911	5.015	5.050	4.992
2034	4.907	4.756	4.656	4.630	4.682	4.785	4.913	5.017	5.050
2035	5.069	4.908	4.757	4.657	4.632	4.686	4.789	4.917	5.019
2036	5.212	5.070	4.909	4.759	4.660	4.637	4.692	4.795	4.920
2037	5.312	5.214	5.072	4.912	4.763	4.666	4.644	4.699	4.800
2038	5.364	5.316	5.217	5.076	4.917	4.770	4.675	4.654	4.706
2039	5.368	5.368	5.319	5.221	5.081	4.925	4.780	4.686	4.663
2040	5.333	5.373	5.373	5.325	5.228	5.090	4.936	4.792	4.696
2041	5.267	5.340	5.379	5.379	5.332	5.238	5.103	4.949	4.803
2042	5.182	5.275	5.347	5.387	5.388	5.343	5.252	5.117	4.962
2043	5.089	5.192	5.283	5.356	5.397	5.401	5.358	5.267	5.130
2044	4.998	5.100	5.201	5.293	5.367	5.411	5.417	5.375	5.281
2045	4.916	5.010	5.111	5.212	5.306	5.383	5.429	5.435	5.391
2046	4.847	4.930	5.022	5.123	5.226	5.323	5.402	5.449	5.452
2047	4.787	4.862	4.943	5.036	5.139	5.245	5.344	5.424	5.467
2048	4.731	4.803	4.876	4.958	5.053	5.159	5.268	5.368	5.444
2049	4.556	4.748	4.818	4.892	4.976	5.075	5.184	5.294	5.390
2050	4.575	4.574	4.765	4.836	4.912	5.000	5.101	5.212	5.318

	54	55	56	57	58	59	60	61	62
2008	4.417	4.317	4.216	4.108	3.995	3.880	3.749	3.623	3.543
2009	4.517	4.428	4.332	4.232	4.122	4.003	3.881	3.742	3.607
2010	4.611	4.546	4.457	4.361	4.261	4.150	4.031	3.907	3.764
2011	4.663	4.638	4.582	4.501	4.406	4.302	4.185	4.059	3.927
2012	4.704	4.705	4.681	4.624	4.539	4.437	4.324	4.198	4.059
2013	4.667	4.677	4.680	4.657	4.599	4.510	4.403	4.285	4.152
2014	4.624	4.641	4.653	4.656	4.631	4.569	4.475	4.364	4.240
2015	4.562	4.600	4.618	4.630	4.631	4.602	4.535	4.436	4.318
2016	4.477	4.538	4.577	4.595	4.605	4.602	4.568	4.495	4.390
2017	4.381	4.455	4.517	4.556	4.571	4.577	4.569	4.528	4.449
2018	4.278	4.360	4.435	4.497	4.533	4.544	4.544	4.530	4.483
2019	4.186	4.259	4.342	4.416	4.474	4.506	4.512	4.506	4.485
2020	4.122	4.169	4.242	4.323	4.394	4.448	4.474	4.475	4.462
2021	4.100	4.107	4.153	4.225	4.303	4.369	4.418	4.439	4.433
2022	4.112	4.085	4.091	4.136	4.205	4.279	4.340	4.383	4.398
2023	4.144	4.098	4.071	4.076	4.118	4.182	4.251	4.307	4.344
2024	4.183	4.131	4.084	4.055	4.058	4.096	4.156	4.219	4.269
2025	4.226	4.171	4.118	4.069	4.038	4.037	4.071	4.125	4.183
2026	4.263	4.214	4.158	4.103	4.052	4.017	4.012	4.042	4.091
2027	4.299	4.252	4.201	4.143	4.086	4.031	3.994	3.984	4.009
2028	4.328	4.289	4.240	4.186	4.126	4.065	4.008	3.966	3.953
2029	4.367	4.318	4.277	4.225	4.169	4.106	4.042	3.981	3.936
2030	4.441	4.358	4.307	4.263	4.208	4.149	4.083	4.016	3.951
2031	4.563	4.433	4.347	4.293	4.245	4.188	4.126	4.057	3.986
2032	4.711	4.555	4.422	4.333	4.275	4.225	4.165	4.100	4.027
2033	4.865	4.704	4.544	4.408	4.316	4.255	4.202	4.139	4.071
2034	4.988	4.858	4.692	4.530	4.390	4.295	4.233	4.176	4.110
2035	5.048	4.981	4.846	4.677	4.512	4.370	4.273	4.207	4.148
2036	5.018	5.041	4.970	4.831	4.658	4.491	4.347	4.247	4.178
2037	4.921	5.012	5.030	4.954	4.811	4.637	4.467	4.321	4.218
2038	4.802	4.917	5.002	5.014	4.934	4.788	4.612	4.440	4.292
2039	4.710	4.800	4.908	4.987	4.994	4.911	4.764	4.585	4.412
2040	4.668	4.709	4.792	4.893	4.967	4.971	4.885	4.736	4.556
2041	4.703	4.668	4.702	4.778	4.874	4.944	4.945	4.857	4.706
2042	4.811	4.703	4.661	4.689	4.760	4.853	4.920	4.917	4.827
2043	4.969	4.811	4.697	4.649	4.672	4.739	4.829	4.892	4.888
2044	5.139	4.970	4.805	4.684	4.632	4.652	4.717	4.803	4.864
2045	5.291	5.140	4.964	4.792	4.667	4.612	4.630	4.692	4.776
2046	5.401	5.292	5.133	4.950	4.775	4.648	4.591	4.606	4.666
2047	5.464	5.403	5.285	5.119	4.932	4.755	4.626	4.568	4.582
2048	5.480	5.467	5.397	5.271	5.101	4.912	4.733	4.604	4.545
2049	5.458	5.484	5.461	5.382	5.252	5.079	4.890	4.710	4.580
2050	5.406	5.464	5.478	5.447	5.363	5.230	5.057	4.866	4.687

	63	64	65	66	67	68	69	70	71
2008	3.527	3.552	3.609	3.641	3.583	3.399	3.132	2.816	2.544
2009	3.518	3.490	3.502	3.545	3.562	3.493	3.303	3.032	2.717
2010	3.624	3.525	3.486	3.485	3.512	3.511	3.424	3.218	2.934
2011	3.774	3.622	3.511	3.457	3.439	3.449	3.432	3.330	3.113
2012	3.914	3.746	3.577	3.447	3.376	3.345	3.346	3.322	3.216
2013	4.005	3.846	3.665	3.482	3.340	3.262	3.229	3.229	3.205
2014	4.097	3.938	3.766	3.571	3.377	3.231	3.151	3.118	3.117
2015	4.185	4.031	3.858	3.673	3.468	3.270	3.123	3.045	3.010
2016	4.263	4.118	3.951	3.766	3.572	3.362	3.165	3.020	2.941
2017	4.335	4.197	4.040	3.861	3.666	3.467	3.257	3.062	2.919
2018	4.395	4.270	4.120	3.952	3.763	3.563	3.363	3.155	2.962
2019	4.429	4.331	4.194	4.033	3.855	3.661	3.460	3.260	3.053
2020	4.433	4.366	4.257	4.109	3.939	3.755	3.558	3.356	3.156
2021	4.412	4.372	4.294	4.174	4.017	3.840	3.653	3.455	3.252
2022	4.383	4.353	4.302	4.214	4.084	3.920	3.740	3.550	3.350
2023	4.350	4.327	4.286	4.225	4.127	3.990	3.821	3.637	3.444
2024	4.298	4.295	4.262	4.211	4.141	4.035	3.892	3.719	3.530
2025	4.225	4.246	4.234	4.192	4.131	4.052	3.939	3.790	3.611
2026	4.141	4.175	4.187	4.167	4.115	4.047	3.959	3.839	3.682
2027	4.051	4.094	4.121	4.124	4.095	4.035	3.957	3.861	3.732
2028	3.971	4.007	4.043	4.062	4.057	4.018	3.949	3.862	3.756
2029	3.917	3.930	3.960	3.989	3.999	3.984	3.936	3.856	3.758
2030	3.901	3.878	3.886	3.910	3.931	3.932	3.906	3.846	3.755
2031	3.918	3.864	3.837	3.840	3.857	3.868	3.858	3.820	3.747
2032	3.954	3.883	3.826	3.795	3.791	3.799	3.799	3.775	3.723
2033	3.996	3.920	3.847	3.787	3.751	3.739	3.734	3.720	3.682
2034	4.040	3.963	3.886	3.810	3.747	3.702	3.678	3.659	3.630
2035	4.080	4.008	3.930	3.852	3.773	3.702	3.646	3.607	3.572
2036	4.118	4.049	3.977	3.899	3.817	3.731	3.648	3.577	3.523
2037	4.149	4.088	4.020	3.948	3.867	3.778	3.680	3.582	3.496
2038	4.189	4.120	4.060	3.993	3.919	3.830	3.729	3.615	3.502
2039	4.264	4.162	4.094	4.036	3.966	3.885	3.784	3.666	3.537
2040	4.383	4.237	4.138	4.072	4.012	3.935	3.840	3.722	3.588
2041	4.527	4.356	4.214	4.118	4.051	3.983	3.892	3.780	3.644
2042	4.677	4.501	4.335	4.196	4.099	4.025	3.942	3.833	3.703
2043	4.798	4.651	4.480	4.318	4.180	4.076	3.986	3.885	3.757
2044	4.859	4.772	4.631	4.465	4.304	4.159	4.040	3.930	3.809
2045	4.837	4.835	4.753	4.617	4.452	4.285	4.124	3.985	3.855
2046	4.750	4.814	4.818	4.741	4.606	4.434	4.251	4.070	3.910
2047	4.643	4.731	4.800	4.808	4.732	4.589	4.401	4.197	3.995
2048	4.561	4.627	4.720	4.794	4.802	4.718	4.557	4.348	4.122
2049	4.524	4.546	4.619	4.718	4.791	4.790	4.687	4.503	4.271
2050	4.561	4.512	4.542	4.621	4.720	4.783	4.762	4.634	4.426

	72	73	74	75	76	77	78	79	80+
2008	2.388	2.399	2.524	2.463	2.575	2.701	2.817	2.899	8.793
2009	2.444	2.284	2.283	2.389	2.317	2.407	2.508	2.596	10.108
2010	2.611	2.333	2.169	2.156	2.242	2.164	2.238	2.320	10.961
2011	2.823	2.498	2.222	2.053	2.026	2.096	2.013	2.072	11.450
2012	2.998	2.709	2.386	2.109	1.935	1.898	1.951	1.864	11.654
2013	3.099	2.880	2.591	2.270	1.993	1.815	1.766	1.803	11.642
2014	3.089	2.977	2.755	2.465	2.146	1.870	1.690	1.634	11.584
2015	3.004	2.969	2.849	2.623	2.332	2.015	1.744	1.565	11.393
2016	2.903	2.889	2.842	2.713	2.483	2.193	1.881	1.616	11.179
2017	2.837	2.792	2.767	2.708	2.570	2.336	2.048	1.745	11.055
2018	2.817	2.730	2.675	2.637	2.567	2.420	2.185	1.903	11.081
2019	2.859	2.711	2.616	2.551	2.501	2.418	2.265	2.031	11.260
2020	2.949	2.753	2.599	2.496	2.420	2.358	2.265	2.108	11.545
2021	3.050	2.840	2.641	2.481	2.370	2.284	2.211	2.110	11.875
2022	3.144	2.939	2.725	2.522	2.356	2.237	2.142	2.060	12.172
2023	3.240	3.031	2.821	2.604	2.396	2.226	2.100	1.998	12.396
2024	3.332	3.124	2.911	2.697	2.476	2.265	2.091	1.960	12.541
2025	3.417	3.214	3.002	2.783	2.565	2.342	2.129	1.953	12.643
2026	3.497	3.297	3.089	2.872	2.650	2.429	2.203	1.990	12.738
2027	3.568	3.377	3.171	2.958	2.736	2.511	2.287	2.061	12.869
2028	3.617	3.446	3.248	3.037	2.819	2.594	2.366	2.141	13.059
2029	3.642	3.495	3.316	3.112	2.896	2.675	2.447	2.217	13.312
2030	3.646	3.520	3.364	3.179	2.970	2.750	2.526	2.295	13.617
2031	3.644	3.525	3.390	3.227	3.036	2.822	2.599	2.371	13.967
2032	3.638	3.524	3.396	3.253	3.084	2.887	2.669	2.442	14.357
2033	3.617	3.520	3.398	3.261	3.111	2.935	2.733	2.511	14.782
2034	3.578	3.501	3.395	3.264	3.120	2.963	2.781	2.573	15.232
2035	3.528	3.464	3.377	3.263	3.125	2.974	2.809	2.620	15.696
2036	3.474	3.417	3.343	3.247	3.125	2.980	2.822	2.649	16.163
2037	3.426	3.365	3.298	3.215	3.112	2.982	2.830	2.663	16.614
2038	3.401	3.320	3.249	3.174	3.083	2.971	2.834	2.672	17.041
2039	3.409	3.297	3.207	3.128	3.045	2.946	2.826	2.679	17.444
2040	3.444	3.305	3.185	3.088	3.001	2.911	2.803	2.673	17.820
2041	3.495	3.340	3.194	3.069	2.965	2.872	2.773	2.654	18.165
2042	3.552	3.392	3.230	3.079	2.948	2.839	2.737	2.627	18.471
2043	3.610	3.447	3.281	3.115	2.959	2.824	2.707	2.595	18.732
2044	3.664	3.505	3.336	3.165	2.995	2.837	2.695	2.569	18.953
2045	3.715	3.558	3.394	3.220	3.046	2.873	2.710	2.559	19.138
2046	3.761	3.609	3.446	3.277	3.100	2.923	2.746	2.574	19.308
2047	3.816	3.655	3.496	3.329	3.156	2.978	2.796	2.611	19.495
2048	3.902	3.710	3.542	3.379	3.208	3.034	2.851	2.661	19.717
2049	4.027	3.794	3.597	3.425	3.258	3.085	2.906	2.715	19.978
2050	4.174	3.917	3.680	3.479	3.304	3.135	2.957	2.770	20.282

Çankırı, Scenario 1 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	2.371	2.364	2.362	2.360	2.358	2.442	2.478	2.514	2.550
2009	2.808	2.430	2.427	2.425	2.423	2.420	2.505	2.546	2.587
2010	2.694	2.717	2.345	2.343	2.341	2.328	2.316	2.406	2.450
2011	2.604	2.645	2.674	2.302	2.300	2.283	2.253	2.237	2.324
2012	2.669	2.635	2.681	2.710	2.338	2.344	2.340	2.319	2.308
2013	2.709	2.667	2.638	2.684	2.714	2.340	2.341	2.337	2.317
2014	2.722	2.707	2.670	2.642	2.688	2.715	2.337	2.339	2.334
2015	2.729	2.720	2.710	2.674	2.646	2.689	2.712	2.335	2.336
2016	2.730	2.727	2.723	2.713	2.677	2.647	2.687	2.710	2.332
2017	2.724	2.728	2.730	2.726	2.716	2.678	2.644	2.684	2.707
2018	2.710	2.722	2.730	2.733	2.729	2.717	2.676	2.642	2.682
2019	2.690	2.708	2.724	2.733	2.736	2.730	2.715	2.673	2.640
2020	2.664	2.688	2.710	2.726	2.735	2.736	2.728	2.713	2.671
2021	2.634	2.662	2.690	2.712	2.729	2.736	2.734	2.725	2.711
2022	2.600	2.632	2.664	2.692	2.715	2.729	2.734	2.732	2.723
2023	2.563	2.598	2.633	2.666	2.694	2.715	2.727	2.732	2.730
2024	2.529	2.561	2.599	2.635	2.668	2.694	2.713	2.725	2.730
2025	2.494	2.527	2.562	2.600	2.637	2.668	2.692	2.711	2.724
2026	2.457	2.492	2.528	2.563	2.602	2.637	2.666	2.690	2.710
2027	2.421	2.455	2.492	2.529	2.564	2.602	2.635	2.664	2.689
2028	2.384	2.419	2.456	2.493	2.530	2.564	2.600	2.634	2.663
2029	2.357	2.382	2.419	2.456	2.494	2.530	2.563	2.599	2.633
2030	2.338	2.355	2.383	2.420	2.457	2.494	2.529	2.561	2.598
2031	2.317	2.336	2.355	2.383	2.420	2.456	2.493	2.528	2.560
2032	2.298	2.315	2.336	2.355	2.383	2.420	2.455	2.491	2.527
2033	2.282	2.296	2.315	2.335	2.355	2.382	2.419	2.455	2.491
2034	2.271	2.279	2.295	2.314	2.335	2.354	2.382	2.418	2.454
2035	2.266	2.269	2.278	2.294	2.314	2.334	2.354	2.381	2.417
2036	2.262	2.263	2.268	2.277	2.294	2.313	2.334	2.353	2.380
2037	2.259	2.259	2.262	2.266	2.276	2.293	2.312	2.333	2.352
2038	2.257	2.255	2.257	2.260	2.265	2.275	2.292	2.312	2.333
2039	2.255	2.254	2.254	2.256	2.259	2.264	2.275	2.292	2.311
2040	2.252	2.251	2.252	2.252	2.254	2.258	2.264	2.275	2.291
2041	2.249	2.248	2.249	2.249	2.250	2.253	2.257	2.263	2.274
2042	2.245	2.245	2.245	2.247	2.247	2.248	2.252	2.257	2.263
2043	2.241	2.241	2.242	2.243	2.244	2.246	2.248	2.252	2.257
2044	2.230	2.236	2.238	2.239	2.240	2.243	2.246	2.248	2.252
2045	2.213	2.225	2.233	2.235	2.236	2.238	2.242	2.246	2.248
2046	2.196	2.208	2.222	2.230	2.232	2.234	2.238	2.243	2.246
2047	2.178	2.191	2.204	2.218	2.226	2.230	2.234	2.239	2.243
2048	2.158	2.173	2.187	2.200	2.214	2.224	2.230	2.235	2.239
2049	2.132	2.152	2.168	2.183	2.196	2.212	2.224	2.230	2.235
2050	2.103	2.126	2.147	2.164	2.179	2.194	2.213	2.225	2.231

	9	10	11	12	13	14	15	16	17
2008	2.586	2.621	2.655	2.691	2.728	2.765	2.800	2.829	2.850
2009	2.626	2.663	2.700	2.741	2.787	2.839	2.893	2.946	2.987
2010	2.493	2.533	2.572	2.614	2.667	2.730	2.804	2.878	2.939
2011	2.368	2.410	2.449	2.490	2.536	2.594	2.665	2.744	2.824
2012	2.394	2.433	2.471	2.514	2.571	2.646	2.739	2.843	2.947
2013	2.307	2.395	2.436	2.476	2.520	2.576	2.650	2.742	2.846
2014	2.316	2.308	2.398	2.440	2.481	2.525	2.581	2.654	2.746
2015	2.334	2.316	2.311	2.403	2.446	2.486	2.529	2.584	2.657
2016	2.335	2.334	2.319	2.315	2.408	2.450	2.490	2.533	2.587
2017	2.331	2.336	2.337	2.323	2.320	2.412	2.454	2.493	2.535
2018	2.706	2.332	2.339	2.341	2.328	2.324	2.416	2.457	2.496
2019	2.681	2.707	2.334	2.342	2.345	2.332	2.327	2.419	2.460
2020	2.639	2.682	2.709	2.338	2.346	2.349	2.335	2.330	2.421
2021	2.670	2.639	2.684	2.712	2.341	2.349	2.352	2.337	2.332
2022	2.710	2.671	2.641	2.686	2.715	2.345	2.352	2.354	2.339
2023	2.723	2.710	2.672	2.643	2.689	2.718	2.347	2.354	2.356
2024	2.729	2.723	2.711	2.675	2.646	2.692	2.720	2.349	2.356
2025	2.729	2.729	2.724	2.713	2.677	2.649	2.694	2.722	2.350
2026	2.723	2.729	2.730	2.726	2.715	2.679	2.650	2.695	2.723
2027	2.709	2.723	2.730	2.732	2.727	2.717	2.681	2.652	2.696
2028	2.688	2.709	2.723	2.731	2.734	2.729	2.718	2.682	2.652
2029	2.662	2.688	2.710	2.724	2.733	2.735	2.730	2.719	2.682
2030	2.632	2.662	2.688	2.710	2.726	2.734	2.736	2.731	2.720
2031	2.597	2.631	2.662	2.689	2.711	2.726	2.734	2.736	2.731
2032	2.560	2.597	2.631	2.663	2.690	2.712	2.727	2.735	2.736
2033	2.526	2.559	2.597	2.632	2.663	2.690	2.712	2.727	2.735
2034	2.490	2.525	2.559	2.596	2.632	2.663	2.690	2.712	2.727
2035	2.453	2.489	2.525	2.558	2.596	2.631	2.663	2.689	2.711
2036	2.416	2.452	2.489	2.524	2.558	2.596	2.631	2.662	2.689
2037	2.380	2.416	2.452	2.488	2.523	2.557	2.595	2.630	2.661
2038	2.352	2.379	2.415	2.450	2.487	2.522	2.556	2.594	2.629
2039	2.332	2.351	2.378	2.413	2.449	2.485	2.521	2.555	2.593
2040	2.311	2.331	2.350	2.376	2.412	2.447	2.484	2.520	2.554
2041	2.291	2.310	2.330	2.348	2.374	2.410	2.446	2.482	2.518
2042	2.274	2.290	2.308	2.327	2.345	2.372	2.408	2.444	2.481
2043	2.263	2.273	2.288	2.306	2.325	2.343	2.370	2.406	2.442
2044	2.257	2.261	2.271	2.285	2.303	2.322	2.341	2.368	2.404
2045	2.252	2.255	2.259	2.268	2.282	2.300	2.320	2.338	2.366
2046	2.248	2.250	2.253	2.256	2.264	2.279	2.297	2.317	2.336
2047	2.245	2.246	2.248	2.250	2.252	2.261	2.276	2.294	2.315
2048	2.242	2.244	2.243	2.244	2.246	2.249	2.258	2.273	2.292
2049	2.239	2.241	2.241	2.240	2.240	2.242	2.245	2.254	2.270
2050	2.235	2.237	2.238	2.237	2.235	2.236	2.238	2.242	2.251

	18	19	20	21	22	23	24	25	26
2008	2.859	2.858	2.851	2.840	2.824	2.804	2.779	2.752	2.722
2009	3.007	3.004	2.984	2.958	2.932	2.908	2.886	2.864	2.840
2010	2.968	2.955	2.908	2.844	2.781	2.731	2.696	2.671	2.645
2011	2.887	2.914	2.898	2.848	2.779	2.709	2.648	2.601	2.563
2012	3.038	3.098	3.114	3.087	3.024	2.939	2.849	2.768	2.699
2013	2.950	3.040	3.099	3.114	3.087	3.024	2.942	2.857	2.779
2014	2.848	2.952	3.040	3.098	3.114	3.087	3.028	2.949	2.867
2015	2.748	2.850	2.952	3.040	3.098	3.114	3.090	3.034	2.959
2016	2.659	2.749	2.850	2.952	3.040	3.098	3.117	3.096	3.044
2017	2.589	2.661	2.750	2.850	2.951	3.040	3.101	3.123	3.105
2018	2.537	2.591	2.661	2.750	2.850	2.952	3.043	3.106	3.131
2019	2.498	2.539	2.591	2.661	2.749	2.850	2.954	3.048	3.114
2020	2.462	2.499	2.539	2.591	2.661	2.750	2.853	2.959	3.055
2021	2.423	2.463	2.500	2.539	2.591	2.661	2.752	2.857	2.966
2022	2.334	2.424	2.463	2.499	2.539	2.591	2.663	2.756	2.863
2023	2.341	2.335	2.424	2.463	2.499	2.539	2.593	2.667	2.762
2024	2.357	2.342	2.335	2.424	2.463	2.499	2.541	2.597	2.672
2025	2.357	2.358	2.342	2.335	2.424	2.463	2.501	2.544	2.601
2026	2.352	2.358	2.358	2.342	2.335	2.424	2.464	2.504	2.548
2027	2.723	2.352	2.358	2.358	2.341	2.335	2.425	2.467	2.507
2028	2.697	2.724	2.352	2.358	2.357	2.341	2.336	2.427	2.470
2029	2.653	2.697	2.724	2.352	2.357	2.357	2.342	2.337	2.430
2030	2.683	2.653	2.697	2.723	2.351	2.357	2.358	2.344	2.340
2031	2.720	2.683	2.653	2.696	2.722	2.351	2.357	2.359	2.345
2032	2.731	2.720	2.682	2.652	2.696	2.722	2.351	2.358	2.360
2033	2.736	2.731	2.719	2.682	2.652	2.695	2.722	2.351	2.358
2034	2.735	2.736	2.730	2.719	2.681	2.651	2.694	2.721	2.351
2035	2.726	2.734	2.735	2.730	2.718	2.680	2.650	2.694	2.720
2036	2.711	2.726	2.733	2.734	2.729	2.717	2.679	2.649	2.692
2037	2.688	2.710	2.725	2.732	2.734	2.728	2.716	2.677	2.647
2038	2.661	2.687	2.709	2.724	2.732	2.732	2.726	2.714	2.675
2039	2.628	2.660	2.686	2.708	2.723	2.730	2.731	2.724	2.711
2040	2.592	2.627	2.659	2.685	2.707	2.722	2.728	2.728	2.720
2041	2.552	2.591	2.626	2.658	2.684	2.706	2.719	2.725	2.723
2042	2.517	2.551	2.589	2.625	2.656	2.683	2.703	2.716	2.720
2043	2.479	2.516	2.550	2.588	2.624	2.655	2.680	2.699	2.710
2044	2.441	2.478	2.514	2.549	2.587	2.622	2.652	2.676	2.693
2045	2.402	2.439	2.476	2.513	2.548	2.585	2.619	2.647	2.669
2046	2.364	2.400	2.437	2.475	2.512	2.546	2.582	2.614	2.640
2047	2.334	2.362	2.399	2.436	2.474	2.510	2.542	2.576	2.606
2048	2.312	2.332	2.360	2.398	2.435	2.472	2.506	2.536	2.568
2049	2.289	2.310	2.330	2.359	2.396	2.433	2.468	2.500	2.527
2050	2.267	2.287	2.308	2.329	2.357	2.394	2.428	2.461	2.490

	27	28	29	30	31	32	33	34	35
2008	2.680	2.623	2.558	2.485	2.419	2.372	2.352	2.351	2.356
2009	2.812	2.772	2.716	2.652	2.582	2.519	2.478	2.466	2.476
2010	2.620	2.596	2.565	2.523	2.474	2.417	2.365	2.330	2.322
2011	2.528	2.502	2.483	2.460	2.427	2.385	2.336	2.290	2.262
2012	2.642	2.595	2.564	2.544	2.521	2.488	2.446	2.396	2.349
2013	2.712	2.657	2.609	2.577	2.555	2.531	2.497	2.454	2.404
2014	2.792	2.727	2.670	2.622	2.587	2.565	2.540	2.505	2.462
2015	2.880	2.806	2.739	2.682	2.632	2.596	2.573	2.547	2.512
2016	2.971	2.892	2.818	2.750	2.691	2.640	2.604	2.580	2.554
2017	3.055	2.983	2.904	2.828	2.759	2.699	2.647	2.611	2.586
2018	3.115	3.066	2.993	2.913	2.836	2.767	2.706	2.654	2.616
2019	3.140	3.126	3.076	3.002	2.921	2.843	2.773	2.712	2.659
2020	3.123	3.150	3.135	3.084	3.009	2.927	2.849	2.778	2.716
2021	3.063	3.132	3.159	3.142	3.090	3.015	2.932	2.853	2.782
2022	2.973	3.071	3.140	3.165	3.148	3.095	3.019	2.936	2.857
2023	2.870	2.981	3.078	3.146	3.171	3.153	3.099	3.023	2.940
2024	2.768	2.877	2.987	3.084	3.151	3.175	3.156	3.103	3.026
2025	2.678	2.775	2.883	2.993	3.088	3.154	3.178	3.159	3.105
2026	2.607	2.684	2.780	2.888	2.996	3.092	3.157	3.180	3.161
2027	2.553	2.612	2.689	2.784	2.891	2.999	3.094	3.159	3.182
2028	2.511	2.557	2.616	2.692	2.787	2.894	3.001	3.096	3.160
2029	2.473	2.515	2.561	2.619	2.695	2.789	2.895	3.002	3.096
2030	2.432	2.476	2.518	2.563	2.621	2.696	2.790	2.896	3.003
2031	2.342	2.435	2.478	2.520	2.564	2.622	2.697	2.791	2.896
2032	2.347	2.343	2.436	2.480	2.521	2.565	2.622	2.697	2.791
2033	2.361	2.348	2.344	2.437	2.480	2.521	2.565	2.622	2.697
2034	2.359	2.361	2.348	2.344	2.436	2.480	2.520	2.564	2.621
2035	2.351	2.358	2.360	2.347	2.343	2.436	2.479	2.519	2.563
2036	2.719	2.349	2.356	2.359	2.346	2.342	2.434	2.477	2.518
2037	2.690	2.716	2.347	2.354	2.357	2.344	2.340	2.432	2.475
2038	2.644	2.687	2.713	2.345	2.352	2.354	2.341	2.338	2.430
2039	2.671	2.640	2.683	2.710	2.341	2.349	2.351	2.338	2.335
2040	2.706	2.667	2.636	2.679	2.706	2.338	2.346	2.348	2.335
2041	2.715	2.701	2.662	2.631	2.675	2.702	2.334	2.342	2.344
2042	2.718	2.709	2.695	2.656	2.626	2.670	2.697	2.330	2.338
2043	2.714	2.711	2.702	2.689	2.651	2.621	2.665	2.693	2.325
2044	2.703	2.706	2.704	2.696	2.683	2.645	2.615	2.660	2.687
2045	2.685	2.695	2.698	2.696	2.689	2.676	2.639	2.610	2.654
2046	2.661	2.676	2.686	2.690	2.689	2.682	2.670	2.633	2.604
2047	2.631	2.651	2.667	2.677	2.682	2.681	2.675	2.663	2.626
2048	2.596	2.620	2.641	2.658	2.669	2.674	2.674	2.668	2.656
2049	2.557	2.585	2.609	2.631	2.648	2.660	2.666	2.666	2.660
2050	2.516	2.545	2.573	2.599	2.621	2.639	2.652	2.658	2.659

