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FISCAL DECENTRALIZATION AND ECONOMIC GROWTH: THE CASE OF TWO EUROPEAN COUNTRIES

by
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AN ABSTRACT OF THE THESIS OF

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Although it is theoretically expected that fiscal decentralization leads to economic growth, there is a mixed picture of the decentralization effect on economic growth across earlier empirical studies. This thesis tested this relationship using the Granger causality test in order to evaluate whether this relationship is unidirectional, bidirectional or whether there is no relationship between the two. Taking the case of Germany and Spain, two European decentralized countries adopting devolution, the thesis found that fiscal decentralization did not cause economic growth, but rather economic growth caused fiscal decentralization. Thus, this thesis opens up the discussion on the ability and the will of more developed economies to call for fiscal decentralization, stressing on the importance of implementation and sequencing in securing its success.

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To My

Beloved Family

CHAPTER I

INTRODUCTION

In the last two decades, the world witnessed a major shift towards less centralization and more decentralization. During that period, over eighty five countries embarked on fiscal decentralization (FD) efforts for more efficient public sector management. Furthermore, major international organizations called for its implementation. For instance, the World Bank insisted that FD, if implemented adequately, can increase government efficiency, decrease political instability and contribute to the overall level of welfare (World Bank 2000).

Given the increasing importance of this notion, it is important to clarify its concept and assess its value: In fact, there are different aspects of decentralization categorized according to its political, administrative and fiscal dimensions. Each of these dimensions has unique characteristics, objectives and requirements for success.

Generally, the political component refers to the transfer of authority from central to local authorities while the administrative component includes the transfer of functional responsibilities from central to local authorities. For its part, the fiscal component addresses the financial relationship between the different levels of government.

While it is important to distinguish between its different aspects, there is considerable overlap between all the components. Actually, in order to reap the economic benefits of decentralization, a political decentralization in terms of decision-making authority is required. But even though some countries have the three components operating simultaneously, it is still possible that a country may be

decentralized in one or two aspects, while less in others.

This thesis will focus on the fiscal aspect of decentralization where fiscal decentralization refers to the public finance dimension of intergovernmental relations. This dimension is a key element of any decentralization program, as in its absence, the autonomy of sub-national governments cannot be achieved and, in this way, the full potential of decentralization cannot be realized.

As one of the stated primary policy objectives of fiscal decentralization is to foster economic growth, this thesis aims to study the causal relationship between fiscal decentralization and economic growth in order to check whether this direction is uni-directional, bi-directional or whether there is no relationship between the two.

Indeed, most developing and transitional countries have either embarked or stated their intention to embark on some form of FD initiative for this purpose. Yet, the interest in FD as an engine for growth was not limited to developing countries, but also emerged as a priority of most OECD countries.

This increasing trend for FD has several roots. As matter of fact, there is a widespread belief that FD is an effective tool for improving the efficiency of public expenditures despite some risks that can threaten macroeconomic stability and increase fiscal deficits. In parallel, the failure of large centralized bureaucracies under different political regimes across the world has increased the demand for more decentralized governments. To add up, FD is also considered as an efficient tool to reduce the central government's grip on the economy.

We begin this thesis with a literature review that introduces the first and second generation of theorists who tackled the concept of FD. In the same chapter, we examine various empirical cases showing the merits and drawbacks of FD, before highlighting a number of implementation polices that can secure the success of FD.

We move then to chapter III, the data and methodology are explained in details. In this chapter, the sources and types of data that will be used are indicated. The study then focuses on two European countries: Germany and Spain, which have important characteristics in common being two European decentralized countries adopting devolution, with regional levels of governments and direct regional elections but which differ in terms of the institutional structure whereby Spain is a unitary decentralized state while Germany is a federal state.

Chapter IV shows the empirical results of the model. We begin by the results of informal unit root tests, and then move to the results ADF unit root tests. We conclude this chapter by showing the results of the granger causality test, from which we deduce the direction of causality between the sub national shares of expenditures, an indicator of FD, and economic growth for both Germany and Spain.

Finally, we highlight the limitations of our study and offer a brief summary in Chapter V.

