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THE TAX-SPEND DEBATE – REVIEW OF THE EMPIRICAL LITERATURE

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Abstract

This article reviews the empirical literature on the "tax-spend debate" or "revenue-expenditure nexus" that emerged in mid 1980s due to concerns over budget deficits. This strand of literature examines the intertemporal relationship between government revenues and government expenditures in the generation of budget deficits. Several observations can be made based on the literature survey: there is insufficient research on less developed and transition countries; not many studies that confirm the tax-spend hypothesis report whether the Friedman (1978) or Buchanan-Wagner (1977) versions is supported; few studies elaborate on the institutional setting in the countries, the key legislation or any specifics of the budgetary process, which all influence the fiscal outcomes; there is an increasing use of non-linear approaches, which allow for a shift in the fiscal behaviour and in the sustainability of the fiscal budget depending on whether an economy is above or below some threshold estimate; there is a much scarcer literature on the tax-spend debate on a subnational level, compared to the national level.

Keywords: tax-spend debate, government revenues, government expenditures, revenue-expenditure nexus, Granger causality.

JEL classification: H20, H50

1. Introduction

The recent global economic crisis and worsening fiscal positions, most notably in the EU, have raised concerns over the long-term fiscal sustainability of some countries. The strong link between macroeconomic stability and fiscal stability is an additional rationale for research on what some economists call the "tax-spend debate" or the "revenue-expenditure nexus". This essentially

means exploring whether changes in government revenues help explain the changes in government expenditures and vice versa. The nature and direction of the relationship between government revenues and expenditures helps determine the path for fiscal consolidation in order to restore sound public finances, so understanding that link is of crucial importance in times of fiscal difficulties (see Narayan and Narayan, 2006). This especially applies to countries trying to maintain budget deficit targets, such as the countries pursuing entry into the European Monetary Union.

Concerns over the rising peacetime budget deficit in the United States triggered the emergence of the empirical literature on the "tax-spend debate" in the 1980s. This body of literature focuses on the intertemporal relationship between government expenditures and government revenues in generation of budget deficits. There is a vast empirical literature on the relationship between revenues and expenditures to date. Until recently however, this type of research has been carried out mainly in developed countries. The literature is much scarcer regarding developing and transition countries, but it has been gaining increasing attention in recent years.

The aim of this article is to provide a non-exhaustive review of the empirical literature to date on the relationship between government revenues and government expenditures and to give some suggestions for future research in the area. The rest of the paper is structured as follows: Section 2 explains the four theoretical hypotheses explaining the link between revenues and expenditures. Section 3 reviews the empirical literature in this area and Section 4 provides concluding remarks and suggestions for further research.

2. Hypotheses of the tax-spend debate

The tax-spend debate has yielded four hypotheses, based on the causality between government revenues and expenditures.

- The *"tax-spend" or "revenues-expenditures" hypothesis* is confirmed when there is a one-directional causality from revenues to expenditures. According to Friedman (1978), raising taxes when pursuing a reduction in government deficits would cause an increase in government expenditure and lead to a persistent budget deficit. According to this hypothesis, fiscal adjustment should take place through spending rather than revenue adjustment (Panagiotis, 2004). Additionally, cutting taxes would actually tighten the government budget constraint and reduce spending, thus narrowing the deficit. Another version of this hypothesis is provided by Buchanan and Wagner (1978) and Young (2009), related to the so called fiscal illusion, supported if a negative unidirectional causality exists from revenues to expenditures. They argue that increased taxes would induce spending cuts because they increase the perceived cost of government programs. On the other hand, tax

cuts ultimately result in larger deficits, because they reduce the perceived cost of government programs, thus leading to a greater demand for such programs and more government spending.

- The *"spend-tax" or "expenditures-revenues" hypothesis* is confirmed when the causality runs from expenditures to revenues. The government determines its expenditures and then adjusts the revenue sources to finance the spending. This hypothesis is consistent with Barro's (1978) view that deficit-financed spending creates higher future tax liabilities, following the Ricardian equivalence proposition. This actually rules out the fiscal illusion. (Konukcu-Onal and Tosun, 2008) Roberts (1978), and Peacock.and Wiseman (1979) justify the need for such a mechanism during crisis (i.e. wars, natural disasters, recessions), but suggested that these temporary increases in government spending will result in higher permanent taxes. Hence, deficits can be reduced by cutting government spending.

