

The links between Income Tax and Personal Income: Case of Kirsehir Province in Turkey

Abstract

This study aims to answer if a province-specific income tax regime can promote income per capita in that city. We aim to answer this question in Kirsehir province setting. Kirsehir is located in Central Anatolia subregion of Turkey and has one of the lowest contributions to Turkey's GDP and been having an income per capita which is close to half of the national GDP per capita figure. Given its socioeconomic structure, the city provides an opportunity to investigate the aforementioned research question. Our major finding is that a city-specific income tax for Kirsehir can help promoting personal income yet the positive effect can be maintained for a two-year period. This is a consistent finding that tax policies can support achieving economic growth only for short run.

1. Research Background

The literature on the long-term relationship between the income tax and personal income is vast. This paper makes another contribution to this discussion via examining the case of Kirsehir province of Turkey. A recent study by Ağdemir and Abukan (2020) forms the sole example of work that discusses tax and socioeconomic structure of the Kirsehir province. The paper has adopted basic descriptive methods and does not contain any statistical analysis of the links between the income tax and personal income specifically in the case of Kirsehir province. In this respect, this study provides a more comprehensive analysis of the tax structure of Kirsehir province in the frame of personal income and income tax.

1.1. Economy of Kirsehir in Brief

Kirsehir has been an extended part of the historical Cappadocia region of Anatolia and has been inhabited since ancient times as stated in Anderson (2008). The contemporaneous city is neighbouring to Ankara, Kirikkale, Nevsehir and Aksaray provinces and has been on a major trade route between Kayseri and Ankara provinces. The cities surrounding Kirsehir province are frontrunners in industrialisation (e.g. Kirikkale, mainly on military industry and oil refining), in tourism (e.g. Nevsehir, Aksaray and Kayseri), and in trade (e.g. Kayseri is known as one of the Anatolian tigers, i.e. cities with a strong capital accumulation due to trade and industry). Furthermore, the city is neighbouring to Ankara, capital

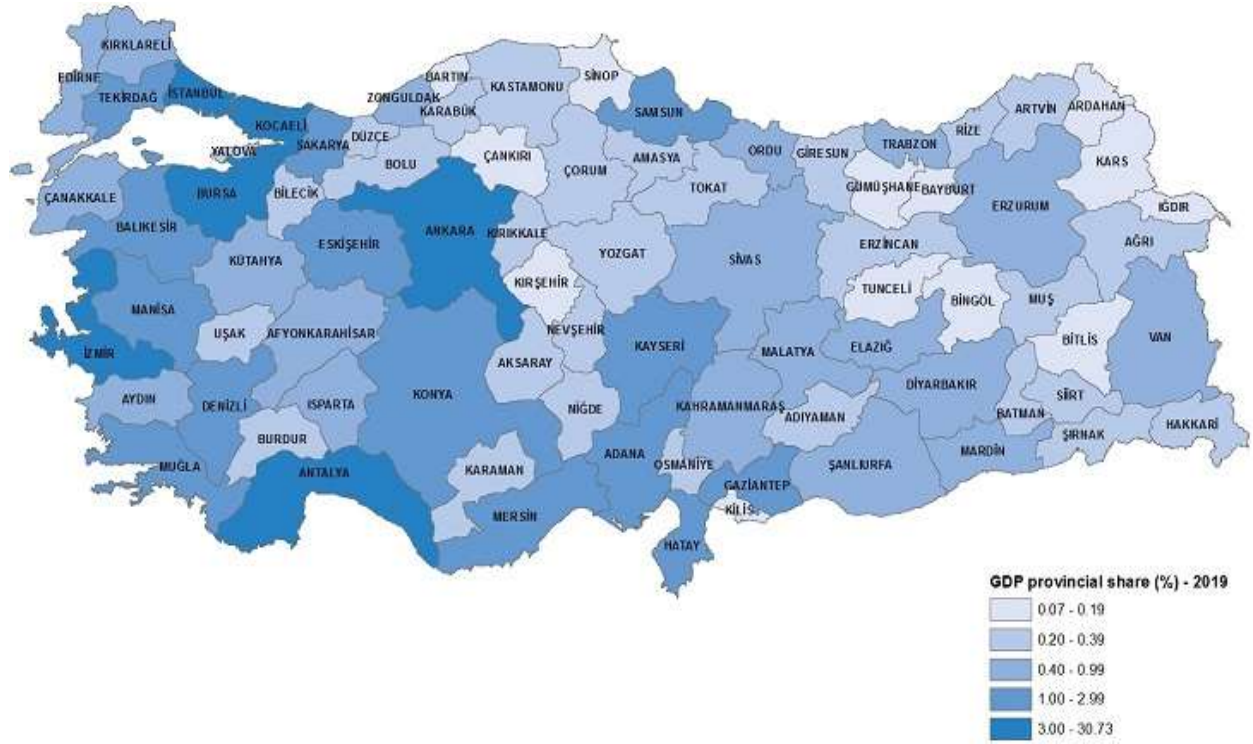
city of Turkey. It is expected that advantageous geographical location of Kirsehir brings a spill-over effect for the city's development, yet Kirsehir is one of the remarkably deprived provinces of the Central Anatolia.