CHAPTER II

LITERATURE REVIEW

A. First Generation Theorists

The first generation of theorists tackling the issue of fiscal decentralization (FD) linked the process of FD to the improvement in the overall degree of public sector responsiveness to the demand for public services. Consequently, they associated it to the enhancement of the efficiency of public these services that is achieved through a better matching of resources with the preferences of the public. In fact, their support for the adoption of FD focused mainly on these four arguments:

Firstly, regional governments are in a better position to adapt outputs of public services to the specific preferences of their constituencies. Secondly, provided the condition of mobility, individuals can move to jurisdictions that satisfy their preferences best. Thirdly, under decentralization, sub-governments will be subject to a competition that will push them to provide a more efficient bundle of public services. Finally, decentralization will foster innovation as sub-governments will adopt new approaches to public policy.

Among the most influential first generation theorists are Tiebout (1956), Oates (1972) Musgrave (1959) and Brennan and Buchanan (1980). The first argued that mobile citizens can choose the jurisdiction that suits their preferences best in terms of taxes and public good bundles. The second asserted that the preferences of heterogeneous citizens can be matched better with decentralized as opposed to centralized regimes. The third specified that the allocation of goods and services should be granted to the sub-national governments while distribution and stabilization

functions should remain the priority of the central government. The fourth called for fiscal decentralization as a tool to restrain the growing size of the government.

In order to better understand the above notions, it would be necessary to go in depth through these main theories:

"Tiebout's sorting" certainly remains one of the most important theories introduced in the field of public finance. Actually, Tiebout (1956) introduced a new notion known as the theory of "impure" goods. As such, he tried to explain FD in terms of competitiveness between localities, whereby the mobility of citizens provides the ultimate mechanism for preference revelation.

His theory initially emerged as a response to the problem of under-provision of goods introduced by Paul Samuelson (1954). The latter based his theories on the notion of public goods that are characterized by "non-excludability" and "non-rivalry" in consumption: Samuelson noted that the free-rider problem leads to market failure showing that "no decentralized system can serve to determine optimally these levels of collective consumption". Based on these assumptions, Samuelson denied the existence of an appropriate mechanism that can determine people's preferences.

As opposed to Samuelson's view, Tiebout (1956) argued that consumer demand for local public goods can be revealed when citizens pick the jurisdiction that offers them the best net benefit. Certainly, with mobility, consumer-voter's preferences can be revealed and consumers will reach an equilibrium where their demand for impure public goods is met, duet to the recognition of the costs of supplying this demand. Furthermore, Tiebout showed that when public goods are provided by competing regions, sorting according to preferences will induce an efficient provision. Besides, he clarified that the higher the revealed degree of mobility of households from one region to another, the higher the efficiency of the allocation of resources, ceteris

paribus. To sum up, Tiebout made two important contributions to the field: he introduced the notion of "impure public goods" and specified that the mobility of tax payers is the appropriate mechanism by which individuals disclose their preferences.

Tiebout's idea was validated by Oates (1972) who proposed a straightforward decentralization theorem, formalizing the basic efficiency argument for the decentralized provision of certain kinds of public goods. Oates (1972) argued that:

> for a public good–the consumption of which is defined over geographical subsets of the total population, and for which the costs of providing each level of output of the good in each jurisdiction are the same for the central or for the respective local government–it will always be more efficient (or at least as efficient) for local governments to provide the Pareto-efficient levels of output for their respective jurisdictions than for the central government to provide any specified and uniform level of output across all jurisdictions (p.35).

Put in simple terms, it would be much more efficient to provide public goods, particularly those categorized by rivalry and constant returns to scale, by lower levels of government then by a single government or higher regional authorities. In effect, all households in a given area should be consuming the same level of goods which will eventually push citizens to compromise their needs. With such diversity among citizens, the only solution would be to divide them into smaller groups. As a result, fewer compromises will be made as the demands of any randomly chosen household will be closer to the demands of the median households. Thus, economic welfare will be enhanced as the good that will be provided would be closer to the households' optimum. Indeed, Oates' rationale of welfare maximization achieved by the provision of goods by local governments stands on firm grounds. For instance, there exists some informational advantage of local governments about the social and economic features of regions, i.e. an asymmetry of information between the central and sub national governments (Oates 1999).

Musgrave (1959) agreed with the previous two scholars when it comes to the allocation of public goods by the sub national governments but insisted that other branches of public finance should be assigned to the central governments. Undeniably, the three branches of public finance that he introduced proved useful in setting the pillars of fiscal decentralization by setting its constraints (stabilization and distribution) and by indicating its potential benefits (efficiency):

Musgrave (1959) divided the economic functions of government into three branches: the stabilization branch, the distribution branch and the allocation branch.