	36	37	38	39	40	41	42	43	44
2008	2.357	2.352	2.338	2.318	2.297	2.279	2.257	2.233	2.206
2009	2.492	2.500	2.497	2.479	2.450	2.422	2.398	2.377	2.357
2010	2.335	2.356	2.369	2.371	2.358	2.334	2.309	2.290	2.273
2011	2.261	2.279	2.301	2.311	2.309	2.291	2.263	2.235	2.214
2012	2.321	2.322	2.342	2.367	2.380	2.380	2.366	2.346	2.329
2013	2.357	2.329	2.329	2.351	2.377	2.391	2.393	2.381	2.362
2014	2.411	2.363	2.336	2.338	2.361	2.388	2.403	2.406	2.396
2015	2.468	2.417	2.370	2.344	2.347	2.371	2.399	2.416	2.421
2016	2.518	2.474	2.423	2.378	2.352	2.356	2.382	2.412	2.430
2017	2.560	2.523	2.480	2.430	2.385	2.361	2.367	2.393	2.424
2018	2.591	2.565	2.529	2.486	2.437	2.394	2.371	2.377	2.405
2019	2.621	2.596	2.570	2.534	2.493	2.445	2.403	2.381	2.388
2020	2.663	2.625	2.600	2.575	2.540	2.500	2.453	2.412	2.391
2021	2.720	2.667	2.629	2.605	2.580	2.547	2.507	2.461	2.421
2022	2.786	2.724	2.671	2.634	2.610	2.586	2.553	2.514	2.470
2023	2.860	2.789	2.727	2.674	2.638	2.615	2.592	2.560	2.522
2024	2.942	2.863	2.791	2.730	2.678	2.642	2.620	2.597	2.566
2025	3.028	2.944	2.865	2.794	2.733	2.682	2.646	2.625	2.603
2026	3.107	3.030	2.946	2.867	2.796	2.736	2.685	2.650	2.629
2027	3.162	3.108	3.031	2.948	2.869	2.798	2.739	2.688	2.654
2028	3.183	3.163	3.109	3.032	2.949	2.870	2.800	2.741	2.691
2029	3.161	3.183	3.164	3.109	3.033	2.950	2.871	2.802	2.743
2030	3.097	3.161	3.183	3.163	3.109	3.033	2.950	2.872	2.803
2031	3.003	3.096	3.160	3.183	3.163	3.109	3.032	2.950	2.872
2032	2.896	3.002	3.096	3.159	3.181	3.162	3.108	3.031	2.949
2033	2.790	2.895	3.001	3.094	3.158	3.180	3.160	3.106	3.029
2034	2.696	2.789	2.893	2.999	3.092	3.155	3.177	3.157	3.102
2035	2.620	2.694	2.787	2.891	2.997	3.089	3.152	3.173	3.153
2036	2.561	2.618	2.692	2.784	2.888	2.993	3.085	3.148	3.168
2037	2.515	2.559	2.615	2.689	2.781	2.884	2.989	3.080	3.142
2038	2.472	2.513	2.556	2.612	2.685	2.776	2.879	2.983	3.073
2039	2.427	2.469	2.509	2.552	2.607	2.680	2.770	2.872	2.975
2040	2.332	2.423	2.465	2.505	2.547	2.601	2.673	2.763	2.864
2041	2.331	2.328	2.419	2.461	2.499	2.541	2.594	2.665	2.754
2042	2.340	2.327	2.323	2.414	2.455	2.492	2.533	2.585	2.655
2043	2.333	2.336	2.322	2.317	2.407	2.447	2.484	2.523	2.575
2044	2.320	2.328	2.330	2.316	2.310	2.399	2.438	2.473	2.512
2045	2.682	2.315	2.322	2.323	2.308	2.301	2.389	2.427	2.461
2046	2.648	2.675	2.308	2.315	2.315	2.299	2.291	2.377	2.413
2047	2.597	2.641	2.668	2.301	2.306	2.305	2.287	2.278	2.363
2048	2.619	2.590	2.634	2.660	2.291	2.295	2.293	2.274	2.263
2049	2.649	2.612	2.582	2.625	2.649	2.280	2.282	2.278	2.258
2050	2.653	2.641	2.603	2.573	2.614	2.637	2.266	2.267	2.261

	45	46	47	48	49	50	51	52	53
2008	2.176	2.147	2.124	2.111	2.104	2.099	2.089	2.069	2.033
2009	2.337	2.314	2.290	2.270	2.258	2.250	2.244	2.233	2.209
2010	2.257	2.242	2.222	2.200	2.182	2.170	2.163	2.159	2.153
2011	2.194	2.177	2.162	2.149	2.138	2.134	2.136	2.140	2.143
2012	2.320	2.313	2.304	2.291	2.273	2.253	2.240	2.233	2.231
2013	2.347	2.340	2.334	2.326	2.315	2.297	2.278	2.264	2.257
2014	2.379	2.366	2.360	2.355	2.348	2.337	2.320	2.301	2.287
2015	2.412	2.397	2.384	2.379	2.376	2.369	2.359	2.342	2.322
2016	2.436	2.428	2.414	2.403	2.398	2.395	2.389	2.379	2.361
2017	2.444	2.451	2.445	2.431	2.420	2.417	2.414	2.408	2.396
2018	2.437	2.458	2.466	2.460	2.447	2.437	2.434	2.431	2.424
2019	2.417	2.450	2.472	2.480	2.475	2.463	2.453	2.449	2.445
2020	2.400	2.429	2.463	2.485	2.494	2.489	2.477	2.467	2.462
2021	2.401	2.411	2.441	2.475	2.498	2.507	2.502	2.489	2.478
2022	2.430	2.411	2.421	2.452	2.486	2.509	2.518	2.513	2.499
2023	2.478	2.439	2.421	2.431	2.462	2.497	2.519	2.527	2.521
2024	2.529	2.485	2.447	2.429	2.440	2.471	2.505	2.527	2.534
2025	2.572	2.535	2.492	2.455	2.437	2.448	2.478	2.512	2.532
2026	2.608	2.577	2.541	2.498	2.461	2.443	2.454	2.484	2.516
2027	2.633	2.612	2.582	2.546	2.503	2.466	2.448	2.458	2.487
2028	2.657	2.636	2.615	2.586	2.549	2.507	2.469	2.451	2.460
2029	2.693	2.659	2.639	2.618	2.588	2.551	2.509	2.471	2.451
2030	2.744	2.694	2.660	2.640	2.619	2.588	2.552	2.509	2.470
2031	2.803	2.744	2.694	2.660	2.639	2.618	2.587	2.550	2.506
2032	2.871	2.801	2.742	2.692	2.658	2.637	2.615	2.584	2.546
2033	2.947	2.868	2.799	2.739	2.689	2.655	2.633	2.610	2.578
2034	3.026	2.943	2.864	2.794	2.735	2.684	2.649	2.627	2.603
2035	3.098	3.021	2.938	2.859	2.788	2.728	2.677	2.641	2.618
2036	3.147	3.092	3.014	2.930	2.851	2.780	2.719	2.667	2.631
2037	3.162	3.140	3.084	3.006	2.921	2.841	2.770	2.708	2.655
2038	3.134	3.153	3.131	3.074	2.995	2.910	2.829	2.757	2.695
2039	3.065	3.125	3.143	3.120	3.062	2.982	2.896	2.815	2.742
2040	2.966	3.054	3.113	3.130	3.106	3.047	2.967	2.880	2.798
2041	2.854	2.955	3.042	3.100	3.116	3.090	3.031	2.949	2.862
2042	2.743	2.842	2.941	3.027	3.084	3.099	3.072	3.011	2.929
2043	2.643	2.730	2.827	2.925	3.010	3.065	3.079	3.051	2.990
2044	2.562	2.629	2.714	2.810	2.907	2.990	3.044	3.057	3.028
2045	2.498	2.547	2.613	2.697	2.791	2.886	2.968	3.020	3.032
2046	2.446	2.482	2.529	2.594	2.676	2.769	2.863	2.943	2.994
2047	2.398	2.429	2.463	2.509	2.572	2.653	2.745	2.837	2.916
2048	2.346	2.379	2.410	2.442	2.487	2.548	2.627	2.717	2.808
2049	2.246	2.327	2.359	2.387	2.418	2.461	2.521	2.599	2.688
2050	2.239	2.225	2.305	2.335	2.362	2.392	2.433	2.492	2.568

	54	55	56	57	58	59	60	61	62
2008	1.985	1.936	1.889	1.840	1.789	1.738	1.681	1.626	1.593
2009	2.170	2.120	2.068	2.016	1.958	1.896	1.831	1.758	1.694
2010	2.139	2.111	2.071	2.027	1.982	1.928	1.868	1.805	1.732
2011	2.140	2.126	2.097	2.057	2.014	1.971	1.920	1.863	1.799
2012	2.230	2.224	2.206	2.172	2.124	2.072	2.017	1.955	1.888
2013	2.253	2.251	2.243	2.222	2.184	2.132	2.074	2.013	1.947
2014	2.278	2.272	2.268	2.257	2.233	2.190	2.132	2.069	2.004
2015	2.306	2.296	2.288	2.281	2.266	2.237	2.189	2.126	2.059
2016	2.340	2.322	2.310	2.299	2.289	2.269	2.235	2.182	2.114
2017	2.377	2.354	2.334	2.320	2.306	2.291	2.266	2.226	2.169
2018	2.411	2.390	2.365	2.343	2.325	2.307	2.286	2.257	2.213
2019	2.437	2.422	2.399	2.372	2.347	2.325	2.302	2.276	2.242
2020	2.457	2.447	2.430	2.405	2.375	2.346	2.319	2.291	2.261
2021	2.472	2.465	2.453	2.434	2.406	2.372	2.339	2.307	2.275
2022	2.487	2.479	2.470	2.456	2.434	2.402	2.364	2.326	2.291
2023	2.507	2.492	2.483	2.472	2.455	2.429	2.393	2.351	2.310
2024	2.527	2.511	2.495	2.483	2.469	2.448	2.419	2.380	2.334
2025	2.539	2.530	2.512	2.494	2.479	2.462	2.438	2.405	2.361
2026	2.535	2.540	2.529	2.509	2.488	2.471	2.450	2.422	2.386
2027	2.518	2.535	2.538	2.525	2.503	2.479	2.459	2.434	2.403
2028	2.487	2.517	2.532	2.533	2.518	2.493	2.466	2.442	2.414
2029	2.459	2.485	2.513	2.526	2.525	2.507	2.479	2.449	2.422
2030	2.449	2.456	2.480	2.505	2.517	2.513	2.492	2.461	2.429
2031	2.466	2.445	2.449	2.472	2.495	2.504	2.497	2.474	2.440
2032	2.501	2.460	2.437	2.440	2.461	2.481	2.488	2.478	2.452
2033	2.539	2.493	2.451	2.427	2.428	2.446	2.465	2.468	2.456
2034	2.570	2.530	2.483	2.439	2.413	2.413	2.429	2.445	2.446
2035	2.593	2.559	2.518	2.469	2.425	2.397	2.395	2.409	2.423
2036	2.606	2.581	2.545	2.503	2.453	2.408	2.379	2.375	2.387
2037	2.618	2.592	2.565	2.529	2.485	2.435	2.388	2.358	2.353
2038	2.641	2.602	2.576	2.548	2.510	2.466	2.414	2.367	2.336
2039	2.678	2.624	2.584	2.556	2.527	2.489	2.444	2.392	2.344
2040	2.724	2.660	2.604	2.563	2.535	2.505	2.467	2.421	2.368
2041	2.779	2.704	2.638	2.582	2.541	2.512	2.482	2.443	2.396
2042	2.841	2.757	2.681	2.615	2.558	2.516	2.487	2.457	2.417
2043	2.907	2.817	2.732	2.656	2.589	2.532	2.491	2.462	2.431
2044	2.965	2.881	2.791	2.705	2.629	2.562	2.506	2.465	2.435
2045	3.002	2.939	2.854	2.763	2.677	2.600	2.535	2.479	2.438
2046	3.004	2.974	2.909	2.824	2.733	2.647	2.572	2.507	2.451
2047	2.966	2.975	2.943	2.878	2.792	2.702	2.618	2.543	2.479
2048	2.886	2.935	2.943	2.910	2.845	2.760	2.671	2.588	2.514
2049	2.778	2.854	2.902	2.909	2.876	2.812	2.728	2.641	2.558
2050	2.656	2.745	2.820	2.867	2.874	2.842	2.779	2.697	2.610

	63	64	65	66	67	68	69	70	71
2008	1.589	1.604	1.631	1.647	1.628	1.559	1.456	1.337	1.232
2009	1.664	1.673	1.709	1.755	1.778	1.745	1.642	1.495	1.331
2010	1.665	1.628	1.628	1.652	1.689	1.706	1.673	1.573	1.431
2011	1.718	1.636	1.580	1.559	1.567	1.597	1.617	1.593	1.506
2012	1.818	1.735	1.654	1.597	1.572	1.572	1.589	1.593	1.555
2013	1.879	1.810	1.731	1.653	1.596	1.567	1.556	1.558	1.548
2014	1.936	1.870	1.804	1.728	1.651	1.589	1.550	1.526	1.514
2015	1.992	1.926	1.862	1.799	1.723	1.642	1.571	1.520	1.483
2016	2.045	1.980	1.916	1.854	1.791	1.711	1.621	1.541	1.478
2017	2.100	2.032	1.969	1.906	1.844	1.777	1.689	1.589	1.498
2018	2.153	2.085	2.019	1.957	1.894	1.828	1.752	1.654	1.545
2019	2.196	2.137	2.070	2.005	1.943	1.875	1.801	1.715	1.609
2020	2.225	2.179	2.121	2.055	1.989	1.922	1.847	1.763	1.668
2021	2.243	2.206	2.161	2.104	2.037	1.966	1.892	1.808	1.715
2022	2.257	2.224	2.188	2.142	2.083	2.012	1.935	1.851	1.759
2023	2.272	2.237	2.204	2.167	2.120	2.057	1.979	1.893	1.801
2024	2.290	2.251	2.216	2.183	2.144	2.092	2.022	1.935	1.842
2025	2.314	2.269	2.230	2.194	2.158	2.114	2.055	1.977	1.883
2026	2.340	2.292	2.246	2.206	2.168	2.127	2.077	2.010	1.924
2027	2.364	2.318	2.268	2.222	2.179	2.136	2.089	2.031	1.956
2028	2.381	2.341	2.293	2.243	2.194	2.147	2.097	2.042	1.976
2029	2.392	2.357	2.316	2.267	2.213	2.160	2.107	2.050	1.988
2030	2.399	2.367	2.331	2.288	2.236	2.178	2.120	2.060	1.997
2031	2.405	2.374	2.340	2.302	2.256	2.200	2.137	2.072	2.007
2032	2.416	2.380	2.346	2.310	2.268	2.218	2.158	2.090	2.019
2033	2.428	2.390	2.351	2.315	2.276	2.230	2.176	2.110	2.037
2034	2.432	2.401	2.361	2.319	2.280	2.237	2.187	2.127	2.057
2035	2.421	2.404	2.371	2.327	2.283	2.240	2.193	2.138	2.074
2036	2.398	2.394	2.373	2.337	2.290	2.242	2.195	2.144	2.085
2037	2.362	2.370	2.362	2.338	2.298	2.248	2.196	2.146	2.091
2038	2.328	2.334	2.338	2.326	2.298	2.255	2.202	2.147	2.094
2039	2.310	2.299	2.301	2.301	2.286	2.254	2.208	2.153	2.096
2040	2.318	2.282	2.267	2.265	2.260	2.241	2.207	2.159	2.102
2041	2.342	2.288	2.249	2.229	2.223	2.215	2.194	2.158	2.108
2042	2.369	2.312	2.254	2.211	2.187	2.178	2.168	2.145	2.108
2043	2.389	2.338	2.276	2.215	2.168	2.142	2.131	2.120	2.095
2044	2.403	2.357	2.302	2.236	2.171	2.122	2.095	2.084	2.071
2045	2.406	2.370	2.320	2.260	2.191	2.124	2.075	2.048	2.036
2046	2.408	2.373	2.332	2.277	2.213	2.142	2.076	2.028	2.002
2047	2.421	2.374	2.334	2.287	2.229	2.163	2.093	2.030	1.983
2048	2.448	2.386	2.334	2.288	2.238	2.178	2.114	2.046	1.985
2049	2.482	2.412	2.345	2.288	2.238	2.186	2.127	2.066	2.001
2050	2.526	2.445	2.370	2.298	2.236	2.185	2.134	2.079	2.021

	72	73	74	75	76	77	78	79	80+
2008	1.160	1.138	1.150	1.120	1.131	1.140	1.138	1.114	3.842
2009	1.191	1.100	1.072	1.081	1.053	1.066	1.073	1.059	4.316
2010	1.273	1.136	1.044	1.011	1.012	978	985	987	4.604
2011	1.373	1.222	1.086	990	949	942	904	909	4.803
2012	1.457	1.319	1.168	1.033	938	896	883	841	4.949
2013	1.498	1.394	1.256	1.107	975	882	837	818	4.991
2014	1.492	1.434	1.328	1.192	1.045	917	825	776	5.009
2015	1.460	1.429	1.367	1.261	1.126	984	858	765	4.992
2016	1.431	1.399	1.363	1.299	1.192	1.060	921	797	4.973
2017	1.426	1.372	1.336	1.296	1.229	1.123	993	856	4.991
2018	1.447	1.369	1.311	1.271	1.227	1.159	1.053	923	5.067
2019	1.493	1.389	1.309	1.248	1.204	1.158	1.086	979	5.199
2020	1.555	1.435	1.329	1.247	1.184	1.137	1.086	1.011	5.370
2021	1.613	1.495	1.374	1.268	1.184	1.118	1.068	1.012	5.552
2022	1.659	1.552	1.433	1.311	1.204	1.119	1.051	995	5.714
2023	1.702	1.597	1.488	1.368	1.246	1.139	1.053	981	5.845
2024	1.743	1.639	1.532	1.422	1.301	1.180	1.072	983	5.949
2025	1.783	1.680	1.573	1.464	1.353	1.232	1.111	1.002	6.047
2026	1.824	1.719	1.613	1.504	1.394	1.282	1.161	1.039	6.155
2027	1.864	1.760	1.652	1.544	1.433	1.322	1.209	1.087	6.291
2028	1.896	1.799	1.691	1.581	1.472	1.360	1.247	1.132	6.457
2029	1.916	1.830	1.730	1.620	1.508	1.397	1.283	1.169	6.651
2030	1.929	1.851	1.761	1.658	1.546	1.432	1.319	1.204	6.860
2031	1.937	1.864	1.783	1.689	1.584	1.469	1.354	1.238	7.082
2032	1.948	1.874	1.796	1.711	1.614	1.506	1.389	1.271	7.314
2033	1.961	1.886	1.807	1.725	1.636	1.536	1.425	1.306	7.557
2034	1.979	1.900	1.819	1.737	1.651	1.558	1.455	1.341	7.808
2035	2.000	1.918	1.834	1.750	1.663	1.573	1.476	1.370	8.067
2036	2.018	1.939	1.853	1.765	1.677	1.586	1.492	1.391	8.328
2037	2.029	1.957	1.874	1.784	1.692	1.600	1.505	1.406	8.584
2038	2.036	1.969	1.893	1.806	1.712	1.616	1.519	1.420	8.833
2039	2.039	1.977	1.906	1.825	1.734	1.636	1.535	1.434	9.073
2040	2.042	1.981	1.914	1.839	1.754	1.658	1.555	1.451	9.305
2041	2.048	1.985	1.920	1.848	1.768	1.678	1.577	1.471	9.535
2042	2.056	1.992	1.924	1.855	1.778	1.692	1.597	1.493	9.767
2043	2.056	2.000	1.933	1.860	1.785	1.703	1.612	1.513	10.001
2044	2.045	2.002	1.942	1.869	1.792	1.711	1.624	1.529	10.238
2045	2.022	1.992	1.945	1.879	1.802	1.718	1.632	1.540	10.470
2046	1.989	1.971	1.936	1.883	1.812	1.729	1.640	1.549	10.695
2047	1.956	1.940	1.917	1.876	1.817	1.740	1.651	1.558	10.914
2048	1.938	1.910	1.888	1.859	1.812	1.746	1.663	1.570	11.129
2049	1.941	1.893	1.859	1.832	1.796	1.742	1.670	1.582	11.341
2050	1.958	1.896	1.844	1.806	1.771	1.728	1.667	1.590	11.553

Çankırı, Scenario 2 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	2.371	2.364	2.362	2.360	2.358	2.442	2.478	2.514	2.550
2009	2.808	2.430	2.427	2.425	2.423	2.420	2.505	2.546	2.587
2010	2.694	2.717	2.345	2.343	2.341	2.328	2.316	2.406	2.450
2011	2.604	2.645	2.674	2.302	2.300	2.283	2.253	2.237	2.324
2012	2.669	2.635	2.681	2.710	2.338	2.344	2.340	2.319	2.308
2013	2.709	2.667	2.638	2.684	2.714	2.340	2.341	2.337	2.317
2014	2.722	2.707	2.670	2.642	2.689	2.715	2.337	2.339	2.334
2015	2.730	2.721	2.711	2.674	2.647	2.690	2.712	2.334	2.336
2016	2.731	2.729	2.724	2.715	2.679	2.648	2.687	2.709	2.332
2017	2.726	2.730	2.732	2.728	2.719	2.680	2.645	2.684	2.707
2018	2.713	2.725	2.734	2.736	2.733	2.720	2.678	2.642	2.682
2019	2.694	2.713	2.729	2.738	2.741	2.734	2.718	2.675	2.640
2020	2.670	2.694	2.717	2.733	2.742	2.742	2.732	2.715	2.672
2021	2.641	2.670	2.698	2.721	2.737	2.744	2.740	2.729	2.712
2022	2.608	2.641	2.673	2.702	2.725	2.739	2.741	2.737	2.726
2023	2.572	2.608	2.645	2.678	2.706	2.727	2.736	2.738	2.735
2024	2.540	2.572	2.612	2.649	2.682	2.708	2.724	2.734	2.736
2025	2.505	2.540	2.576	2.616	2.653	2.683	2.706	2.722	2.731
2026	2.470	2.506	2.544	2.580	2.620	2.654	2.681	2.703	2.720
2027	2.435	2.470	2.509	2.547	2.584	2.621	2.652	2.679	2.701
2028	2.399	2.435	2.474	2.513	2.551	2.585	2.619	2.650	2.677
2029	2.373	2.400	2.439	2.477	2.516	2.552	2.583	2.617	2.648
2030	2.355	2.374	2.403	2.442	2.481	2.517	2.551	2.581	2.615
2031	2.336	2.356	2.377	2.406	2.445	2.482	2.516	2.549	2.579
2032	2.318	2.336	2.359	2.380	2.409	2.446	2.480	2.514	2.547
2033	2.303	2.318	2.339	2.361	2.383	2.410	2.444	2.478	2.512
2034	2.294	2.303	2.321	2.341	2.364	2.383	2.409	2.443	2.477
2035	2.290	2.294	2.305	2.323	2.344	2.365	2.382	2.407	2.441
2036	2.287	2.290	2.296	2.307	2.325	2.345	2.363	2.380	2.406
2037	2.285	2.287	2.292	2.298	2.310	2.326	2.343	2.362	2.379
2038	2.286	2.285	2.289	2.294	2.300	2.310	2.325	2.342	2.361
2039	2.285	2.285	2.287	2.290	2.295	2.300	2.309	2.323	2.341
2040	2.284	2.285	2.286	2.288	2.292	2.296	2.299	2.308	2.322
2041	2.283	2.283	2.286	2.288	2.289	2.292	2.295	2.298	2.307
2042	2.281	2.282	2.284	2.287	2.289	2.289	2.291	2.294	2.297
2043	2.278	2.280	2.282	2.285	2.288	2.289	2.289	2.290	2.293
2044	2.269	2.277	2.280	2.283	2.285	2.288	2.288	2.288	2.289
2045	2.254	2.268	2.277	2.281	2.283	2.285	2.287	2.287	2.287
2046	2.239	2.253	2.268	2.277	2.281	2.283	2.285	2.286	2.287
2047	2.223	2.238	2.253	2.268	2.277	2.281	2.283	2.284	2.286
2048	2.204	2.221	2.237	2.252	2.268	2.277	2.280	2.282	2.284
2049	2.180	2.202	2.221	2.237	2.252	2.268	2.277	2.280	2.282
2050	2.154	2.178	2.202	2.220	2.236	2.252	2.267	2.276	2.279

	9	10	11	12	13	14	15	16	17
2008	2.586	2.621	2.655	2.691	2.728	2.765	2.800	2.829	2.850
2009	2.626	2.663	2.700	2.741	2.787	2.839	2.893	2.946	2.987
2010	2.493	2.533	2.572	2.614	2.667	2.730	2.804	2.878	2.939
2011	2.368	2.410	2.449	2.490	2.536	2.594	2.665	2.744	2.824
2012	2.394	2.433	2.471	2.514	2.571	2.646	2.739	2.843	2.947
2013	2.307	2.395	2.436	2.476	2.520	2.576	2.650	2.742	2.846
2014	2.316	2.308	2.398	2.441	2.481	2.525	2.581	2.654	2.746
2015	2.333	2.317	2.311	2.403	2.447	2.487	2.530	2.585	2.658
2016	2.335	2.334	2.320	2.316	2.409	2.452	2.492	2.534	2.588
2017	2.331	2.336	2.338	2.325	2.322	2.415	2.457	2.496	2.538
2018	2.706	2.332	2.340	2.343	2.331	2.328	2.420	2.461	2.499
2019	2.681	2.707	2.335	2.345	2.349	2.336	2.332	2.424	2.465
2020	2.639	2.682	2.710	2.341	2.351	2.354	2.341	2.337	2.428
2021	2.671	2.640	2.685	2.715	2.347	2.356	2.359	2.346	2.341
2022	2.711	2.672	2.643	2.690	2.721	2.352	2.361	2.364	2.349
2023	2.725	2.712	2.676	2.648	2.696	2.726	2.357	2.365	2.367
2024	2.734	2.726	2.716	2.680	2.654	2.701	2.731	2.361	2.369
2025	2.735	2.735	2.729	2.720	2.686	2.659	2.706	2.735	2.365
2026	2.730	2.736	2.737	2.734	2.725	2.691	2.664	2.710	2.738
2027	2.719	2.731	2.739	2.742	2.739	2.730	2.695	2.667	2.713
2028	2.700	2.720	2.734	2.743	2.747	2.743	2.734	2.698	2.670
2029	2.676	2.701	2.722	2.738	2.748	2.751	2.747	2.737	2.701
2030	2.647	2.677	2.703	2.726	2.742	2.752	2.754	2.750	2.740
2031	2.614	2.648	2.679	2.707	2.730	2.746	2.755	2.757	2.753
2032	2.578	2.615	2.650	2.683	2.711	2.734	2.749	2.758	2.760
2033	2.546	2.579	2.617	2.653	2.686	2.714	2.737	2.752	2.760
2034	2.512	2.547	2.581	2.620	2.657	2.689	2.717	2.739	2.754
2035	2.476	2.512	2.549	2.584	2.623	2.660	2.692	2.719	2.741
2036	2.441	2.477	2.514	2.551	2.587	2.626	2.662	2.694	2.721
2037	2.405	2.441	2.478	2.516	2.554	2.589	2.628	2.664	2.696
2038	2.379	2.406	2.443	2.480	2.519	2.556	2.591	2.630	2.665
2039	2.360	2.379	2.407	2.444	2.483	2.521	2.558	2.593	2.631
2040	2.340	2.361	2.380	2.409	2.447	2.484	2.522	2.559	2.594
2041	2.322	2.341	2.362	2.382	2.410	2.448	2.486	2.524	2.560
2042	2.306	2.322	2.341	2.363	2.383	2.412	2.449	2.487	2.524
2043	2.297	2.306	2.323	2.343	2.364	2.384	2.413	2.450	2.487
2044	2.292	2.297	2.307	2.324	2.344	2.365	2.385	2.414	2.451
2045	2.289	2.292	2.297	2.308	2.325	2.344	2.366	2.386	2.414
2046	2.287	2.289	2.293	2.298	2.308	2.325	2.345	2.366	2.386
2047	2.286	2.287	2.289	2.293	2.298	2.309	2.325	2.345	2.366
2048	2.285	2.286	2.287	2.289	2.293	2.298	2.309	2.325	2.345
2049	2.283	2.285	2.286	2.286	2.289	2.293	2.298	2.308	2.325
2050	2.281	2.283	2.285	2.286	2.286	2.289	2.293	2.297	2.308

