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The Family as a Source of Social Capital in Three Balkans Countries: Key Indicators

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Abstract

The paper faces the family social capital concept. This is a concept on which demography starts to reflect only recently. In this paper, after revising existing theoretical approaches and literature, an operationalization of the concept of family social capital is proposed. Using aggregate panel data for three Balkans countries this research demonstrates the importance of family as a source of social capital. The results from the two underlying components of our PCA are associated to the underlying theoretical constructs of family social capital. In that way, these components appear to reflect two different aspects: component 1 via CBR and POP14 variables reflects strong demographic ties and the family and the component 2 which through GGFCE reflects the direct help for families and children by the State. Macedonia is the country which has the most positive correlation with the CBR and POP14. In contrast, Greece is typically least associated with these two variables under consideration.

Keywords: social capital, PCA, crude birth rate, social protection, divorce rate, age structure

1. Introduction

Contemporary family relations have become a central point for public debate and academic interest worldwide (Edwards et al., 2003). According to Bertani (2013) in the last three decades and more, both the ageing of population and declining fertility rate are well known situations in European countries which have undoubtedly caused intense changes in family and social functioning. Thus, for instance, Bertani (2013) provides some illustrations that may be in line with our research, such as the progressive increasing rates of divorce rates, the new family forms, more and more participation of women in the labor market, and the organization for care within the families from outside. Although there are significant variations in family patterns within regions, and even within specific countries, scholars have noted that it is generally considered that Northwest European family systems are very different from those in many other parts of the world. It has been found that societies outside of northwestern Europe are more generally family organized, have significant family solidarity and were often extended, and marriage was often universal (Thornton & Philipov, 2009). On the contrary, societies in northwestern Europe are perceived to be less family organized, have more individualistic and less parental authority, and have weaker systems of intergenerational support.

When debating the modern context of the family, Mikesell-Mather (1993) points out three development points. The first development is the extension of the concept of what constitutes a “family” in the modern view. The second development is the treatment of children as autonomous individuals, separate and independent from their parents in the legal sense. The revolution in reproductive technologies is the third development. According to this scholar, the most important legal changes of the “family” are a direct result of a huge shift in our social, political, and economic establishments in the 1960s, 1970s, and 1980s. As stated by Edwards, et al., (2003) the families are often considered as a source of social capital generation or devastation. The welfare system, as a new design of social cohesion dated from the second half of the last century, and the welfare state, which means

that a real measures should be taken by the national governments to activate the tools to ensure the economic wellbeing of their citizens mostly through the instrument of redistribution of resources, are experiencing new local and global challenges (Bertani, 2013). The aim of this paper is to evaluate whether the family produces social capital and how to act and react in the face of current challenges, originated by the social system and societal conditions in general. Therefore, this research is an attempt to apply the concept of social capital in family demography with a purpose to explore socio-economic and demographic background of family social capital in three Balkans countries. Thus, this research study furthermore aims to contribute to the rising debate about the role of economic and demographic factors on the producing or generating of social capital. There is a well-founded motivation why these countries were chosen. Our selected countries for this research study are three countries of the Balkans: Greece, Macedonia[1]and Serbia. All these three countries belong to the so-called "Mediterranean welfare system", as a part of the Southern European system alongside three other original systems: the "liberal", "social democratic" and "conservative-corporatist" (Bertani, 2013, p.87). As a result of this geographical closeness, the analysis of the family social capital concept within these countries gives interesting findings. This model of the "Mediterranean welfare system", is relatively strong on the side of social security and is characterized and based on an assumption that still considers the family as a choice of stable life. Within the comparative literature on social welfare systems, South European countries have been considered as part of the conservative model (Andreotti et al., 2001), and this model is characterized by two main features: 1) a high level of subsidiary to the family; and 2) the importance of the breadwinner position within the labor market. Moreno (2006) also indicates that the Mediterranean region is characterized by strong family ties and that such circumstances have deep historical roots and is not diminishing at present in any fundamental way.

Looking at the Eurostat data on marriage and divorce within these countries can be noticed that both marital decrease and fertility within marriage decrease or its postponement have not been accompanied in a sudden way by an increase of births outside of marriage or not converged to forming cohabitation unions. Indeed, there is not a strong convergence process regarding civil marriages but rather a durable regional homogeneity. Greece has the rate of births outside of marriage in Europe of only 12.4% against the estimated average of 42.7% for the EU countries in 2019; the same of 12.4% was recorded for Macedonia as well and about 27% for Serbia, respectively (Eurostat, 2022). In other words, in Greece, Serbia and Macedonia more than 70% of births occurred within marriages. Regarding marriage instability, Macedonia has the one of the lowest divorce rate in Europe, with latest value in 2017 of 1‰, then Serbia with 1.3‰, and highest rate has Greece with 1.8‰ (Eurostat, 2022). There is no doubt that all three countries (Greece, Macedonia and Serbia) represent a specific family model in which the family still plays a key role for marriage and reproduction. The paper is organized as follows: Section 2 contains the theoretical background of the research including literature review and previous research studies on family social capital. Section 3 presents the data used and methodology approach of the study. Section 4 shows empirical results with application of the PCA approach and main findings. Section 5 and 6 provide main discussion and conclusion points for the research study.

2. Theoretical Background

Social capital is a rather unclear concept and, often, scholars take on different explanations and different measures for it (Bartolini, Bilancini and Pugno, 2013). Although the concept of social capital includes the economic concept of capital, in whatever way, economic theoreticians are hesitating in regard to this (Ignjatović, 2012). Some scholars believe that social capital is not capital but a "bad metaphor", as it cannot be transferred nor could it be converted into other types of capital. As Ignjatović (2012) points further, some others have pointed out that social capital should not be characterized as actual capital, because the opportunity cost of its utilization cannot be calculated. Social capital is one of the popular modern concepts with widely practical use, such as globalization, civil society, and postmodernism, which has been intensively used in the past decades in scientific research and public affairs issues (Bobić, 2012). The receipt of social capital in demography is, however, occurring recently. Besides in academic circles, social capital has become a key concept in government policy-making as well. The main difficulty in this respect is that the social capital explicitly has been recognized as a multi-dimensional concept by both the economic and sociological theories, while in most empirical applications the definition for the social capital is largely determined by the data set and consequently limited on the very narrow range of proxies that the chosen data set contains (Gannon and Roberts, 2018). As a result, the social capital became to a high degree a disputable concept, facing many conceptual and methodological issues (Tomanović, 2008).