As to the demographics, the number of the inhabitants is barely close to 250 thousand, and has been steady over a period of time, according to the TURKSTAT population data. The majority of the population lives in the central districts, and around 20 percent of its population lives in the rural areas of the province. Nevertheless, main occupations are animal husbandry, agriculture and then small-scale businesses. The city lacks of industrial development although it has enjoyed a developed infrastructure and working in the services provided by government (education, healthcare, security etc.) is another prominent type of occupation. It should also be noted that Kirsehir has one of the cities with a remarkable population abroad, so the city benefits significant flow of remittances.

The map provided below demonstrates contribution to Turkey's GDP on province basis. As seen, Kirsehir is one of the lowest contributing cities to the Turkey's GDP across the country and as well as in the Central Anatolian Region¹.

¹ Central Anatolia region covers provinces of Ankara, Cankiri, Kirikkale, Kirsehir, Corum, Yozgat, Kayseri, Nevsehir, Aksaray and Eskisehir.

Figure 1: GDP Provincial Share as of 2019



The figure is extracted from TURKSTAT. Weblink: <https://data.tuik.gov.tr/Bulten/Index?p=Gross-Domestic-Product-by-Provinces-2019-33663&dil=2>. Last Access: 30.01.222

Table 1: Ranking of Provinces according to the GDP per capita of 2019

Ranking	Province	GDP per capita in TRY	GDP per capita in USD
1	İstanbul	86798.4	15285.1
2	Kocaeli	81228.1	14304.1
3	Ankara	71027.3	12507.8
4	Tekirdağ	70787.6	12465.6
5	Antalya	60631.6	10677.1
6	İzmir	60553.6	10663.4
7	Bursa	58956.7	10382.2
8	Bilecik	57068.5	10049.7
9	Kırklareli	57034.5	10043.7
10	Muğla	56462.9	9943.0
11	Eskişehir	55608.2	9792.5
12	Yalova	55029.3	9690.6
13	Bolu	54155.6	9536.7
14	Çanakkale	53679.5	9452.9
	Türkiye-Turkey	52315.6	9212.7
15	Artvin	50832.7	8951.5
16	Sakarya	49757.0	8762.1
17	Manisa	49466.7	8711.0
18	Tunceli	47829.6	8422.7
19	Erzincan	47287.5	8327.3
20	Karaman	47001.5	8276.9
21	Denizli	46529.3	8193.7
22	Balıkesir	44302.0	7801.5
23	Kayseri	44210.8	7785.4
24	Edirne	44088.2	7763.9
25	Uşak	43783.1	7710.1
26	Düzce	43749.4	7704.2
27	Mersin	43384.0	7639.8
28	Burdur	42288.6	7447.0
29	Kütahya	41820.2	7364.5
30	Isparta	41229.1	7260.4
31	Konya	40892.6	7201.1
32	Rize	40717.6	7170.3
33	Kırıkkale	39245.9	6911.1
34	Kastamonu	38758.0	6825.2
35	Karabük	38715.4	6817.7
36	Aydın	37888.6	6672.1
37	Gaziantep	37633.0	6627.1
38	Çankırı	37589.4	6619.4
39	Trabzon	37314.1	6571.0
40	Aksaray	37053.3	6525.0
41	Adana	36820.7	6484.1
42	Nevşehir	36730.8	6468.2
43	Zonguldak	36692.6	6461.5
44	Afyonkarahisar	36110.1	6358.9