	18	19	20	21	22	23	24	25	26
2008	2.859	2.858	2.851	2.840	2.824	2.804	2.779	2.752	2.722
2009	3.007	3.004	2.984	2.958	2.932	2.908	2.886	2.864	2.840
2010	2.968	2.955	2.908	2.844	2.781	2.731	2.696	2.671	2.645
2011	2.887	2.914	2.898	2.848	2.779	2.709	2.648	2.601	2.563
2012	3.038	3.098	3.114	3.087	3.024	2.939	2.849	2.768	2.699
2013	2.950	3.040	3.099	3.114	3.087	3.024	2.942	2.857	2.779
2014	2.848	2.952	3.041	3.098	3.114	3.087	3.028	2.950	2.868
2015	2.748	2.850	2.952	3.040	3.098	3.114	3.091	3.035	2.961
2016	2.661	2.750	2.851	2.952	3.040	3.099	3.118	3.098	3.047
2017	2.591	2.663	2.751	2.851	2.952	3.041	3.103	3.126	3.109
2018	2.541	2.593	2.664	2.752	2.851	2.953	3.045	3.110	3.137
2019	2.502	2.543	2.595	2.664	2.752	2.852	2.957	3.052	3.121
2020	2.468	2.505	2.544	2.595	2.664	2.753	2.856	2.965	3.064
2021	2.431	2.470	2.506	2.544	2.595	2.665	2.757	2.864	2.976
2022	2.344	2.433	2.471	2.506	2.545	2.597	2.670	2.765	2.876
2023	2.353	2.346	2.434	2.472	2.507	2.546	2.601	2.678	2.777
2024	2.370	2.355	2.347	2.435	2.472	2.508	2.550	2.609	2.689
2025	2.372	2.373	2.356	2.348	2.435	2.474	2.512	2.558	2.620
2026	2.368	2.374	2.374	2.357	2.348	2.437	2.478	2.519	2.568
2027	2.741	2.369	2.375	2.374	2.357	2.350	2.440	2.484	2.529
2028	2.715	2.742	2.371	2.376	2.374	2.358	2.353	2.447	2.494
2029	2.672	2.717	2.743	2.371	2.376	2.376	2.362	2.360	2.456
2030	2.703	2.674	2.718	2.743	2.371	2.377	2.379	2.368	2.368
2031	2.742	2.705	2.675	2.718	2.743	2.372	2.380	2.385	2.376
2032	2.755	2.743	2.705	2.675	2.718	2.744	2.375	2.385	2.393
2033	2.761	2.756	2.744	2.705	2.675	2.718	2.747	2.380	2.393
2034	2.762	2.762	2.756	2.744	2.705	2.675	2.721	2.751	2.387
2035	2.755	2.763	2.763	2.756	2.744	2.706	2.677	2.725	2.757
2036	2.742	2.756	2.763	2.763	2.756	2.744	2.708	2.681	2.731
2037	2.722	2.743	2.757	2.763	2.762	2.756	2.746	2.711	2.687
2038	2.697	2.723	2.743	2.756	2.762	2.763	2.758	2.749	2.716
2039	2.666	2.697	2.723	2.743	2.756	2.762	2.764	2.760	2.753
2040	2.632	2.667	2.697	2.722	2.742	2.756	2.763	2.766	2.764
2041	2.594	2.632	2.667	2.697	2.722	2.742	2.757	2.766	2.770
2042	2.561	2.595	2.632	2.666	2.696	2.722	2.743	2.758	2.768
2043	2.525	2.561	2.594	2.631	2.666	2.696	2.722	2.744	2.761
2044	2.488	2.525	2.561	2.594	2.631	2.665	2.696	2.723	2.746
2045	2.451	2.487	2.524	2.560	2.593	2.630	2.665	2.697	2.725
2046	2.414	2.450	2.487	2.524	2.559	2.593	2.630	2.666	2.698
2047	2.386	2.413	2.450	2.486	2.523	2.559	2.592	2.630	2.666
2048	2.366	2.385	2.413	2.449	2.486	2.522	2.558	2.592	2.630
2049	2.344	2.365	2.384	2.412	2.448	2.485	2.521	2.557	2.592
2050	2.324	2.344	2.364	2.384	2.411	2.448	2.484	2.521	2.557

	27	28	29	30	31	32	33	34	35
2008	2.680	2.623	2.558	2.485	2.419	2.372	2.352	2.351	2.356
2009	2.812	2.772	2.716	2.652	2.582	2.519	2.478	2.466	2.476
2010	2.620	2.596	2.565	2.523	2.474	2.417	2.365	2.330	2.322
2011	2.528	2.502	2.483	2.460	2.427	2.385	2.336	2.290	2.262
2012	2.642	2.595	2.564	2.544	2.521	2.488	2.446	2.396	2.349
2013	2.712	2.657	2.609	2.577	2.555	2.531	2.497	2.454	2.404
2014	2.793	2.727	2.671	2.622	2.588	2.565	2.540	2.505	2.462
2015	2.882	2.808	2.742	2.684	2.634	2.598	2.574	2.549	2.513
2016	2.975	2.897	2.822	2.754	2.695	2.644	2.607	2.583	2.557
2017	3.060	2.989	2.911	2.835	2.766	2.705	2.653	2.616	2.591
2018	3.123	3.075	3.004	2.924	2.846	2.776	2.715	2.661	2.624
2019	3.150	3.138	3.089	3.016	2.935	2.856	2.785	2.723	2.670
2020	3.135	3.165	3.152	3.102	3.028	2.945	2.865	2.794	2.731
2021	3.078	3.150	3.180	3.165	3.113	3.038	2.954	2.874	2.802
2022	2.990	3.093	3.164	3.192	3.176	3.123	3.047	2.963	2.882
2023	2.890	3.006	3.107	3.177	3.204	3.186	3.133	3.055	2.971
2024	2.790	2.905	3.019	3.120	3.188	3.213	3.195	3.141	3.063
2025	2.702	2.804	2.918	3.031	3.130	3.197	3.222	3.203	3.148
2026	2.632	2.716	2.817	2.930	3.041	3.139	3.205	3.229	3.210
2027	2.580	2.645	2.728	2.828	2.939	3.050	3.146	3.212	3.235
2028	2.541	2.593	2.657	2.739	2.838	2.948	3.057	3.153	3.219
2029	2.505	2.553	2.605	2.668	2.748	2.846	2.955	3.064	3.159
2030	2.467	2.517	2.564	2.615	2.676	2.756	2.853	2.961	3.070
2031	2.379	2.478	2.527	2.574	2.623	2.684	2.762	2.859	2.966
2032	2.386	2.389	2.488	2.536	2.581	2.630	2.690	2.768	2.864
2033	2.402	2.396	2.398	2.496	2.544	2.588	2.635	2.695	2.773
2034	2.401	2.411	2.404	2.406	2.503	2.550	2.593	2.640	2.700
2035	2.395	2.410	2.419	2.412	2.413	2.509	2.555	2.598	2.645
2036	2.765	2.403	2.417	2.426	2.418	2.418	2.513	2.559	2.602
2037	2.737	2.772	2.410	2.424	2.431	2.422	2.422	2.517	2.562
2038	2.693	2.744	2.778	2.415	2.428	2.435	2.426	2.426	2.520
2039	2.721	2.698	2.749	2.783	2.420	2.432	2.439	2.429	2.429
2040	2.758	2.727	2.703	2.754	2.786	2.423	2.435	2.442	2.432
2041	2.769	2.763	2.731	2.707	2.757	2.789	2.426	2.438	2.444
2042	2.773	2.772	2.766	2.734	2.710	2.759	2.791	2.428	2.440
2043	2.771	2.777	2.776	2.769	2.737	2.712	2.761	2.793	2.429
2044	2.763	2.774	2.779	2.778	2.771	2.738	2.713	2.762	2.794
2045	2.748	2.765	2.776	2.781	2.779	2.772	2.739	2.714	2.762
2046	2.726	2.750	2.767	2.777	2.782	2.780	2.772	2.739	2.714
2047	2.699	2.727	2.750	2.767	2.777	2.782	2.780	2.772	2.739
2048	2.666	2.699	2.727	2.750	2.767	2.777	2.781	2.779	2.771
2049	2.630	2.666	2.698	2.726	2.750	2.766	2.776	2.780	2.778
2050	2.591	2.629	2.665	2.697	2.725	2.749	2.765	2.775	2.779

	36	37	38	39	40	41	42	43	44
2008	2.357	2.352	2.338	2.318	2.297	2.279	2.257	2.233	2.206
2009	2.492	2.500	2.497	2.479	2.450	2.422	2.398	2.377	2.357
2010	2.335	2.356	2.369	2.371	2.358	2.334	2.309	2.290	2.273
2011	2.261	2.279	2.301	2.311	2.309	2.291	2.263	2.235	2.214
2012	2.321	2.322	2.342	2.367	2.380	2.380	2.366	2.346	2.329
2013	2.357	2.329	2.329	2.351	2.377	2.391	2.393	2.381	2.362
2014	2.411	2.364	2.336	2.338	2.361	2.388	2.404	2.407	2.397
2015	2.470	2.418	2.372	2.345	2.348	2.373	2.402	2.419	2.424
2016	2.521	2.477	2.426	2.381	2.355	2.360	2.386	2.416	2.435
2017	2.564	2.528	2.485	2.435	2.391	2.367	2.374	2.401	2.433
2018	2.598	2.572	2.536	2.493	2.445	2.403	2.381	2.389	2.418
2019	2.631	2.606	2.579	2.545	2.504	2.457	2.416	2.396	2.406
2020	2.677	2.639	2.614	2.588	2.555	2.516	2.471	2.431	2.413
2021	2.739	2.684	2.646	2.622	2.599	2.567	2.529	2.486	2.448
2022	2.809	2.746	2.692	2.655	2.633	2.611	2.580	2.544	2.503
2023	2.889	2.816	2.754	2.701	2.666	2.645	2.624	2.595	2.561
2024	2.978	2.896	2.824	2.762	2.711	2.677	2.658	2.639	2.612
2025	3.070	2.984	2.903	2.832	2.772	2.722	2.689	2.671	2.654
2026	3.154	3.076	2.991	2.911	2.841	2.782	2.734	2.702	2.686
2027	3.216	3.160	3.082	2.998	2.919	2.850	2.793	2.746	2.716
2028	3.241	3.221	3.166	3.089	3.006	2.929	2.861	2.805	2.759
2029	3.224	3.246	3.227	3.172	3.096	3.015	2.939	2.872	2.817
2030	3.165	3.229	3.252	3.233	3.179	3.104	3.024	2.949	2.884
2031	3.075	3.169	3.234	3.257	3.239	3.187	3.113	3.034	2.960
2032	2.971	3.079	3.174	3.239	3.263	3.246	3.195	3.122	3.044
2033	2.868	2.975	3.084	3.179	3.245	3.270	3.253	3.203	3.131
2034	2.777	2.872	2.980	3.088	3.184	3.251	3.276	3.261	3.211
2035	2.704	2.781	2.876	2.984	3.093	3.189	3.257	3.283	3.269
2036	2.648	2.707	2.784	2.880	2.988	3.098	3.195	3.263	3.290
2037	2.605	2.651	2.710	2.788	2.884	2.993	3.103	3.201	3.269
2038	2.565	2.608	2.654	2.713	2.792	2.888	2.997	3.108	3.206
2039	2.523	2.568	2.610	2.657	2.717	2.795	2.893	3.002	3.113
2040	2.431	2.525	2.570	2.613	2.660	2.720	2.799	2.897	3.006
2041	2.434	2.433	2.527	2.572	2.615	2.663	2.723	2.802	2.900
2042	2.445	2.435	2.434	2.529	2.574	2.618	2.665	2.726	2.805
2043	2.441	2.447	2.436	2.436	2.530	2.576	2.620	2.668	2.728
2044	2.430	2.442	2.447	2.437	2.437	2.531	2.577	2.621	2.669
2045	2.794	2.431	2.442	2.448	2.438	2.438	2.532	2.578	2.622
2046	2.762	2.794	2.431	2.442	2.448	2.438	2.438	2.533	2.579
2047	2.714	2.762	2.793	2.430	2.442	2.448	2.438	2.438	2.532
2048	2.738	2.713	2.761	2.792	2.430	2.441	2.447	2.437	2.437
2049	2.770	2.737	2.712	2.760	2.791	2.428	2.439	2.445	2.435
2050	2.777	2.769	2.735	2.710	2.758	2.788	2.426	2.437	2.443

	45	46	47	48	49	50	51	52	53
2008	2.176	2.147	2.124	2.111	2.104	2.099	2.089	2.069	2.033
2009	2.337	2.314	2.290	2.270	2.258	2.250	2.244	2.233	2.209
2010	2.257	2.242	2.222	2.200	2.182	2.170	2.163	2.159	2.153
2011	2.194	2.177	2.162	2.149	2.138	2.134	2.136	2.140	2.143
2012	2.320	2.313	2.304	2.291	2.273	2.253	2.240	2.233	2.231
2013	2.347	2.340	2.334	2.326	2.315	2.297	2.278	2.264	2.257
2014	2.380	2.367	2.361	2.357	2.350	2.339	2.322	2.303	2.288
2015	2.415	2.400	2.388	2.383	2.380	2.374	2.363	2.346	2.327
2016	2.442	2.435	2.421	2.410	2.407	2.404	2.398	2.388	2.370
2017	2.454	2.462	2.456	2.443	2.434	2.431	2.429	2.423	2.412
2018	2.451	2.473	2.483	2.479	2.467	2.458	2.456	2.453	2.447
2019	2.436	2.471	2.495	2.505	2.502	2.491	2.483	2.480	2.477
2020	2.424	2.457	2.493	2.517	2.529	2.526	2.516	2.507	2.504
2021	2.432	2.444	2.478	2.515	2.541	2.553	2.551	2.541	2.532
2022	2.467	2.452	2.466	2.501	2.539	2.565	2.578	2.576	2.565
2023	2.522	2.488	2.474	2.489	2.525	2.564	2.591	2.603	2.600
2024	2.579	2.541	2.508	2.496	2.512	2.549	2.588	2.614	2.626
2025	2.628	2.597	2.561	2.529	2.518	2.535	2.572	2.611	2.636
2026	2.670	2.646	2.616	2.581	2.550	2.539	2.557	2.593	2.631
2027	2.701	2.686	2.664	2.635	2.600	2.571	2.560	2.578	2.613
2028	2.731	2.717	2.704	2.682	2.654	2.620	2.591	2.580	2.597
2029	2.773	2.746	2.733	2.720	2.699	2.672	2.639	2.609	2.598
2030	2.830	2.787	2.761	2.749	2.737	2.716	2.690	2.656	2.626
2031	2.896	2.843	2.801	2.776	2.765	2.753	2.733	2.706	2.671
2032	2.971	2.908	2.856	2.815	2.790	2.779	2.768	2.747	2.720
2033	3.054	2.982	2.920	2.869	2.828	2.804	2.793	2.781	2.760
2034	3.141	3.064	2.993	2.932	2.881	2.841	2.816	2.805	2.793
2035	3.220	3.150	3.074	3.003	2.942	2.892	2.852	2.827	2.815
2036	3.276	3.228	3.158	3.083	3.013	2.952	2.902	2.861	2.836
2037	3.297	3.283	3.235	3.166	3.091	3.021	2.960	2.910	2.868
2038	3.275	3.303	3.290	3.242	3.173	3.098	3.028	2.967	2.916
2039	3.211	3.280	3.308	3.295	3.248	3.179	3.104	3.033	2.971
2040	3.118	3.216	3.285	3.313	3.300	3.252	3.183	3.108	3.036
2041	3.010	3.121	3.220	3.289	3.316	3.303	3.255	3.186	3.109
2042	2.903	3.013	3.124	3.222	3.291	3.318	3.305	3.256	3.186
2043	2.808	2.906	3.015	3.126	3.224	3.292	3.319	3.304	3.255
2044	2.730	2.809	2.907	3.016	3.127	3.224	3.291	3.318	3.302
2045	2.670	2.731	2.810	2.907	3.016	3.126	3.222	3.289	3.314
2046	2.622	2.670	2.731	2.809	2.906	3.015	3.124	3.219	3.284
2047	2.578	2.622	2.669	2.729	2.808	2.904	3.011	3.119	3.213
2048	2.531	2.576	2.620	2.667	2.726	2.804	2.900	3.006	3.113
2049	2.435	2.528	2.574	2.616	2.663	2.722	2.799	2.894	2.999
2050	2.432	2.431	2.525	2.569	2.612	2.658	2.716	2.792	2.885

	54	55	56	57	58	59	60	61	62
2008	1.985	1.936	1.889	1.840	1.789	1.738	1.681	1.626	1.593
2009	2.170	2.120	2.068	2.016	1.958	1.896	1.831	1.758	1.694
2010	2.139	2.111	2.071	2.027	1.982	1.928	1.868	1.805	1.732
2011	2.140	2.126	2.097	2.057	2.014	1.971	1.920	1.863	1.799
2012	2.230	2.224	2.206	2.172	2.124	2.072	2.017	1.955	1.888
2013	2.253	2.251	2.243	2.222	2.184	2.132	2.074	2.013	1.947
2014	2.280	2.274	2.269	2.259	2.234	2.191	2.133	2.070	2.005
2015	2.311	2.300	2.293	2.285	2.270	2.241	2.193	2.129	2.061
2016	2.349	2.331	2.319	2.309	2.297	2.277	2.242	2.188	2.120
2017	2.393	2.370	2.350	2.335	2.321	2.304	2.278	2.237	2.178
2018	2.434	2.413	2.389	2.366	2.347	2.328	2.305	2.273	2.227
2019	2.469	2.455	2.432	2.405	2.378	2.354	2.329	2.300	2.263
2020	2.500	2.490	2.474	2.448	2.417	2.386	2.356	2.324	2.290
2021	2.527	2.521	2.509	2.490	2.460	2.424	2.387	2.351	2.314
2022	2.554	2.548	2.539	2.525	2.502	2.467	2.425	2.382	2.341
2023	2.588	2.575	2.567	2.555	2.537	2.509	2.469	2.421	2.373
2024	2.622	2.607	2.593	2.582	2.566	2.543	2.509	2.463	2.410
2025	2.646	2.640	2.624	2.607	2.591	2.572	2.543	2.503	2.452
2026	2.655	2.663	2.655	2.636	2.615	2.596	2.570	2.535	2.491
2027	2.649	2.671	2.678	2.667	2.644	2.619	2.594	2.563	2.523
2028	2.631	2.665	2.685	2.688	2.674	2.647	2.616	2.586	2.550
2029	2.613	2.645	2.677	2.695	2.694	2.676	2.644	2.608	2.573
2030	2.614	2.627	2.657	2.686	2.700	2.695	2.672	2.635	2.594
2031	2.640	2.626	2.637	2.665	2.691	2.700	2.691	2.662	2.621
2032	2.684	2.651	2.636	2.645	2.669	2.691	2.695	2.681	2.648
2033	2.731	2.694	2.660	2.642	2.648	2.668	2.685	2.684	2.666
2034	2.770	2.740	2.701	2.665	2.644	2.646	2.662	2.674	2.670
2035	2.801	2.777	2.745	2.705	2.666	2.642	2.640	2.651	2.659
2036	2.823	2.807	2.782	2.748	2.705	2.663	2.635	2.629	2.636
2037	2.842	2.827	2.810	2.783	2.746	2.700	2.655	2.624	2.614
2038	2.873	2.845	2.829	2.810	2.780	2.741	2.692	2.643	2.608
2039	2.919	2.875	2.846	2.828	2.807	2.774	2.731	2.679	2.627
2040	2.974	2.920	2.875	2.844	2.823	2.799	2.763	2.718	2.662
2041	3.037	2.973	2.918	2.871	2.838	2.815	2.788	2.749	2.701
2042	3.109	3.035	2.970	2.913	2.864	2.829	2.803	2.773	2.731
2043	3.184	3.105	3.030	2.963	2.905	2.854	2.816	2.787	2.755
2044	3.252	3.179	3.099	3.023	2.954	2.893	2.840	2.800	2.769
2045	3.297	3.246	3.172	3.090	3.012	2.941	2.879	2.823	2.781
2046	3.308	3.290	3.237	3.161	3.078	2.998	2.926	2.861	2.804
2047	3.278	3.300	3.280	3.225	3.148	3.064	2.982	2.907	2.841
2048	3.206	3.268	3.289	3.267	3.211	3.132	3.046	2.963	2.886
2049	3.104	3.195	3.256	3.275	3.252	3.194	3.114	3.026	2.941
2050	2.989	3.093	3.183	3.242	3.259	3.234	3.175	3.093	3.004

	63	64	65	66	67	68	69	70	71
2008	1.589	1.604	1.631	1.647	1.628	1.559	1.456	1.337	1.232
2009	1.664	1.673	1.709	1.755	1.778	1.745	1.642	1.495	1.331
2010	1.665	1.628	1.628	1.652	1.689	1.706	1.673	1.573	1.431
2011	1.718	1.636	1.580	1.559	1.567	1.597	1.617	1.593	1.506
2012	1.818	1.735	1.654	1.597	1.572	1.572	1.589	1.593	1.555
2013	1.879	1.810	1.731	1.653	1.596	1.567	1.556	1.558	1.548
2014	1.937	1.871	1.805	1.730	1.652	1.591	1.551	1.526	1.514
2015	1.995	1.928	1.865	1.803	1.728	1.646	1.575	1.523	1.484
2016	2.050	1.985	1.922	1.862	1.800	1.720	1.629	1.546	1.481
2017	2.108	2.040	1.978	1.918	1.858	1.791	1.702	1.600	1.505
2018	2.166	2.098	2.033	1.974	1.913	1.848	1.771	1.671	1.557
2019	2.215	2.156	2.090	2.028	1.968	1.903	1.828	1.739	1.627
2020	2.251	2.204	2.147	2.084	2.022	1.957	1.882	1.794	1.693
2021	2.279	2.240	2.195	2.141	2.078	2.010	1.935	1.847	1.748
2022	2.302	2.267	2.231	2.189	2.134	2.065	1.987	1.900	1.800
2023	2.330	2.292	2.259	2.225	2.181	2.120	2.042	1.952	1.852
2024	2.360	2.318	2.282	2.251	2.215	2.166	2.095	2.005	1.902
2025	2.397	2.348	2.307	2.273	2.240	2.199	2.140	2.056	1.954
2026	2.438	2.384	2.337	2.297	2.261	2.223	2.172	2.100	2.005
2027	2.477	2.424	2.372	2.326	2.285	2.243	2.195	2.131	2.047
2028	2.509	2.462	2.411	2.360	2.312	2.266	2.214	2.153	2.077
2029	2.535	2.493	2.449	2.399	2.346	2.292	2.236	2.172	2.100
2030	2.557	2.519	2.479	2.435	2.383	2.325	2.262	2.194	2.119
2031	2.578	2.541	2.504	2.464	2.418	2.361	2.293	2.220	2.141
2032	2.604	2.562	2.524	2.488	2.446	2.394	2.328	2.251	2.166
2033	2.631	2.587	2.545	2.508	2.469	2.421	2.361	2.285	2.197
2034	2.649	2.613	2.569	2.527	2.488	2.443	2.387	2.317	2.231
2035	2.652	2.630	2.594	2.550	2.506	2.461	2.409	2.343	2.263
2036	2.642	2.633	2.611	2.574	2.528	2.478	2.426	2.364	2.289
2037	2.618	2.622	2.613	2.590	2.551	2.500	2.443	2.381	2.309
2038	2.596	2.599	2.602	2.592	2.566	2.522	2.463	2.397	2.327
2039	2.591	2.577	2.579	2.581	2.567	2.536	2.485	2.418	2.344
2040	2.609	2.571	2.557	2.557	2.555	2.537	2.498	2.439	2.364
2041	2.644	2.589	2.550	2.534	2.531	2.525	2.499	2.453	2.386
2042	2.681	2.623	2.567	2.527	2.508	2.501	2.487	2.454	2.400
2043	2.711	2.659	2.600	2.543	2.501	2.477	2.463	2.442	2.401
2044	2.734	2.689	2.636	2.575	2.516	2.469	2.440	2.419	2.390
2045	2.747	2.711	2.665	2.610	2.546	2.484	2.432	2.397	2.369
2046	2.759	2.724	2.686	2.637	2.580	2.513	2.446	2.389	2.347
2047	2.782	2.735	2.698	2.658	2.606	2.545	2.474	2.402	2.340
2048	2.818	2.757	2.708	2.669	2.625	2.570	2.505	2.430	2.354
2049	2.863	2.793	2.730	2.678	2.636	2.589	2.530	2.461	2.382
2050	2.917	2.837	2.764	2.698	2.644	2.598	2.548	2.485	2.413

	72	73	74	75	76	77	78	79	80+
2008	1.160	1.138	1.150	1.120	1.131	1.140	1.138	1.114	3.842
2009	1.191	1.100	1.072	1.081	1.053	1.066	1.073	1.059	4.316
2010	1.273	1.136	1.044	1.011	1.012	978	985	987	4.604
2011	1.373	1.222	1.086	990	949	942	904	909	4.803
2012	1.457	1.319	1.168	1.033	938	896	883	841	4.949
2013	1.498	1.394	1.256	1.107	975	882	837	818	4.991
2014	1.492	1.434	1.328	1.192	1.045	917	825	776	5.009
2015	1.460	1.429	1.367	1.260	1.126	984	859	765	4.993
2016	1.432	1.399	1.363	1.298	1.192	1.060	921	797	4.975
2017	1.430	1.373	1.335	1.295	1.228	1.123	994	856	4.994
2018	1.454	1.372	1.311	1.270	1.226	1.158	1.053	924	5.071
2019	1.505	1.395	1.311	1.247	1.203	1.157	1.087	980	5.204
2020	1.572	1.445	1.334	1.248	1.183	1.136	1.087	1.012	5.377
2021	1.638	1.511	1.383	1.271	1.184	1.118	1.068	1.013	5.560
2022	1.691	1.575	1.447	1.318	1.207	1.120	1.052	996	5.724
2023	1.742	1.627	1.508	1.380	1.253	1.143	1.055	982	5.857
2024	1.793	1.677	1.559	1.440	1.312	1.186	1.077	986	5.962
2025	1.842	1.726	1.608	1.489	1.370	1.244	1.118	1.007	6.063
2026	1.893	1.775	1.656	1.537	1.417	1.299	1.173	1.047	6.176
2027	1.943	1.825	1.704	1.584	1.464	1.345	1.226	1.099	6.318
2028	1.983	1.872	1.751	1.629	1.509	1.389	1.269	1.148	6.492
2029	2.013	1.913	1.798	1.676	1.553	1.432	1.311	1.190	6.696
2030	2.036	1.943	1.838	1.722	1.598	1.475	1.354	1.231	6.919
2031	2.056	1.966	1.868	1.761	1.643	1.519	1.395	1.271	7.158
2032	2.078	1.986	1.892	1.791	1.682	1.563	1.437	1.311	7.410
2033	2.103	2.009	1.912	1.815	1.712	1.601	1.480	1.352	7.677
2034	2.134	2.035	1.936	1.836	1.736	1.631	1.517	1.393	7.955
2035	2.168	2.066	1.962	1.859	1.757	1.654	1.546	1.429	8.243
2036	2.200	2.100	1.993	1.886	1.781	1.676	1.569	1.457	8.537
2037	2.226	2.132	2.027	1.917	1.807	1.699	1.591	1.480	8.828
2038	2.247	2.158	2.059	1.951	1.838	1.725	1.614	1.501	9.115
2039	2.265	2.180	2.086	1.983	1.872	1.756	1.640	1.525	9.396
2040	2.283	2.198	2.108	2.010	1.904	1.790	1.671	1.551	9.673
2041	2.304	2.216	2.127	2.033	1.931	1.822	1.704	1.581	9.951
2042	2.325	2.238	2.146	2.053	1.954	1.849	1.736	1.614	10.236
2043	2.340	2.260	2.168	2.072	1.974	1.872	1.763	1.645	10.527
2044	2.343	2.276	2.191	2.095	1.994	1.893	1.786	1.672	10.824
2045	2.333	2.279	2.207	2.118	2.017	1.913	1.807	1.695	11.121
2046	2.313	2.271	2.212	2.135	2.041	1.936	1.827	1.715	11.414
2047	2.293	2.253	2.205	2.141	2.058	1.960	1.850	1.736	11.706
2048	2.287	2.235	2.189	2.136	2.066	1.978	1.874	1.760	11.997
2049	2.301	2.230	2.173	2.121	2.062	1.986	1.893	1.784	12.288
2050	2.330	2.245	2.169	2.107	2.049	1.985	1.902	1.803	12.582