2.1 Literature Review

Since our research focus is family social capital, according to Hogan (2001) the force of the relations between parents and child may be a measure of accessible social capital. In this regard, Aboim (2010) points that one of the indicators could be also the acceptance of divorce and cohabitation and the link between parenthood and marriage. According to Sedano et al., (2009) marriage is the main producer of social capital through the birth and

rearing of the children, and he further points: “As children moves through the education system, parents can provide instrumental assistance, spread information about education and future opportunities, establish and reinforce the rules of expected behavior, and offer support as children navigate new scenarios, by conveying their own experiences with both success and failure”. Simply put, the social capital of the family is the relationship between children and parents (and, when families include other members, also the relationships with these members). The marital status is an important source of information on the family, which, according to Bartolini, Bilancini and Pugno (2013) has been considered as one of the main sources of social capital. Bobić (2012) explains that with entering into marital relations as a type of transaction between individuals for the most part it is provides biological and social reproduction, through which the power and privileges are transferred to future generations. According to Nan Marie Astone et al., (1999) family behavior, including marriage and childrearing, remain the classic examples of investment in social capital and according to these scholars, in the United States the phrase “starting a family” is usually reserved for having a first child, rather than getting married. Accordingly, family formation is considered as the most important type of investment in social capital made in all societies. In addition to marriage and death the birth of a child is one of the three key demographic events. According to Bobić (2012) this event requires change of the existent relations in the family network of both partners, and in this way, with the birth of a child; it is considered that the family has been strengthened.

Social capital within the family is different from financial or human capital (Coleman, 1988). In the opinion of Gök (2016) family is understood as a major resource for both bridging and bonding social capital, and the human, social, cultural and economic capital of family have effects on future social capital of an individual. In addition, Hogan (2001) emphasizes that social capital is connected with human and family development by formation of resources and the spread of better options with social networks. Hogan (2001) also confirms the usefulness of the three forms of capital in studying family well-being, making differentiation among human capital, financial capital, and social capital. While the observation of Hogan (2001) is on social capital, on resources immanent in the structure of the relationships among individuals in families and communities, he acknowledges that the three forms of capital are interrelated. Sedano et al., (2009) emphasize that the greatest social capital of a family at first stems from the relationship between parents and children, and then from the relationship with other adults who are related to the family. It is worth mentioning that the various perspectives on families and on social capital as well have the credit of revealing a number of key tensions and difficulties in social capital theorizing.

Edwards (2004) points out that favored social capital theorists in the field of policy development tend to prioritize economic or political effects or the consequences of family and social relationships. Therefore, families are regarded as significant for the economic and political stability and order. Ciscel and Heat (2001) had a more radical view regarding these circumstances and claim that the contemporary demonstration of corporate capitalism destroys the functioning of family and as a result the social capital as well. The small number of children in nuclear families causes less intergenerational family links and consequently, as stated by Gök (2016), the end of traditional families is damaging to buildup of social capital. Rises of cohabitation, divorce and separation, single-parenting and people living alone are viewed as indication of a destabilization of traditional values and are presumed to lead to a decrease of a family social capital (Gillies, 2004). Furthermore, as Gillies (2004) pointed out, the mainstream social capital literature becomes a powerful political rhetoric about the damaging impact of family breakdown on children and for society in general. Given that families present a key fundament for social capital, there are opinions that the state has a responsibility to handle the current deficit in parenting support and to make sure to help parents in order to carry out their basic duties.

As emphasized by Coleman (1988), the most prominent aspect of structural deficiency in contemporary families is the single-parent family. Also, the nuclear family itself, in which one or both parents work outside the home, may be seen as structurally deficient, because lacking the social capital comes with the absence of parents during the day, or other adult relatives within the household. Furthermore, Coleman (1988) explains that even if parents or adults are physically present there may be a lack of social capital in the family, i.e. in case there are not strong relations between children and parents. Through the shared values, the families provide a link and order between families, communities and a society. Both ‘the family’ and social capital are set up as fundamental and strong bases for social cohesion, but also easily eroded and in need of protection and support (Edwards, 2004). Furthermore, as stated by Sedano et al., (2009), the families are small societies, and the network of trust established across generations and between spouses within the family is a crucial factor for an order in society as a whole. In a contrary, the disintegration of the ‘traditional’ family and the rise of a range of diverse family forms (such as single mother, same-sex, cohabiting, step, and dual worker) are considered as irresponsible behavior, social disconnection and social disorder in regard to the recognized family values. Thus, in this view, according to Sedano et al., (2009) ‘the family’ is in need of protection from state intervention, mostly in the form of welfare benefits and providing normative and policy support to the family.

Edwards et al. (2003) emphasize that the two social capital theorists who represent the family as a key concept in their understandings of social capital are James S. Coleman and Pierre Bourdieu. According to these scholars,

Coleman tries to integrate economic rationality and social organization theories, bringing into focus both action and structure. Thus, Coleman makes a causal link between the investment in the next generation (economically rational exchange and cost-benefit effect) and the cohesive moral norms and structural sanctions. Furthermore, Coleman mentions that the social capital is a resource within 'the family' that is permanently in the structure of intergenerational relationships, particularly between parents and children. Accordingly, parents invest in their children, as the next generation of the family who consequently and/or eventually will support them in later life. This resource makes it possible for children to increase their human capital through education, which then makes them able to gain greater economic treasures. This process of social capital generating within families seems to be entirely connected to social capital as a resource outside 'the family', where parents and children have close and/or local relationships with established social structure of norms, trust and commitments. It is interesting to point out that Coleman indicates a number of characteristics of modern life as a threat to social capital both within and outside 'the family', for example: changing family structures lead to a deficit of social capital, especially in regard to increasing of single-parent families (Edwards et al., 2003). These developments mean that strong families and strong communities are less often present nowadays than in the past, and that they will be even less present in the future as well.

The work of *Bourdieu* on social capital includes a focus on families as well. Differently from Coleman, his focus is not on the decadence of social capital in a modern society, i.e. Bourdieu understands social capital as a created set of social responsibilities (Edwards et al., 2003). People acquire their social capital from their membership of a group, such as a family or kinship group. According to Bourdieu, social capital is the product of individual or collective investment strategies, directed at setting up or producing social relationships that are directly operational in the short or long term. Bourdieu says that the links comprising social capital are built up over time and may be transmitted over generations.

Robert Putnam and Francis Fukuyama are more involved themselves in researching social capital as a structural aspect of large aggregates as communities, regions and nations – instead of individuals and families (Edwards et al., 2003, p.8). However, what is important is that these two scholars are recognizing the "family" as a key feature of social capital in their reasoning, but in some different ways. In that way, *Putnam* is well aware of the evidence that changing family life has a most fundamental causal effect on social capital decline. *Fukuyama* also hypothesizes that the trends as rising divorce rates and births outside marriage may potentially contribute to weaker social capital but this rise, according to him, may actually also lead some family members to incline to greater degree of association with people and groups outside the family.

2.2 Previous Research Studies

Franklin (2007) points about the decline in social capital in the US since the Second World War as well as Bartolini, Bilancini and Pugno (2013) also have been empirically confirmed as dramatically declining social capital in the US. He considers that this decline is due to society becoming more individualized and more perfectionistic. The 1960s generation, as he writes down, has had great "merit" in the breakdown of traditional family life and for isolation of individuals in society.