- The *fiscal synchronization hypothesis* (Musgrave, 1966; Meltzer and Richard, 1981) is confirmed with bidirectional causality between revenues and expenditures. The government makes decisions about consumption and taxes simultaneously and the public is said to understand the benefits of government services in relation to their costs. The best strategy for narrowing fiscal deficits is to undertake simultaneous measures to increase revenues and cut spending.

- According to the *institutional separation* or *fiscal independence hypothesis* (Wildavsky, 1988; Baghestani and McNown, 1994) revenues and expenditures are independent of each other. There is no relationship between them and each component is given by the long-run economic growth, the decisions regarding tax and spending being taken independently. In this case, there is no long run co-integration between the variables and no causality.

3. Review of the empirical literature

There is a substantial volume of empirical studies investigating the relationship between revenues and expenditures since the 1980s. Compared to the empirical literature on the tax-spend debate at the national level, there are far fewer studies at the sub-national level. (e.g. Joulfaian and Mookerjee (1990) for OECD countries; Dahlberg and Johansson (1998) for Swedish municipalities; Westerlund et al. (2011), Payne (1997) Marlow and Manage (1988), Chowdhury (1988), Holtz-Eakin et al. (1989) for USA.

Table 1 in the Appendix summarizes the empirical results for the national level of government. The majority of empirical studies have focused on developed countries, whereas there are fewer studies related to emerging and less developed countries. Payne (2003) noted the absence of studies related to transition economies and argued that it was perhaps due to the fact

that many of these countries did not begin the transition to market-oriented economies until the early 1990s, as well as the unavailability of reliable time-series data of sufficient frequency. However, there are a growing number of studies focusing on developing and transition economies recently.

The existing literature, however, has yielded inconsistent results. The inconclusiveness of results stems from country specific characteristics, but also from the different time periods, different approaches and instruments used to model the relationship, different degree of temporal aggregation, or inclusion of a third variable (usually GDP). The methodology varies across studies, however the empirical literature fundamentally focuses on the concept of Granger (1969) causality, allowing the researcher to explain how the future values of one variable are based on the past levels of another variable. The early studies performed bivariate causality tests between revenues and expenditures. However, due to the possibility of omitted variable bias (Lutkepohl, 1982), several studies incorporate additional variables (usually GDP) in order to capture a country's overall level of economic activity and estimate multivariate vector autoregressive models. Some of the earlier examinations of the relationship between revenues and expenditures for the USA are Trehan and Walsh (1988), followed by Hakkio and Rush (1991). Blackley (1986) who was one of the first researchers to empirically prove the tax-spend hypothesis for the USA, confirmed in Bohn (1991). Using Granger causality, the tax-spend thesis was supported in Payne (1997) for Canada; Hussain (2004) for Pakistan 1973-2003, Ram (1988a) for the USA.

Since Engle and Granger (1987) introduced the co-integration analysis, a new group of studies emerged around the error correction model (ECM), which deals with the spurious correlation created by non-stationary time series and provides both short- and long-run results. The bivariate co-integration approach was soon extended to a multivariate framework by Johansen (1988) and Johansen and Juselius (1990). This was followed by a large body of empirical studies using VAR and VECM. Some studies that have confirmed the tax-spend thesis are: Huang and Tang (1992) for Taiwan; Hasan and Lincoln (1997), for the UK; Panagiotis (2004) for Greece; Park (1998) for Korea; Darrat (1998) for Turkey; Hatemi-j and Shukur (1999) for Finland; Obeng (2015) for Ghana; Al-Khulaifi (2012) for Qatar. The spend-tax hypothesis is confirmed in: Bella and Quinteri (1995) and Legrenzi and Milas (2004) for Italy; and Hong (2009) for Malaysia; Lusinyan and Thornton (2010) for the UK; Richter and Paparas (2013) and Kollias and Markydakis (1995) for Greece; Li (2001) for China; De Castro et al. (2004) for Spain; Katrakilidis (1997) and Athanasenas et al. (2014) for Greece; Al-Quadir (2005) for Saudi Arabia; Nyamongo et al. (2007) for South Africa; Taha and Loganathan (2008) for Malaysia; Aslan and Taşdemir (2009) for Turkey; Elyasil and Rahimi (2012) for Iran; Al-Zeaud (2014) for Jordan; Takumah (2014) for Ghana. Regarding single-country studies on transition economies,