Çankırı, Scenario 3 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	2.371	2.364	2.362	2.360	2.358	2.442	2.478	2.514	2.550
2009	2.808	2.430	2.427	2.425	2.423	2.420	2.505	2.546	2.587
2010	2.694	2.717	2.345	2.343	2.341	2.328	2.316	2.406	2.450
2011	2.604	2.645	2.674	2.302	2.300	2.283	2.253	2.237	2.324
2012	2.669	2.635	2.681	2.710	2.338	2.344	2.340	2.319	2.308
2013	2.709	2.667	2.638	2.684	2.714	2.340	2.341	2.337	2.317
2014	2.722	2.707	2.670	2.642	2.689	2.715	2.337	2.339	2.334
2015	2.730	2.721	2.710	2.674	2.646	2.690	2.712	2.334	2.336
2016	2.731	2.729	2.724	2.714	2.678	2.648	2.687	2.709	2.332
2017	2.725	2.730	2.732	2.728	2.718	2.680	2.645	2.684	2.707
2018	2.713	2.724	2.733	2.736	2.732	2.719	2.677	2.642	2.682
2019	2.693	2.712	2.728	2.737	2.740	2.733	2.717	2.674	2.640
2020	2.669	2.693	2.715	2.732	2.741	2.741	2.731	2.714	2.672
2021	2.640	2.668	2.696	2.719	2.736	2.742	2.739	2.728	2.712
2022	2.606	2.639	2.672	2.700	2.723	2.737	2.740	2.736	2.726
2023	2.570	2.606	2.643	2.675	2.704	2.724	2.735	2.737	2.734
2024	2.538	2.570	2.610	2.646	2.679	2.705	2.722	2.732	2.735
2025	2.504	2.539	2.574	2.613	2.650	2.681	2.703	2.720	2.730
2026	2.469	2.504	2.542	2.578	2.617	2.652	2.679	2.701	2.718
2027	2.434	2.470	2.508	2.546	2.582	2.619	2.650	2.676	2.699
2028	2.399	2.435	2.473	2.512	2.550	2.583	2.617	2.647	2.674
2029	2.374	2.401	2.439	2.477	2.516	2.551	2.581	2.614	2.645
2030	2.356	2.375	2.404	2.442	2.481	2.517	2.549	2.579	2.613
2031	2.338	2.358	2.379	2.408	2.446	2.482	2.515	2.547	2.577
2032	2.320	2.339	2.361	2.382	2.412	2.448	2.481	2.513	2.545
2033	2.306	2.322	2.343	2.365	2.386	2.413	2.446	2.479	2.512
2034	2.298	2.308	2.326	2.347	2.369	2.388	2.412	2.444	2.477
2035	2.295	2.300	2.311	2.329	2.350	2.370	2.386	2.410	2.442
2036	2.294	2.297	2.303	2.315	2.333	2.352	2.369	2.384	2.408
2037	2.293	2.295	2.300	2.307	2.319	2.334	2.350	2.367	2.383
2038	2.294	2.294	2.299	2.304	2.311	2.320	2.333	2.348	2.366
2039	2.295	2.296	2.298	2.302	2.308	2.312	2.319	2.331	2.347
2040	2.294	2.296	2.299	2.301	2.306	2.309	2.310	2.317	2.330
2041	2.294	2.296	2.300	2.302	2.305	2.307	2.308	2.309	2.316
2042	2.294	2.296	2.299	2.303	2.306	2.306	2.306	2.306	2.307
2043	2.293	2.296	2.299	2.303	2.307	2.307	2.305	2.304	2.305
2044	2.285	2.294	2.299	2.303	2.306	2.308	2.306	2.303	2.303
2045	2.272	2.287	2.297	2.302	2.306	2.307	2.307	2.304	2.302
2046	2.258	2.273	2.290	2.301	2.305	2.307	2.306	2.305	2.303
2047	2.244	2.260	2.276	2.293	2.304	2.307	2.306	2.305	2.304
2048	2.227	2.245	2.263	2.280	2.296	2.305	2.305	2.304	2.303
2049	2.205	2.229	2.248	2.266	2.283	2.298	2.304	2.304	2.303
2050	2.180	2.207	2.231	2.251	2.269	2.284	2.297	2.303	2.303

	9	10	11	12	13	14	15	16	17
2008	2.586	2.621	2.655	2.691	2.728	2.765	2.800	2.829	2.850
2009	2.626	2.663	2.700	2.741	2.787	2.839	2.893	2.946	2.987
2010	2.493	2.533	2.572	2.614	2.667	2.730	2.804	2.878	2.939
2011	2.368	2.410	2.449	2.490	2.536	2.594	2.665	2.744	2.824
2012	2.394	2.433	2.471	2.514	2.571	2.646	2.739	2.843	2.947
2013	2.307	2.395	2.436	2.476	2.520	2.576	2.650	2.742	2.846
2014	2.316	2.308	2.398	2.441	2.481	2.525	2.581	2.654	2.746
2015	2.333	2.317	2.311	2.403	2.446	2.487	2.530	2.585	2.658
2016	2.335	2.335	2.320	2.316	2.409	2.452	2.491	2.534	2.588
2017	2.331	2.336	2.338	2.325	2.321	2.414	2.456	2.495	2.537
2018	2.706	2.332	2.339	2.343	2.330	2.327	2.419	2.460	2.498
2019	2.681	2.707	2.335	2.344	2.348	2.335	2.331	2.423	2.463
2020	2.639	2.682	2.710	2.340	2.350	2.353	2.340	2.335	2.426
2021	2.671	2.640	2.685	2.715	2.346	2.355	2.358	2.344	2.338
2022	2.711	2.672	2.643	2.690	2.720	2.351	2.359	2.361	2.347
2023	2.725	2.712	2.675	2.648	2.695	2.725	2.355	2.363	2.365
2024	2.733	2.726	2.715	2.680	2.653	2.700	2.729	2.359	2.366
2025	2.734	2.734	2.729	2.720	2.685	2.658	2.704	2.733	2.362
2026	2.729	2.735	2.737	2.733	2.725	2.690	2.662	2.707	2.735
2027	2.717	2.730	2.738	2.741	2.739	2.730	2.694	2.665	2.710
2028	2.698	2.718	2.733	2.743	2.746	2.743	2.734	2.697	2.668
2029	2.674	2.699	2.721	2.738	2.748	2.751	2.747	2.737	2.700
2030	2.645	2.675	2.702	2.725	2.743	2.752	2.755	2.751	2.740
2031	2.612	2.646	2.678	2.706	2.730	2.747	2.756	2.759	2.753
2032	2.576	2.613	2.649	2.682	2.711	2.735	2.751	2.760	2.761
2033	2.545	2.578	2.616	2.653	2.687	2.716	2.739	2.754	2.762
2034	2.511	2.546	2.580	2.620	2.658	2.691	2.719	2.742	2.757
2035	2.476	2.512	2.549	2.585	2.625	2.662	2.695	2.723	2.745
2036	2.442	2.477	2.515	2.553	2.589	2.629	2.666	2.698	2.725
2037	2.408	2.443	2.480	2.519	2.558	2.594	2.633	2.669	2.701
2038	2.382	2.409	2.446	2.484	2.524	2.562	2.597	2.636	2.672
2039	2.365	2.383	2.412	2.450	2.489	2.528	2.566	2.600	2.638
2040	2.347	2.366	2.386	2.416	2.455	2.493	2.532	2.568	2.603
2041	2.329	2.348	2.369	2.390	2.420	2.459	2.497	2.534	2.571
2042	2.315	2.331	2.350	2.373	2.395	2.424	2.462	2.499	2.537
2043	2.307	2.316	2.333	2.354	2.377	2.399	2.428	2.465	2.502
2044	2.304	2.308	2.319	2.337	2.359	2.381	2.402	2.430	2.467
2045	2.303	2.305	2.311	2.323	2.341	2.363	2.385	2.405	2.432
2046	2.302	2.304	2.308	2.315	2.327	2.345	2.366	2.387	2.407
2047	2.303	2.303	2.306	2.312	2.319	2.331	2.348	2.368	2.389
2048	2.304	2.304	2.305	2.310	2.316	2.323	2.334	2.351	2.370
2049	2.303	2.305	2.306	2.309	2.314	2.320	2.326	2.337	2.353
2050	2.303	2.304	2.307	2.310	2.313	2.318	2.323	2.328	2.338

	18	19	20	21	22	23	24	25	26
2008	2.859	2.858	2.851	2.840	2.824	2.804	2.779	2.752	2.722
2009	3.007	3.004	2.984	2.958	2.932	2.908	2.886	2.864	2.840
2010	2.968	2.955	2.908	2.844	2.781	2.731	2.696	2.671	2.645
2011	2.887	2.914	2.898	2.848	2.779	2.709	2.648	2.601	2.563
2012	3.038	3.098	3.114	3.087	3.024	2.939	2.849	2.768	2.699
2013	2.950	3.040	3.099	3.114	3.087	3.024	2.942	2.857	2.779
2014	2.848	2.952	3.040	3.098	3.114	3.087	3.028	2.950	2.868
2015	2.748	2.850	2.952	3.040	3.098	3.114	3.091	3.035	2.960
2016	2.660	2.750	2.851	2.952	3.040	3.099	3.118	3.098	3.046
2017	2.591	2.662	2.751	2.851	2.952	3.041	3.102	3.125	3.108
2018	2.540	2.592	2.663	2.751	2.850	2.953	3.044	3.109	3.135
2019	2.501	2.541	2.593	2.663	2.751	2.851	2.956	3.051	3.119
2020	2.466	2.503	2.542	2.593	2.663	2.752	2.855	2.963	3.061
2021	2.428	2.468	2.504	2.542	2.593	2.664	2.755	2.862	2.973
2022	2.341	2.430	2.469	2.504	2.542	2.594	2.667	2.762	2.872
2023	2.349	2.343	2.431	2.469	2.504	2.543	2.598	2.674	2.772
2024	2.367	2.351	2.344	2.431	2.469	2.505	2.547	2.605	2.684
2025	2.368	2.369	2.352	2.344	2.431	2.470	2.509	2.554	2.615
2026	2.364	2.370	2.370	2.352	2.344	2.432	2.474	2.515	2.564
2027	2.738	2.366	2.371	2.370	2.352	2.345	2.436	2.480	2.525
2028	2.713	2.739	2.367	2.371	2.370	2.354	2.349	2.443	2.490
2029	2.670	2.714	2.740	2.367	2.371	2.371	2.357	2.356	2.453
2030	2.702	2.672	2.715	2.740	2.367	2.372	2.375	2.364	2.366
2031	2.742	2.704	2.673	2.715	2.740	2.368	2.376	2.381	2.374
2032	2.756	2.743	2.704	2.673	2.715	2.741	2.372	2.383	2.391
2033	2.763	2.757	2.744	2.704	2.673	2.716	2.744	2.378	2.392
2034	2.764	2.765	2.758	2.744	2.704	2.674	2.719	2.750	2.388
2035	2.759	2.766	2.765	2.757	2.744	2.705	2.677	2.725	2.759
2036	2.746	2.760	2.766	2.765	2.757	2.745	2.708	2.683	2.734
2037	2.727	2.748	2.761	2.766	2.765	2.758	2.748	2.714	2.692
2038	2.702	2.728	2.748	2.761	2.766	2.766	2.761	2.754	2.723
2039	2.673	2.704	2.729	2.748	2.760	2.767	2.769	2.767	2.762
2040	2.640	2.674	2.704	2.728	2.748	2.761	2.769	2.774	2.776
2041	2.604	2.641	2.675	2.704	2.728	2.748	2.764	2.775	2.783
2042	2.572	2.605	2.642	2.675	2.704	2.729	2.751	2.770	2.783
2043	2.538	2.574	2.606	2.642	2.674	2.704	2.732	2.757	2.778
2044	2.503	2.539	2.574	2.606	2.641	2.675	2.707	2.737	2.765
2045	2.469	2.504	2.540	2.574	2.605	2.642	2.678	2.712	2.745
2046	2.434	2.470	2.505	2.539	2.573	2.606	2.645	2.683	2.720
2047	2.408	2.435	2.470	2.504	2.539	2.574	2.609	2.650	2.691
2048	2.391	2.409	2.435	2.470	2.504	2.540	2.577	2.614	2.657
2049	2.372	2.392	2.409	2.435	2.469	2.505	2.542	2.582	2.621
2050	2.354	2.373	2.392	2.409	2.434	2.470	2.507	2.547	2.589

	27	28	29	30	31	32	33	34	35
2008	2.680	2.623	2.558	2.485	2.419	2.372	2.352	2.351	2.356
2009	2.812	2.772	2.716	2.652	2.582	2.519	2.478	2.466	2.476
2010	2.620	2.596	2.565	2.523	2.474	2.417	2.365	2.330	2.322
2011	2.528	2.502	2.483	2.460	2.427	2.385	2.336	2.290	2.262
2012	2.642	2.595	2.564	2.544	2.521	2.488	2.446	2.396	2.349
2013	2.712	2.657	2.609	2.577	2.555	2.531	2.497	2.454	2.404
2014	2.793	2.727	2.671	2.622	2.588	2.565	2.540	2.505	2.462
2015	2.881	2.807	2.741	2.683	2.633	2.598	2.574	2.549	2.513
2016	2.974	2.896	2.821	2.753	2.694	2.643	2.606	2.582	2.556
2017	3.059	2.988	2.909	2.833	2.764	2.704	2.652	2.614	2.590
2018	3.121	3.073	3.001	2.921	2.844	2.774	2.712	2.660	2.622
2019	3.148	3.135	3.086	3.013	2.932	2.853	2.782	2.720	2.667
2020	3.132	3.162	3.148	3.098	3.023	2.941	2.861	2.790	2.728
2021	3.074	3.146	3.175	3.160	3.108	3.033	2.949	2.869	2.797
2022	2.986	3.087	3.159	3.186	3.170	3.117	3.040	2.956	2.876
2023	2.885	2.999	3.100	3.170	3.196	3.179	3.125	3.048	2.963
2024	2.785	2.898	3.012	3.111	3.180	3.205	3.186	3.132	3.055
2025	2.697	2.798	2.911	3.023	3.121	3.188	3.212	3.193	3.139
2026	2.627	2.710	2.811	2.922	3.033	3.130	3.196	3.219	3.200
2027	2.576	2.641	2.723	2.822	2.932	3.042	3.137	3.203	3.226
2028	2.538	2.590	2.653	2.734	2.832	2.940	3.049	3.145	3.209
2029	2.503	2.551	2.602	2.665	2.744	2.841	2.948	3.057	3.151
2030	2.465	2.516	2.564	2.613	2.674	2.753	2.848	2.955	3.063
2031	2.378	2.478	2.528	2.575	2.623	2.683	2.760	2.856	2.962
2032	2.386	2.391	2.490	2.539	2.584	2.632	2.691	2.768	2.862
2033	2.403	2.399	2.403	2.501	2.549	2.593	2.639	2.698	2.774
2034	2.404	2.416	2.411	2.414	2.511	2.557	2.600	2.647	2.705
2035	2.399	2.416	2.427	2.421	2.423	2.519	2.565	2.607	2.653
2036	2.771	2.412	2.428	2.438	2.431	2.431	2.527	2.572	2.614
2037	2.745	2.783	2.423	2.439	2.447	2.439	2.439	2.533	2.578
2038	2.703	2.757	2.794	2.434	2.448	2.455	2.446	2.446	2.540
2039	2.734	2.715	2.768	2.804	2.442	2.456	2.462	2.453	2.452
2040	2.773	2.746	2.726	2.778	2.812	2.450	2.463	2.469	2.459
2041	2.786	2.784	2.756	2.735	2.787	2.820	2.457	2.469	2.475
2042	2.793	2.797	2.795	2.766	2.744	2.794	2.827	2.464	2.475
2043	2.794	2.804	2.808	2.804	2.774	2.751	2.801	2.833	2.470
2044	2.788	2.805	2.815	2.817	2.813	2.782	2.758	2.807	2.839
2045	2.775	2.799	2.815	2.824	2.825	2.820	2.788	2.764	2.812
2046	2.755	2.786	2.809	2.824	2.832	2.832	2.826	2.794	2.769
2047	2.730	2.765	2.796	2.818	2.832	2.839	2.838	2.832	2.799
2048	2.700	2.740	2.775	2.804	2.825	2.839	2.845	2.844	2.837
2049	2.667	2.711	2.750	2.784	2.812	2.832	2.845	2.850	2.849
2050	2.631	2.677	2.720	2.759	2.791	2.818	2.838	2.850	2.856

	36	37	38	39	40	41	42	43	44
2008	2.357	2.352	2.338	2.318	2.297	2.279	2.257	2.233	2.206
2009	2.492	2.500	2.497	2.479	2.450	2.422	2.398	2.377	2.357
2010	2.335	2.356	2.369	2.371	2.358	2.334	2.309	2.290	2.273
2011	2.261	2.279	2.301	2.311	2.309	2.291	2.263	2.235	2.214
2012	2.321	2.322	2.342	2.367	2.380	2.380	2.366	2.346	2.329
2013	2.357	2.329	2.329	2.351	2.377	2.391	2.393	2.381	2.362
2014	2.411	2.364	2.336	2.338	2.361	2.388	2.404	2.407	2.397
2015	2.469	2.418	2.371	2.345	2.348	2.373	2.401	2.418	2.423
2016	2.520	2.476	2.426	2.380	2.355	2.359	2.385	2.415	2.434
2017	2.563	2.527	2.484	2.434	2.390	2.366	2.372	2.400	2.431
2018	2.597	2.570	2.534	2.492	2.444	2.401	2.379	2.386	2.415
2019	2.629	2.603	2.577	2.542	2.501	2.455	2.413	2.393	2.402
2020	2.674	2.635	2.610	2.585	2.552	2.512	2.467	2.427	2.408
2021	2.734	2.680	2.642	2.618	2.594	2.562	2.524	2.481	2.443
2022	2.803	2.741	2.687	2.650	2.627	2.605	2.574	2.538	2.496
2023	2.882	2.810	2.747	2.695	2.659	2.638	2.617	2.588	2.553
2024	2.970	2.889	2.816	2.755	2.704	2.670	2.650	2.630	2.602
2025	3.061	2.976	2.895	2.824	2.764	2.714	2.681	2.663	2.645
2026	3.145	3.067	2.982	2.902	2.833	2.774	2.725	2.694	2.677
2027	3.206	3.150	3.073	2.989	2.911	2.842	2.785	2.738	2.709
2028	3.232	3.212	3.157	3.080	2.998	2.921	2.854	2.798	2.753
2029	3.216	3.238	3.218	3.164	3.089	3.008	2.932	2.867	2.812
2030	3.157	3.221	3.244	3.225	3.172	3.098	3.019	2.945	2.881
2031	3.069	3.163	3.227	3.251	3.233	3.182	3.109	3.031	2.959
2032	2.968	3.075	3.169	3.234	3.259	3.243	3.193	3.121	3.045
2033	2.868	2.974	3.081	3.176	3.243	3.268	3.253	3.205	3.135
2034	2.780	2.874	2.980	3.088	3.184	3.252	3.279	3.265	3.218
2035	2.711	2.786	2.880	2.987	3.096	3.194	3.262	3.291	3.278
2036	2.659	2.717	2.792	2.887	2.995	3.106	3.204	3.274	3.303
2037	2.620	2.665	2.723	2.799	2.896	3.005	3.116	3.215	3.286
2038	2.584	2.626	2.671	2.730	2.808	2.905	3.015	3.128	3.228
2039	2.546	2.590	2.632	2.678	2.738	2.817	2.915	3.027	3.140
2040	2.458	2.551	2.596	2.639	2.686	2.747	2.827	2.927	3.039
2041	2.465	2.464	2.557	2.603	2.647	2.695	2.757	2.839	2.939
2042	2.481	2.470	2.469	2.564	2.611	2.656	2.706	2.769	2.851
2043	2.481	2.486	2.476	2.476	2.572	2.620	2.666	2.717	2.781
2044	2.475	2.486	2.492	2.483	2.484	2.581	2.630	2.677	2.729
2045	2.844	2.481	2.492	2.499	2.491	2.493	2.591	2.641	2.690
2046	2.818	2.849	2.486	2.499	2.506	2.500	2.503	2.602	2.653
2047	2.774	2.823	2.854	2.493	2.506	2.515	2.510	2.514	2.614
2048	2.804	2.779	2.828	2.860	2.500	2.515	2.525	2.520	2.526
2049	2.842	2.809	2.785	2.834	2.867	2.509	2.524	2.536	2.532
2050	2.854	2.847	2.814	2.790	2.841	2.875	2.518	2.535	2.547

	45	46	47	48	49	50	51	52	53
2008	2.176	2.147	2.124	2.111	2.104	2.099	2.089	2.069	2.033
2009	2.337	2.314	2.290	2.270	2.258	2.250	2.244	2.233	2.209
2010	2.257	2.242	2.222	2.200	2.182	2.170	2.163	2.159	2.153
2011	2.194	2.177	2.162	2.149	2.138	2.134	2.136	2.140	2.143
2012	2.320	2.313	2.304	2.291	2.273	2.253	2.240	2.233	2.231
2013	2.347	2.340	2.334	2.326	2.315	2.297	2.278	2.264	2.257
2014	2.380	2.367	2.361	2.356	2.349	2.338	2.321	2.302	2.288
2015	2.415	2.399	2.387	2.382	2.379	2.373	2.362	2.345	2.326
2016	2.441	2.434	2.420	2.409	2.405	2.402	2.396	2.386	2.368
2017	2.452	2.459	2.454	2.441	2.431	2.428	2.425	2.420	2.408
2018	2.448	2.470	2.479	2.475	2.463	2.453	2.451	2.448	2.442
2019	2.433	2.467	2.490	2.500	2.496	2.485	2.476	2.473	2.470
2020	2.419	2.451	2.486	2.510	2.521	2.518	2.507	2.499	2.495
2021	2.425	2.437	2.470	2.507	2.532	2.543	2.541	2.530	2.520
2022	2.459	2.443	2.457	2.491	2.528	2.553	2.565	2.562	2.551
2023	2.512	2.477	2.463	2.477	2.512	2.549	2.575	2.587	2.583
2024	2.569	2.530	2.496	2.483	2.498	2.533	2.571	2.596	2.607
2025	2.618	2.586	2.549	2.516	2.503	2.519	2.555	2.592	2.617
2026	2.661	2.636	2.605	2.568	2.537	2.524	2.541	2.576	2.612
2027	2.693	2.678	2.654	2.624	2.588	2.557	2.546	2.562	2.596
2028	2.724	2.710	2.696	2.673	2.644	2.609	2.579	2.567	2.582
2029	2.768	2.741	2.728	2.715	2.693	2.665	2.630	2.600	2.587
2030	2.828	2.785	2.759	2.747	2.734	2.713	2.686	2.651	2.620
2031	2.896	2.844	2.803	2.778	2.766	2.754	2.734	2.706	2.671
2032	2.973	2.912	2.861	2.821	2.797	2.786	2.775	2.754	2.725
2033	3.059	2.989	2.929	2.879	2.840	2.816	2.806	2.794	2.773
2034	3.149	3.075	3.006	2.947	2.898	2.859	2.836	2.825	2.813
2035	3.232	3.164	3.091	3.023	2.965	2.917	2.878	2.855	2.844
2036	3.292	3.247	3.180	3.108	3.041	2.983	2.935	2.897	2.873
2037	3.317	3.307	3.262	3.197	3.126	3.059	3.001	2.954	2.914
2038	3.300	3.331	3.322	3.279	3.214	3.143	3.077	3.019	2.971
2039	3.242	3.314	3.347	3.338	3.295	3.231	3.161	3.094	3.036
2040	3.154	3.256	3.330	3.362	3.354	3.312	3.248	3.178	3.111
2041	3.053	3.168	3.271	3.345	3.379	3.371	3.329	3.265	3.194
2042	2.953	3.067	3.183	3.287	3.361	3.395	3.387	3.345	3.280
2043	2.865	2.967	3.082	3.199	3.302	3.377	3.411	3.403	3.360
2044	2.795	2.879	2.982	3.098	3.215	3.319	3.393	3.427	3.418
2045	2.743	2.809	2.894	2.998	3.114	3.231	3.335	3.409	3.441
2046	2.703	2.757	2.824	2.910	3.014	3.130	3.247	3.350	3.423
2047	2.666	2.717	2.772	2.840	2.926	3.030	3.146	3.262	3.365
2048	2.627	2.680	2.732	2.787	2.855	2.942	3.046	3.162	3.277
2049	2.539	2.641	2.695	2.747	2.803	2.871	2.958	3.062	3.176
2050	2.545	2.553	2.656	2.710	2.763	2.819	2.888	2.974	3.077

	54	55	56	57	58	59	60	61	62
2008	1.985	1.936	1.889	1.840	1.789	1.738	1.681	1.626	1.593
2009	2.170	2.120	2.068	2.016	1.958	1.896	1.831	1.758	1.694
2010	2.139	2.111	2.071	2.027	1.982	1.928	1.868	1.805	1.732
2011	2.140	2.126	2.097	2.057	2.014	1.971	1.920	1.863	1.799
2012	2.230	2.224	2.206	2.172	2.124	2.072	2.017	1.955	1.888
2013	2.253	2.251	2.243	2.222	2.184	2.132	2.074	2.013	1.947
2014	2.279	2.274	2.269	2.258	2.234	2.191	2.133	2.070	2.005
2015	2.310	2.299	2.292	2.284	2.270	2.240	2.192	2.128	2.060
2016	2.347	2.329	2.317	2.307	2.295	2.276	2.241	2.186	2.118
2017	2.389	2.366	2.347	2.332	2.317	2.301	2.276	2.235	2.176
2018	2.429	2.408	2.383	2.361	2.342	2.323	2.301	2.270	2.224
2019	2.462	2.448	2.425	2.398	2.371	2.348	2.323	2.295	2.258
2020	2.490	2.480	2.464	2.439	2.408	2.377	2.348	2.317	2.284
2021	2.515	2.508	2.497	2.477	2.448	2.413	2.376	2.341	2.306
2022	2.539	2.533	2.524	2.510	2.487	2.453	2.412	2.370	2.330
2023	2.570	2.557	2.548	2.537	2.519	2.491	2.452	2.405	2.359
2024	2.602	2.587	2.572	2.561	2.546	2.523	2.490	2.445	2.394
2025	2.626	2.619	2.602	2.585	2.569	2.550	2.522	2.483	2.434
2026	2.635	2.643	2.634	2.614	2.593	2.573	2.548	2.514	2.471
2027	2.631	2.652	2.657	2.646	2.623	2.597	2.572	2.541	2.503
2028	2.615	2.648	2.667	2.669	2.654	2.627	2.596	2.565	2.530
2029	2.601	2.632	2.663	2.679	2.678	2.658	2.625	2.589	2.553
2030	2.606	2.618	2.647	2.675	2.687	2.682	2.657	2.618	2.577
2031	2.639	2.623	2.633	2.659	2.684	2.691	2.680	2.649	2.607
2032	2.689	2.655	2.638	2.646	2.668	2.688	2.690	2.673	2.638
2033	2.743	2.705	2.670	2.650	2.654	2.672	2.687	2.683	2.662
2034	2.790	2.759	2.719	2.682	2.659	2.659	2.671	2.680	2.672
2035	2.830	2.806	2.773	2.731	2.690	2.664	2.658	2.665	2.669
2036	2.860	2.845	2.819	2.784	2.739	2.694	2.663	2.652	2.654
2037	2.889	2.875	2.858	2.830	2.792	2.743	2.694	2.657	2.642
2038	2.930	2.904	2.888	2.869	2.837	2.795	2.742	2.687	2.647
2039	2.987	2.945	2.916	2.898	2.876	2.840	2.793	2.735	2.677
2040	3.051	3.000	2.957	2.926	2.905	2.878	2.838	2.787	2.725
2041	3.126	3.065	3.012	2.966	2.933	2.907	2.876	2.831	2.776
2042	3.208	3.138	3.076	3.021	2.972	2.935	2.905	2.869	2.821
2043	3.294	3.220	3.149	3.084	3.027	2.974	2.933	2.898	2.858
2044	3.374	3.306	3.231	3.157	3.090	3.029	2.972	2.925	2.887
2045	3.431	3.385	3.316	3.239	3.162	3.091	3.026	2.965	2.914
2046	3.454	3.442	3.395	3.323	3.243	3.163	3.088	3.018	2.953
2047	3.436	3.465	3.452	3.402	3.328	3.244	3.160	3.080	3.006
2048	3.378	3.447	3.475	3.458	3.406	3.328	3.240	3.151	3.068
2049	3.290	3.389	3.457	3.481	3.462	3.406	3.324	3.231	3.139
2050	3.190	3.302	3.398	3.463	3.485	3.462	3.401	3.315	3.219