A review of the scanty results of empirical studies conducted so far according to Wosiek (2016) lead to a reasoning that the individual types of social connections and social capital aspects act differently under the conditions of economic crisis. Furthermore, Wosiek (2016) arises the hypothesis that under conditions of economic uncertainty social capital is of more importance to those most poverty-stricken, i.e. for them it is the only resource they could rely on, despite the fact that the this rare effect of reinforcing family links is with a short or medium-term at most, since the financial capacities of friends and family may be limited. The observations of social capital in Iceland before and after the economic crisis struck in 2008 indicate that not only family connections were strengthened, but also those outside of the family, i.e., civic, social and political activity of Icelanders became more intense[2].

The Balkans are famous for the widespread collectives, i.e., extended households that are made up of the father and married sons, have maintained for a long time, until the beginning of the 20th century (Bobić, 2012). In the period of intensive industrialization of the 1950s and 1960s, the rise of the small, nuclear family has been noticed, and the extended family was on the downturn, where the older members were active in agriculture, the middle generation worked in the close by towns, while the younger generation was being educated and preparing for a work in the urban settlements (Bobić, 2012, p.49).

The two databases (World Values Survey and European Values Study), as the most comprehensive examinations, consisting data on attitudes of individuals and their social activities in different areas of human interest - religion, politics, economic and social life, have been conducted in the Balkans countries since the mid-1990s, and data on the citizens' attitudes towards the social and political changes they have witnessed are available in the third (1994-1999), the fourth (1999-2004) and the fifth (2005-2008) wave of World Values Survey (WVS, 2009) and the fourth wave of European Values Study, completed in 2010 (EVS 2011). From the results of these surveys, it

could be concluded that individuals who live in the Balkan countries highly value relations with friends and family and rely on their support during their life (Golubović et al., 2014). The importance of bonding ties in the Balkans is very high, taking into consideration that over 90% of respondents declared that family is very important in their life (Golubović et al., 2014). What is also interesting is that the intensity of this type of social relations is continual over time, as all the time the percentage of respondents who ranked a great importance on family is high. A decrease of dependence on family ties has been observed only in the last period, while still a high percentage of the population state that they are "very concerned" for the living conditions of their families (Golubović et al., 2014, p.87).

In the context of protracted transformation of society in Serbia during the end of 1990s and the beginning of 2000s, Tomanović (2008, p.7) emphasizes that Serbia was witnessing notably a "retrograde" change in family structure: namely, the proportion of extended family households have increased to 25%-30% of all households during this mentioned period[3]. Tomanović (2008) further explains that the reasons for the prevalent increase in the share of extended family households in Serbia for the mentioned period were mainly due to housing shortage for young couples and their staying within parental households (about 50% of all marriages started in parental households) and to high unemployment rate. Tomanović (2008, p.7) notes that once it was a rural phenomenon, it was increasingly becoming an urban phenomenon as well. Thus, under the conditions of scarce resources, obstructions and "blocked" society, this kind of extended family households had a trait of "survival strategy" for Serbia during that period. The divorce rate in Serbia is low since several decades ago, as are cohabitations (1-2%), but recently there has been a noticeable rise in divorce trends, which together with the birth outside of marriage may signify a transformation of marriage, i.e., a gradual change from the traditionalism and pluralization of lifestyles (Bobić, 2012). According to her, a legalized marriage is the "safer" option for survival, since it possesses higher levels of social capital. Research of the social capital of families from 2008 have shown that sociability, networks and exchange of resources are very high in wedded families in Serbia, not only among younger couples, but between older couples as well (ibid, p.53).

Concerning social capital research in Greece, there is a limited literature which makes analyses mainly on macro level and moreover, Greece is often not included in European comparative studies (Jones et al., 2008). Although measuring social capital is not an easy research task, Paraskevopoulos (2007) underlines that in the case of Greece the lack of historical databases constitutes an additional obstruction. However, a limited number of publications have analyzed the current situation of social capital in Greece. The larger part of these studies underline that not all features of social capital in Greece are equally weak and especially, the components of social capital such as family networks and those between friends (informal networks) are recognized as very solid and in contrast social trust is significantly low (Jones et al., 2008). Significantly high scores for the factor 'family' were revealed for Greece compared to other European countries in a recent analysis, (Jones et al., 2008, p.6). The development of the Greek interventionist state was historically based on patron-client relationships between state agencies and its citizens (Jones et al., 2008; Lyberaki & Tinios, 2014). Although this feature had some positive influence during the economic development of Greece in the 60s and 70s from last century, nowadays a political system in which the state has substantial centralized control over social and economic affairs is recognized as a major obstacle for structural changes in both the public and the private domain. Using data from a series of Euro barometer surveys (1986-2006), the European Values Survey (EVS) of 1999, surveys of the Greek National Center for Social Research (EKKE) and two rounds of the European Social Survey (ESS 2002/2003 and 2004/2005), and applying Confirmatory Factor Analysis (CFA) with selected 12 ordinal variables, in their research, Jones et al., (2008) have found that in regard to other components of social capital (such as social and institutional trust), informal networks were one of the 'strong' features of social capital in Greece. The importance of these networks (especially family networks) might be associated with the function of the family in Greece as a substitute for inefficiency of the state and subsequent to family as a source of support and benefits for the individual. The available data indicated that there was no difference between the importance of family ties and networks of friends.

3. Data and Methodology

3.1 Operationalization of the Variables

It is well known that social scientists are unable to agree on a common procedure for measuring social capital. A very important thing when measuring social capital is to determine its true utility net of its externalities, adds Byrappa (2007). Solow himself has argued in relation to measuring social capital and as he said: "It is a dirty job, but someone has to do it; and mainstream economics has puristically shied away from the task" (Gannon & Roberts, 2018). Wosiek (2016) speaks about the microeconomic and macroeconomic determinants of social capital. Within the microeconomic determinants of the social capital are included: psychological and socio-economic characteristics of a person, such as personal income, level of education, family and social status, personal values and experiences which determine the chances and motivations of individuals to 'invest' in social

capital and to participate in social relations. The macroeconomic determinants of social capital incorporate: systemic factors or the context, such as the overall level of socio-economic development, the reliability of formal institutions among citizens, the level of social and economic inequalities, and so on.

Gabel and Kamerman (2006) emphasized that public investment in children and families within and across countries are measured as a share of gross domestic product (GDP), a share of total public investment in social protection, real spending on benefits and services for families with children, and spending per-child. The confidence in institutions is widely recognized as a very important measure and proxy for the identification of social capital. According to Paraskevopoulos (2007) what really matters is not trust in institutions generally, but instead trusts in the institutions that are mostly involved in the implementation of public policies. As a potential measure for social capital within families, Gabel and Kamerman (2006) have stressed out the real spending on family benefits and expenditures on family benefits per child as a means of comparing the generosity of each country toward its children. The receiving of public assistance as a child as well as the education of the parents are considered as proxies for the potential socioeconomic background of the family (Nichols & Feltey, 2006) and as potential resources of the extended family. A more "classical" economic approach is when a measure for the social capital is some explanatory variable or when several other explanatory variables may be included in a model, e.g. investments, education, etc. (Hjøllund & Svendsen, 2000). In such a research context, Hjøllund et al., (2001) consider that while measuring a social capital, two or three variables are mostly found, where one may dominate and to represent the "social capital", while the other(s) could be identified as something else.