Payne et al. (2003) found evidence that supports the tax-spend hypothesis for Croatia (1994-1999) using VAR. Lojanica (2015) found an unidirectional causality from government expenditures to government revenues in Serbia within VECM, confirmed by Lukovic and Grbic (2014) using VAR. Nikolov (2006), within a VAR framework, found a bi-directional causality for Macedonia, while Tashevska (2015), using VECM, found evidence for the revenue-expenditure hypothesis. Hye and Jalil (2010), using ARDL, found a bidirectional long run relationship, with a sharper impact of revenue shock on expenditure than vice versa.

Some studies have applied this technique to multiple countries, with varying results among them: Ram (1988b); Joulfain and Mookerjee (1991) examined 22 OECD countries; Baffes and Shah (1994) 3 Latin American countries; Owoye (1995) the G7 countries; Koren and Stiassny (1998) 9 European countries; Ewing and Payne (1998) 5 Latin American countries; Garcia and Henin (1999) 5 European countries; Kollias and Makrydakis (2000), Greece and Ireland, Spain and Portugal. Chang et al. (2002) 10 industrialized countries; Narayan and Narayan (2006) 12 developing countries, using the Toda and Yamamoto (1995) test for Granger causality; Konukcu-Onal and Tosun (2008) based on the Granger causality, examined Belarus, the Russian Federation, Kazakhstan and the Kyrgyz Republic; Wolde-Rufael (2008) 13 African countries; Magazzino (2012) 15 ECOWAS countries; Afonso and Jalles, (2014) OECD countries.

A number of studies have recently used panel data analysis to investigate the relationship between revenues and spending across different countries over time. Chang and Chang (2009) using panel VAR found evidence of the tax-spend hypothesis for 15 OECD countries; Afonso and Jalles, (2014) found that changes in revenues appear to induce permanent changes in long-run expenditures in the OECD countries. Afonso and Rault (2009) examined 25 EU countries and calculated varying causalities for those countries. Mehrara et al. (2011a) confirmed the fiscal synchronization hypothesis for 40 Asian economies. Mehrara et al. (2011b) found that revenues Granger cause expenditures in oil exporting countries. Alagidede and Tweneboah (2015) for a panel of Latin American countries found a bidirectional causality between revenue and expenditure in the long run. Vamvoukas (2011) EU-15). Several studies have employed a bootstrap panel Granger causality approach proposed by Konya (2006), which provides results for the causality for each country in the panel, while accounting for the economic dependences between them: Bolat (2014) for the EU-10; Bolat and Belke (2015) for Central and Eastern European economies; Mutascu (2015) for PIIGS; Mutascu (2016) for 10 EU ex-communist countries.

The latest notable breakthrough in the empirical literature on the revenue-expenditure nexus is the introduction of nonlinear models. The main idea behind this set of studies is that the sustainability of the fiscal budget

changes depending on whether an economy is above or below some threshold estimate. The threshold autoregressive (TAR) estimator and MTAR are most frequently used to investigate the tax-spend hypothesis, as well as Threshold error correction models (TECM). Using such methods, asymmetric behaviour regarding the relationship between government revenues and expenditures was found in: Apergis et al. (2012) for Greece; Ewing et al. (2006), Cipollini et al. (2009), Young (2011) for the US; Bajo-Rubio et al. (2006) for Spain; Aworinde and Ogundipe (2015) for Nigeria; Keho (2011) for Cote d'Ivoire; Paleologou (2013) for Greece; Tiwari and Mutascu (2016) for Romania; Saunoris and Payne (2010) for UK; Jibao et al. (2012) for South Africa. On the other hand, no asymmetric cointegration was found in: Zapf and Payne (2009) for the USA, Paleologou (2013) for Sweden and Germany; Aworinde (2013); Payne et al. (2008) for Turkey; Phiri (2017) for the South African economy.