The first is responsible for aggregate demand, fiscal policy, and price stability. The second is tasked with tax and transfer programs. The third is concerned with the production of the goods and services that cannot be provided by the competitive private markets.

In reality, Musgrave (1959) considered that locally financed fiscal policy is likely to benefit an area that is much broader than the area financing the activity. He added that the openness of a national economy implies that the benefits of local fiscal and monetary policies cannot be captured by sub national units of government. Therefore, he concluded that the efficiency of the monetary and fiscal policies can only be secured if they are undertaken at the national level, as the decentralization of fiscal arrangements is at odds with the macroeconomic stabilization objective.

Musgrave had a similar stance when it comes to redistribution. He indicated that even if citizens reveal their preferences in a local election, there would be an incentive for them to move from a region to another that suits them best. Under a negative income tax, for instance, rich citizens hurt by taxation would be pushed to leave the jurisdiction while poor households benefiting from the program will be encouraged to move to the region in question. Consequently, Musgrave recommends

assigning redistributive policies to the highest level of governments.

In contrast, Musgrave insisted that the local or sub national levels of government should be in charge with the "allocation branch" given the diversity of tastes in demand and existing economies of scale. Local levels can better allocate public services and infrastructure. This is so for two main reasons: The sub-national governments can maximize their localities' benefits as they have a better understanding on how to manage their localities' resources. Besides, the existence of so-called "impure" goods leads to congestion in consumption that cannot be solved by the central government. In short, this branch should be assigned to sub national governments to ensure that the heterogeneous preferences and tastes of the inhabitants are taken into consideration. Failing to do so will lead to inefficiencies as the central government will be incapable of satisfying the wide range of public goods across regions.

The final stream of the first generation theory is inspired from the public choice literature with Brennan and Buchanan (1980) reviving Thomas Hobbes' (1660) theory that described the state as a Leviathan:

> an artificial man, though of greater stature and strength than the natural, for whose protection and defense it was intended; and in which the sovereignty is an artificial soul, as giving life and motion to the whole body… (Hobbes 1660, 1)

Based on this definition, Brennan and Buchanan (1980) defined the public sector as a monolithic agent, a "Leviathan," that seeks its own aggrandizement through maximizing the revenues extracted from the economy. To constrain the expansionary tendencies of government, these scholars proposed decentralizing political and fiscal authority. As a consequence, competition between public bodies, or sub national governments, will restrain the growing powers of the monopolist public sector: by allocating government functions to appropriate sub-levels of governments, excessive

taxation will be reduced and the size of the aggregate government sector will decrease. In brief, this theory calls for a smaller size of government through fiscal decentralization:

> Total government intrusion into the economy should be smaller, ceteris paribus, the greater the extent to which taxes and expenditures are decentralized, the more homogeneous are the separate units, the smaller the jurisdictions, and the lower the net regional rents" (p. 185).

B. Second Generation Theorists

Following these first generation theorists, the end of the last decade of the twentieth century witnessed the emergence of a second generation theory of fiscal decentralization, a wave that went beyond the classical theory of public finance literature to combine theories of the firm, economics of information, principal-agent problem and the theory of contract (Oates 2005).

Leading studies of the second generation theory are with Lockwood (2002) and Besley and Coate (2003) and Seabright (1996).

The first stream of this new literature studied the decentralization theorem within a political economy context, stressing more the inefficient outcome of the centralized governments than the trade-off between preference matching and externalities.

This was particularly reflected by the work of Lockwood (2002) and Besley and Coate (2003). Lockwood argued that inefficiencies exist in centralization mainly because of the bargaining process. The latter, driven by cost-minimization, leads to the adoption of the cheapest public goods that are below efficient level. Besley and Coate (2003) followed the same reasoning assuming the presence of heterogeneity across regions. They concluded that decentralization dominates centralization particularly because the median voter would select a delegate with preferences for the public good

higher than himself, which will lead to an equilibrium that is above the efficient level.