Among the factors that indicate the decline of the family as a source of social capital, Sedano-Rodríguez, Aguileraand and Paris (2009) have mentioned the following factors: the population structure, the birth rate, divorce, and social protection. Therefore, our indeed focus will be exactly on these variables since they affect the family from within. One of the indicators of the social protection factor is the variable: General Government final consumption expenditure. The General Government final consumption expenditure includes goods and services produced by the government, as well as purchases of goods and services by governments that are supplied to households as social transfers in kind. General government final consumption expenditure represents the spending of general governments (including federal, provincial, territorial and local) on goods and services. The goods and services are consumed by the general government within the year they are purchased. The expenditures are often made on behalf of households, such as expenditures on health care and education, wages and salaries (Eurostat 2019; Statistics of Canada, 2019).

3.2 Data

For the achievement of the empirical objectives of our research and the testing of hypotheses relating to measurement of the family social capital, aggregate annual time series data from UN, World Bank databases as well as from Eurostat and Serbian National statistics offices have been used (UN, 2020; World Bank, 2020; Eurostat, 2021). In particular, the main references are UN, World Bank and Eurostat data from 2000-2020. These data cover the period 2000-2020, including three countries from the Balkan region: Greece, Macedonia, and Serbia. For our research, data for the variable - General government final consumption expenditure as percentage distribution (GGFCE), (UN, 2022).The data for the variables-population ages 0-14 (% of total population) (POP14) and for the crude birth rate (CBR) were obtained from World Bank development indicators database (World Bank, 2022). Furthermore, data for the variable - crude divorce rate (CDR) were retrieved from Eurostat databases (Eurostat, 2022). Due to data gaps about Serbia (1991-2004), additional sources for these years were used. Thus, for Serbian crude divorce rate for these years mentioned above were used data from both the Statistical office of Republic of Serbia (RZS, 2001; RZS, 2006). Due to the same reason as mentioned above, the value of crude divorce rate for Greece in 2018-2020 is an estimation that was made by the author of this research study. The data for all variables in our research through the period 2000-2020 are presented in Figure 1.

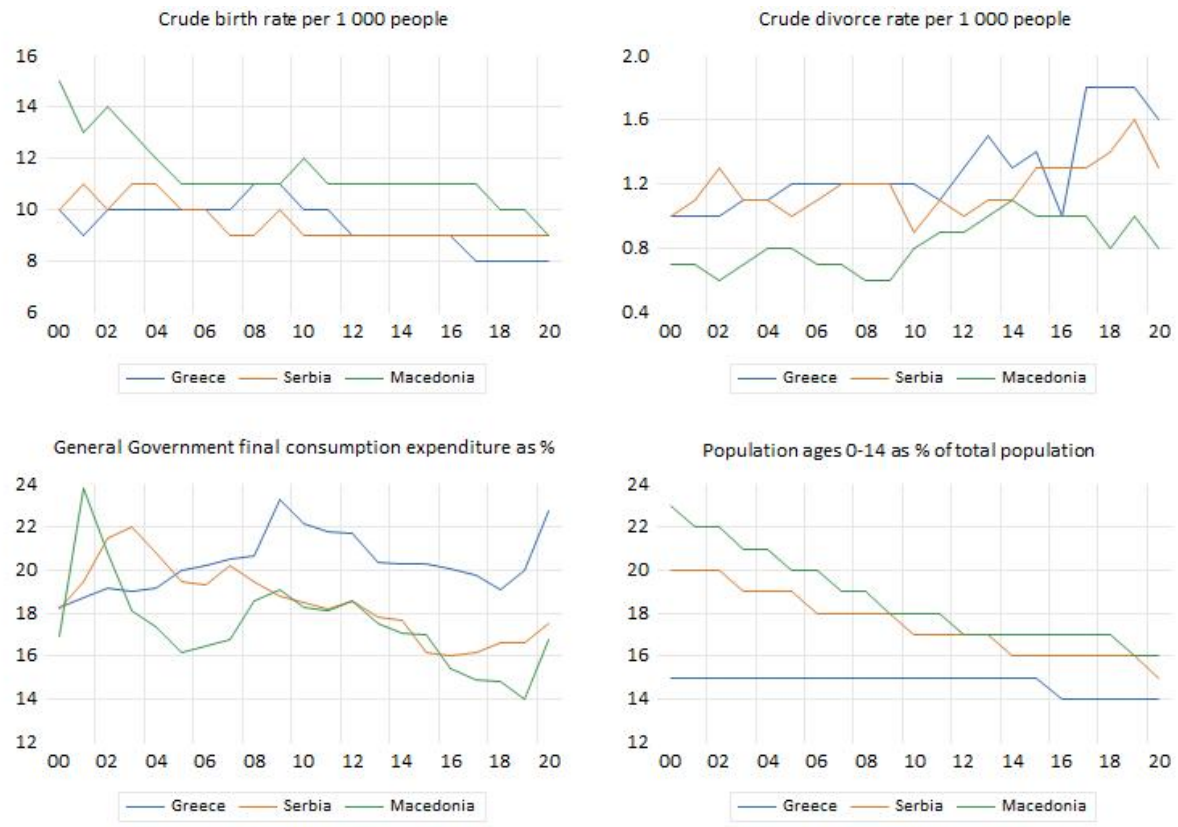

Figure 1. CBR, CMR, 0-14 and GGFCE for Greece, Serbia and Macedonia from 2000 until 2020