Conclusion

The empirical evidence in the literature on the relationship between government expenditures and government revenues, or the tax-spend debate, yields inconsistent results. Each country has specific characteristics, which determine the trends of macroeconomic indicators. The inconclusiveness of the results also stems from the fact that the studies of the causal links between the variables analyze different time periods or use different methodologies.

However, several observations can be made that suggest some directions for further research in the area. First, there is almost no presence of less developed and transition countries in earlier studies. The recent literature explores these countries as well. In fact, they are even more prevailing in the most recent research. However, there is still need to expand the literature on the tax-spend issue for less developed as well as transition economies. It would be interesting to see also if the transition towards market economy and the undertaken reforms have induced a change in the revenue-expenditure nexus (provided there is sufficient data). Second, very few studies that confirm the tax-spend hypothesis report whether the results support the Friedman (1978) or Buchanan-Wagner (1977) version. This is quite important, since they support a different behaviour of the revenues and expenditures and require different policies for narrowing the fiscal deficit. Third, as Payne (2003) noted, few studies have discussed possible regime shifts in legislation that may have influenced the behaviour and actions of the fiscal authorities. Most of the studies, especially the multi-country studies, focus mainly on the empirical examination of the relationship between revenues and expenditures, but do not elaborate on the institutional setting in the countries, or the key legislation or any specifics of the budgetary process, which all influence the fiscal outcomes.

Hence, there is a need for additional research focused on a single country, taking into account the institutional setting, the macroeconomic environment, possible regime shifts in the budgetary process, in the legislation or in the key policies. Fifth, there is an increasing use of non-linear approaches, which allow for a switch in the fiscal behaviour and in the sustainability of the fiscal budget depending on whether an economy is above or below some threshold estimate. These approaches offer some additional insight and should be more extensively employed. Sixth, in the literature using co-integration and VECM, attention should be also paid to the adjustment of revenues and expenditures in the context of fiscal sustainability, in compliance with the long-term intertemporal government budget constraint. Seventh, there is very little literature on the tax-spend debate on a sub-national level, especially for developing countries, compared to the national level. Hence, a future fruitful field of research could be the examination of the budgetary process, the tax-spend relationship and budget deficit sustainability at subnational levels.

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Appendix

Table 1. Summary of the empirical literature on the tax-spend debate

Study	Country	Time period	Method	Results
von Furstenberg et al. (1986)	US	1954-1982	VAR	S-T
Anderson et al. (1986)	US	1946-1983	Granger causality	S-T
Manage and Marlow (1986)	US	1929-1982	Granger causality	FS
Blackley (1986)	US	1929-1982	Granger causality	T-S (Friedman)
Ram (1988a)	US	1929-1983	Granger causality	T-S
Ram (1988b)		1958-1985	Granger causality	T-S (Friedman)
Ahiakpor and Amirkhalkhali (1989)	Canada	1926-1985	Granger causality	T-S (Friedman)
Miller and Russek (1989)	US	1946-1986	ECM	FS
Bohn (1991)	US	1792-1988	ECM	T-S
Jones and Joulfaian (1991)	US	1792-1986	ECM	S-T (short-run); FS (long run)
Huang and Tan (1992)	Taiwan	1951-1987	VAR	T-S
Jondeau (1992)	France	1960-1962	ECM	T-S
De Haan and Siermann (1993)	Netherlands	1900-1988	ECM	S-T
Baffes and Shah (1994)	3 Latin American countries	1895-1984	ECM	T-S (Brazil); FS (Argentina and Mexico)
Baghestani and McNown (1994)	US	1955-1989	ECM	IS
Bella and Quinteri (1995)	Italy	1866-1989	ECM	S-T
Kollias and Makrydakis (1995)	Greece	1950-1990	ECM	S-T
Koren and Stiassny (1998)	9 European countries	1953-1992	Structural VAR / ECM	T-S: Germany, Netherlands, United Kingdom and US; S-T: Austria, France, Italy; FI: Sweden and Switzerland
Owoye (1995)	G7 countries	1961-1990	ECM	T-S (Italy, Japan); FS (US, Germany, UK, France, Canada);