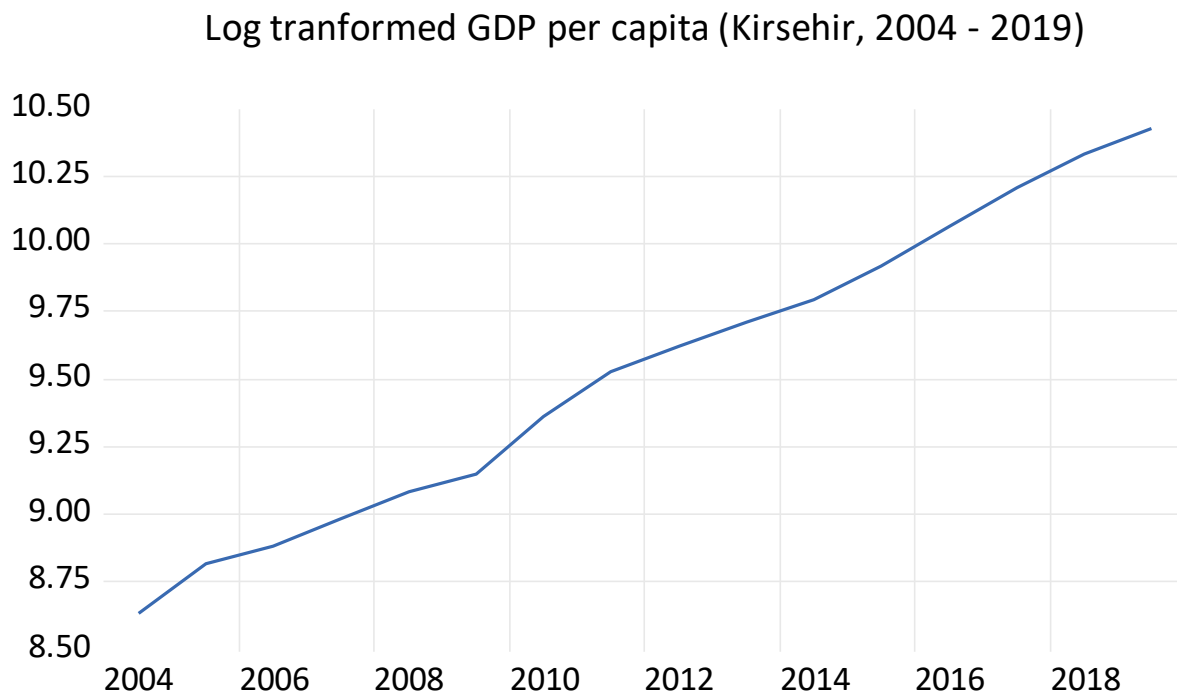
45	Niğde	35914.5	6324.5
46	Amasya	35742.8	6294.3
47	Sivas	34989.3	6161.6
48	Samsun	34800.3	6128.3
49	Ardahan	34645.0	6100.9
50	Kahramanmaraş	34105.7	6006.0
51	Bayburt	33982.3	5984.2
52	Kırşehir	33771.7	5947.1
53	Elazığ	32228.4	5675.4
54	Bartın	32190.1	5668.6
55	Hatay	31898.6	5617.3
56	Çorum	31586.4	5562.3
57	Sinop	31554.2	5556.6
58	Giresun	31222.8	5498.3
59	Iğdır	30737.7	5412.9
60	Malatya	30422.9	5357.4
61	Ordu	30267.3	5330.0
62	Erzurum	30235.1	5324.4
63	Hakkari	30192.1	5316.8
64	Osmaniye	29966.8	5277.1
65	Kilis	29105.5	5125.4
66	Gümüşhane	29083.9	5121.6
67	Mardin	28863.2	5082.8
68	Yozgat	28711.7	5056.1
69	Bingöl	27322.4	4811.4
70	Şırnak	27280.0	4804.0
71	Tokat	26901.6	4737.3
72	Siirt	26591.8	4682.8
73	Kars	26271.8	4626.4
74	Diyarbakır	23645.4	4163.9
75	Batman	23398.7	4120.5
76	Muş	23327.2	4107.9
77	Adıyaman	22454.3	3954.2
78	Bitlis	22179.8	3905.8
79	Van	18708.4	3294.5
80	Şanlıurfa	17464.5	3075.5
81	Ağrı	16727.4	2945.7