Source: Author's design based on World Bank, UN and Eurostat data

3.3 Method

Principal Component Analysis (PCA) focuses on representing a set of compact data by extracting a certain number of features or components, which contain most of the information carried by the data (Gnecco and Sanguinet, 2009). When the data have a defined-dimensional representation, PCA is consistent with an orthogonal transformation of the coordinate system, come after by the projection of the data on a subset of the new coordinates, which are called principal components, for this reason is the name of "Principal Component Analysis". This technique is driven by the fact that often only a small number of correctly-chosen components contain almost all the information needed for subsequent processing of the data (Gnecco and Sanguinet, 2009). Principal component analysis is to a very great degree an important multivariate statistical technique with fair enough mathematical rigor to ease any serious future projects (Bai and Ng, 2002). Even though PCA is deeply rooted in linear algebra, it is a very visual experience as well. Therefore, its main fitting feature is the capability to visualize multidimensional structures across two-dimensional main points. Specifically, comparing two principal directions provides plenty of information that is typically out of reach in conventional multidimensional contexts. A powerful tool for making inferences unique to PCA is element-wise comparison of two principal directions. Principal directions, the eigenvectors or principal components. However, the literature has retained the term principal components for future use for the projections of the original system variables on the principal directions. Thus, principal components refer to the column vectors and sometimes are also referred to as scores. As a result of the diagonalization properties, the variance of each principal component is in fact the eigenvalue connected with the underlying principal direction, and there is no mutual correlation between the principal components. Besides, with the principal directions it is possible to quantify how correlated the original variables are. Furthermore, since principal directions are sorted in decreasing order of importance (principality), the first few directions will capture the larger part of variation, leaving the less principal directions to contribute information to only a limited extent. Appropriately, there is significantly dimensionality reduction while

retaining the majority of information. This means that with reducing dimensionality it obviously leads to data denoising. Hence two principal directions are considered as $Ej = [e1, j \ldots . em, j]$ and $Ek = [e1, k \ldots . em, k]$ and if $\{V1, j, k, \ldots, Vm, j, k\}$ denotes set of vectors from the origin (0.0) to (ei, j, ei, k) for $i \in 1, \ldots ., mi \in 1, . . m$ (Bai and Ng, 2002). Put in other words $Vi, j, k = (ei, j, ei, k)$т, at that time for any (j, k) principal direction pairs, a plot of all m vectors Vi, j, k for $i \in 1, \ldots ., mi \in 1, . . m$, on a single plot, is called a loading plot. In particular, there is significant association between vectors Vi, j, k and original variable covariances SXi, Xs or for any (j, k) principal direction pairs there is a proportion of covariance SXi, Xs. The covariance matrix contains all noise and redundancy information connected with a matrix. The idea behind principal component analysis is to express again the original covariance matrix using a set (matrix) that results in a new, diagonal covariance matrix, where off-diagonal elements in the new-original covariance matrix are brought to zero and redundancy has been removed. In the end, it can be noticed that matrix rank determines the maximum number of eigenvectors (eigenvalues) that can be extracted for the mentioned matrix.

4. Empirical Results

PCA was applied to study the data of social capital in families. In particular, our dataset summarizes annual data on macro level for four variables in three Balkans countries (Greece, Macedonia and Serbia) from 2000-2020. The data contains four variables, associated with General government final consumption expenditure as percentage distribution of GDP (GGFC), Crude birth rate (CBR), Crude divorce rate (CDR) and the percentage of the population ages 0-14 (POP14). Certain tools and protocols from the PCA literature have been applied. Thus, firstly in Table 1 the PCA fundamentals were summarized. Furthermore, an overview of eigenvalues and eigenvectors has been produced and this is a result from applying the principal component decomposition to the covariance or correlation matrix associated across the four variables of interest. The output, which is summarized Figure 1, consists of three parts. The first part gives a summary of the information on eigenvalues. The second and last parts are categorized in order of importance, measured as the proportion of information explained by each principal direction. In particular, it can be seen that the first principal direction explains roughly 61.6% of the information contained in the underlying correlation matrix, the second, 25%, etc. In addition, the cumulative proportion of information explained by the first two principal directions is approximately 87(61.6 + 25) %.

The second part sums up the eigenvectors related with each of the principal eigenvalues. Furthermore, in contrast with the fact that the eigenvalues underscore how much of the overall information is extracted in each of the principal directions, the eigenvectors disclose how much weight each variable has for each direction. Therefore, the respective importance of any variable in a given principal direction is effectively the proportion of the eigenvector length ascribed to that variable. Thus, in the case of our first eigenvector, CBR accounts for 33.47% of the overall direction length (0.578453^2 x100) and similarly POP14 accounts for 32.25% of the direction. In the other (second) principal direction it is GGFC that carries most weight, contributing 93.49% to the direction length (0.966889^2 x100). Consistently, it is comprehensible that the first principal direction is approximately equally dominated by CBR and POP14, whereas the second principal direction is nearly wholly governed by GGFC. Finally, the third part of Table 1 presents the correlation matrix to which the eigen-decomposition has been applied. A fast explanation of the correlation structure shows that CDR is highly negatively correlated with CBR, whereas the CBR reveals a strong positive correlation with POP14. Moreover, there is a medium negative correlation between POP14 and CDR. Instinctively; this is in line with common sense. As a result of the higher divorce rates, births generally and typically are observed in smaller numbers. On the other hand, birth rates are more pronounced in those areas with younger population structure. The younger population structure favors more births simply because there are more people.

Table 1. Principal components analysis

Eigenvalues: (Sum = 4, Average = 1)

Number	Value	Difference	Proportion	Cumulative Value	Cumulative Proportion
1	2.463769	1.461964	0.6159	2.463769	0.6159
2	1.001805	0.677039	0.2505	3.465574	0.8664
3	0.324766	0.115107	0.0812	3.790341	0.9476
4	0.209659	---	0.0524	4.000000	1.0000

Eigenvectors (loadings):

Variable	PC 1	PC 2	PC 3	PC 4
CBR	0.578453	0.213467	0.001578	0.787287
CDR	-0.567277	0.082980	0.719007	0.392862
GGFCE	-0.145143	0.966889	-0.141280	-0.155238
POP14	0.567910	0.112569	0.680490	-0.449154

Ordinary correlations:

	CBR	CDR	GGFCE	POP14
CBR	1.000000			
CDR	-0.725509	1.000000		
GGFCE	-0.025780	0.237458	1.000000	
POP14	0.759656	-0.662471	-0.110650	1.000000

Source: Author's calculation, Sample 2000-2020. Included observations: 63. Computed using: Ordinary correlations. Extracting 4 of 4 possible components.

From Figure 2, it can be seen the graphical descriptions for the underlying eigenvalues. Figure 2 contains the ordered eigenvalues, the differences between consecutive eigenvalues plot as well as the cumulative proportion of the eigenvalues plot. This is implemented in line with the methodology modified from Bai and Ng (2002) protocol. From the first graph of Figure 2, it is evident that a twist occurs at the 2nd eigenvalue and it is likely to conclude that scree plot analysis indicates that the first two eigenvalues should be retained. The idea behind the second graph is to retain all eigenvalues whose differences are between the consecutive eigenvalues[4]. It is comprehensible that only the first two eigenvalues meet the expectations of this principle. The idea behind the third graph of the cumulative proportion of information explained by the consecutive principal eigenvalues in Figure 2 is to retain those eigenvalues that form parts of the cumulative curve whose slopes are at least as steep as the line with slope 1. In our case, it is very clear that only two eigenvalues seem to form such a part: eigenvalues 1 and 2. All three graphical methods point out that the first two eigenvalues and their associated eigenvectors should be retained.