The second stream studied the trade-off between centralized and decentralized provision within the context of electoral accountability: In this case, the electorates are the principals whereas the politicians are the agents. The presence of asymmetric information, in its turn, lies behind the inefficiency of the government. What decentralization can achieve, according to these theorists, is to reduce the information asymmetry by inducing yardstick and /or tax competition among sub-national governments. Yardstick competition occurs when each sub national unit works on enhancing its tax policies and levels of public good provision in order to gain the support of the citizens who can easily compare the performance of their government to that of the nearby governments. Tax competition occurs when each local government works on developing appropriate tax rates in order to attract a tax base. These two mechanisms will create an incentive to reduce rent diversion and/or the influence of lobbies. Similarly, they will allow the electorate to exercise control over the politicians, holding them more accountable. All of this would lead to the formation of more efficient governments (Porcelli 2009).

This is exactly what Siebright (1996) indicated: decentralization contributes in the improvement of governments' accountability, since the reelection of officials depends mainly on the welfare of the region they are governing. As opposed to the central government where voters cannot monitor effectively the work of the politicians and their fulfillment of their electoral promises, local governments makes this control feasible with the easy access to information and the low transaction costs involved in the process.

In summary, while the first generation theorists considered decentralization to be a safeguard against asymmetrical regions solely, the second called for

decentralization as a tool for the enhancement of accountability and efficiency. The latter emphasized, essentially, that “institutions matter” and invited the experts in the field to look beyond the traditional pillars of fiscal decentralization that were identified within the first generation by underlining the non-fiscal aspects of decentralization reforms (Weingast 2006). More precisely, they warned against starting with a blank slate when tackling the design of a country’s intergovernmental fiscal design. Instead, they called for using the existing country’s institutions as the basis for reforms along with the incorporation of participatory and accountable governance and public administration into the design and practice of fiscal decentralization (Boex 2009).

C. Empirical Evidence

Moving to the empirical outcomes, various papers focused on the importance of fiscal decentralization in reducing corruption, enhancing public services delivery, inducing economic growth and increasing social capital, while others warned from the adverse effects FD has on the economy.

In his paper entitled "Does fiscal decentralization strengthen social capital?” Luiz de Mello (2010) examined whether FD enhances social capital which is measured in terms of interpersonal trust. Using the latest wave data of data from the World Values Survey Data, that covers 80 countries since 1981, and running unrelated probit regressions for a cross section of countries, the author concluded that people living in decentralized countries give more importance to their participation in government decisions than those who don’t: The preliminary description of the data showed that 47.6% of residents in decentralized countries insist that people should participate more in decision-making compared to 44.8% among residents in centralized countries. In addition, the 27.7 % within the former group believe that people can be trusted

compared to 24.1% among the latter group. These results are important as pro-voice attitudes are correlated with greater social capital. Such evidence was complemented by country-specific regressions for Brazil and Indonesia, conducted in the same paper. The empirical results of these regressions turned out to be consistent with previous findings: the cohorts of individuals that were exposed to decentralization are generally more pro-voice than their counterparts that have not been exposed to decentralization. However, these attitudes were translated in a positive impact on social capital in Brazil, but to a lesser extent in Indonesia, possibly because its decentralization experience and political liberalization are relatively new.

Another paper " Decentralization and economic growth revisited: "an empirical note", done by Atshushi Iimi (2005), studied the relationship between fiscal decentralization and economic growth. Iimi used cross-country data from on 51 countries divided as following: 7 low income countries, 10 lower-middle income countries, 12 upper-middle countries, and 22 high income countries, from the period extending from 1997 to 2001. Based on the latest macroeconomic data including the fiscal expenditure of local governments, he ran a model using the instrument variables (IV) technique and found that fiscal decentralization had a significant positive impact on GDP growth per capita, as the coefficient of fiscal decentralization was positive and statistically significant. The author confirmed then that transferring fiscal functions to sub-national governments is conducive to growth, particularly on the fiscal expenditure side.

These findings were corroborated by various others. In the thesis entitled "The Effect of Fiscal Decentralization on Economic Growth", Siti Aisyah (2008) investigated the impact of fiscal decentralization on economic growth in 19 provinces including 180 districts in Indonesia, after the implementation of the FD law (Law No.25/1999) in

2001. Based on a panel model, Aisyah deduced that the relationship between growth and FD, measured by local government expenditure or general allocation fund, is positive effect after three years of FD's implementation. In fact, the results showed that if fiscal decentralization, measured through local government expenditure, increases by 1 %, economic growth will increase by 0.00026%. While if fiscal decentralization, measured through general allocation fund, increases by 1%, economic growth will increase by 0.00088 %. Despite the relatively small effect on growth, the paper pointed out that FD benefits were materialized in reduction of tensions and conflicts across Indonesian regions, which made these provinces more attractive to foreign investors and thus more likely to achieve economic growth.