The table is extracted from TURKSTAT. Weblink: <https://data.tuik.gov.tr/Bulten/Index?p=Gross-Domestic-Product-by-Provinces-2019-33663&dil=2>. Last Access: 30.01.222

As shown in the Table 1, Kirsehir is among the low-income provinces of Turkey and being ranked in the second half of the list. The personal income is roughly 60 percent of the GDP per capita of Turkey in terms of Turkish liras. In terms of

contribution to the Turkey's GDP, TURKSTAT data² shows that the contribution of the city has been negative, (-0.1 percent) as of 2019. In other words, Kirsehir has caused a loss in GDP; this can be interpreted as that increase in per capita GDP of Kirsehir province has been slower than the increase in per capita GDP of Turkey, thus the difference is compensated by other provinces of Turkey. Nonetheless, the rise of the per capita income has been steady for 2004 – 2019 period as shown below.

Figure 2: GDP per capita, Kirsehir, 2004 - 2019



Data from TURKSTAT. Weblink: <https://data.tuik.gov.tr/Bulten/Index?p=Gross-Domestic-Product-by-Provinces-2019-33663&dil=2> Last Access: 30.01.2022.

1.2. Taxation Regime in Turkey

A study by Turkmen – Ceylan (2019) explains that Turkish tax system has been regressive, i.e. violates the ability to pay principle in taxation and the tax system prioritises efficiency (i.e. revenue maximisation) over equity. The study discusses that revenue generated through indirect taxes (taxes that are collected from consumption) dominates the

² Table 7, weblink: <https://data.tuik.gov.tr/Bulten/Index?p=Gross-Domestic-Product-by-Provinces-2019-33663&dil=2>. Last access: 30.01.2022.