Hondroyiannis and Papapetrou (1996)	Greece	1957-1993	ECM	S-T
Katrakilidis (1997)	Greece	1974-1991	ECM	FS
Payne (1997)	Canada	1950-1994	ECM	T-S
Vamvoukas (1997)	Greece	1948-1993	ECM	S-T
Darrat (1998)	Turkey	1967-1994	VECM	T-S (Buchanan-Wagner)
Ewing and Payne (1998)	5 L. American countries	1950-1994	ECM	T-S: Colombia, Guatemala Ecuador; FS (Chile, Paraguay)
Park (1998)	Korea	1964-1992		T-S
Cheng (1999)	Latin American countries	1949-1995	Granger causality	T-S: Columbia, Dominican Republic, Honduras, Paraguay; FS: Chile, Panama, Brazil, Peru
Garcia and Henin (1999)	5 industrialized countries	1960-1996	ECM	T-S: Canada, France, US, Germany; S-T Japan
Hatemi-j and Shukur (1999)	Finland	1960-1997	VAR	T-S
Kollias and Makrydakis (2000)		1960-1995	ECM	T-S: Spain; FS: Greece, Ireland: FI – Ireland
Islam (2001)	US	1929-1997	Granger-causality tests also examining structural breaks	S-T
Li (2001)	China	1950-1997	VECM and VAR	FS
Chang, Liu and Caudil (2002)	10 Industrialized countries	1951-1996	T-S: Japan, South Korea, Taiwan, UK and US; S-T: Australia and South Africa; FS: Canada; FI: New Zealand and Thailand	
Chang and Cho (2002)	China	1977-1999	MVECM	T-S
Payne et al. (2003)	Croatia	1994-1999	VAR	T-S
Hussain (2004)	Pakistan; Saudi-Arabia	1973-2003	Granger causality	T-S
Al-Quadir (2005)	Saudi-Arabia	1964-2001	ECM	T-S
Bajo-Rubio et al. (2006)	Spain	1964-2003	TVECM	Asymmetric relationship
Ewing et al. (2006)	USA	1958-2003 1982-2004	TAR and MTAR	Asymmetric cointegration
Narayan and Narayan (2006)	12 Developing countries Macedonia	1995-2002	Granger causality	S-T: Haiti; T-S: Peru, South Africa, Quatemala, Uruguray, Ecuador
Nikolov (2006)			VAR	FS
Nyamongo et al. (2007)	South Africa	1994-2004	VAR	FS
Konukcu-Onal and Tosun (2008)	4 Ex Soviet countries	1991-2007	Granger causality	T-S: Belarus and Russia; FS: Kazakhstan and Kyrgyz Republic
Payne et al. (2008)	Turkey	1968-2004	TAR and MTAR	No asymmetric cointegration
Taha and Loganathan (2008)	Malaysia	1970-2006	VAR	FS
Wolde-Rufael (2008)	13 African countries	1964-2003	VAR	S-T: Burkina Faso; T-S: Ethiopia, Ghana, Kenya, Nigeria, Mali, Zambia; FS: Mauritius, Swaziland, Zimbabwe; FI: Botswana, Burundi, Rwanda
Afonso and Rault (2009)	EU-25	1960-2006	Bootstrap panel Granger causality	S-T: Italy, France, Spain, Greece, Portugal; T-S: Germany, Belgium, Austria, Finland, UK
Cipollini et al. (2009)	USA	1947-2004	TVECM	Asymmetric relationship
Hong (2009)	Malaysia	1970-2007	VECM	S-T
Aslan and Taşdemir (2009)	Turkey	1950-2007	VECM	FS