In parallel, the effect of fiscal decentralization on the efficient allocation of public resources was carefully studied by the paper entitled "fiscal decentralization and infant mortality: empirical evidence from rural India" by Asfaw *et al.* in 2007. In this study, a model was developed to empirically test the impact of fiscal decentralization on rural infant mortality in India between 1990 and 1997. The random effect regression outcomes indicated that rural fiscal decentralization had a negative and statistically significant effect on rural infant mortality, and the results proved to be robust. The paper also examined other complementary factors such as political decentralization, and deduced that increasing political decentralization can enhance the effectiveness of FD. In fact, the rural infant mortality rate proved to be very low in states with relatively high political participation of the community.

The effect of FD on corruption was also highlighted in a paper entitled "Decentralization and Corruption: Evidence Across Countries" conducted by Fisman and Gatti (2002). They examined the cross-country relationship between fiscal decentralization and corruption as measured by a number of different indices. Using the

following model: CORRUPTi = a + b1*DECENTRi + b2*log(GDPi) + b3*CIVILi + b4*log (POPi) + ei and data from a cross section of 57 countries, they found that decentralization had a negative and strongly significant sign, implying that countries with more decentralized expenditures have better corruption ratings. This result was found robust to a wide range of specifications. Furthermore, the size of the coefficient indicated that a one standard deviation increase in decentralization will be associated with a 40% improvement in the country's corruption ratings.

Yet, Remy Prud'homme noted that the benefits of decentralization are not as direct as the theory claims, insisting that there are serious drawbacks that should be taken into consideration when designing a decentralization program. In his "The dangers of decentralization" published in 1995, he noted that when decentralization is implemented in the wrong circumstances or applied on the wrong sectors, it may cause more harm than good. Among the negative effects of decentralization, he stressed that a decentralized system can make macroeconomic policies more difficult to implement. This was particularly shown in Argentina, the country that went through decentralization. As a matter of fact, its provincial expenditures increased rapidly to more than 11.2% of GDP in 1986, however its revenues as a share of GDP decreased by 0.6% between 1980 and 1986. That deficit was either financed by transfers from the central government or by borrowing, two means that were both inflationary. Such transfers by the Ministry of Finance rewarded and encouraged provincial mismanagement which led to government deficits of a large magnitude. This practice was summarized by the World Bank (1990) as follows: "These provincial/national financial practices have contributed to unsustainable public sector fiscal and quasi-fiscal deficits, and their continuation would undermine national efforts to attain price stability and to promote sustainable economic development".

Another paper entitled “Education decentralization, public spending and social justice in Nigeria” by Geo-Jaja, published in 2006, warned that fiscal decentralization on its own may not be sufficient to achieve the desired benefits. In Nigeria, for instance, efficiency, equity, adequacy and economic and political participation have not been achieved following decentralization. A possible explanation for this is that Decentralization in Nigeria's case involved “deconcentration” and “delegation” whereby the central government retained considerable powers.

In fact, Geo-Jaja distinguished between deconcentration that involves shifting central government responsibilities to sub-national governments, delegation that includes the delegation of central government powers to sub national governments and devolution whereby central governments completely give up their powers and revenue-raising activities to sub national governments. Then he indicated that although the last represents the true version of decentralization, it is not being applied in Nigeria. Taking the education sector as an example, he indicated that decentralization in Nigeria focused on shifting responsibilities rather than on enhancing social justice. For example, the central government, not the sub national governments, determines teacher's compensation, budget allocation and the accessibility to basic education. Finally, he suggested that the central government should accept the role of supporter and promoter of decentralization by assisting sub national governments in supplying social services and assigning responsibility for their finances. He concluded that decentralization on its own cannot enhance education service delivery or improve the capacities of sub national governments and the integration of social policy in broader development goals.

The effect of FD on the provision of public services was also tackled, in a study entitled “Decentralisation and convergence in health among the provinces of Spain (1980–2001)” conducted by Montero-Granados, Jimenez and Marti. The authors

measured the effect of decentralization on the health sector among the provinces of Spain during 1980-2001, using the traditional Sigma and beta convergence models and Life Expectancy at Birth (LEB) and Infant Mortality (IM) as health indicators. One of the most crucial findings resulting from this study is that some provinces that had initially had worse Infant Mortality have clearly improved their situation especially compared to those who were initially better. However, using the traditional methodology of convergence, the conclusion of the analysis did not seem to confirm the hypothesis of the existence of convergence among the provinces of Spain.