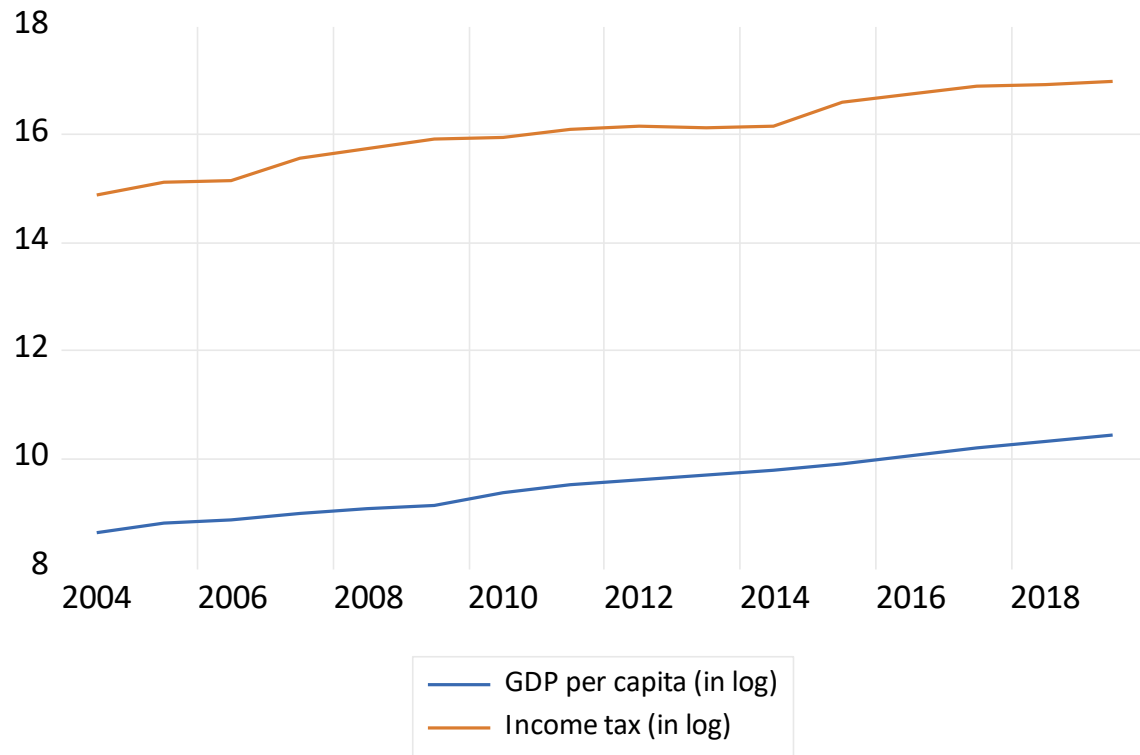
total tax revenue. On the other hand, direct taxes such as welfare tax are found to be not fulfilling its redistributive role appropriately due to being moderately progressive. It is also stated that income tax which is also theoretically expected to be progressive is mainly collected from wage – earners and due to its limited share in the total tax revenue, it cannot contribute to a more equal redistribution of income. As an expected outcome this regressive tax regime, degree of regressivity of the tax system becomes more severe in the low-income provinces of Turkey: indirect taxes collected from low-income consumers are not sensitive to their income. Also, the regressivity of the direct taxes when redistributing the income makes Kirsehir, a deprived city with remarkably low per capita income and limited economic activity, a critical example for understanding income tax and personal income links.

2. Method and Results

2.1. Descriptive Analysis

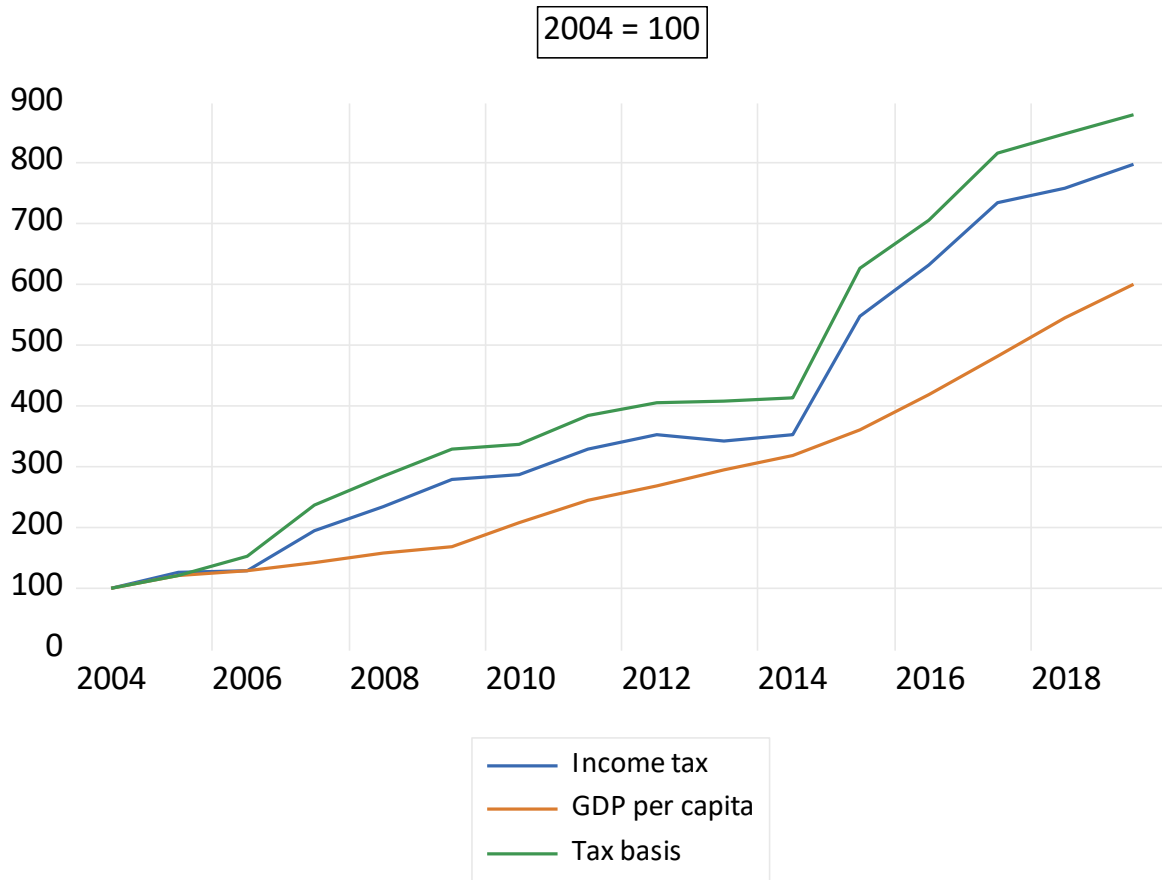
This paper uses annual time series data of GDP per capita data from TURKSTAT and income tax data from Revenue Administration. It covers a period from 2004 to 2019, hence the number of observations is 16. Basic descriptive statistics are as provided below:

Figure 3: GDP per capita and Income Tax between 2004 -2019



The Figure – 3 reveals that income tax (cumulative, for Kirsehir province) has increased faster than the income per capita from 2014 onwards. In other words, degree of progressivity of the income tax has diminished over time.

Figure 4: Evolution of GDP per capita, Income Tax and Tax Basis (2004=100)



Data from Revenue Administration. Weblink:

https://gib.gov.tr/sites/default/files/fileadmin/user_upload/VI/Karsilastirma_GV.html Last Access: 30.01.2022.

The evolution of the income tax, the GDP per capita and the tax basis becomes more evident when these series are indexed to 2004 (the beginning year of the analysis). As seen in the Figure -4, the income tax and the tax basis (the personal income which is subjected to the income tax) have shown a break in the trend from 2015 onwards, and started to rise faster than the GDP per capita. This basic yet descriptive analysis forms evidence that tax burden for income taxpayers from Kirsehir started to experience a more regressive income tax regimen as suggested in Wagstaff et al. (2001) and Turkmen – Ceylan (2019).

2.2. Granger Causality between Income Tax and Personal Income

The tax theory expects a reciprocal relationship between income tax and personal income, yet stronger feedback from personal income to the income tax in the short run is expected to be observed. The Granger causality helps us to test if this theoretical expectation holds for income taxpayer from Kirsehir.

By definition, the Granger causality implies that a pair of variables which are subject to investigation of causality can be used to predict each other if a reciprocal causality is present. Hence, the long run causality between the income tax

and income per capita is tested via Granger causality test. It should also be noted that the predictability includes a long run dimension rather than being a short run pattern. Therefore, Granger causality tests can be run with different lags that of each represents a different long run setting. In our case, Kirsehir is not exempt from official tax regime, thus changes in the tax law can come into effect immediately or the next fiscal year. This means that the long run can be as short as 1 year. Nonetheless, the core principles of the tax regime can still stay the same and the long run can be even extended up to a decade. However, it should be noted that our T=16, and up to fourth lag we can estimate the Granger causality tests. Having said that, here are the results of the Granger causality tests obtained for lags from one to four.