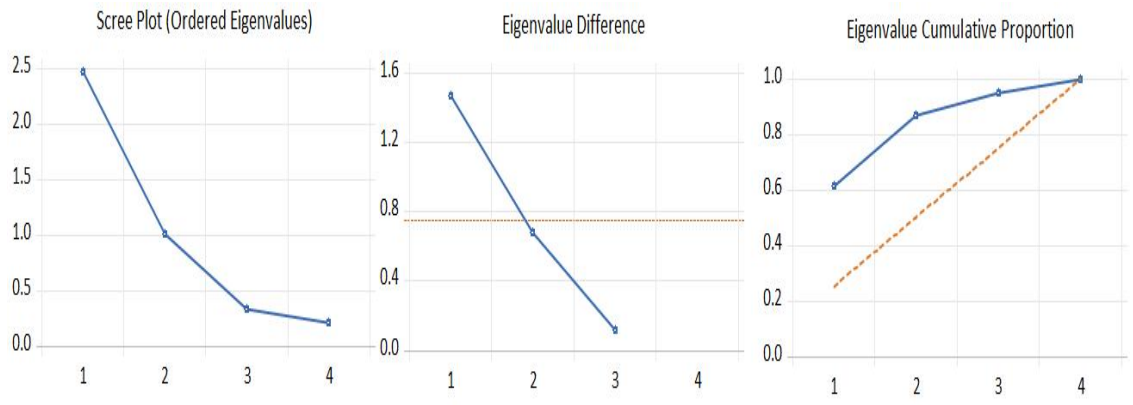

Figure 2. Eigenvalue plots output

Source: Author's design

Since only the first two principal eigenvalues have been retained, the principal directions are studied furthermore by looking at the loading plots across these first two principal directions.

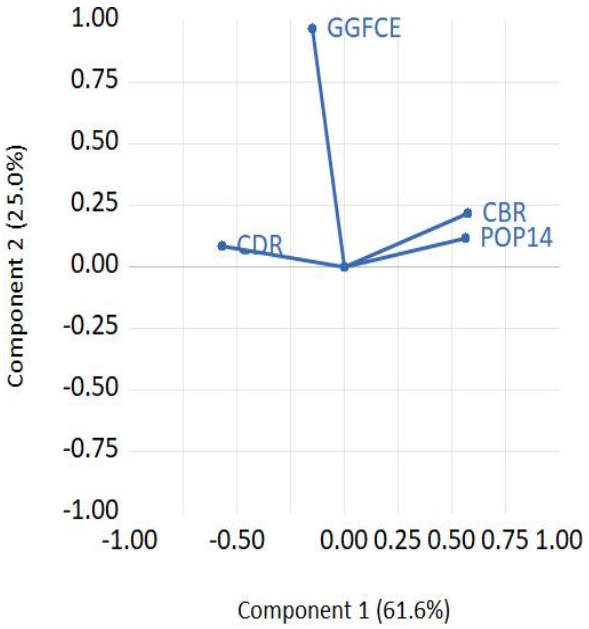

Figure 3. Variable Loading Plots Output

Source: Author's design

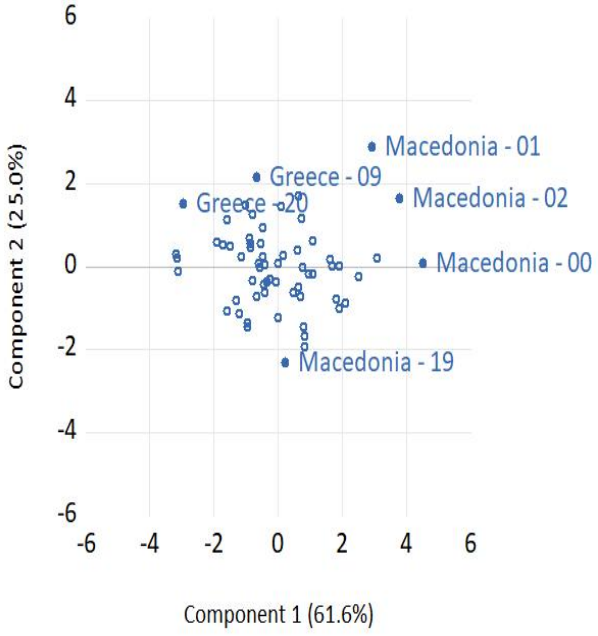

Figure 4. Component Scores Plot Output

Source: Author's design

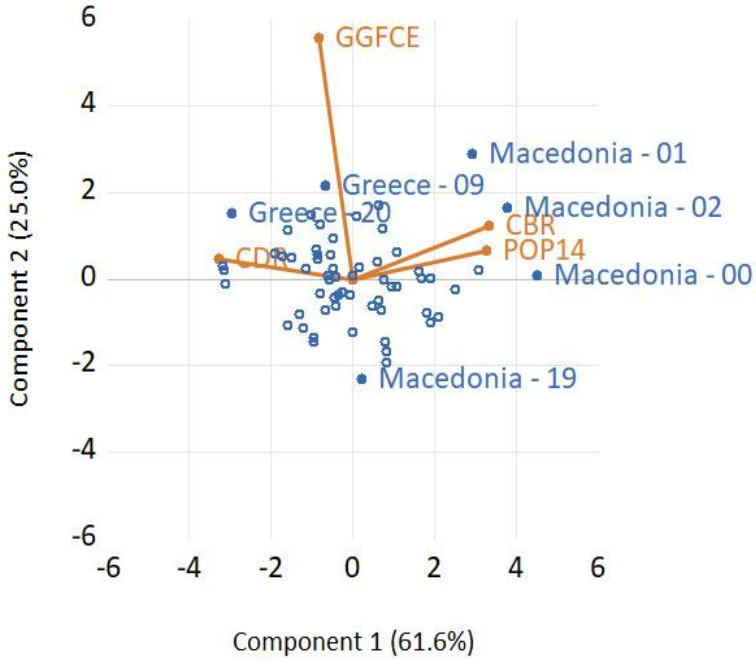

Figure 5. Biplots (scores & loading) Output

Source: Author's design

Figure 3 provides information on which variables dominate and by how much each one of the principal

directions when these variables are used to produce the principal component vectors (score vectors). From Figure 3 it can be noticed that the two variables, CBR and POP14 are moderately positively correlated with the first principal direction, whereas GGFCE is strongly positively correlated with the second principal direction. The variable CDR is moderately negatively correlated with the first principal direction and weakly positive with the second principal direction. When looking at vector lengths, it can also be seen that CBR and POP14 are approximately equally most important in the first direction; in contrast GGFCE is significantly more dominant than either of the prior three, although in the second direction.