Young (2009)	US	1955-2005	Granger causality	T-S
Zapf and Payne (2009)	US	1959-2005	ECM	T-S; no asymmetric cointegration
Saunoris and Payne (2010)	UK	1955-2009	ECM	S-T; asymmetric cointegration
Hye and Jalil (2010)	Romania	1998-2008	ARDL	FS
Keho (2011)	Cote D'Ivoire	1960-2007	TVECM	Asymmetric cointegration
Mehrara et al. (2011a)	40 Asian countries	1995-2008	Panel cointegration	FS
Mehrara et al. (2011b)	11 oil exporting countries	1980-2009	Panel cointegration	T-S
Young (2011)	USA	1959-2007	TAR and MTAR	Asymmetric cointegration
Apergis et al. (2012)	Greece	1957-2009	TAR and MTAR	T-S; Asymmetric cointegration
Al-Khulaifi (2012)	Qatar	1980-2011	VECM	T-S
Elyasil and Rahimi (2012)	Iran	1963-2011	ARDL	FS
Aworinde (2013)	Nigeria	1961-2012	Nonlinear causal tests	T-S
Richter and Paparas (2013)	Greece	1833-2009	Granger causality	S-T
Dogan (2013)	Turkey	1924-2011	VECM	S-T
Paleologou (2013)	Greece, Sweden, Germany	1965-2009	TAR, MTAR	T-S: Greece; FS: Sweden, Germany; asymmetric cointegration in Greece
Al-Zeaud (2014)	Jordan	1990-2011	VECM	S-T
Athanasenas et al. (2014)	Greece	1999-2010	NARDL	S-T; asymmetric cointegration
Lukovic and Grbic (2014)	Serbia	2003-2012	VAR	S-T
Magazzino (2014)	10 ASEAN countries	1980-2012	Panel cointegration	T-S
Takumah (2014)	Ghana	1986-2012	VECM	FS
Aworinde and Ogundipe (2015)	Nigeria	1961-2012	TAR and MTAR	S-T; asymmetric cointegration
Bolat and Belke (2015)	CEE	1999-2014	Bootstrap panel Granger causality	T-S: Slovenia; S-T: Estonia, Latvia and Slovakia; FS: Romania and Bulgaria; FI: Czech Republic, Hungary, Lithuania, and Poland
Brothaler and Getzner (2015)	Austria	1948-2013	Granger causality, VAR, VEC	S-T
Lojanica (2015)	Serbia	2003-2014	VECM	S-T
Obeng (2015)	Ghana	1980-2013	VAR	T-S
Tashevska (2015)	Macedonia	2002-2014	VECM	T-S
Mutascu (2015)	PIIGS	1988-2014	Bootstrap panel Granger causality	T-S: Greece, Italy; S-T: Portugal; FI: Ireland, Spain
Mutascu (2016)	10 EEC	1995-2012	Bootstrap panel Granger causality	S-T: Bulgaria; T-S: Czech Republic, Hungary, Slovenia; FS: Slovak Republic; FI: Estonia, Latvia, Lithuania, Poland, and Romania
Tiwari and Mutascu (2016)	Romania	1999-2012	TAR and MTAR	S-T; long-run asymmetric adjustments
Baharumshah et al. (2016)	South Africa	1960-2013	TAR and MTAR	No asymmetric cointegration
Phiri (2017)	South Africa	1960-2016	MTAR	FS; no asymmetric cointegration

Note: S-T, T-S, FS and FI denote spend-tax, tax-spend, fiscal synchronization and fiscal independence, respectively.

ДЕБАТАТА ОКОЛУ ДАНОЦИТЕ И ЈАВНАТА ПОТРОШУВАЧКА: ПРЕГЛЕД НА ЕМПИРИСКАТА ЛИТЕРАТУРА

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Апстракт

Овој труд дава преглед на емпириската литература за „дебатата околу даноците и потрошувачката“ или „нексус приходи-расходи“ која се појави во средината на 1980-те години, како одговор на загриженоста за буџетските дефицити. Оваа област ја истражува меѓувременската врска помеѓу јавните приходи и јавните расходи при генерирањето на буџетски дефицит. Врз основа на прегледот на литературата може да се дојде до неколку согледувања: постои помал број на истражувања кои се однесуваат на земјите во развој и во транзиција; само мал дел од студиите кои ја потврдуваат хипотезата приходи-расходи кажуваат дали е присутна верзијата на Фридман (1978) или на Бјукенен-Вагнер (1977); малку студии ги елаборираат институционалната поставеност на земјите, клучните законодавни решенија или спецификите на буџетскиот процес, кои влијаат врз фискалните резултати; постои растечка примена на нелинеарни пристапи, кои опфаќаат можна промена во фискалната одржливост во зависност од тоа дали економијата се наоѓа над или под определен праг; постои оскудна литература на ова поле на субнационално ниво, во споредба со истражувањата на национално ниво.

Клучни зборови: даноци-потрошувачка, јавни приходи, јавни расходи, Грејнџерова каузалност.

JEL класификација: H20, H50