2.2.2. Granger Causality Test Results

LAG 1

Pairwise Granger Causality Tests

Sample: 2004 2019

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LNGDPPC does not Granger Cause LNINCTAX	15	1.62274	0.2268
LNINCTAX does not Granger Cause LNGDPPC		1.41609	0.2571

As can be seen the Granger causality between income tax and per capita income is found to be reciprocal when the one year is taken to be a long run period. We reject the null hypotheses which claims that there is no causality between income tax and income per capita. This finding is consistent with the theoretical expectations which assumes that there is a reciprocal causality in between the income tax and income per capita. In other words, when the income increases there will be more income tax revenue collected. This is consistent with the tax theory which states that a progressive income tax regime works as an automatic stabiliser. Also, when there is more income tax revenue is collected, there is more likely to experience an economic growth which is promoted by efficient use of fiscal policies as explained in Atgür 2020.

LAG 2

Pairwise Granger Causality Tests

Sample: 2004 2019

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNGDPPC does not Granger Cause LNINCTAX	14	1.25583	0.3303
LNINCTAX does not Granger Cause LNGDPPC		2.02091	0.1884

A theoretically remarkable finding is observed with when the Granger causality is tested with two years lag. As can be seen, we are again not able to reject that income tax does not cause a change in income per capita. This is an important finding that shows that fiscal policies, particularly the tax regime, can affect income per capita in the long run. As a policy tool, this means that a province-specific tax regime which aims to increase income per capita in these less developed cities, can be a purposeful fiscal policy tool.

LAG 3

Pairwise Granger Causality Tests
Sample: 2004 2019
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
LNGDPPC does not Granger Cause LNINCTAX	13	2.01782	0.2130
LNINCTAX does not Granger Cause LNGDPPC		0.62620	0.6239

As seen, once the Granger causality is tested for lag three (i.e. the long run is determined to be three years), the impact of income tax on the income per capita becomes more solid. This confirms our aforementioned hypothesis that claims a Kirsehir-specific income tax regime can help city increase its income per capita.

LAG 4

Pairwise Granger Causality Tests
Sample: 2004 2019
Lags: 4

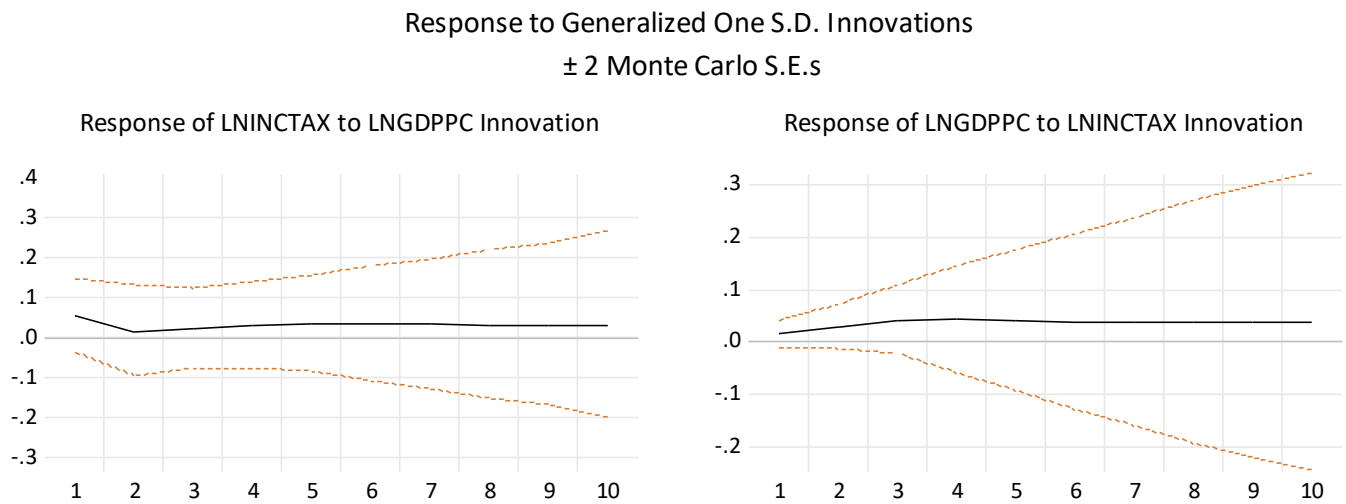
Null Hypothesis:	Obs	F-Statistic	Prob.
LNGDPPC does not Granger Cause LNINCTAX	12	1.98250	0.3003
LNINCTAX does not Granger Cause LNGDPPC		1.10632	0.4864