The output generated in Figure 4 is a scatter plot of principal component 1 (score vector 1) vs. principal component 2 (score vector 2). Therefore, there are some important notices to be made. Specifically, from Figure 4 it could be seen that Macedonia is the country which has the most positive correlation with the CBR and POP14, especially during the period 2000-2002. In contrast, Greece is typically least associated with these two variables under consideration, especially when observed in 2009 and 2020. Considering these results, it is considered that Serbia is somewhere in the middle between these two countries as outliers. Furthermore, it can be concluded that there is no country of all three that is mostly positively associated with GGFCE, whereas the least positively associated with GGFCE has been Macedonia during 2019. In Figure 5 are placed the loading vectors and score vectors onto a single graph labeled the biplot. From a conclusive point of view, there is no anything to provide beyond what was commented previously. Nonetheless, having both the loading and score vectors emerge on the same graph visually strengthens the previous analysis.

5. Discussion

Our findings show that all four underlying variables of the theoretical construct of family social capital are significantly associated with the first and second component direction. Thus, the variables are positively related to the first and second principal direction. This potential ‘bright side’ of social capital has been mentioned in the family literature before, but there has been small-scale empirical verification, especially in regard to the relationship between social capital and family. Also the results provide some measure of validity for the variables; hence there should be a solid confidence in their estimated impact, by which that can add relevant weight to the argument that the family is a source of a social capital. The results from the two underlying components related with our three countries of interest seem to relate largely to underlying theoretical constructs of family social capital. In that way, these components appear to reflect two different aspects: component 1 via CBR and POP14 variables reflects strong demographic ties and the family and the component 2 which through GGFCE reflects the direct help for families and children by the State. These components related to the constructs of social capital have been identified in the theoretical literature as well. As Nan Marie Astone et al. (1999) pointed out that family behaviour, including marriage and childrearing, remain the classic examples of investment in social capital, our results also reflect their findings. From the other side, our empirical results confirmed the points of Gillies (2004) as well; as he has pointed out that the rises of cohabitation, divorce and separation are viewed as indication of a destabilization of traditional values and are presumed to lead to a decrease of a family social capital. These points are in line also with the reasoning of Fukuyama about social capital in the family cited here by Edwards et al. (2003).

The case of social capital of families within these three countries points at the fact that the standard indicators and measures are quite sufficient and/or efficient. However, there is also empirical evidence that there are some risks in the different levels of the societies. One of the reasons for the falling birth rate was the transformation of the family since the 1960s (Sedano et al. 2009). These changes have affected women, the length and stability of marriage, relationships between generations, having children started to be delayed etc. Therefore, if we focus on the CDR variable and its impact on the first principal direction from Figures 3-5 it can be seen very clearly its devastation influence in terms of creating social capital for families. It is known that the absence of adults may lead to a structural deficit in families. Stability in family relations is a determining segment in social capital, thus the data on divorce are very significant. Namely, the number of divorces increased between 1 per 1 000 to 1.8 per 1 000 during 2000-2017 mostly in Greece and this is about an 80% rise. Serbia has an increase of divorces approximately for about 30% during the same period and there has been noticed a fluctuation trend of divorces for Macedonia without any significant increase. Greece is among the countries in the EU with the largest population of senior citizens than children since it is well known that the issue of ageing of population within the EU has been addressed a long time ago. The population under age 14 is now only 14% of the total population in Greece, 15% in Serbia and 16% for Macedonia (World Bank, 2022). Furthermore, even though during the 1990s the number of births has declined sharply all over Europe, including our three countries of research interest, our research results show that social capital of the family is not as strong as it was earlier but it is maintained at the moderate level within our three countries.

Finally, all these three countries belong to the so-called “Mediterranean welfare system”, as a part of the Southern European system. This model of the “Mediterranean welfare system”, is relatively strong on the side of

social security and is characterized and based on an assumption that still considers the family as a choice of stable life (Bertani, 2013). In this context, it is undoubtedly that the Governments promote rather social policies than family policies since the social protection systems tend to give priority to factors different than the family (e.g. education) but the family is the first source of producing social capital in the countries. Our empirical results about the role of the GGFCE variable (Figures 3-5) just confirm these findings. In addition, the effects or the consequences of family and social relationships are clearly seen in our countries, as was pointed out by Edwards (2004) as well as the responsibility of the state toward the parents (Gillies, 2004).

6. Conclusion

In this paper was conducted an aggregate data exploratory implementation of PCA on family social capital across three Balkan states. The purpose was to complement the theoretical exposition on PCA and to illustrate the use of numerous and available PCA tools with concise interpretations. This research has contributed to the social capital literature and family as a source of it by providing empirical analysis which explores whether or not social capital is a useful concept to the underlying variables of the theoretical construct of family social capital. One of the main aspects of the research was to know better how the family contributes to the production of social capital. This research paper has tried to explore this theme. This paper has taken a largely macroeconomic perspective with having macro-implications in these three Balkans countries. The results also confirm that the macro variables at the national level such as birth rate and population structure as well as the effect of social protection have an important weight in determining the levels of producing social capital within families.

References

Aboim, S., (2010). Family and gender values in contemporary Europe: The attitudinal gender gap from a cross-national perspective. *Portuguese Journal of Social Science*, *9*(1), pp. 33–58. doi: 10.1386/pjss.9.1.33_1.

Andreotti, A., Garcia-Soledad, M., Gomez, A., Hespanha, P., Kazepov, Y, & Mingione, E., (2001). Does a Southern European Model Exist? *Journal of European Area Studies*, *9*(1), pp. 43-63. doi: 10.1080/14608460120061948.

Astone, N.M., Nathanson, C.A., Schoen, R., & Kim, Y.J. (1999). Family demography, social theory, and investment in Social capital. *Population and Development Review*, *25*(1), pp. 1-31.

Bai, Jushan and Ng Serena, (2002). Determining the number of factors in approximate factor models. *Econometrica, 70*(1), pp. 191-221.

Bartolini, S., Bilancini, E., & Pugno, M. (2013). Did the Decline in Social Capital Depress Americans' Happiness? *Social Indicators Research, 110*(3), pp. 1033-1059. doi: https://doi.org/10.1007/s11205-011-9971-x.

Bertani, M. (2013). Families in Italy in the face of the crisis of Mediterranean welfare. *Italian Sociological Review, 3*(2), pp. 85-100.

Bobić, M. (2012). The Application of the Concept of Social Capital in Understanding Marriage and Family in Contemporary Serbia. In: P. Cvetičanin, & A. Birešev (Eds.), *Social and cultural capital in Western Balkan societies*, pp. 41-58. Centre for Empirical Cultural Studies of South-East Europe, University of Belgrade.

Byrappa, R. (2007). Social Capital, Fukuyama in the Henhouse, and other Dangers to the Family and Community. *Öt Kontinens, Eötvös Loránd Tudományegyetem, Budapest* (1), pp. 197-205.

Ciscel, H. D., & Heat, J.A., (2001). To market, to market: imperial capitalism's destruction of social capital and the family. *Review of Radical Political Economics*, (33), pp. 401-414.

Coleman, S. J. (1988). Social Capital in the Creation of Human Capital. *The American Journal of Sociology*, (94), pp. 95-120, Supplement: Organizations and Institutions: Sociological and Economic Approaches to the Analysis of Social Structure.