	63	64	65	66	67	68	69	70	71
2008	1.589	1.604	1.631	1.647	1.628	1.559	1.456	1.337	1.232
2009	1.664	1.673	1.709	1.755	1.778	1.745	1.642	1.495	1.331
2010	1.665	1.628	1.628	1.652	1.689	1.706	1.673	1.573	1.431
2011	1.718	1.636	1.580	1.559	1.567	1.597	1.617	1.593	1.506
2012	1.818	1.735	1.654	1.597	1.572	1.572	1.589	1.593	1.555
2013	1.879	1.810	1.731	1.653	1.596	1.567	1.556	1.558	1.548
2014	1.937	1.870	1.805	1.729	1.652	1.591	1.551	1.526	1.514
2015	1.994	1.928	1.864	1.802	1.727	1.645	1.574	1.522	1.484
2016	2.049	1.984	1.921	1.860	1.798	1.718	1.627	1.545	1.481
2017	2.106	2.038	1.976	1.915	1.855	1.787	1.699	1.597	1.504
2018	2.163	2.095	2.030	1.970	1.909	1.843	1.767	1.667	1.555
2019	2.211	2.151	2.086	2.023	1.963	1.897	1.822	1.734	1.623
2020	2.245	2.198	2.141	2.078	2.015	1.949	1.874	1.787	1.688
2021	2.271	2.233	2.188	2.133	2.069	2.000	1.926	1.839	1.741
2022	2.292	2.258	2.222	2.178	2.122	2.053	1.976	1.889	1.791
2023	2.317	2.279	2.247	2.212	2.168	2.106	2.028	1.939	1.841
2024	2.345	2.304	2.268	2.237	2.200	2.151	2.080	1.990	1.889
2025	2.380	2.332	2.292	2.258	2.225	2.183	2.123	2.041	1.939
2026	2.420	2.367	2.320	2.282	2.246	2.207	2.155	2.084	1.989
2027	2.457	2.406	2.355	2.310	2.270	2.229	2.180	2.116	2.032
2028	2.489	2.444	2.395	2.345	2.299	2.253	2.201	2.139	2.063
2029	2.516	2.475	2.432	2.384	2.333	2.281	2.225	2.161	2.086
2030	2.540	2.502	2.463	2.421	2.372	2.316	2.253	2.185	2.108
2031	2.563	2.526	2.490	2.452	2.409	2.354	2.288	2.213	2.133
2032	2.593	2.550	2.514	2.479	2.440	2.391	2.326	2.247	2.161
2033	2.624	2.580	2.538	2.503	2.467	2.421	2.362	2.285	2.195
2034	2.648	2.611	2.567	2.527	2.490	2.448	2.393	2.322	2.233
2035	2.658	2.634	2.598	2.556	2.514	2.471	2.419	2.352	2.269
2036	2.656	2.645	2.622	2.587	2.543	2.495	2.443	2.379	2.299
2037	2.642	2.643	2.633	2.610	2.574	2.524	2.466	2.402	2.326
2038	2.630	2.629	2.631	2.621	2.597	2.554	2.495	2.426	2.350
2039	2.635	2.618	2.618	2.620	2.608	2.578	2.526	2.455	2.374
2040	2.665	2.623	2.607	2.607	2.607	2.589	2.549	2.485	2.403
2041	2.713	2.653	2.612	2.596	2.595	2.588	2.561	2.509	2.433
2042	2.764	2.700	2.642	2.602	2.585	2.577	2.561	2.521	2.458
2043	2.808	2.751	2.689	2.632	2.591	2.567	2.550	2.522	2.470
2044	2.845	2.795	2.739	2.678	2.620	2.574	2.541	2.512	2.472
2045	2.874	2.832	2.783	2.728	2.666	2.603	2.548	2.504	2.463
2046	2.901	2.861	2.820	2.772	2.715	2.648	2.577	2.511	2.456
2047	2.940	2.888	2.849	2.809	2.758	2.697	2.622	2.540	2.464
2048	2.993	2.927	2.876	2.837	2.795	2.740	2.671	2.585	2.493
2049	3.054	2.979	2.914	2.864	2.823	2.777	2.713	2.633	2.538
2050	3.125	3.040	2.966	2.902	2.850	2.805	2.749	2.676	2.586

	72	73	74	75	76	77	78	79	80+
2008	1.160	1.138	1.150	1.120	1.131	1.140	1.138	1.114	3.842
2009	1.191	1.100	1.072	1.081	1.053	1.066	1.073	1.059	4.316
2010	1.273	1.136	1.044	1.011	1.012	978	985	987	4.604
2011	1.373	1.222	1.086	990	949	942	904	909	4.803
2012	1.457	1.319	1.168	1.033	938	896	883	841	4.949
2013	1.498	1.394	1.256	1.107	975	882	837	818	4.991
2014	1.492	1.434	1.328	1.192	1.045	917	825	776	5.009
2015	1.460	1.429	1.367	1.260	1.126	984	859	765	4.993
2016	1.432	1.399	1.363	1.298	1.192	1.060	921	797	4.974
2017	1.429	1.373	1.335	1.295	1.228	1.123	994	856	4.993
2018	1.452	1.371	1.311	1.270	1.226	1.158	1.053	924	5.070
2019	1.502	1.394	1.310	1.247	1.203	1.157	1.087	980	5.203
2020	1.569	1.443	1.333	1.248	1.183	1.136	1.087	1.012	5.375
2021	1.632	1.508	1.381	1.270	1.184	1.118	1.068	1.013	5.558
2022	1.684	1.570	1.444	1.317	1.206	1.120	1.052	996	5.722
2023	1.733	1.620	1.504	1.378	1.251	1.142	1.054	982	5.854
2024	1.782	1.668	1.553	1.436	1.310	1.185	1.076	985	5.960
2025	1.829	1.716	1.600	1.483	1.366	1.241	1.117	1.006	6.060
2026	1.878	1.762	1.647	1.529	1.412	1.295	1.171	1.045	6.172
2027	1.928	1.811	1.692	1.575	1.457	1.340	1.222	1.097	6.314
2028	1.968	1.858	1.738	1.618	1.500	1.382	1.265	1.145	6.486
2029	1.999	1.898	1.784	1.663	1.542	1.424	1.305	1.186	6.688
2030	2.023	1.929	1.824	1.708	1.586	1.465	1.346	1.225	6.909
2031	2.045	1.953	1.854	1.747	1.630	1.507	1.385	1.264	7.144
2032	2.070	1.975	1.879	1.777	1.668	1.550	1.427	1.302	7.392
2033	2.098	2.000	1.901	1.802	1.699	1.588	1.468	1.342	7.653
2034	2.133	2.029	1.927	1.825	1.723	1.618	1.505	1.382	7.925
2035	2.170	2.063	1.955	1.850	1.746	1.642	1.534	1.418	8.208
2036	2.206	2.100	1.989	1.879	1.771	1.665	1.559	1.447	8.496
2037	2.237	2.136	2.026	1.912	1.800	1.690	1.581	1.470	8.783
2038	2.263	2.167	2.062	1.949	1.833	1.719	1.606	1.493	9.066
2039	2.288	2.194	2.093	1.985	1.870	1.752	1.635	1.518	9.346
2040	2.312	2.218	2.120	2.016	1.905	1.788	1.667	1.546	9.624
2041	2.341	2.243	2.145	2.043	1.936	1.823	1.703	1.578	9.905
2042	2.372	2.272	2.170	2.068	1.964	1.854	1.738	1.613	10.193
2043	2.396	2.303	2.199	2.094	1.989	1.881	1.768	1.647	10.490
2044	2.410	2.328	2.231	2.123	2.014	1.907	1.796	1.678	10.795
2045	2.412	2.342	2.256	2.155	2.044	1.932	1.821	1.705	11.101
2046	2.405	2.346	2.271	2.180	2.075	1.962	1.847	1.730	11.408
2047	2.399	2.340	2.275	2.196	2.101	1.993	1.876	1.756	11.715
2048	2.408	2.335	2.271	2.202	2.118	2.020	1.908	1.786	12.025
2049	2.437	2.345	2.268	2.198	2.125	2.037	1.934	1.817	12.338
2050	2.482	2.375	2.278	2.197	2.123	2.045	1.952	1.844	12.659

Sinop, Scenario 1 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	2.439	2.431	2.429	2.427	2.425	2.609	2.700	2.787	2.864
2009	2.969	2.457	2.454	2.452	2.451	2.439	2.609	2.696	2.782
2010	2.903	2.971	2.466	2.463	2.462	2.460	2.447	2.617	2.705
2011	2.828	2.894	2.967	2.463	2.461	2.460	2.459	2.445	2.614
2012	2.722	2.795	2.867	2.941	2.437	2.425	2.410	2.404	2.390
2013	2.679	2.717	2.795	2.867	2.941	2.438	2.426	2.412	2.405
2014	2.660	2.674	2.717	2.795	2.868	2.942	2.439	2.427	2.413
2015	2.639	2.656	2.674	2.717	2.796	2.868	2.942	2.440	2.428
2016	2.616	2.634	2.655	2.674	2.718	2.796	2.868	2.943	2.440
2017	2.591	2.611	2.634	2.655	2.674	2.718	2.796	2.868	2.942
2018	2.564	2.587	2.611	2.634	2.656	2.674	2.717	2.796	2.868
2019	2.533	2.560	2.586	2.611	2.634	2.655	2.673	2.717	2.795
2020	2.497	2.528	2.559	2.586	2.611	2.633	2.654	2.673	2.716
2021	2.457	2.493	2.528	2.559	2.586	2.610	2.632	2.653	2.671
2022	2.412	2.453	2.492	2.527	2.559	2.585	2.608	2.631	2.652
2023	2.367	2.408	2.452	2.492	2.527	2.557	2.583	2.607	2.629
2024	2.341	2.363	2.407	2.452	2.491	2.526	2.555	2.581	2.604
2025	2.311	2.337	2.362	2.407	2.451	2.490	2.523	2.553	2.579
2026	2.279	2.307	2.336	2.361	2.406	2.449	2.487	2.521	2.550
2027	2.245	2.275	2.306	2.335	2.360	2.404	2.446	2.484	2.518
2028	2.209	2.241	2.274	2.305	2.334	2.358	2.401	2.443	2.481
2029	2.184	2.205	2.240	2.273	2.304	2.332	2.355	2.397	2.439
2030	2.166	2.180	2.204	2.238	2.271	2.302	2.328	2.351	2.393
2031	2.146	2.163	2.178	2.203	2.237	2.269	2.297	2.324	2.347
2032	2.123	2.142	2.161	2.177	2.201	2.234	2.264	2.293	2.319
2033	2.100	2.120	2.141	2.160	2.176	2.198	2.229	2.259	2.288
2034	2.081	2.096	2.118	2.139	2.158	2.172	2.193	2.224	2.254
2035	2.067	2.077	2.094	2.116	2.137	2.154	2.167	2.188	2.219
2036	2.054	2.063	2.075	2.092	2.114	2.133	2.149	2.161	2.182
2037	2.041	2.050	2.061	2.073	2.090	2.110	2.127	2.143	2.155
2038	2.029	2.037	2.047	2.059	2.071	2.086	2.104	2.121	2.136
2039	2.016	2.025	2.035	2.045	2.057	2.066	2.079	2.097	2.114
2040	2.001	2.012	2.022	2.032	2.043	2.052	2.059	2.072	2.090
2041	1.988	1.997	2.009	2.020	2.029	2.038	2.044	2.052	2.065
2042	1.975	1.983	1.994	2.006	2.017	2.024	2.030	2.037	2.044
2043	1.963	1.970	1.980	1.991	2.003	2.011	2.016	2.022	2.029
2044	1.944	1.958	1.967	1.977	1.988	1.997	2.003	2.008	2.014
2045	1.919	1.940	1.955	1.964	1.974	1.982	1.989	1.995	1.999
2046	1.895	1.914	1.936	1.951	1.961	1.968	1.973	1.980	1.986
2047	1.873	1.891	1.911	1.933	1.948	1.954	1.958	1.964	1.971
2048	1.850	1.868	1.887	1.907	1.929	1.941	1.945	1.949	1.955
2049	1.824	1.845	1.864	1.883	1.903	1.922	1.931	1.935	1.939
2050	1.794	1.819	1.841	1.860	1.879	1.896	1.912	1.921	1.925

	9	10	11	12	13	14	15	16	17
2008	2.929	2.988	3.049	3.124	3.218	3.321	3.432	3.519	3.542
2009	2.862	2.932	2.996	3.058	3.126	3.207	3.291	3.385	3.457
2010	2.795	2.879	2.953	3.018	3.077	3.137	3.208	3.283	3.366
2011	2.700	2.786	2.866	2.935	2.993	3.044	3.096	3.160	3.223
2012	2.565	2.661	2.757	2.840	2.902	2.941	2.968	2.997	3.042
2013	2.391	2.565	2.661	2.756	2.840	2.903	2.943	2.970	3.000
2014	2.406	2.391	2.565	2.660	2.756	2.841	2.904	2.946	2.974
2015	2.413	2.405	2.391	2.564	2.659	2.757	2.842	2.907	2.950
2016	2.428	2.412	2.404	2.389	2.563	2.660	2.758	2.845	2.911
2017	2.440	2.427	2.411	2.402	2.388	2.563	2.661	2.761	2.850
2018	2.942	2.438	2.425	2.408	2.401	2.388	2.565	2.665	2.766
2019	2.867	2.940	2.436	2.422	2.406	2.400	2.389	2.568	2.669
2020	2.793	2.864	2.936	2.432	2.420	2.406	2.402	2.393	2.573
2021	2.714	2.791	2.861	2.933	2.430	2.419	2.407	2.405	2.398
2022	2.669	2.711	2.787	2.857	2.930	2.429	2.420	2.411	2.411
2023	2.649	2.666	2.707	2.782	2.853	2.928	2.430	2.424	2.417
2024	2.626	2.645	2.661	2.702	2.778	2.851	2.929	2.434	2.430
2025	2.601	2.622	2.640	2.656	2.698	2.777	2.852	2.933	2.440
2026	2.575	2.597	2.616	2.634	2.651	2.695	2.778	2.857	2.939
2027	2.546	2.570	2.591	2.610	2.629	2.649	2.696	2.782	2.863
2028	2.513	2.541	2.564	2.584	2.605	2.627	2.650	2.701	2.788
2029	2.476	2.508	2.534	2.556	2.578	2.602	2.628	2.654	2.708
2030	2.435	2.470	2.500	2.526	2.550	2.575	2.602	2.632	2.661
2031	2.388	2.428	2.462	2.492	2.520	2.547	2.576	2.607	2.640
2032	2.341	2.381	2.420	2.454	2.485	2.516	2.548	2.581	2.615
2033	2.314	2.334	2.372	2.411	2.447	2.481	2.517	2.553	2.588
2034	2.282	2.306	2.325	2.363	2.403	2.443	2.482	2.522	2.561
2035	2.248	2.274	2.296	2.315	2.355	2.399	2.443	2.487	2.530
2036	2.212	2.239	2.264	2.286	2.306	2.351	2.399	2.449	2.496
2037	2.175	2.203	2.229	2.253	2.277	2.302	2.351	2.405	2.457
2038	2.147	2.165	2.192	2.218	2.244	2.272	2.302	2.357	2.414
2039	2.128	2.138	2.154	2.181	2.208	2.239	2.272	2.308	2.365
2040	2.106	2.118	2.126	2.142	2.171	2.202	2.239	2.278	2.317
2041	2.081	2.095	2.106	2.113	2.132	2.165	2.203	2.245	2.288
2042	2.056	2.071	2.083	2.093	2.103	2.126	2.165	2.209	2.254
2043	2.035	2.044	2.057	2.069	2.082	2.096	2.126	2.171	2.218
2044	2.019	2.023	2.031	2.044	2.058	2.075	2.096	2.132	2.181
2045	2.004	2.007	2.009	2.017	2.032	2.051	2.075	2.103	2.142
2046	1.989	1.991	1.993	1.994	2.004	2.025	2.051	2.082	2.113
2047	1.975	1.976	1.976	1.978	1.982	1.997	2.024	2.057	2.092
2048	1.960	1.962	1.961	1.961	1.965	1.974	1.997	2.031	2.068
2049	1.943	1.946	1.946	1.945	1.947	1.957	1.974	2.004	2.042
2050	1.928	1.929	1.930	1.929	1.931	1.939	1.956	1.981	2.015

	18	19	20	21	22	23	24	25	26
2008	3.481	3.357	3.206	3.067	2.960	2.904	2.886	2.877	2.854
2009	3.464	3.388	3.250	3.084	2.939	2.838	2.800	2.807	2.826
2010	3.426	3.422	3.333	3.183	3.009	2.862	2.766	2.737	2.752
2011	3.288	3.322	3.288	3.170	3.002	2.830	2.704	2.639	2.642
2012	3.096	3.159	3.197	3.167	3.054	2.892	2.727	2.608	2.551
2013	3.045	3.099	3.162	3.199	3.168	3.055	2.893	2.728	2.610
2014	3.004	3.048	3.100	3.162	3.199	3.168	3.055	2.894	2.730
2015	2.978	3.007	3.050	3.101	3.162	3.197	3.167	3.055	2.894
2016	2.953	2.980	3.008	3.049	3.099	3.159	3.196	3.166	3.054
2017	2.915	2.956	2.981	3.007	3.047	3.096	3.156	3.193	3.164
2018	2.854	2.918	2.957	2.980	3.003	3.043	3.092	3.154	3.191
2019	2.770	2.856	2.918	2.954	2.975	2.998	3.038	3.088	3.151
2020	2.674	2.773	2.856	2.915	2.949	2.969	2.993	3.033	3.085
2021	2.578	2.676	2.772	2.853	2.909	2.942	2.963	2.987	3.029
2022	2.403	2.580	2.676	2.768	2.846	2.901	2.935	2.957	2.982
2023	2.416	2.406	2.579	2.671	2.760	2.837	2.893	2.928	2.951
2024	2.422	2.419	2.404	2.574	2.662	2.751	2.828	2.885	2.921
2025	2.435	2.424	2.417	2.398	2.565	2.652	2.741	2.819	2.878
2026	2.445	2.438	2.422	2.410	2.388	2.553	2.641	2.731	2.811
2027	2.945	2.448	2.435	2.415	2.399	2.376	2.541	2.630	2.722
2028	2.869	2.947	2.445	2.427	2.403	2.385	2.363	2.530	2.621
2029	2.794	2.871	2.943	2.436	2.414	2.388	2.371	2.351	2.520
2030	2.714	2.796	2.867	2.933	2.422	2.398	2.373	2.359	2.340
2031	2.668	2.716	2.792	2.856	2.918	2.405	2.382	2.359	2.347
2032	2.646	2.669	2.711	2.781	2.840	2.900	2.389	2.368	2.347
2033	2.621	2.648	2.664	2.699	2.764	2.821	2.882	2.373	2.354
2034	2.595	2.623	2.642	2.652	2.682	2.744	2.802	2.865	2.359
2035	2.567	2.597	2.617	2.629	2.634	2.661	2.724	2.785	2.850
2036	2.537	2.569	2.591	2.604	2.610	2.612	2.640	2.706	2.769
2037	2.503	2.539	2.563	2.576	2.583	2.587	2.590	2.621	2.689
2038	2.464	2.504	2.532	2.547	2.555	2.559	2.564	2.570	2.603
2039	2.421	2.466	2.497	2.516	2.525	2.530	2.535	2.543	2.551
2040	2.373	2.422	2.458	2.480	2.493	2.499	2.505	2.514	2.524
2041	2.324	2.374	2.414	2.441	2.456	2.466	2.473	2.482	2.494
2042	2.295	2.326	2.366	2.396	2.416	2.429	2.439	2.450	2.462
2043	2.262	2.296	2.317	2.347	2.371	2.387	2.401	2.415	2.429
2044	2.227	2.263	2.287	2.298	2.321	2.341	2.358	2.375	2.393
2045	2.189	2.227	2.254	2.267	2.270	2.290	2.311	2.332	2.352
2046	2.150	2.190	2.218	2.233	2.239	2.238	2.259	2.284	2.308
2047	2.122	2.151	2.180	2.196	2.204	2.206	2.206	2.231	2.259
2048	2.101	2.122	2.140	2.158	2.166	2.170	2.173	2.177	2.206
2049	2.077	2.102	2.111	2.118	2.127	2.131	2.136	2.143	2.151
2050	2.051	2.077	2.090	2.088	2.086	2.091	2.096	2.105	2.117

	27	28	29	30	31	32	33	34	35
2008	2.812	2.743	2.657	2.565	2.488	2.435	2.418	2.427	2.446
2009	2.825	2.799	2.736	2.652	2.563	2.489	2.440	2.425	2.436
2010	2.780	2.790	2.774	2.723	2.651	2.571	2.501	2.452	2.435
2011	2.686	2.735	2.757	2.749	2.708	2.644	2.569	2.501	2.452
2012	2.563	2.614	2.669	2.697	2.695	2.659	2.599	2.527	2.462
2013	2.553	2.564	2.614	2.667	2.693	2.690	2.654	2.595	2.525
2014	2.611	2.554	2.564	2.612	2.663	2.688	2.685	2.649	2.592
2015	2.730	2.612	2.553	2.561	2.608	2.657	2.682	2.680	2.646
2016	2.894	2.730	2.610	2.550	2.557	2.602	2.652	2.677	2.677
2017	3.053	2.893	2.728	2.607	2.545	2.551	2.596	2.646	2.673
2018	3.163	3.051	2.890	2.724	2.601	2.539	2.545	2.591	2.642
2019	3.189	3.160	3.048	2.886	2.718	2.595	2.533	2.539	2.586
2020	3.148	3.186	3.156	3.043	2.880	2.711	2.588	2.527	2.535
2021	3.081	3.144	3.182	3.151	3.036	2.873	2.705	2.582	2.522
2022	3.025	3.077	3.139	3.175	3.144	3.029	2.865	2.698	2.577
2023	2.978	3.020	3.072	3.133	3.168	3.136	3.021	2.859	2.693
2024	2.945	2.972	3.014	3.065	3.125	3.160	3.128	3.014	2.853
2025	2.915	2.940	2.966	3.007	3.057	3.117	3.152	3.121	3.008
2026	2.871	2.909	2.933	2.959	2.999	3.049	3.109	3.145	3.114
2027	2.804	2.864	2.902	2.925	2.950	2.991	3.041	3.101	3.137
2028	2.714	2.796	2.856	2.893	2.916	2.941	2.982	3.032	3.094
2029	2.612	2.706	2.788	2.847	2.884	2.907	2.933	2.974	3.025
2030	2.510	2.603	2.698	2.779	2.838	2.875	2.898	2.924	2.966
2031	2.330	2.501	2.594	2.688	2.769	2.829	2.866	2.890	2.916
2032	2.336	2.320	2.491	2.585	2.678	2.760	2.819	2.857	2.881
2033	2.336	2.326	2.310	2.481	2.574	2.668	2.750	2.810	2.849
2034	2.342	2.325	2.315	2.300	2.471	2.564	2.659	2.741	2.802
2035	2.346	2.331	2.314	2.304	2.289	2.461	2.555	2.649	2.732
2036	2.837	2.334	2.319	2.302	2.293	2.279	2.450	2.545	2.640
2037	2.755	2.824	2.322	2.307	2.291	2.283	2.268	2.441	2.535
2038	2.674	2.741	2.811	2.309	2.296	2.280	2.272	2.258	2.431
2039	2.587	2.660	2.727	2.798	2.297	2.284	2.269	2.262	2.248
2040	2.535	2.573	2.646	2.714	2.785	2.286	2.273	2.259	2.252
2041	2.507	2.520	2.558	2.632	2.701	2.773	2.275	2.263	2.248
2042	2.476	2.491	2.505	2.544	2.619	2.689	2.761	2.264	2.252
2043	2.443	2.459	2.476	2.490	2.530	2.606	2.677	2.750	2.252
2044	2.409	2.426	2.443	2.461	2.476	2.518	2.595	2.665	2.738
2045	2.373	2.391	2.410	2.428	2.446	2.463	2.506	2.583	2.653
2046	2.332	2.354	2.374	2.394	2.413	2.433	2.451	2.493	2.570
2047	2.287	2.313	2.337	2.358	2.379	2.400	2.420	2.438	2.481
2048	2.237	2.267	2.295	2.320	2.343	2.365	2.387	2.408	2.425
2049	2.183	2.217	2.249	2.277	2.304	2.329	2.352	2.374	2.394
2050	2.128	2.162	2.198	2.231	2.262	2.290	2.316	2.339	2.361

	36	37	38	39	40	41	42	43	44
2008	2.461	2.470	2.469	2.460	2.449	2.443	2.444	2.455	2.471
2009	2.457	2.473	2.481	2.478	2.466	2.453	2.445	2.446	2.458
2010	2.443	2.462	2.475	2.481	2.476	2.462	2.447	2.442	2.449
2011	2.433	2.441	2.457	2.469	2.475	2.468	2.453	2.440	2.438
2012	2.414	2.398	2.407	2.424	2.437	2.444	2.439	2.427	2.419
2013	2.461	2.414	2.398	2.406	2.423	2.435	2.441	2.434	2.421
2014	2.523	2.460	2.414	2.398	2.405	2.421	2.432	2.436	2.427
2015	2.590	2.522	2.460	2.413	2.396	2.403	2.418	2.427	2.429
2016	2.644	2.589	2.521	2.458	2.412	2.394	2.399	2.413	2.421
2017	2.674	2.642	2.587	2.520	2.457	2.409	2.391	2.395	2.407
2018	2.670	2.672	2.640	2.585	2.518	2.454	2.406	2.386	2.388
2019	2.639	2.668	2.670	2.638	2.583	2.515	2.450	2.401	2.380
2020	2.583	2.636	2.665	2.667	2.635	2.580	2.511	2.446	2.395
2021	2.531	2.580	2.633	2.662	2.664	2.632	2.576	2.507	2.439
2022	2.518	2.527	2.577	2.630	2.659	2.661	2.628	2.571	2.500
2023	2.573	2.514	2.524	2.573	2.627	2.656	2.657	2.624	2.565
2024	2.688	2.568	2.511	2.521	2.570	2.624	2.652	2.652	2.617
2025	2.847	2.683	2.564	2.507	2.517	2.567	2.620	2.647	2.646
2026	3.002	2.842	2.678	2.560	2.503	2.514	2.563	2.615	2.641
2027	3.108	2.996	2.837	2.674	2.557	2.500	2.510	2.558	2.609
2028	3.131	3.101	2.991	2.832	2.670	2.553	2.496	2.506	2.552
2029	3.087	3.124	3.095	2.985	2.828	2.666	2.549	2.492	2.499
2030	3.018	3.080	3.118	3.090	2.981	2.824	2.662	2.545	2.485
2031	2.959	3.010	3.073	3.112	3.085	2.976	2.820	2.657	2.538
2032	2.908	2.951	3.003	3.067	3.107	3.080	2.972	2.815	2.651
2033	2.873	2.900	2.944	2.997	3.062	3.102	3.076	2.967	2.808
2034	2.840	2.865	2.893	2.937	2.992	3.057	3.098	3.070	2.960
2035	2.793	2.831	2.857	2.886	2.932	2.987	3.053	3.092	3.063
2036	2.723	2.784	2.823	2.850	2.880	2.927	2.983	3.047	3.085
2037	2.630	2.713	2.775	2.816	2.844	2.875	2.923	2.977	3.040
2038	2.525	2.621	2.704	2.767	2.810	2.839	2.871	2.917	2.970
2039	2.421	2.515	2.612	2.696	2.761	2.805	2.835	2.866	2.910
2040	2.238	2.410	2.506	2.603	2.690	2.756	2.800	2.830	2.859
2041	2.241	2.227	2.401	2.498	2.597	2.685	2.752	2.795	2.822
2042	2.237	2.230	2.217	2.392	2.491	2.592	2.681	2.747	2.788
2043	2.240	2.226	2.219	2.209	2.385	2.486	2.587	2.676	2.740
2044	2.241	2.228	2.215	2.210	2.202	2.380	2.482	2.583	2.668
2045	2.725	2.228	2.217	2.205	2.203	2.197	2.376	2.477	2.575
2046	2.640	2.712	2.217	2.207	2.198	2.198	2.193	2.371	2.470
2047	2.557	2.627	2.700	2.207	2.200	2.193	2.194	2.188	2.364
2048	2.467	2.543	2.614	2.690	2.199	2.194	2.188	2.189	2.181
2049	2.412	2.453	2.530	2.604	2.681	2.193	2.190	2.184	2.182
2050	2.380	2.397	2.440	2.519	2.595	2.675	2.189	2.186	2.177

	45	46	47	48	49	50	51	52	53
2008	2.491	2.505	2.504	2.482	2.445	2.399	2.358	2.327	2.315
2009	2.477	2.499	2.516	2.517	2.498	2.464	2.421	2.382	2.353
2010	2.469	2.496	2.525	2.548	2.555	2.539	2.509	2.471	2.435
2011	2.450	2.474	2.505	2.539	2.566	2.576	2.564	2.538	2.505
2012	2.422	2.439	2.468	2.504	2.543	2.574	2.589	2.580	2.557
2013	2.410	2.412	2.426	2.453	2.487	2.523	2.552	2.564	2.554
2014	2.412	2.400	2.399	2.411	2.436	2.468	2.501	2.528	2.538
2015	2.419	2.402	2.387	2.384	2.394	2.417	2.446	2.478	2.502
2016	2.421	2.408	2.389	2.372	2.367	2.375	2.396	2.423	2.452
2017	2.412	2.410	2.396	2.374	2.356	2.348	2.354	2.372	2.397
2018	2.398	2.402	2.397	2.381	2.357	2.337	2.327	2.331	2.348
2019	2.380	2.388	2.389	2.382	2.364	2.338	2.316	2.304	2.306
2020	2.371	2.369	2.375	2.374	2.365	2.344	2.317	2.293	2.280
2021	2.386	2.360	2.356	2.359	2.356	2.346	2.324	2.295	2.269
2022	2.431	2.375	2.347	2.341	2.342	2.337	2.325	2.301	2.271
2023	2.491	2.420	2.362	2.332	2.324	2.323	2.316	2.303	2.277
2024	2.556	2.480	2.406	2.347	2.315	2.305	2.302	2.294	2.279
2025	2.608	2.544	2.466	2.390	2.329	2.296	2.284	2.280	2.270
2026	2.636	2.596	2.530	2.450	2.373	2.310	2.275	2.261	2.256
2027	2.631	2.625	2.582	2.514	2.432	2.354	2.289	2.252	2.238
2028	2.599	2.620	2.610	2.565	2.496	2.413	2.332	2.267	2.229
2029	2.542	2.588	2.605	2.594	2.547	2.476	2.391	2.310	2.243
2030	2.490	2.531	2.573	2.588	2.575	2.527	2.455	2.368	2.286
2031	2.476	2.478	2.516	2.556	2.570	2.555	2.505	2.432	2.345
2032	2.529	2.464	2.464	2.500	2.538	2.550	2.533	2.482	2.408
2033	2.641	2.517	2.450	2.447	2.481	2.518	2.528	2.510	2.458
2034	2.798	2.629	2.502	2.433	2.429	2.461	2.496	2.505	2.486
2035	2.949	2.785	2.614	2.485	2.415	2.409	2.440	2.473	2.481
2036	3.053	2.936	2.769	2.596	2.466	2.395	2.387	2.417	2.450
2037	3.074	3.039	2.920	2.752	2.577	2.446	2.373	2.365	2.393
2038	3.029	3.061	3.023	2.902	2.732	2.557	2.424	2.350	2.341
2039	2.960	3.016	3.044	3.005	2.882	2.711	2.534	2.401	2.327
2040	2.900	2.946	3.000	3.026	2.984	2.861	2.688	2.511	2.378
2041	2.848	2.886	2.930	2.981	3.005	2.962	2.838	2.665	2.488
2042	2.812	2.835	2.870	2.911	2.960	2.983	2.939	2.814	2.641
2043	2.778	2.799	2.818	2.851	2.891	2.939	2.960	2.915	2.789
2044	2.729	2.764	2.782	2.800	2.831	2.869	2.915	2.936	2.890
2045	2.658	2.716	2.748	2.763	2.779	2.809	2.846	2.891	2.911
2046	2.565	2.644	2.699	2.729	2.743	2.758	2.786	2.822	2.867
2047	2.459	2.551	2.628	2.680	2.708	2.721	2.735	2.762	2.798
2048	2.354	2.446	2.535	2.609	2.660	2.687	2.699	2.711	2.739
2049	2.171	2.340	2.429	2.516	2.589	2.638	2.664	2.675	2.688
2050	2.172	2.158	2.324	2.411	2.496	2.567	2.616	2.641	2.652