Once the Granger causality test at lag three and four is interpreted all together, a remarkable finding is observed: an increase in income per capita definitely means a higher income tax revenue collected from taxpayers from Kirsehir. Yet there is still a probability that we can accept this argument can be falsified for roughly 20 to 30 percent of the tax revenue (to note: probability of this argument is 21 percent at lag 3 and 30 percent at lag four). However, the hypothesis that states a higher income tax does not lead to a higher income per capita becomes less valid in the long run (we can accept this hypothesis at 62 percent and 49 percent in the lag three and in the lag four respectively). This is a consistent finding that fiscal policies can promote economic growth in the short run but in the long run. As a policy implication, it

can be concluded that a long-run economic growth can be achieved via public expenditure, infrastructure or province-specific development policies.

To examine consistency of our findings, we have run a simple VAR analysis at levels. The VAR analysis, when the stability condition is satisfied, allows to produce impulse response functions. Thus, it is possible to foresee how the personal income tax will react once a shock is imposed on income per capita and vice versa. Our VAR estimates at level satisfy the stability assumption, i.e. confirms validity of a long-run reciprocal relationship between the income tax and income per capita for Kirsehir province. The impulse response graphs are as provided below:

Figure 5: Impulse Response Function Results: Generalised Effects



As suggested by our Granger causality test results, once a shock is observed in on of these variables, the other once achieves its long-run equilibrium no longer than in three-year time frame. Hence, if a tax policy is going to be designed for the Kirsehir province, it should first target to plan the following three years.

3. Conclusion

This study aimed to analyse if a province-specific tax policy design can promote economic growth of the Kirsehir province in Turkey. The study found that there is a long run relationship between the personal income tax and the personal income for Kirsehir province. It is also revealed that there is a long-run, bidirectional causality between the personal income tax and the income per capita. Our findings allow us to develop policy implications. Accordingly, if tax policy regime designed that is taking into account Kirsehir's economic structure, it can promote expansion of personal income. However, although this is a positive outcome, the effect is going to be limited only with a few years, namely for the following three years from the imposition of the newly designed tax policy.

REFERENCES

- Ağdemir, Z., Abukan D., 2020. Kırşehir Kentinin Vergi Yapısına Ekonomik ve Sosyal Göstergeler Çerçevesinde Genel Bir Bakış. *Vergi Ve Sosyoekonomik Göstergeler Çerçevesinde Türkiye*, pp.1059-1074.
- Anderson, W., 2008. Settlement change in Byzantine Galatia: an assessment of finds from the general survey of central Anatolia. *Anatolian Archaeological Studies*, 17, pp.233-239.
- Atgür, M., 2020. Kamu harcamalarının ekonomik büyüme üzerindeki etkisi: Wagner yasası'nın ve Keynesyen hipotez'in Türkiye'de geçerliliği üzerine bir inceleme. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 34(3), pp.895-915.
- Turkmen - Ceylan, Fethiye Burcu, 2019. Tax Elasticity and Progressivity for Turkish Tax System. *Advance*. Preprint. <https://doi.org/10.31124/advance.8052854.v1>
- Wagstaff, A. and Van Doorslaer, E., 2001. What makes the personal income tax progressive? A comparative analysis for fifteen OECD countries. *International Tax and Public Finance*, 8(3), pp.299-316.
- TURKSTAT. Weblink: <https://data.tuik.gov.tr/Bulten/Index?p=Gross-Domestic-Product-by-Provinces-2019-33663&dil=2> Last Access: 30.01.2022.
- Revenue Administration. Weblink: https://gib.gov.tr/sites/default/files/fileadmin/user_upload/VI/Karsilastirma_GV.html Last Access: 30.01.2022.