Edwards, R. (2004). Present and absent in troubling ways: families and social capital debates. *The Sociological Review, 52*(1), pp. 1-21. https://doi.org/10.1111/j.1467-954X.2004.00439.x.

Edwards, R., Franklin, J., & Holland, J. (2003). Families and Social Capital: Exploring the Issues. Families & Social Capital ESRC Research Group Working Paper No. 1. South Bank University, London.

Eurostat, (2022). Marriage and divorce statistics. Retrieved on 28 August 2022 from https://ec.europa.eu/eurostat/data/database.

Franklin, J. (2007). Social capital: between harmony and dissonance. Families & Social Capital ESRC Research Group Working Paper No. 22. South Bank University, London.

Gabel, S.G., & Kamerman, S.B. (2006). Investing in Children: Public Commitment in Twenty-one Industrialized Countries. *Social Service Review*, June 2006, 239-263.

Gannon, B., & Roberts, J. (2018). Social capital: exploring the theory and empirical divide. *Empirical Economics, 58*(3), pp. 899-919. https://doi.org/10.1007/s00181-018-1556-y.

Gillies, V. (2004). Parenting and Social Capital: Accessing Help and Support from informal social network. *Sociologija, 46*(3), pp. 245-258.

Gnecco, G., and Sanguinet, M. (2009). Accuracy of suboptimal solutions to kernel principal component analysis. *Computational Optimization and Applications, 42*(2), pp. 265-287. DOI 10.1007/s10589-007-9108-y.

Gök, M. (2016). Family as a significant source of social capital: Structural restrictions and discussions. *International Journal of Human Sciences, 13*(1), pp. 881-899. doi:10.14687/ijhs.v13i1.3603.

Golubović, N., Džunić, M., & Marinković, S. (2014). A Comparative Analysis of Social Capital in the Western Balkan countries. *Industrija, 42*(2), pp. 71-92. doi: 10.5937/industrija42-5375.

Hjøllund, L., & Svendsen, G.T. (2000). Social Capital: A Standard Method of Measurement. In M. Paldam, & G.T. Svendsen (Eds.), pp.1-27, *Trust, Social Capital and Economic Growth: An International Comparison*. Cheltenham, Edward Elgar.

Hjøllund, L. Paldam,M and Svendsen, G.T. (2001). Social Capital in Russia and Denmark: A comparative study. In M. Paldam, & G.T. Svendsen (Eds.), pp.1-29, *Trust, Social Capital and Economic Growth: An International Comparison*. Cheltenham: Edward Elgar.

Hogan, M.J. (2001). Social capital: potential in family social sciences. *Journal of Socio-Economics*, 30(2), 151–155.

Ignjatović, S. (2012). Notion of social capital in academic dispute and in public policy. In: P. Cvetičanin, P. & A. Birešev (Eds.), pp.11-27, *Social and cultural capital in Western Balkan societies.* Centre for Empirical Cultural Studies of South-East Europe, University of Belgrade.

Jones, N., Malesios, C., Iosifides, T., & Sophoulis, C.M. (2008). Social capital in Greece: Measurement and comparative perspectives. *South European Society and Politics, 13*(2), pp. 175-193. doi: 10.1080/13608740802156687.

Lyberaki, A., & Tinios, P. (2014). The Informal Welfare State and the Family: Invisible Actors in the Greek Drama. *Political Studies Review, 12*(2), pp. 193–208. doi: 10.1111/1478-9302.12049.

Mikesell-Mather, V. (1993). Evolution and Revolution in family law. *St. Mary's Law Journal*, (25), pp. 405-433.

Moreno, L., (2006). The Model of Social Protection in Southern Europe: Enduring Characteristics? *RFAS*, (1), pp. 73-95.

Nichols, L., Elman, C., & Feltey, K.M. (2006). The Economic Resource Receipt of New Mothers. *Journal of Family Issues, 27*(9), pp. 1305-1330. doi 10.1177/0192513X06287249.

Sedano-Rodríguez, A., Aguilera, C.J., & Paris, A.C. (2009). The decline of the family as a source of social capital in the EU: Some indicators. *Educación y Educadores*, *12*(3), pp. 161-177.

Statistical office of the Republic of Serbia. (2006). Demographic statistics 2002-2003. RZS, Belgrade.

Statistics of Canada (2019). General government final consumption expenditures. Retrieved on July 27, 2019, from https://www150.statcan.gc.ca/n1/pub/13-607-x/2016001/227-eng.htm.

Office of Informatics and Statistics of Republic of Serbia. (2001). Statistical Yearbook of Republic of Serbia 2001. RZS, Belgrade.

Paraskevopoulos, J.C. (2007). Social Capital and Public Policy in Greece. GreeSE paper No 9, 1-48. Hellenic Observatory Papers on Greece and Southeast Europe.

Thornton, A., & Philipov, D. (2009). Sweeping Changes in Marriage, Cohabitation, and Childbearing in Central and Eastern Europe: New Insights from the Developmental Idealism Framework. *European Journal of Population, 25*(2), pp. 123–156. doi:10.1007/s10680-009-9181-2.

Tomanović, S. (2008). Families and social capital in Serbia: Some issues in research and policy. *Sociologija, 50*(1), pp. 1-16.

Tomanović, S. (2012). The significance and meaning of expressive and instrumental social capital for young people from different social strata. In: P. Cvetičanin, & A. Birešev (Eds.), pp.29-39, *Social and cultural capital in Western Balkan societies*. Centre for Empirical Cultural Studies of South-East Europe, University of Belgrade.

UN, (2022). United Nations Statistical Division: National Accounts-Analysis of Main Aggregates. Retrieved on 28 Aug 2022 latest from https://unstats.un.org/unsd/snaama/Index.

World Bank, (2022). World Bank Open Data, open access to global development data: Indicators. Retrieved on 03 Sept 2022 at latest from https://data.worldbank.org/indicator.

Wosiek, M. (2016). Social capital under conditions of economic crisis — the example of Southern European countries. *Ekonomia i Prawo/ Ecomomics and Law, 15*(3), pp. 401–414. doi:10.12775/EiP.2016.027.

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[1] This research refers to the political entity known as Republic of Macedonia, which declared independence in 1991, and therefore was one of the successor states after the disintegration of the Yugoslav federation.

[2] Wosiek, (2016). The author points out that the observed strengthening of family links occurred not only as a result of the crisis, but it was a continuation of long-term trends of social capital growth in Iceland. While the economic crisis affected for the most part an increase of political and social involvement of Icelanders and a lowering of the scale of social and institutional trust, p.406.

[3] Tomanović, (2008). Extended family household is a concept referring to a specific family composition and structure. The extended family households could be vertically extended - multigenerational with three or four generations in the same household or horizontally extended- where siblings or other relatives with their families living together p.7.

[4] Using the upper part from Table 1 the average can be obtained as: (1.461964+0.677039+ 0.115107)/3= 0.75137.