	54	55	56	57	58	59	60	61	62
2008	2.313	2.316	2.312	2.292	2.250	2.192	2.125	2.064	2.018
2009	2.340	2.338	2.339	2.333	2.311	2.266	2.206	2.137	2.072
2010	2.410	2.401	2.402	2.404	2.395	2.366	2.314	2.245	2.167
2011	2.478	2.461	2.459	2.464	2.465	2.450	2.412	2.350	2.272
2012	2.527	2.500	2.484	2.481	2.484	2.483	2.464	2.423	2.356
2013	2.529	2.497	2.468	2.450	2.446	2.447	2.444	2.425	2.382
2014	2.526	2.499	2.465	2.435	2.415	2.409	2.410	2.406	2.384
2015	2.510	2.496	2.468	2.432	2.401	2.380	2.373	2.372	2.366
2016	2.474	2.481	2.465	2.435	2.398	2.366	2.344	2.336	2.333
2017	2.425	2.446	2.450	2.433	2.402	2.364	2.331	2.308	2.299
2018	2.371	2.397	2.416	2.419	2.401	2.369	2.330	2.296	2.271
2019	2.321	2.343	2.368	2.385	2.387	2.368	2.335	2.295	2.260
2020	2.281	2.294	2.315	2.338	2.354	2.355	2.334	2.300	2.259
2021	2.255	2.254	2.267	2.286	2.308	2.323	2.322	2.300	2.265
2022	2.244	2.229	2.227	2.239	2.256	2.277	2.290	2.288	2.265
2023	2.246	2.218	2.202	2.200	2.210	2.226	2.245	2.258	2.254
2024	2.252	2.220	2.192	2.175	2.172	2.181	2.196	2.214	2.224
2025	2.254	2.227	2.195	2.166	2.148	2.143	2.151	2.165	2.181
2026	2.246	2.229	2.202	2.169	2.139	2.120	2.114	2.121	2.133
2027	2.232	2.221	2.204	2.176	2.143	2.112	2.092	2.085	2.090
2028	2.214	2.208	2.197	2.179	2.150	2.116	2.084	2.063	2.055
2029	2.205	2.190	2.183	2.172	2.154	2.124	2.088	2.056	2.034
2030	2.220	2.181	2.166	2.159	2.147	2.128	2.097	2.061	2.027
2031	2.262	2.196	2.158	2.142	2.134	2.121	2.101	2.070	2.032
2032	2.321	2.239	2.173	2.134	2.118	2.110	2.095	2.074	2.041
2033	2.384	2.298	2.216	2.150	2.111	2.094	2.084	2.069	2.046
2034	2.435	2.361	2.275	2.193	2.126	2.087	2.069	2.058	2.041
2035	2.462	2.411	2.338	2.252	2.170	2.103	2.062	2.043	2.030
2036	2.458	2.439	2.388	2.315	2.229	2.146	2.078	2.037	2.016
2037	2.426	2.435	2.416	2.365	2.292	2.205	2.122	2.053	2.010
2038	2.370	2.404	2.412	2.394	2.343	2.268	2.181	2.097	2.026
2039	2.319	2.348	2.382	2.390	2.372	2.319	2.244	2.155	2.070
2040	2.305	2.297	2.327	2.360	2.368	2.348	2.295	2.218	2.128
2041	2.355	2.283	2.276	2.306	2.339	2.346	2.324	2.270	2.191
2042	2.465	2.334	2.263	2.256	2.285	2.317	2.322	2.299	2.243
2043	2.617	2.443	2.313	2.243	2.236	2.264	2.294	2.297	2.272
2044	2.765	2.595	2.422	2.294	2.223	2.215	2.242	2.270	2.271
2045	2.866	2.743	2.574	2.402	2.274	2.203	2.193	2.218	2.244
2046	2.887	2.844	2.722	2.554	2.383	2.254	2.181	2.170	2.193
2047	2.843	2.865	2.822	2.701	2.534	2.362	2.232	2.159	2.146
2048	2.775	2.821	2.844	2.802	2.681	2.513	2.340	2.210	2.135
2049	2.716	2.753	2.801	2.824	2.782	2.660	2.491	2.317	2.185
2050	2.666	2.695	2.733	2.781	2.804	2.760	2.637	2.467	2.293

	63	64	65	66	67	68	69	70	71
2008	1.996	1.989	1.991	1.983	1.948	1.875	1.776	1.663	1.562
2009	2.021	1.993	1.979	1.974	1.958	1.914	1.834	1.728	1.608
2010	2.094	2.038	2.004	1.983	1.970	1.943	1.887	1.794	1.676
2011	2.183	2.100	2.031	1.984	1.951	1.926	1.892	1.831	1.733
2012	2.268	2.167	2.068	1.983	1.923	1.882	1.856	1.822	1.763
2013	2.313	2.222	2.117	2.015	1.928	1.865	1.823	1.794	1.759
2014	2.339	2.266	2.172	2.064	1.959	1.870	1.806	1.763	1.733
2015	2.342	2.293	2.216	2.118	2.007	1.901	1.811	1.748	1.703
2016	2.324	2.296	2.242	2.161	2.060	1.948	1.842	1.753	1.689
2017	2.292	2.279	2.245	2.187	2.102	2.000	1.888	1.783	1.694
2018	2.259	2.248	2.229	2.191	2.128	2.042	1.939	1.828	1.724
2019	2.232	2.215	2.199	2.175	2.132	2.067	1.980	1.878	1.768
2020	2.221	2.189	2.167	2.146	2.117	2.071	2.005	1.918	1.817
2021	2.221	2.179	2.143	2.115	2.090	2.057	2.010	1.944	1.857
2022	2.227	2.180	2.133	2.091	2.059	2.030	1.997	1.948	1.882
2023	2.228	2.186	2.134	2.082	2.036	2.002	1.971	1.936	1.887
2024	2.217	2.187	2.140	2.083	2.028	1.979	1.943	1.912	1.876
2025	2.188	2.177	2.142	2.090	2.029	1.971	1.922	1.885	1.853
2026	2.146	2.148	2.132	2.092	2.036	1.973	1.914	1.865	1.828
2027	2.099	2.107	2.104	2.083	2.039	1.980	1.917	1.858	1.809
2028	2.056	2.061	2.063	2.055	2.029	1.983	1.924	1.861	1.803
2029	2.022	2.019	2.018	2.015	2.003	1.974	1.927	1.869	1.807
2030	2.001	1.985	1.977	1.971	1.964	1.948	1.919	1.873	1.816
2031	1.995	1.966	1.944	1.931	1.920	1.910	1.894	1.865	1.819
2032	2.000	1.959	1.925	1.899	1.881	1.868	1.857	1.842	1.813
2033	2.010	1.966	1.920	1.881	1.850	1.830	1.816	1.806	1.791
2034	2.015	1.976	1.926	1.875	1.832	1.800	1.779	1.766	1.756
2035	2.010	1.981	1.936	1.882	1.827	1.782	1.750	1.730	1.718
2036	2.000	1.976	1.942	1.892	1.834	1.778	1.733	1.702	1.683
2037	1.986	1.966	1.937	1.898	1.844	1.785	1.729	1.686	1.656
2038	1.981	1.952	1.928	1.894	1.850	1.795	1.736	1.683	1.641
2039	1.997	1.947	1.914	1.884	1.846	1.801	1.747	1.690	1.639
2040	2.040	1.964	1.909	1.871	1.837	1.797	1.753	1.701	1.647
2041	2.099	2.007	1.925	1.866	1.824	1.789	1.750	1.708	1.658
2042	2.162	2.065	1.969	1.882	1.820	1.776	1.741	1.705	1.665
2043	2.213	2.127	2.026	1.925	1.836	1.772	1.729	1.697	1.662
2044	2.242	2.178	2.088	1.983	1.878	1.788	1.725	1.685	1.655
2045	2.241	2.208	2.139	2.044	1.935	1.830	1.741	1.681	1.644
2046	2.215	2.207	2.169	2.095	1.996	1.886	1.782	1.697	1.640
2047	2.164	2.181	2.169	2.125	2.046	1.946	1.838	1.738	1.656
2048	2.118	2.132	2.143	2.124	2.076	1.996	1.898	1.794	1.697
2049	2.107	2.086	2.094	2.099	2.076	2.026	1.948	1.853	1.752
2050	2.158	2.076	2.049	2.051	2.052	2.026	1.978	1.902	1.811

	72	73	74	75	76	77	78	79	80+
2008	1.495	1.474	1.487	1.450	1.459	1.472	1.481	1.479	5.566
2009	1.502	1.429	1.402	1.406	1.362	1.363	1.367	1.367	6.073
2010	1.548	1.436	1.359	1.326	1.321	1.274	1.269	1.265	6.412
2011	1.613	1.482	1.368	1.287	1.246	1.234	1.184	1.175	6.607
2012	1.667	1.547	1.416	1.298	1.211	1.164	1.146	1.096	6.692
2013	1.698	1.600	1.478	1.346	1.227	1.137	1.085	1.058	6.702
2014	1.695	1.631	1.530	1.407	1.274	1.153	1.060	1.003	6.683
2015	1.670	1.629	1.560	1.456	1.331	1.197	1.076	981	6.623
2016	1.642	1.605	1.559	1.486	1.379	1.252	1.118	996	6.559
2017	1.629	1.579	1.537	1.485	1.408	1.298	1.170	1.036	6.527
2018	1.635	1.567	1.513	1.466	1.408	1.326	1.214	1.086	6.544
2019	1.664	1.574	1.502	1.443	1.391	1.327	1.241	1.127	6.612
2020	1.708	1.603	1.510	1.434	1.370	1.311	1.243	1.153	6.716
2021	1.755	1.645	1.538	1.442	1.362	1.293	1.229	1.156	6.837
2022	1.794	1.692	1.579	1.469	1.370	1.287	1.213	1.144	6.950
2023	1.819	1.730	1.624	1.510	1.397	1.295	1.207	1.129	7.045
2024	1.825	1.754	1.662	1.553	1.436	1.321	1.216	1.125	7.118
2025	1.815	1.760	1.686	1.589	1.478	1.358	1.241	1.134	7.184
2026	1.793	1.752	1.693	1.613	1.513	1.399	1.277	1.158	7.257
2027	1.770	1.732	1.685	1.621	1.537	1.433	1.316	1.193	7.351
2028	1.753	1.710	1.667	1.615	1.546	1.457	1.349	1.230	7.472
2029	1.748	1.695	1.648	1.599	1.541	1.466	1.372	1.262	7.620
2030	1.753	1.692	1.634	1.582	1.527	1.463	1.382	1.285	7.786
2031	1.762	1.697	1.631	1.569	1.511	1.450	1.380	1.295	7.957
2032	1.766	1.706	1.637	1.568	1.500	1.436	1.369	1.294	8.124
2033	1.761	1.712	1.648	1.574	1.500	1.427	1.357	1.286	8.278
2034	1.740	1.707	1.654	1.585	1.508	1.428	1.350	1.275	8.412
2035	1.707	1.687	1.650	1.592	1.519	1.436	1.351	1.269	8.527
2036	1.670	1.656	1.632	1.589	1.526	1.448	1.360	1.272	8.631
2037	1.637	1.621	1.602	1.572	1.524	1.456	1.372	1.281	8.732
2038	1.611	1.589	1.569	1.544	1.509	1.455	1.381	1.293	8.839
2039	1.597	1.565	1.539	1.513	1.483	1.441	1.381	1.302	8.955
2040	1.595	1.552	1.516	1.485	1.453	1.417	1.368	1.303	9.073
2041	1.604	1.551	1.504	1.463	1.427	1.389	1.346	1.292	9.189
2042	1.616	1.560	1.504	1.453	1.407	1.365	1.321	1.272	9.290
2043	1.623	1.572	1.514	1.454	1.398	1.346	1.298	1.249	9.368
2044	1.621	1.580	1.527	1.464	1.400	1.339	1.282	1.229	9.425
2045	1.614	1.579	1.535	1.477	1.411	1.341	1.275	1.214	9.464
2046	1.604	1.573	1.534	1.486	1.424	1.352	1.278	1.208	9.491
2047	1.601	1.563	1.529	1.486	1.433	1.366	1.290	1.212	9.520
2048	1.617	1.561	1.520	1.481	1.434	1.376	1.304	1.225	9.560
2049	1.658	1.577	1.518	1.473	1.430	1.377	1.314	1.239	9.616
2050	1.712	1.618	1.535	1.472	1.423	1.374	1.316	1.249	9.689

Sinop, Scenario 2 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	2.439	2.431	2.429	2.427	2.425	2.609	2.700	2.787	2.864
2009	2.969	2.457	2.454	2.452	2.451	2.439	2.609	2.696	2.782
2010	2.903	2.971	2.466	2.463	2.462	2.460	2.447	2.617	2.705
2011	2.828	2.894	2.967	2.463	2.461	2.460	2.459	2.445	2.614
2012	2.722	2.795	2.867	2.941	2.437	2.425	2.410	2.404	2.390
2013	2.679	2.717	2.795	2.867	2.941	2.438	2.426	2.412	2.405
2014	2.661	2.674	2.717	2.796	2.868	2.942	2.439	2.428	2.413
2015	2.639	2.656	2.674	2.718	2.796	2.869	2.943	2.441	2.429
2016	2.616	2.635	2.656	2.675	2.719	2.797	2.870	2.944	2.442
2017	2.592	2.612	2.635	2.657	2.676	2.720	2.798	2.871	2.946
2018	2.565	2.588	2.613	2.636	2.658	2.677	2.721	2.800	2.872
2019	2.534	2.562	2.589	2.613	2.637	2.659	2.678	2.722	2.801
2020	2.499	2.531	2.562	2.589	2.614	2.638	2.660	2.680	2.724
2021	2.459	2.496	2.531	2.563	2.590	2.616	2.639	2.662	2.681
2022	2.414	2.456	2.496	2.532	2.564	2.592	2.617	2.641	2.663
2023	2.369	2.412	2.457	2.497	2.533	2.565	2.593	2.618	2.642
2024	2.344	2.367	2.412	2.458	2.499	2.535	2.567	2.594	2.620
2025	2.314	2.341	2.367	2.413	2.459	2.500	2.536	2.568	2.596
2026	2.282	2.312	2.342	2.368	2.414	2.460	2.501	2.537	2.569
2027	2.249	2.280	2.313	2.343	2.369	2.416	2.461	2.502	2.538
2028	2.214	2.247	2.281	2.313	2.344	2.370	2.417	2.462	2.503
2029	2.189	2.212	2.247	2.282	2.314	2.345	2.372	2.418	2.463
2030	2.173	2.187	2.213	2.248	2.283	2.315	2.346	2.373	2.419
2031	2.153	2.171	2.188	2.213	2.249	2.283	2.316	2.347	2.374
2032	2.131	2.152	2.172	2.189	2.214	2.250	2.284	2.317	2.348
2033	2.108	2.130	2.152	2.172	2.190	2.215	2.251	2.285	2.318
2034	2.091	2.107	2.130	2.153	2.173	2.190	2.216	2.252	2.286
2035	2.078	2.089	2.107	2.131	2.153	2.174	2.191	2.217	2.252
2036	2.065	2.077	2.090	2.108	2.132	2.154	2.174	2.192	2.217
2037	2.054	2.064	2.077	2.090	2.108	2.132	2.154	2.175	2.192
2038	2.043	2.052	2.064	2.077	2.090	2.109	2.133	2.155	2.176
2039	2.030	2.041	2.052	2.064	2.077	2.091	2.109	2.133	2.156
2040	2.017	2.029	2.041	2.052	2.065	2.078	2.091	2.110	2.133
2041	2.004	2.015	2.029	2.041	2.053	2.065	2.078	2.092	2.110
2042	1.993	2.003	2.015	2.029	2.041	2.053	2.065	2.078	2.092
2043	1.981	1.991	2.003	2.015	2.029	2.042	2.053	2.065	2.079
2044	1.964	1.980	1.991	2.002	2.015	2.029	2.042	2.053	2.066
2045	1.940	1.962	1.979	1.990	2.002	2.015	2.029	2.042	2.053
2046	1.917	1.938	1.962	1.979	1.990	2.002	2.015	2.029	2.042
2047	1.896	1.916	1.938	1.962	1.979	1.990	2.002	2.015	2.029
2048	1.875	1.894	1.915	1.937	1.961	1.979	1.990	2.002	2.015
2049	1.849	1.873	1.893	1.915	1.937	1.961	1.978	1.990	2.002
2050	1.821	1.848	1.872	1.893	1.914	1.937	1.961	1.978	1.989

	9	10	11	12	13	14	15	16	17
2008	2.929	2.988	3.049	3.124	3.218	3.321	3.432	3.519	3.542
2009	2.862	2.932	2.996	3.058	3.126	3.207	3.291	3.385	3.457
2010	2.795	2.879	2.953	3.018	3.077	3.137	3.208	3.283	3.366
2011	2.700	2.786	2.866	2.935	2.993	3.044	3.096	3.160	3.223
2012	2.565	2.661	2.757	2.840	2.902	2.941	2.968	2.997	3.042
2013	2.391	2.565	2.661	2.756	2.840	2.903	2.943	2.970	3.000
2014	2.406	2.392	2.565	2.660	2.757	2.841	2.904	2.946	2.974
2015	2.414	2.406	2.392	2.565	2.661	2.757	2.843	2.907	2.949
2016	2.430	2.415	2.407	2.392	2.566	2.662	2.759	2.846	2.910
2017	2.443	2.430	2.415	2.407	2.392	2.567	2.664	2.762	2.849
2018	2.946	2.443	2.431	2.415	2.407	2.393	2.569	2.667	2.766
2019	2.873	2.947	2.444	2.431	2.415	2.408	2.395	2.572	2.670
2020	2.802	2.874	2.947	2.444	2.431	2.416	2.410	2.398	2.575
2021	2.725	2.802	2.874	2.947	2.444	2.432	2.418	2.413	2.402
2022	2.682	2.725	2.803	2.874	2.947	2.445	2.434	2.421	2.417
2023	2.664	2.682	2.725	2.803	2.874	2.948	2.447	2.437	2.425
2024	2.643	2.665	2.683	2.725	2.803	2.875	2.950	2.450	2.441
2025	2.621	2.644	2.665	2.683	2.726	2.804	2.877	2.953	2.454
2026	2.597	2.621	2.644	2.665	2.683	2.726	2.806	2.879	2.956
2027	2.570	2.597	2.621	2.644	2.665	2.684	2.728	2.808	2.882
2028	2.539	2.570	2.597	2.621	2.644	2.666	2.685	2.731	2.811
2029	2.504	2.540	2.571	2.597	2.621	2.645	2.667	2.688	2.733
2030	2.464	2.505	2.540	2.571	2.597	2.622	2.646	2.670	2.690
2031	2.420	2.465	2.505	2.540	2.571	2.598	2.624	2.648	2.672
2032	2.374	2.420	2.465	2.505	2.540	2.572	2.600	2.626	2.651
2033	2.348	2.375	2.420	2.465	2.505	2.540	2.573	2.601	2.628
2034	2.319	2.349	2.375	2.420	2.465	2.505	2.542	2.574	2.603
2035	2.287	2.319	2.349	2.375	2.420	2.465	2.506	2.543	2.576
2036	2.253	2.287	2.319	2.349	2.375	2.421	2.466	2.508	2.545
2037	2.218	2.253	2.287	2.319	2.349	2.375	2.422	2.468	2.509
2038	2.193	2.218	2.253	2.287	2.319	2.349	2.376	2.423	2.469
2039	2.176	2.193	2.218	2.253	2.287	2.319	2.350	2.377	2.424
2040	2.156	2.176	2.193	2.218	2.253	2.287	2.320	2.351	2.378
2041	2.134	2.156	2.176	2.193	2.218	2.253	2.288	2.321	2.352
2042	2.110	2.134	2.156	2.176	2.193	2.218	2.254	2.288	2.322
2043	2.092	2.110	2.134	2.156	2.176	2.193	2.218	2.254	2.289
2044	2.079	2.092	2.110	2.133	2.156	2.176	2.193	2.219	2.255
2045	2.065	2.078	2.092	2.110	2.133	2.156	2.176	2.193	2.219
2046	2.053	2.065	2.078	2.091	2.110	2.133	2.156	2.176	2.193
2047	2.042	2.053	2.065	2.078	2.091	2.110	2.133	2.155	2.176
2048	2.029	2.041	2.053	2.065	2.078	2.091	2.109	2.133	2.155
2049	2.015	2.028	2.041	2.053	2.065	2.078	2.091	2.109	2.133
2050	2.001	2.014	2.028	2.041	2.052	2.064	2.077	2.090	2.109

	18	19	20	21	22	23	24	25	26
2008	3.481	3.357	3.206	3.067	2.960	2.904	2.886	2.877	2.854
2009	3.464	3.388	3.250	3.084	2.939	2.838	2.800	2.807	2.826
2010	3.426	3.422	3.333	3.183	3.009	2.862	2.766	2.737	2.752
2011	3.288	3.322	3.288	3.170	3.002	2.830	2.704	2.639	2.642
2012	3.096	3.159	3.197	3.167	3.054	2.892	2.727	2.608	2.551
2013	3.045	3.099	3.162	3.199	3.168	3.055	2.893	2.728	2.610
2014	3.004	3.048	3.101	3.163	3.200	3.169	3.056	2.895	2.730
2015	2.977	3.007	3.051	3.102	3.164	3.200	3.170	3.057	2.897
2016	2.953	2.980	3.009	3.052	3.104	3.165	3.201	3.171	3.059
2017	2.914	2.956	2.983	3.011	3.053	3.105	3.166	3.203	3.173
2018	2.853	2.917	2.958	2.985	3.012	3.055	3.106	3.168	3.205
2019	2.769	2.856	2.920	2.960	2.986	3.013	3.056	3.107	3.170
2020	2.674	2.773	2.859	2.922	2.962	2.987	3.015	3.058	3.110
2021	2.579	2.677	2.776	2.861	2.923	2.963	2.989	3.017	3.060
2022	2.406	2.583	2.680	2.778	2.862	2.925	2.965	2.991	3.019
2023	2.421	2.410	2.586	2.682	2.779	2.864	2.926	2.967	2.993
2024	2.429	2.424	2.413	2.588	2.684	2.781	2.865	2.928	2.969
2025	2.445	2.432	2.427	2.415	2.589	2.685	2.782	2.867	2.930
2026	2.457	2.448	2.435	2.429	2.416	2.591	2.687	2.784	2.869
2027	2.959	2.460	2.450	2.437	2.431	2.418	2.592	2.689	2.786
2028	2.885	2.962	2.463	2.452	2.438	2.432	2.419	2.594	2.691
2029	2.814	2.888	2.964	2.464	2.453	2.440	2.433	2.421	2.596
2030	2.736	2.816	2.890	2.965	2.466	2.455	2.441	2.435	2.423
2031	2.693	2.739	2.818	2.891	2.966	2.467	2.456	2.442	2.437
2032	2.675	2.695	2.740	2.819	2.892	2.967	2.468	2.457	2.444
2033	2.653	2.677	2.697	2.741	2.820	2.893	2.967	2.469	2.459
2034	2.630	2.655	2.678	2.698	2.742	2.821	2.894	2.968	2.471
2035	2.605	2.632	2.656	2.679	2.699	2.743	2.821	2.894	2.969
2036	2.578	2.607	2.633	2.657	2.680	2.699	2.743	2.822	2.895
2037	2.547	2.580	2.608	2.634	2.658	2.680	2.699	2.744	2.823
2038	2.511	2.548	2.581	2.609	2.634	2.658	2.680	2.700	2.745
2039	2.470	2.512	2.549	2.581	2.609	2.634	2.658	2.681	2.701
2040	2.425	2.471	2.513	2.549	2.581	2.609	2.634	2.659	2.681
2041	2.379	2.426	2.472	2.513	2.549	2.581	2.609	2.635	2.659
2042	2.353	2.380	2.426	2.472	2.513	2.549	2.581	2.609	2.635
2043	2.322	2.353	2.380	2.426	2.472	2.513	2.549	2.581	2.609
2044	2.289	2.323	2.353	2.380	2.426	2.472	2.513	2.549	2.581
2045	2.255	2.290	2.323	2.353	2.380	2.426	2.471	2.512	2.548
2046	2.219	2.255	2.289	2.322	2.353	2.379	2.425	2.471	2.512
2047	2.193	2.219	2.255	2.289	2.322	2.352	2.379	2.425	2.470
2048	2.176	2.193	2.219	2.254	2.288	2.321	2.352	2.378	2.424
2049	2.155	2.175	2.192	2.218	2.254	2.288	2.320	2.351	2.377
2050	2.132	2.154	2.175	2.192	2.217	2.253	2.287	2.320	2.350

	27	28	29	30	31	32	33	34	35
2008	2.812	2.743	2.657	2.565	2.488	2.435	2.418	2.427	2.446
2009	2.825	2.799	2.736	2.652	2.563	2.489	2.440	2.425	2.436
2010	2.780	2.790	2.774	2.723	2.651	2.571	2.501	2.452	2.435
2011	2.686	2.735	2.757	2.749	2.708	2.644	2.569	2.501	2.452
2012	2.563	2.614	2.669	2.697	2.695	2.659	2.599	2.527	2.462
2013	2.553	2.564	2.614	2.667	2.693	2.690	2.654	2.595	2.525
2014	2.612	2.555	2.565	2.612	2.663	2.688	2.685	2.650	2.592
2015	2.733	2.614	2.555	2.563	2.609	2.658	2.683	2.681	2.647
2016	2.899	2.734	2.614	2.553	2.559	2.604	2.653	2.679	2.678
2017	3.061	2.900	2.734	2.612	2.550	2.555	2.599	2.649	2.676
2018	3.175	3.063	2.900	2.732	2.609	2.545	2.550	2.595	2.647
2019	3.207	3.176	3.063	2.899	2.729	2.604	2.541	2.546	2.593
2020	3.172	3.208	3.176	3.061	2.895	2.724	2.599	2.537	2.544
2021	3.112	3.173	3.208	3.174	3.057	2.890	2.719	2.595	2.535
2022	3.062	3.113	3.173	3.206	3.171	3.052	2.885	2.716	2.593
2023	3.021	3.064	3.113	3.171	3.203	3.166	3.047	2.881	2.713
2024	2.995	3.023	3.064	3.112	3.168	3.198	3.161	3.043	2.879
2025	2.971	2.997	3.023	3.062	3.108	3.163	3.193	3.157	3.041
2026	2.932	2.972	2.997	3.021	3.059	3.104	3.159	3.189	3.155
2027	2.871	2.934	2.972	2.995	3.018	3.055	3.099	3.155	3.187
2028	2.788	2.872	2.934	2.971	2.992	3.014	3.050	3.096	3.153
2029	2.693	2.789	2.873	2.932	2.968	2.988	3.010	3.047	3.094
2030	2.598	2.694	2.789	2.871	2.930	2.964	2.984	3.007	3.045
2031	2.425	2.599	2.694	2.788	2.869	2.926	2.961	2.981	3.005
2032	2.439	2.426	2.599	2.693	2.786	2.865	2.923	2.958	2.979
2033	2.446	2.440	2.426	2.598	2.690	2.783	2.862	2.920	2.956
2034	2.460	2.447	2.440	2.425	2.596	2.687	2.779	2.859	2.918
2035	2.472	2.461	2.447	2.439	2.423	2.593	2.684	2.777	2.857
2036	2.970	2.472	2.461	2.446	2.437	2.420	2.590	2.682	2.775
2037	2.896	2.971	2.472	2.460	2.444	2.434	2.418	2.588	2.680
2038	2.824	2.896	2.970	2.471	2.458	2.441	2.432	2.416	2.586
2039	2.745	2.824	2.896	2.969	2.470	2.456	2.439	2.430	2.414
2040	2.701	2.745	2.823	2.895	2.967	2.467	2.454	2.437	2.428
2041	2.681	2.701	2.745	2.822	2.893	2.965	2.465	2.452	2.436
2042	2.659	2.681	2.701	2.744	2.820	2.891	2.962	2.463	2.450
2043	2.635	2.659	2.681	2.699	2.742	2.818	2.888	2.960	2.462
2044	2.609	2.634	2.658	2.680	2.698	2.740	2.816	2.887	2.959
2045	2.581	2.609	2.634	2.657	2.678	2.696	2.738	2.815	2.885
2046	2.548	2.580	2.608	2.633	2.656	2.677	2.694	2.737	2.813
2047	2.511	2.547	2.579	2.607	2.631	2.654	2.675	2.693	2.735
2048	2.470	2.511	2.547	2.578	2.606	2.630	2.653	2.674	2.692
2049	2.423	2.469	2.510	2.546	2.577	2.604	2.629	2.651	2.672
2050	2.377	2.423	2.468	2.509	2.545	2.576	2.603	2.628	2.650

	36	37	38	39	40	41	42	43	44
2008	2.461	2.470	2.469	2.460	2.449	2.443	2.444	2.455	2.471
2009	2.457	2.473	2.481	2.478	2.466	2.453	2.445	2.446	2.458
2010	2.443	2.462	2.475	2.481	2.476	2.462	2.447	2.442	2.449
2011	2.433	2.441	2.457	2.469	2.475	2.468	2.453	2.440	2.438
2012	2.414	2.398	2.407	2.424	2.437	2.444	2.439	2.427	2.419
2013	2.461	2.414	2.398	2.406	2.423	2.435	2.441	2.434	2.421
2014	2.523	2.461	2.414	2.398	2.405	2.421	2.432	2.436	2.427
2015	2.591	2.523	2.461	2.414	2.397	2.403	2.418	2.427	2.430
2016	2.646	2.591	2.524	2.461	2.413	2.395	2.400	2.414	2.421
2017	2.677	2.646	2.591	2.524	2.460	2.412	2.392	2.396	2.408
2018	2.675	2.677	2.646	2.591	2.523	2.458	2.409	2.388	2.390
2019	2.646	2.675	2.678	2.646	2.590	2.521	2.455	2.405	2.382
2020	2.592	2.646	2.676	2.678	2.645	2.588	2.518	2.451	2.399
2021	2.543	2.592	2.647	2.676	2.677	2.643	2.585	2.514	2.445
2022	2.534	2.543	2.593	2.647	2.675	2.675	2.640	2.581	2.508
2023	2.593	2.534	2.544	2.593	2.646	2.673	2.672	2.636	2.576
2024	2.713	2.593	2.535	2.544	2.592	2.644	2.670	2.668	2.630
2025	2.878	2.713	2.593	2.535	2.544	2.591	2.642	2.666	2.662
2026	3.040	2.878	2.713	2.594	2.535	2.542	2.588	2.638	2.661
2027	3.153	3.039	2.878	2.713	2.593	2.533	2.540	2.584	2.632
2028	3.186	3.153	3.039	2.878	2.712	2.591	2.531	2.536	2.579
2029	3.152	3.185	3.153	3.039	2.877	2.710	2.589	2.527	2.531
2030	3.093	3.151	3.185	3.152	3.038	2.875	2.708	2.585	2.523
2031	3.044	3.092	3.151	3.184	3.151	3.036	2.872	2.704	2.581
2032	3.004	3.044	3.092	3.150	3.183	3.149	3.033	2.869	2.700
2033	2.978	3.003	3.043	3.091	3.149	3.181	3.146	3.029	2.864
2034	2.955	2.978	3.003	3.043	3.090	3.147	3.178	3.142	3.024
2035	2.917	2.954	2.978	3.002	3.041	3.088	3.144	3.174	3.137
2036	2.856	2.916	2.954	2.977	3.001	3.039	3.085	3.140	3.169
2037	2.774	2.856	2.916	2.953	2.975	2.999	3.036	3.081	3.135
2038	2.679	2.774	2.855	2.915	2.951	2.973	2.996	3.033	3.077
2039	2.585	2.679	2.773	2.854	2.913	2.949	2.971	2.993	3.028
2040	2.414	2.585	2.678	2.772	2.853	2.911	2.947	2.967	2.988
2041	2.428	2.413	2.584	2.677	2.770	2.851	2.909	2.944	2.963
2042	2.435	2.427	2.412	2.583	2.676	2.768	2.848	2.906	2.940
2043	2.449	2.434	2.426	2.411	2.582	2.674	2.766	2.845	2.902
2044	2.461	2.448	2.433	2.425	2.410	2.580	2.672	2.763	2.842
2045	2.957	2.460	2.447	2.432	2.424	2.408	2.578	2.669	2.760
2046	2.884	2.956	2.459	2.446	2.430	2.422	2.406	2.575	2.666
2047	2.812	2.882	2.954	2.458	2.445	2.429	2.420	2.404	2.572
2048	2.734	2.810	2.881	2.953	2.456	2.443	2.427	2.417	2.401
2049	2.690	2.732	2.809	2.879	2.951	2.454	2.441	2.424	2.415
2050	2.671	2.689	2.731	2.807	2.877	2.948	2.452	2.438	2.422

	45	46	47	48	49	50	51	52	53
2008	2.491	2.505	2.504	2.482	2.445	2.399	2.358	2.327	2.315
2009	2.477	2.499	2.516	2.517	2.498	2.464	2.421	2.382	2.353
2010	2.469	2.496	2.525	2.548	2.555	2.539	2.509	2.471	2.435
2011	2.450	2.474	2.505	2.539	2.566	2.576	2.564	2.538	2.505
2012	2.422	2.439	2.468	2.504	2.543	2.574	2.589	2.580	2.557
2013	2.410	2.412	2.426	2.453	2.487	2.523	2.552	2.564	2.554
2014	2.412	2.400	2.399	2.411	2.437	2.468	2.502	2.528	2.538
2015	2.419	2.402	2.388	2.385	2.395	2.418	2.447	2.478	2.502
2016	2.422	2.409	2.390	2.374	2.369	2.376	2.397	2.423	2.453
2017	2.413	2.412	2.397	2.376	2.358	2.350	2.356	2.374	2.398
2018	2.400	2.404	2.400	2.383	2.360	2.339	2.330	2.333	2.349
2019	2.382	2.390	2.392	2.386	2.368	2.342	2.319	2.308	2.309
2020	2.375	2.373	2.379	2.378	2.370	2.350	2.322	2.298	2.284
2021	2.392	2.366	2.362	2.365	2.363	2.353	2.330	2.301	2.274
2022	2.438	2.382	2.354	2.348	2.350	2.345	2.333	2.309	2.278
2023	2.501	2.429	2.371	2.341	2.333	2.333	2.326	2.312	2.286
2024	2.568	2.492	2.418	2.358	2.326	2.316	2.314	2.305	2.289
2025	2.623	2.559	2.481	2.405	2.344	2.310	2.298	2.294	2.283
2026	2.655	2.614	2.548	2.468	2.391	2.328	2.292	2.279	2.273
2027	2.654	2.646	2.604	2.536	2.454	2.375	2.311	2.274	2.258
2028	2.626	2.645	2.636	2.592	2.523	2.439	2.359	2.292	2.254
2029	2.573	2.618	2.635	2.624	2.578	2.508	2.423	2.341	2.273
2030	2.525	2.565	2.608	2.624	2.612	2.564	2.492	2.405	2.322
2031	2.517	2.518	2.556	2.597	2.612	2.597	2.548	2.474	2.387
2032	2.575	2.509	2.509	2.546	2.585	2.598	2.582	2.531	2.456
2033	2.694	2.568	2.501	2.499	2.534	2.572	2.583	2.566	2.514
2034	2.858	2.687	2.560	2.491	2.488	2.522	2.558	2.568	2.549
2035	3.018	2.851	2.678	2.550	2.481	2.476	2.508	2.543	2.551
2036	3.131	3.011	2.842	2.669	2.540	2.469	2.463	2.494	2.527
2037	3.163	3.124	3.002	2.833	2.659	2.529	2.457	2.450	2.479
2038	3.130	3.156	3.115	2.993	2.823	2.648	2.517	2.444	2.436
2039	3.071	3.123	3.148	3.106	2.983	2.812	2.636	2.504	2.430
2040	3.023	3.065	3.115	3.139	3.096	2.972	2.800	2.624	2.491
2041	2.983	3.017	3.058	3.107	3.130	3.086	2.961	2.788	2.611
2042	2.958	2.978	3.010	3.050	3.098	3.119	3.074	2.948	2.775
2043	2.935	2.953	2.971	3.003	3.041	3.088	3.108	3.062	2.935
2044	2.897	2.930	2.947	2.964	2.995	3.032	3.078	3.097	3.050
2045	2.837	2.892	2.924	2.940	2.957	2.986	3.022	3.067	3.085
2046	2.756	2.833	2.887	2.918	2.933	2.949	2.977	3.012	3.056
2047	2.662	2.751	2.828	2.881	2.911	2.926	2.940	2.968	3.002
2048	2.569	2.658	2.747	2.822	2.875	2.904	2.918	2.932	2.958
2049	2.398	2.565	2.654	2.742	2.817	2.869	2.897	2.910	2.923
2050	2.412	2.395	2.561	2.649	2.737	2.811	2.862	2.890	2.902

	54	55	56	57	58	59	60	61	62
2008	2.313	2.316	2.312	2.292	2.250	2.192	2.125	2.064	2.018
2009	2.340	2.338	2.339	2.333	2.311	2.266	2.206	2.137	2.072
2010	2.410	2.401	2.402	2.404	2.395	2.366	2.314	2.245	2.167
2011	2.478	2.461	2.459	2.464	2.465	2.450	2.412	2.350	2.272
2012	2.527	2.500	2.484	2.481	2.484	2.483	2.464	2.423	2.356
2013	2.529	2.497	2.468	2.450	2.446	2.447	2.444	2.425	2.382
2014	2.526	2.499	2.465	2.435	2.415	2.409	2.410	2.406	2.384
2015	2.510	2.496	2.467	2.432	2.400	2.379	2.373	2.372	2.366
2016	2.475	2.481	2.465	2.434	2.397	2.365	2.343	2.336	2.333
2017	2.426	2.446	2.450	2.432	2.400	2.363	2.330	2.307	2.298
2018	2.372	2.397	2.415	2.417	2.399	2.366	2.328	2.294	2.270
2019	2.324	2.344	2.367	2.384	2.384	2.364	2.331	2.292	2.257
2020	2.284	2.296	2.315	2.336	2.351	2.351	2.330	2.296	2.256
2021	2.259	2.257	2.267	2.284	2.304	2.318	2.317	2.296	2.261
2022	2.249	2.233	2.229	2.238	2.253	2.272	2.285	2.283	2.261
2023	2.253	2.223	2.205	2.199	2.207	2.222	2.240	2.252	2.248
2024	2.262	2.227	2.196	2.176	2.170	2.176	2.190	2.207	2.218
2025	2.266	2.237	2.201	2.168	2.148	2.140	2.146	2.159	2.175
2026	2.261	2.242	2.211	2.174	2.141	2.119	2.111	2.116	2.128
2027	2.251	2.237	2.217	2.185	2.147	2.113	2.091	2.082	2.086
2028	2.237	2.228	2.213	2.191	2.158	2.120	2.085	2.063	2.053
2029	2.233	2.215	2.204	2.188	2.166	2.132	2.093	2.058	2.034
2030	2.253	2.212	2.192	2.180	2.163	2.140	2.106	2.067	2.031
2031	2.302	2.232	2.190	2.169	2.156	2.138	2.115	2.080	2.040
2032	2.368	2.282	2.211	2.167	2.145	2.132	2.114	2.089	2.054
2033	2.438	2.348	2.261	2.189	2.145	2.122	2.108	2.089	2.064
2034	2.496	2.418	2.327	2.240	2.167	2.122	2.099	2.084	2.064
2035	2.531	2.477	2.398	2.306	2.218	2.144	2.099	2.075	2.059
2036	2.534	2.513	2.457	2.377	2.285	2.196	2.122	2.076	2.052
2037	2.511	2.516	2.493	2.436	2.356	2.263	2.174	2.100	2.053
2038	2.464	2.494	2.498	2.474	2.416	2.335	2.241	2.152	2.077
2039	2.421	2.447	2.476	2.479	2.453	2.395	2.313	2.219	2.129
2040	2.416	2.405	2.431	2.458	2.459	2.433	2.373	2.291	2.197
2041	2.477	2.402	2.389	2.413	2.439	2.440	2.412	2.352	2.269
2042	2.597	2.463	2.386	2.373	2.396	2.420	2.420	2.391	2.330
2043	2.761	2.583	2.448	2.370	2.356	2.378	2.401	2.399	2.369
2044	2.922	2.747	2.568	2.432	2.354	2.339	2.359	2.381	2.378
2045	3.037	2.908	2.732	2.553	2.416	2.338	2.322	2.340	2.361
2046	3.072	3.023	2.893	2.717	2.537	2.400	2.321	2.304	2.321
2047	3.044	3.059	3.008	2.878	2.701	2.521	2.384	2.303	2.285
2048	2.991	3.032	3.045	2.993	2.862	2.685	2.504	2.366	2.285
2049	2.948	2.980	3.019	3.031	2.978	2.846	2.668	2.487	2.348
2050	2.914	2.938	2.968	3.005	3.016	2.961	2.829	2.650	2.469

	63	64	65	66	67	68	69	70	71
2008	1.996	1.989	1.991	1.983	1.948	1.875	1.776	1.663	1.562
2009	2.021	1.993	1.979	1.974	1.958	1.914	1.834	1.728	1.608
2010	2.094	2.038	2.004	1.983	1.970	1.943	1.887	1.794	1.676
2011	2.183	2.100	2.031	1.984	1.951	1.926	1.892	1.831	1.733
2012	2.268	2.167	2.068	1.983	1.923	1.882	1.856	1.822	1.763
2013	2.313	2.222	2.117	2.015	1.928	1.865	1.823	1.794	1.759
2014	2.339	2.266	2.172	2.064	1.959	1.870	1.806	1.763	1.733
2015	2.342	2.293	2.216	2.118	2.008	1.901	1.812	1.748	1.703
2016	2.324	2.296	2.243	2.162	2.061	1.949	1.843	1.754	1.689
2017	2.292	2.279	2.246	2.188	2.104	2.002	1.890	1.784	1.695
2018	2.258	2.248	2.230	2.192	2.131	2.044	1.941	1.831	1.726
2019	2.231	2.215	2.200	2.177	2.135	2.071	1.983	1.881	1.771
2020	2.219	2.189	2.168	2.148	2.121	2.075	2.010	1.923	1.821
2021	2.218	2.178	2.143	2.117	2.093	2.062	2.015	1.949	1.862
2022	2.223	2.177	2.132	2.093	2.063	2.036	2.003	1.955	1.888
2023	2.224	2.183	2.133	2.084	2.040	2.007	1.978	1.944	1.894
2024	2.212	2.184	2.139	2.085	2.032	1.986	1.951	1.920	1.884
2025	2.183	2.173	2.141	2.092	2.034	1.979	1.931	1.895	1.862
2026	2.141	2.145	2.131	2.095	2.042	1.982	1.925	1.876	1.838
2027	2.095	2.105	2.105	2.086	2.046	1.991	1.929	1.871	1.821
2028	2.054	2.060	2.065	2.061	2.039	1.995	1.939	1.876	1.817
2029	2.022	2.020	2.022	2.023	2.014	1.989	1.945	1.887	1.823
2030	2.005	1.990	1.984	1.981	1.978	1.967	1.940	1.893	1.834
2031	2.002	1.973	1.954	1.945	1.938	1.932	1.918	1.889	1.841
2032	2.012	1.971	1.939	1.916	1.903	1.894	1.885	1.869	1.838
2033	2.026	1.982	1.938	1.902	1.876	1.860	1.848	1.838	1.819
2034	2.037	1.997	1.949	1.902	1.863	1.835	1.816	1.803	1.789
2035	2.038	2.008	1.965	1.914	1.864	1.823	1.792	1.772	1.756
2036	2.034	2.009	1.977	1.931	1.877	1.825	1.782	1.749	1.727
2037	2.026	2.006	1.979	1.943	1.894	1.839	1.785	1.740	1.705
2038	2.028	2.000	1.976	1.946	1.908	1.857	1.799	1.743	1.697
2039	2.053	2.002	1.971	1.945	1.912	1.871	1.818	1.759	1.701
2040	2.105	2.027	1.974	1.940	1.911	1.875	1.832	1.778	1.717
2041	2.173	2.079	1.999	1.944	1.907	1.875	1.838	1.793	1.736
2042	2.245	2.147	2.052	1.970	1.912	1.872	1.839	1.799	1.751
2043	2.306	2.220	2.120	2.022	1.938	1.878	1.836	1.800	1.758
2044	2.346	2.281	2.192	2.090	1.991	1.904	1.842	1.799	1.760
2045	2.355	2.321	2.254	2.163	2.059	1.958	1.870	1.805	1.759
2046	2.339	2.331	2.294	2.224	2.131	2.025	1.922	1.833	1.766
2047	2.300	2.316	2.305	2.266	2.193	2.098	1.990	1.886	1.794
2048	2.265	2.278	2.291	2.277	2.235	2.160	2.063	1.953	1.846
2049	2.266	2.244	2.254	2.264	2.248	2.203	2.125	2.025	1.913
2050	2.329	2.245	2.221	2.229	2.236	2.216	2.168	2.087	1.985

	72	73	74	75	76	77	78	79	80+
2008	1.495	1.474	1.487	1.450	1.459	1.472	1.481	1.479	5.566
2009	1.502	1.429	1.402	1.406	1.362	1.363	1.367	1.367	6.073
2010	1.548	1.436	1.359	1.326	1.321	1.274	1.269	1.265	6.412
2011	1.613	1.482	1.368	1.287	1.246	1.234	1.184	1.175	6.607
2012	1.667	1.547	1.416	1.298	1.211	1.164	1.146	1.096	6.692
2013	1.698	1.600	1.478	1.346	1.227	1.137	1.085	1.058	6.702
2014	1.695	1.631	1.530	1.407	1.274	1.153	1.060	1.003	6.683
2015	1.670	1.629	1.560	1.456	1.331	1.197	1.076	981	6.623
2016	1.642	1.605	1.559	1.486	1.379	1.253	1.118	997	6.559
2017	1.630	1.579	1.537	1.485	1.408	1.298	1.170	1.037	6.528
2018	1.636	1.568	1.513	1.466	1.408	1.326	1.214	1.086	6.546
2019	1.666	1.575	1.503	1.443	1.391	1.327	1.241	1.128	6.614
2020	1.710	1.604	1.510	1.435	1.370	1.312	1.243	1.153	6.718
2021	1.759	1.648	1.539	1.443	1.363	1.293	1.229	1.156	6.840
2022	1.799	1.695	1.582	1.471	1.371	1.287	1.213	1.144	6.954
2023	1.825	1.734	1.628	1.512	1.399	1.296	1.208	1.130	7.049
2024	1.832	1.760	1.666	1.556	1.438	1.323	1.217	1.126	7.123
2025	1.823	1.767	1.691	1.593	1.481	1.361	1.243	1.135	7.190
2026	1.802	1.759	1.699	1.618	1.517	1.402	1.280	1.160	7.264
2027	1.780	1.740	1.692	1.627	1.542	1.437	1.320	1.196	7.360
2028	1.765	1.720	1.675	1.621	1.551	1.461	1.353	1.234	7.483
2029	1.762	1.706	1.656	1.606	1.547	1.471	1.377	1.266	7.632
2030	1.768	1.704	1.643	1.589	1.533	1.468	1.387	1.290	7.800
2031	1.780	1.711	1.642	1.577	1.518	1.456	1.386	1.300	7.974
2032	1.787	1.723	1.650	1.577	1.508	1.443	1.375	1.300	8.143
2033	1.785	1.731	1.663	1.586	1.509	1.434	1.364	1.292	8.300
2034	1.768	1.730	1.672	1.599	1.518	1.436	1.357	1.282	8.438
2035	1.739	1.713	1.671	1.608	1.531	1.446	1.360	1.277	8.556
2036	1.707	1.686	1.656	1.608	1.541	1.460	1.370	1.281	8.664
2037	1.679	1.656	1.630	1.594	1.542	1.470	1.384	1.291	8.770
2038	1.659	1.629	1.601	1.570	1.530	1.472	1.395	1.306	8.883
2039	1.652	1.610	1.576	1.543	1.507	1.461	1.399	1.317	9.006
2040	1.656	1.604	1.558	1.520	1.482	1.441	1.389	1.321	9.133
2041	1.673	1.609	1.553	1.504	1.460	1.417	1.370	1.313	9.259
2042	1.692	1.626	1.559	1.499	1.445	1.397	1.349	1.297	9.373
2043	1.708	1.646	1.576	1.506	1.442	1.384	1.331	1.277	9.467
2044	1.715	1.662	1.596	1.523	1.450	1.382	1.319	1.261	9.541
2045	1.718	1.669	1.612	1.543	1.467	1.390	1.318	1.250	9.599
2046	1.717	1.672	1.620	1.560	1.487	1.407	1.327	1.250	9.648
2047	1.725	1.672	1.624	1.568	1.504	1.428	1.345	1.260	9.703
2048	1.752	1.680	1.624	1.572	1.513	1.445	1.365	1.278	9.771
2049	1.804	1.707	1.633	1.573	1.517	1.454	1.383	1.299	9.858
2050	1.870	1.759	1.660	1.582	1.519	1.460	1.392	1.317	9.966

Sinop, Scenario 3 – Single Ages

	0	1	2	3	4	5	6	7	8
2008	2.439	2.431	2.429	2.427	2.425	2.609	2.700	2.787	2.864
2009	2.969	2.457	2.454	2.452	2.451	2.439	2.609	2.696	2.782
2010	2.903	2.971	2.466	2.463	2.462	2.460	2.447	2.617	2.705
2011	2.828	2.894	2.967	2.463	2.461	2.460	2.459	2.445	2.614
2012	2.722	2.795	2.867	2.941	2.437	2.425	2.410	2.404	2.390
2013	2.679	2.717	2.795	2.867	2.941	2.438	2.426	2.412	2.405
2014	2.661	2.674	2.717	2.796	2.868	2.942	2.439	2.428	2.413
2015	2.640	2.656	2.674	2.718	2.796	2.869	2.944	2.441	2.429
2016	2.617	2.636	2.656	2.675	2.719	2.798	2.871	2.946	2.443
2017	2.594	2.613	2.636	2.657	2.676	2.720	2.800	2.873	2.948
2018	2.568	2.590	2.614	2.637	2.658	2.678	2.723	2.802	2.875
2019	2.537	2.564	2.591	2.615	2.638	2.660	2.680	2.725	2.804
2020	2.503	2.534	2.565	2.592	2.616	2.640	2.663	2.683	2.728
2021	2.464	2.500	2.535	2.566	2.593	2.618	2.643	2.666	2.686
2022	2.420	2.462	2.501	2.536	2.567	2.595	2.621	2.646	2.669
2023	2.376	2.418	2.462	2.502	2.538	2.570	2.599	2.625	2.649
2024	2.351	2.374	2.419	2.464	2.504	2.540	2.574	2.602	2.628
2025	2.323	2.350	2.375	2.421	2.465	2.507	2.544	2.577	2.606
2026	2.292	2.321	2.351	2.377	2.422	2.468	2.511	2.548	2.581
2027	2.259	2.290	2.323	2.353	2.378	2.425	2.473	2.515	2.552
2028	2.225	2.258	2.292	2.324	2.354	2.382	2.430	2.477	2.520
2029	2.201	2.224	2.260	2.294	2.326	2.358	2.387	2.435	2.482
2030	2.185	2.200	2.226	2.261	2.296	2.330	2.363	2.392	2.440
2031	2.166	2.185	2.202	2.228	2.263	2.299	2.335	2.368	2.397
2032	2.145	2.166	2.187	2.204	2.230	2.267	2.305	2.341	2.374
2033	2.123	2.145	2.168	2.189	2.206	2.234	2.273	2.311	2.347
2034	2.106	2.123	2.147	2.170	2.191	2.210	2.240	2.279	2.317
2035	2.094	2.106	2.125	2.149	2.172	2.195	2.217	2.246	2.285
2036	2.082	2.094	2.108	2.127	2.152	2.177	2.202	2.223	2.253
2037	2.071	2.082	2.096	2.110	2.130	2.156	2.183	2.208	2.230
2038	2.061	2.071	2.084	2.098	2.113	2.134	2.163	2.190	2.215
2039	2.049	2.061	2.074	2.087	2.101	2.118	2.142	2.170	2.197
2040	2.037	2.050	2.063	2.076	2.089	2.106	2.125	2.149	2.178
2041	2.025	2.037	2.052	2.066	2.078	2.094	2.114	2.132	2.156
2042	2.014	2.026	2.040	2.055	2.068	2.084	2.102	2.121	2.140
2043	2.004	2.015	2.028	2.042	2.057	2.074	2.092	2.110	2.129
2044	1.987	2.005	2.017	2.031	2.045	2.063	2.082	2.100	2.118
2045	1.964	1.988	2.007	2.020	2.033	2.051	2.071	2.090	2.108
2046	1.943	1.966	1.991	2.010	2.023	2.039	2.059	2.080	2.099
2047	1.922	1.944	1.968	1.994	2.013	2.029	2.048	2.068	2.089
2048	1.902	1.924	1.947	1.971	1.996	2.019	2.038	2.057	2.077
2049	1.878	1.904	1.926	1.949	1.974	2.003	2.028	2.047	2.066
2050	1.851	1.880	1.907	1.929	1.952	1.980	2.012	2.037	2.056

	9	10	11	12	13	14	15	16	17
2008	2.929	2.988	3.049	3.124	3.218	3.321	3.432	3.519	3.542
2009	2.862	2.932	2.996	3.058	3.126	3.207	3.291	3.385	3.457
2010	2.795	2.879	2.953	3.018	3.077	3.137	3.208	3.283	3.366
2011	2.700	2.786	2.866	2.935	2.993	3.044	3.096	3.160	3.223
2012	2.565	2.661	2.757	2.840	2.902	2.941	2.968	2.997	3.042
2013	2.391	2.565	2.661	2.756	2.840	2.903	2.943	2.970	3.000
2014	2.406	2.392	2.566	2.661	2.757	2.841	2.904	2.946	2.973
2015	2.415	2.407	2.393	2.567	2.662	2.758	2.843	2.906	2.948
2016	2.431	2.416	2.409	2.394	2.568	2.663	2.760	2.845	2.908
2017	2.445	2.433	2.418	2.410	2.396	2.569	2.665	2.761	2.846
2018	2.950	2.447	2.435	2.420	2.412	2.398	2.571	2.666	2.763
2019	2.877	2.952	2.450	2.438	2.423	2.414	2.399	2.572	2.667
2020	2.807	2.880	2.955	2.453	2.440	2.425	2.416	2.400	2.573
2021	2.731	2.810	2.884	2.958	2.456	2.443	2.426	2.417	2.401
2022	2.689	2.734	2.814	2.887	2.962	2.459	2.444	2.427	2.416
2023	2.673	2.693	2.739	2.818	2.891	2.964	2.460	2.444	2.426
2024	2.653	2.677	2.698	2.743	2.822	2.894	2.965	2.460	2.443
2025	2.633	2.658	2.682	2.703	2.748	2.825	2.895	2.965	2.458
2026	2.611	2.638	2.663	2.687	2.708	2.751	2.826	2.894	2.962
2027	2.586	2.616	2.644	2.669	2.693	2.711	2.752	2.825	2.891
2028	2.558	2.592	2.622	2.650	2.675	2.696	2.712	2.750	2.822
2029	2.525	2.564	2.599	2.629	2.656	2.679	2.697	2.710	2.747
2030	2.488	2.532	2.571	2.606	2.636	2.660	2.680	2.695	2.707
2031	2.446	2.495	2.539	2.579	2.613	2.640	2.661	2.677	2.691
2032	2.403	2.453	2.503	2.548	2.586	2.617	2.641	2.658	2.673
2033	2.380	2.411	2.462	2.512	2.555	2.590	2.618	2.638	2.653
2034	2.353	2.388	2.420	2.471	2.519	2.560	2.591	2.615	2.632
2035	2.324	2.362	2.398	2.430	2.479	2.524	2.560	2.588	2.609
2036	2.293	2.333	2.372	2.408	2.438	2.484	2.525	2.557	2.581
2037	2.260	2.302	2.343	2.382	2.417	2.443	2.485	2.521	2.550
2038	2.238	2.270	2.313	2.354	2.391	2.422	2.444	2.480	2.514
2039	2.224	2.247	2.281	2.324	2.363	2.397	2.422	2.439	2.473
2040	2.206	2.234	2.259	2.293	2.334	2.369	2.397	2.417	2.431
2041	2.186	2.216	2.246	2.271	2.303	2.340	2.369	2.392	2.409
2042	2.165	2.197	2.229	2.258	2.282	2.309	2.340	2.364	2.383
2043	2.149	2.176	2.210	2.242	2.269	2.288	2.309	2.334	2.355
2044	2.139	2.161	2.190	2.223	2.253	2.275	2.288	2.303	2.324
2045	2.128	2.151	2.175	2.204	2.235	2.259	2.276	2.282	2.293
2046	2.118	2.140	2.165	2.189	2.215	2.242	2.259	2.269	2.271
2047	2.109	2.131	2.155	2.179	2.201	2.222	2.242	2.252	2.258
2048	2.099	2.122	2.146	2.170	2.192	2.208	2.222	2.234	2.241
2049	2.088	2.113	2.138	2.161	2.183	2.199	2.208	2.215	2.223
2050	2.077	2.102	2.128	2.154	2.175	2.190	2.199	2.200	2.203

	18	19	20	21	22	23	24	25	26
2008	3.481	3.357	3.206	3.067	2.960	2.904	2.886	2.877	2.854
2009	3.464	3.388	3.250	3.084	2.939	2.838	2.800	2.807	2.826
2010	3.426	3.422	3.333	3.183	3.009	2.862	2.766	2.737	2.752
2011	3.288	3.322	3.288	3.170	3.002	2.830	2.704	2.639	2.642
2012	3.096	3.159	3.197	3.167	3.054	2.892	2.727	2.608	2.551
2013	3.045	3.099	3.162	3.199	3.168	3.055	2.893	2.728	2.610
2014	3.003	3.048	3.101	3.164	3.200	3.170	3.057	2.896	2.731
2015	2.976	3.006	3.051	3.104	3.166	3.203	3.172	3.059	2.899
2016	2.950	2.979	3.009	3.054	3.107	3.170	3.206	3.176	3.063
2017	2.910	2.953	2.982	3.013	3.058	3.111	3.174	3.211	3.180
2018	2.848	2.913	2.956	2.986	3.018	3.064	3.117	3.179	3.216
2019	2.764	2.850	2.916	2.961	2.992	3.024	3.070	3.123	3.185
2020	2.668	2.766	2.854	2.922	2.968	2.999	3.031	3.076	3.129
2021	2.574	2.670	2.770	2.860	2.929	2.976	3.007	3.038	3.083
2022	2.401	2.576	2.675	2.777	2.868	2.938	2.985	3.015	3.046
2023	2.417	2.403	2.580	2.682	2.786	2.878	2.948	2.993	3.023
2024	2.426	2.418	2.408	2.588	2.692	2.797	2.889	2.958	3.002
2025	2.443	2.427	2.424	2.416	2.599	2.704	2.808	2.899	2.967
2026	2.457	2.444	2.433	2.432	2.428	2.612	2.716	2.820	2.909
2027	2.961	2.459	2.450	2.442	2.445	2.442	2.625	2.728	2.830
2028	2.889	2.962	2.464	2.460	2.456	2.460	2.456	2.638	2.740
2029	2.820	2.891	2.968	2.475	2.474	2.471	2.475	2.470	2.650
2030	2.745	2.821	2.897	2.979	2.490	2.491	2.488	2.490	2.483
2031	2.704	2.745	2.827	2.908	2.994	2.508	2.508	2.503	2.503
2032	2.688	2.704	2.752	2.839	2.924	3.012	2.525	2.524	2.517
2033	2.669	2.688	2.711	2.765	2.857	2.944	3.031	2.542	2.539
2034	2.649	2.670	2.695	2.724	2.783	2.877	2.963	3.048	2.558
2035	2.628	2.650	2.677	2.709	2.743	2.804	2.897	2.981	3.064
2036	2.604	2.628	2.657	2.691	2.729	2.765	2.825	2.916	2.997
2037	2.576	2.604	2.636	2.672	2.711	2.751	2.787	2.844	2.933
2038	2.544	2.576	2.612	2.651	2.693	2.735	2.774	2.807	2.862
2039	2.508	2.544	2.584	2.628	2.673	2.717	2.759	2.795	2.826
2040	2.466	2.507	2.552	2.601	2.651	2.698	2.742	2.780	2.814
2041	2.425	2.466	2.516	2.569	2.624	2.677	2.724	2.764	2.800
2042	2.402	2.424	2.474	2.533	2.593	2.651	2.703	2.747	2.784
2043	2.376	2.401	2.433	2.493	2.558	2.622	2.678	2.727	2.768
2044	2.347	2.375	2.410	2.451	2.518	2.587	2.650	2.703	2.748
2045	2.316	2.346	2.384	2.429	2.478	2.548	2.616	2.675	2.725
2046	2.284	2.315	2.355	2.404	2.457	2.509	2.578	2.642	2.697
2047	2.262	2.283	2.325	2.375	2.432	2.489	2.539	2.605	2.665
2048	2.249	2.261	2.293	2.345	2.404	2.464	2.520	2.567	2.629
2049	2.232	2.247	2.271	2.314	2.375	2.438	2.497	2.548	2.591
2050	2.213	2.230	2.257	2.293	2.345	2.410	2.471	2.526	2.573

	27	28	29	30	31	32	33	34	35
2008	2.812	2.743	2.657	2.565	2.488	2.435	2.418	2.427	2.446
2009	2.825	2.799	2.736	2.652	2.563	2.489	2.440	2.425	2.436
2010	2.780	2.790	2.774	2.723	2.651	2.571	2.501	2.452	2.435
2011	2.686	2.735	2.757	2.749	2.708	2.644	2.569	2.501	2.452
2012	2.563	2.614	2.669	2.697	2.695	2.659	2.599	2.527	2.462
2013	2.553	2.564	2.614	2.667	2.693	2.690	2.654	2.595	2.525
2014	2.613	2.555	2.565	2.613	2.664	2.688	2.686	2.650	2.593
2015	2.734	2.615	2.556	2.564	2.610	2.660	2.684	2.682	2.648
2016	2.902	2.737	2.617	2.556	2.562	2.607	2.656	2.681	2.681
2017	3.067	2.905	2.739	2.617	2.554	2.559	2.603	2.653	2.680
2018	3.184	3.071	2.908	2.739	2.615	2.552	2.556	2.601	2.652
2019	3.220	3.188	3.073	2.908	2.738	2.613	2.549	2.554	2.601
2020	3.190	3.225	3.191	3.074	2.908	2.736	2.611	2.548	2.554
2021	3.135	3.195	3.228	3.193	3.074	2.906	2.735	2.610	2.548
2022	3.090	3.140	3.199	3.230	3.193	3.073	2.905	2.734	2.611
2023	3.053	3.096	3.144	3.201	3.231	3.192	3.072	2.905	2.735
2024	3.031	3.059	3.100	3.147	3.202	3.230	3.191	3.072	2.906
2025	3.010	3.038	3.065	3.104	3.149	3.202	3.230	3.192	3.073
2026	2.976	3.018	3.044	3.069	3.106	3.150	3.203	3.231	3.194
2027	2.919	2.984	3.024	3.048	3.071	3.107	3.151	3.204	3.233
2028	2.840	2.927	2.991	3.029	3.051	3.073	3.109	3.152	3.206
2029	2.750	2.850	2.935	2.996	3.033	3.054	3.075	3.111	3.155
2030	2.661	2.760	2.858	2.941	3.001	3.036	3.056	3.078	3.114
2031	2.495	2.672	2.769	2.864	2.946	3.004	3.039	3.059	3.082
2032	2.516	2.506	2.681	2.776	2.870	2.950	3.007	3.042	3.063
2033	2.530	2.527	2.515	2.688	2.782	2.874	2.953	3.011	3.047
2034	2.552	2.542	2.537	2.524	2.695	2.787	2.878	2.958	3.016
2035	2.572	2.564	2.552	2.546	2.531	2.700	2.791	2.883	2.963
2036	3.078	2.584	2.575	2.561	2.553	2.537	2.705	2.796	2.889
2037	3.012	3.091	2.596	2.585	2.569	2.559	2.542	2.711	2.803
2038	2.948	3.025	3.103	2.606	2.593	2.576	2.566	2.548	2.718
2039	2.878	2.962	3.037	3.113	2.615	2.600	2.583	2.572	2.556
2040	2.842	2.892	2.974	3.048	3.122	2.622	2.607	2.589	2.580
2041	2.831	2.857	2.905	2.986	3.058	3.130	2.629	2.615	2.597
2042	2.817	2.846	2.870	2.917	2.996	3.066	3.137	2.637	2.623
2043	2.802	2.833	2.860	2.883	2.927	3.004	3.074	3.145	2.646
2044	2.786	2.819	2.848	2.873	2.894	2.937	3.013	3.082	3.154
2045	2.767	2.803	2.833	2.861	2.884	2.903	2.945	3.021	3.091
2046	2.744	2.784	2.818	2.847	2.873	2.895	2.913	2.955	3.031
2047	2.718	2.762	2.800	2.832	2.860	2.883	2.904	2.922	2.964
2048	2.686	2.736	2.778	2.815	2.845	2.871	2.894	2.914	2.932
2049	2.650	2.705	2.752	2.793	2.828	2.857	2.881	2.904	2.925
2050	2.613	2.669	2.722	2.768	2.807	2.840	2.868	2.892	2.915

	36	37	38	39	40	41	42	43	44
2008	2.461	2.470	2.469	2.460	2.449	2.443	2.444	2.455	2.471
2009	2.457	2.473	2.481	2.478	2.466	2.453	2.445	2.446	2.458
2010	2.443	2.462	2.475	2.481	2.476	2.462	2.447	2.442	2.449
2011	2.433	2.441	2.457	2.469	2.475	2.468	2.453	2.440	2.438
2012	2.414	2.398	2.407	2.424	2.437	2.444	2.439	2.427	2.419
2013	2.461	2.414	2.398	2.406	2.423	2.435	2.441	2.434	2.421
2014	2.524	2.461	2.415	2.398	2.405	2.421	2.432	2.436	2.428
2015	2.592	2.524	2.462	2.415	2.397	2.403	2.418	2.428	2.430
2016	2.648	2.593	2.525	2.462	2.414	2.396	2.401	2.414	2.422
2017	2.681	2.649	2.594	2.526	2.461	2.413	2.393	2.397	2.409
2018	2.680	2.682	2.650	2.595	2.525	2.460	2.410	2.389	2.391
2019	2.653	2.682	2.684	2.651	2.594	2.524	2.457	2.406	2.384
2020	2.602	2.655	2.684	2.685	2.651	2.593	2.521	2.454	2.402
2021	2.556	2.604	2.657	2.685	2.684	2.649	2.590	2.517	2.449
2022	2.550	2.559	2.607	2.659	2.685	2.683	2.647	2.586	2.513
2023	2.613	2.554	2.562	2.609	2.659	2.684	2.681	2.643	2.582
2024	2.738	2.616	2.557	2.564	2.609	2.658	2.682	2.677	2.639
2025	2.909	2.741	2.620	2.559	2.565	2.608	2.656	2.678	2.673
2026	3.076	2.912	2.745	2.622	2.560	2.564	2.606	2.653	2.675
2027	3.197	3.080	2.916	2.747	2.623	2.560	2.562	2.603	2.650
2028	3.237	3.201	3.084	2.919	2.749	2.623	2.558	2.559	2.600
2029	3.211	3.241	3.205	3.087	2.920	2.748	2.621	2.555	2.557
2030	3.160	3.215	3.245	3.208	3.088	2.919	2.746	2.619	2.553
2031	3.119	3.165	3.220	3.249	3.209	3.088	2.918	2.744	2.617
2032	3.087	3.125	3.170	3.224	3.250	3.209	3.086	2.915	2.742
2033	3.069	3.093	3.130	3.174	3.225	3.250	3.207	3.083	2.913
2034	3.053	3.075	3.098	3.134	3.176	3.225	3.248	3.204	3.081
2035	3.022	3.059	3.081	3.103	3.136	3.176	3.223	3.245	3.202
2036	2.970	3.029	3.066	3.086	3.105	3.136	3.174	3.221	3.243
2037	2.896	2.977	3.036	3.070	3.088	3.105	3.135	3.172	3.219
2038	2.810	2.904	2.984	3.041	3.073	3.089	3.104	3.133	3.170
2039	2.726	2.818	2.911	2.989	3.044	3.074	3.087	3.102	3.132
2040	2.564	2.734	2.826	2.916	2.992	3.044	3.072	3.086	3.101
2041	2.588	2.573	2.742	2.832	2.920	2.993	3.043	3.071	3.085
2042	2.606	2.597	2.581	2.748	2.835	2.920	2.992	3.042	3.071
2043	2.632	2.616	2.606	2.587	2.751	2.836	2.920	2.991	3.042
2044	2.655	2.642	2.624	2.612	2.591	2.753	2.836	2.919	2.991
2045	3.163	2.665	2.651	2.631	2.616	2.593	2.752	2.835	2.919
2046	3.101	3.173	2.674	2.657	2.635	2.618	2.592	2.752	2.836
2047	3.041	3.112	3.182	2.681	2.662	2.637	2.618	2.592	2.753
2048	2.975	3.052	3.121	3.189	2.686	2.664	2.637	2.618	2.594
2049	2.943	2.986	3.062	3.128	3.193	2.688	2.664	2.637	2.619
2050	2.936	2.955	2.996	3.069	3.133	3.195	2.688	2.664	2.639

	45	46	47	48	49	50	51	52	53
2008	2.491	2.505	2.504	2.482	2.445	2.399	2.358	2.327	2.315
2009	2.477	2.499	2.516	2.517	2.498	2.464	2.421	2.382	2.353
2010	2.469	2.496	2.525	2.548	2.555	2.539	2.509	2.471	2.435
2011	2.450	2.474	2.505	2.539	2.566	2.576	2.564	2.538	2.505
2012	2.422	2.439	2.468	2.504	2.543	2.574	2.589	2.580	2.557
2013	2.410	2.412	2.426	2.453	2.487	2.523	2.552	2.564	2.554
2014	2.413	2.400	2.400	2.412	2.437	2.469	2.502	2.529	2.539
2015	2.420	2.403	2.389	2.387	2.397	2.420	2.449	2.480	2.505
2016	2.423	2.411	2.393	2.377	2.372	2.380	2.401	2.428	2.457
2017	2.415	2.414	2.401	2.381	2.363	2.357	2.362	2.381	2.406
2018	2.402	2.407	2.405	2.390	2.368	2.348	2.340	2.344	2.360
2019	2.385	2.395	2.398	2.395	2.378	2.354	2.333	2.322	2.324
2020	2.379	2.378	2.387	2.389	2.383	2.365	2.339	2.316	2.304
2021	2.396	2.372	2.371	2.378	2.378	2.371	2.351	2.324	2.299
2022	2.444	2.390	2.365	2.363	2.368	2.367	2.358	2.336	2.307
2023	2.508	2.438	2.384	2.358	2.354	2.357	2.355	2.344	2.321
2024	2.578	2.503	2.433	2.377	2.350	2.344	2.346	2.342	2.329
2025	2.635	2.573	2.498	2.426	2.370	2.341	2.334	2.334	2.328
2026	2.669	2.630	2.568	2.492	2.419	2.361	2.331	2.323	2.321
2027	2.671	2.665	2.626	2.563	2.486	2.412	2.353	2.321	2.311
2028	2.646	2.667	2.661	2.621	2.557	2.479	2.404	2.344	2.310
2029	2.598	2.643	2.664	2.657	2.616	2.551	2.472	2.396	2.334
2030	2.554	2.595	2.641	2.661	2.653	2.611	2.544	2.464	2.386
2031	2.551	2.553	2.594	2.638	2.657	2.648	2.605	2.537	2.456
2032	2.615	2.550	2.552	2.592	2.636	2.654	2.644	2.599	2.530
2033	2.740	2.614	2.549	2.551	2.590	2.633	2.650	2.638	2.592
2034	2.912	2.740	2.614	2.549	2.550	2.588	2.630	2.645	2.632
2035	3.080	2.911	2.740	2.614	2.549	2.549	2.586	2.626	2.640
2036	3.201	3.079	2.912	2.741	2.615	2.549	2.548	2.584	2.622
2037	3.243	3.201	3.080	2.912	2.741	2.615	2.548	2.546	2.580
2038	3.219	3.243	3.202	3.081	2.914	2.742	2.615	2.548	2.544
2039	3.170	3.220	3.245	3.204	3.083	2.915	2.743	2.616	2.546
2040	3.132	3.172	3.222	3.247	3.206	3.084	2.916	2.744	2.615
2041	3.102	3.134	3.175	3.225	3.249	3.208	3.086	2.917	2.743
2042	3.086	3.104	3.138	3.179	3.228	3.252	3.210	3.088	2.917
2043	3.072	3.089	3.109	3.142	3.183	3.232	3.255	3.212	3.088
2044	3.044	3.076	3.094	3.114	3.147	3.188	3.236	3.258	3.213
2045	2.993	3.048	3.081	3.100	3.120	3.153	3.193	3.240	3.260
2046	2.922	2.998	3.054	3.088	3.107	3.127	3.159	3.198	3.243
2047	2.839	2.927	3.005	3.061	3.095	3.114	3.133	3.165	3.202
2048	2.756	2.844	2.935	3.013	3.070	3.104	3.122	3.141	3.170
2049	2.598	2.763	2.853	2.944	3.022	3.079	3.112	3.130	3.147
2050	2.624	2.605	2.772	2.863	2.954	3.032	3.089	3.121	3.137

	54	55	56	57	58	59	60	61	62
2008	2.313	2.316	2.312	2.292	2.250	2.192	2.125	2.064	2.018
2009	2.340	2.338	2.339	2.333	2.311	2.266	2.206	2.137	2.072
2010	2.410	2.401	2.402	2.404	2.395	2.366	2.314	2.245	2.167
2011	2.478	2.461	2.459	2.464	2.465	2.450	2.412	2.350	2.272
2012	2.527	2.500	2.484	2.481	2.484	2.483	2.464	2.423	2.356
2013	2.529	2.497	2.468	2.450	2.446	2.447	2.444	2.425	2.382
2014	2.527	2.500	2.465	2.435	2.415	2.410	2.410	2.406	2.385
2015	2.512	2.498	2.469	2.433	2.402	2.381	2.374	2.373	2.367
2016	2.479	2.485	2.469	2.438	2.401	2.368	2.346	2.338	2.336
2017	2.433	2.453	2.456	2.438	2.406	2.368	2.334	2.312	2.302
2018	2.383	2.408	2.425	2.427	2.407	2.374	2.335	2.301	2.277
2019	2.339	2.359	2.382	2.397	2.397	2.376	2.342	2.302	2.267
2020	2.304	2.316	2.334	2.354	2.368	2.366	2.345	2.310	2.269
2021	2.284	2.282	2.292	2.308	2.326	2.339	2.336	2.314	2.278
2022	2.280	2.264	2.259	2.267	2.281	2.298	2.310	2.306	2.282
2023	2.290	2.261	2.242	2.235	2.241	2.254	2.270	2.280	2.275
2024	2.304	2.271	2.239	2.219	2.210	2.215	2.227	2.242	2.251
2025	2.314	2.286	2.251	2.217	2.195	2.185	2.189	2.200	2.214
2026	2.313	2.296	2.266	2.229	2.194	2.171	2.161	2.164	2.173
2027	2.307	2.297	2.278	2.246	2.207	2.171	2.147	2.136	2.138
2028	2.298	2.292	2.279	2.257	2.224	2.184	2.148	2.124	2.111
2029	2.298	2.283	2.275	2.259	2.237	2.202	2.162	2.125	2.100
2030	2.322	2.285	2.267	2.256	2.239	2.216	2.181	2.140	2.103
2031	2.376	2.309	2.269	2.249	2.237	2.219	2.195	2.160	2.118
2032	2.446	2.364	2.295	2.252	2.231	2.218	2.199	2.174	2.138
2033	2.520	2.434	2.349	2.278	2.235	2.212	2.198	2.179	2.154
2034	2.583	2.509	2.420	2.334	2.261	2.217	2.194	2.179	2.160
2035	2.624	2.573	2.496	2.405	2.317	2.244	2.199	2.176	2.160
2036	2.633	2.614	2.560	2.481	2.388	2.300	2.227	2.181	2.157
2037	2.616	2.624	2.602	2.545	2.465	2.371	2.283	2.209	2.163
2038	2.575	2.608	2.612	2.588	2.529	2.448	2.355	2.266	2.192
2039	2.540	2.568	2.597	2.599	2.573	2.513	2.432	2.338	2.249
2040	2.543	2.534	2.559	2.585	2.585	2.557	2.497	2.415	2.321
2041	2.612	2.538	2.525	2.547	2.571	2.570	2.542	2.481	2.398
2042	2.741	2.607	2.530	2.514	2.535	2.557	2.555	2.526	2.465
2043	2.915	2.737	2.600	2.520	2.503	2.522	2.543	2.540	2.510
2044	3.087	2.911	2.730	2.590	2.509	2.491	2.509	2.529	2.525
2045	3.212	3.082	2.904	2.720	2.580	2.497	2.478	2.495	2.515
2046	3.260	3.209	3.075	2.894	2.709	2.568	2.486	2.466	2.482
2047	3.244	3.257	3.202	3.066	2.884	2.698	2.557	2.474	2.454
2048	3.203	3.242	3.251	3.193	3.055	2.872	2.687	2.546	2.462
2049	3.173	3.203	3.237	3.243	3.182	3.044	2.861	2.675	2.534
2050	3.151	3.173	3.199	3.229	3.232	3.171	3.032	2.849	2.664

	63	64	65	66	67	68	69	70	71
2008	1.996	1.989	1.991	1.983	1.948	1.875	1.776	1.663	1.562
2009	2.021	1.993	1.979	1.974	1.958	1.914	1.834	1.728	1.608
2010	2.094	2.038	2.004	1.983	1.970	1.943	1.887	1.794	1.676
2011	2.183	2.100	2.031	1.984	1.951	1.926	1.892	1.831	1.733
2012	2.268	2.167	2.068	1.983	1.923	1.882	1.856	1.822	1.763
2013	2.313	2.222	2.117	2.015	1.928	1.865	1.823	1.794	1.759
2014	2.340	2.267	2.173	2.065	1.960	1.871	1.807	1.763	1.733
2015	2.343	2.295	2.218	2.120	2.010	1.904	1.814	1.749	1.704
2016	2.327	2.299	2.246	2.166	2.066	1.954	1.847	1.757	1.691
2017	2.296	2.284	2.252	2.195	2.112	2.010	1.897	1.790	1.699
2018	2.265	2.255	2.238	2.202	2.142	2.056	1.953	1.840	1.733
2019	2.240	2.225	2.211	2.190	2.150	2.086	1.999	1.895	1.781
2020	2.232	2.202	2.183	2.165	2.140	2.096	2.030	1.941	1.835
2021	2.235	2.195	2.162	2.138	2.117	2.087	2.040	1.972	1.881
2022	2.244	2.199	2.156	2.119	2.092	2.066	2.034	1.983	1.912
2023	2.250	2.209	2.161	2.114	2.074	2.044	2.014	1.978	1.924
2024	2.244	2.216	2.172	2.121	2.071	2.028	1.994	1.960	1.919
2025	2.221	2.211	2.180	2.134	2.079	2.027	1.979	1.941	1.903
2026	2.185	2.189	2.176	2.142	2.093	2.036	1.980	1.929	1.886
2027	2.146	2.155	2.156	2.140	2.103	2.051	1.990	1.930	1.875
2028	2.112	2.117	2.123	2.122	2.103	2.063	2.006	1.941	1.877
2029	2.086	2.084	2.087	2.091	2.086	2.064	2.019	1.958	1.889
2030	2.076	2.061	2.056	2.057	2.057	2.049	2.021	1.972	1.907
2031	2.079	2.051	2.034	2.028	2.025	2.022	2.008	1.975	1.921
2032	2.096	2.056	2.026	2.007	1.998	1.992	1.983	1.963	1.925
2033	2.117	2.073	2.032	2.001	1.979	1.966	1.955	1.940	1.914
2034	2.133	2.095	2.051	2.008	1.975	1.949	1.931	1.914	1.893
2035	2.139	2.112	2.073	2.028	1.983	1.946	1.916	1.892	1.868
2036	2.141	2.119	2.091	2.051	2.004	1.956	1.914	1.878	1.847
2037	2.138	2.121	2.099	2.070	2.029	1.978	1.925	1.877	1.834
2038	2.145	2.120	2.103	2.080	2.049	2.004	1.948	1.889	1.835
2039	2.175	2.128	2.102	2.084	2.059	2.025	1.975	1.913	1.848
2040	2.232	2.158	2.111	2.085	2.065	2.037	1.997	1.940	1.872
2041	2.304	2.215	2.142	2.095	2.067	2.044	2.010	1.963	1.899
2042	2.382	2.288	2.200	2.126	2.078	2.047	2.018	1.977	1.922
2043	2.449	2.366	2.273	2.185	2.111	2.059	2.022	1.985	1.937
2044	2.495	2.433	2.351	2.259	2.170	2.093	2.035	1.991	1.946
2045	2.510	2.480	2.419	2.337	2.244	2.152	2.069	2.005	1.952
2046	2.501	2.496	2.466	2.405	2.323	2.227	2.129	2.039	1.966
2047	2.469	2.488	2.483	2.454	2.392	2.306	2.204	2.099	2.001
2048	2.442	2.457	2.477	2.472	2.441	2.376	2.284	2.174	2.061
2049	2.451	2.431	2.448	2.467	2.461	2.426	2.353	2.253	2.135
2050	2.523	2.441	2.423	2.439	2.457	2.447	2.404	2.323	2.214

	72	73	74	75	76	77	78	79	80+
2008	1.495	1.474	1.487	1.450	1.459	1.472	1.481	1.479	5.566
2009	1.502	1.429	1.402	1.406	1.362	1.363	1.367	1.367	6.073
2010	1.548	1.436	1.359	1.326	1.321	1.274	1.269	1.265	6.412
2011	1.613	1.482	1.368	1.287	1.246	1.234	1.184	1.175	6.607
2012	1.667	1.547	1.416	1.298	1.211	1.164	1.146	1.096	6.692
2013	1.698	1.600	1.478	1.346	1.227	1.137	1.085	1.058	6.702
2014	1.695	1.630	1.530	1.406	1.274	1.153	1.060	1.003	6.683
2015	1.671	1.628	1.560	1.456	1.331	1.197	1.076	981	6.623
2016	1.643	1.605	1.558	1.485	1.379	1.252	1.118	997	6.560
2017	1.632	1.580	1.537	1.484	1.407	1.298	1.171	1.037	6.529
2018	1.640	1.569	1.513	1.465	1.407	1.326	1.214	1.087	6.548
2019	1.673	1.578	1.504	1.443	1.390	1.327	1.241	1.128	6.617
2020	1.721	1.610	1.513	1.435	1.370	1.311	1.243	1.154	6.722
2021	1.773	1.657	1.544	1.445	1.363	1.293	1.229	1.157	6.845
2022	1.818	1.708	1.590	1.475	1.373	1.287	1.213	1.145	6.959
2023	1.849	1.752	1.639	1.519	1.403	1.298	1.209	1.131	7.055
2024	1.861	1.782	1.682	1.567	1.445	1.326	1.219	1.128	7.130
2025	1.857	1.794	1.711	1.608	1.491	1.367	1.247	1.138	7.199
2026	1.843	1.792	1.724	1.637	1.531	1.412	1.286	1.165	7.277
2027	1.827	1.779	1.723	1.650	1.560	1.451	1.329	1.203	7.377
2028	1.817	1.764	1.711	1.650	1.573	1.478	1.366	1.244	7.504
2029	1.820	1.755	1.697	1.639	1.573	1.492	1.394	1.279	7.661
2030	1.832	1.759	1.690	1.627	1.564	1.494	1.408	1.306	7.837
2031	1.850	1.772	1.694	1.621	1.554	1.486	1.410	1.320	8.023
2032	1.865	1.790	1.707	1.626	1.549	1.477	1.405	1.324	8.205
2033	1.870	1.805	1.726	1.640	1.555	1.474	1.398	1.320	8.378
2034	1.861	1.811	1.742	1.659	1.569	1.481	1.396	1.315	8.534
2035	1.840	1.802	1.748	1.675	1.589	1.496	1.403	1.314	8.672
2036	1.816	1.783	1.741	1.682	1.605	1.515	1.419	1.323	8.802
2037	1.797	1.761	1.723	1.675	1.612	1.532	1.438	1.338	8.932
2038	1.785	1.743	1.701	1.659	1.607	1.540	1.455	1.358	9.072
2039	1.787	1.732	1.685	1.639	1.592	1.536	1.465	1.375	9.223
2040	1.800	1.734	1.675	1.624	1.574	1.522	1.462	1.385	9.382
2041	1.824	1.748	1.678	1.615	1.560	1.506	1.450	1.384	9.542
2042	1.852	1.773	1.693	1.619	1.553	1.494	1.436	1.374	9.693
2043	1.876	1.800	1.717	1.634	1.558	1.488	1.425	1.361	9.826
2044	1.890	1.824	1.745	1.659	1.573	1.494	1.420	1.352	9.942
2045	1.900	1.839	1.769	1.687	1.598	1.510	1.427	1.349	10.045
2046	1.907	1.849	1.784	1.711	1.626	1.535	1.443	1.356	10.142
2047	1.921	1.856	1.794	1.726	1.650	1.563	1.469	1.373	10.247
2048	1.956	1.871	1.802	1.737	1.666	1.587	1.497	1.399	10.369
2049	2.015	1.905	1.817	1.745	1.677	1.603	1.521	1.427	10.511
2050	2.088	1.964	1.851	1.760	1.685	1.615	1.538	1.451	10.676

c) City Populations of Kastamonu Çankırı and Sinop, 2011 – 2023

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Kastamonu	94.000	97.284	100.414	103.632	106.945	110.354	113.863	117.471	121.172	124.967	128.852	132.825	136.892
Çankırı	70.733	76.051	79.391	82.871	86.499	90.272	94.197	98.274	102.497	106.870	111.395	116.068	120.897
Sinop	38.921	39.855	41.197	42.584	44.020	45.503	47.036	48.620	50.251	51.931	53.660	55.434	57.257