Other papers also highlighted the negative effects of decentralization:

In their paper entitled "The Economic (In) Efficiency of Devolution", Rodriguez-Pose and Bwire examined the effect of fiscal decentralization on growth based on regional data of three federal countries: Germany, India and the US and three newly devolved countries :Italy, Spain and Mexico. Using linear regression models, they tested regional growth rates during centralized and decentralized periods between 1975 and 2005. However, they did not conclude that there is a positive relationship between decentralization and growth.

Their findings were supported by another paper for Thortnton (2006) entitled "Fiscal Decentralization and Economic Growth Reconsidered". Though the study was criticized for the small number of observation (19), the study found no statistically significant effect of fiscal or political decentralization on growth. The author had differentiated in his study between administrative and substantive decentralization. As high sub national revenue is not a true reflection of high local autonomy according to him, he measured sub national revenues and expenditures that are controlled by sub national authorities and added a political decentralization dummy variable that emphasizes the difference between federal states and unitary states.

Sacchi and Salotti (2011) studied the linkages between fiscal decentralization, overall income inequality and regional economic disparities in their paper entitled "Income inequality, regional disparities, and fiscal decentralization in industrialized countries". Based on a sample of 23 countries for the period 1971-2000, they examined the effects of FD on overall income inequality. They found that a higher degree of tax decentralization is positively and significantly correlated with higher levels of income inequality across households within a country, while expenditure decentralization did not have significant effects on income inequality. These results showed that lowering the degree of tax decentralization is crucial to improving income redistribution policies, which conforms to the traditional theory of fiscal decentralization (Musgrave 1959) that indicated that sub-national governments should have a minimal role in redistributive policies as opposed to the central governments.

As seen, the empirical evidence on the effect of fiscal decentralization is mixed and this is happening for many reasons: Firstly, even if the decision is made to decentralize, central agencies may have the incentive to implement the process slowly. Secondly, ill-prepared sub national governments on the managerial, political and technical levels can harm the process of FD. Thirdly, the degree of fiscal decentralization is not always well determined.

These differences in the contexts of FD make the development of meaningful comparative research and major rules for the field quite hard. In fact, FD systems do vary in the number of levels of government that exist and the nature of the constitutional and legislative relationship among them: Sub national governments differ in the degree of their revenue-raising autonomy and expenditure decision-making. They are also different in terms of the degree of political decentralization and grassroots legitimacy, as some local governors are elected whereas others are appointed by the central

government. Plus, sub-national government managerial and fiscal capacity across and within countries vary significantly.

But despite these contextual differences, some work has been done to identify the basic elements of a good decentralized system and a number of key factors affecting the possibility of its realization, as the real issue is not whether there should be fiscal decentralization or not, but rather how it should be achieved.

D. Implementation Rules for Fiscal Decentralization

Paul Smoke (2000) identified these elements in the paper he submitted to the Conference on Fiscal Decentralization, International Monetary Fund, Washington, DC November 20-21, 2000:

Firstly, there should be an appropriate enabling environment that can start with constitutional mandates that would guarantee a minimum level of autonomy, responsibilities and rights for the sub-national governments. But while this is important, it is not sufficient. Additional elements to enhance an appropriate environment for fiscal decentralization are needed: a political will to decentralize, the adoption of robust and clearly defined constitutional and/or legal provisions to support decentralization and the strengthening of decentralized levels of government as well as the setup of an appropriately empowered mechanism in order to coordinate the complex activities resulting from decentralization. In short, central governments must be aware that sub-national governments need resources and capacity to be able to succeed.

Secondly, there should be an appropriate assignment of functions to sub-national governments as indicated in the fiscal federalism literature. The problem, however, resides in the lack of implementation of the expenditures functions. This happens for two reasons: the central government almost never has the incentive to

decentralize the services it provides, particularly if this entails losing the prestige and resources to these sub national governments, and so it slows down the decentralization process. In addition, sub-national governments are likely to perform poorly if they don't have the capacity to handle their responsibilities especially if too many sectors are decentralized at a rapid pace. This in turn will be used as an excuse by the central government to keep the services centralized.

Thirdly, there should be an appropriate assignment of revenues to Sub-national Governments as clarified in the literature. Under this category, three main concerns arise: firstly, assigned revenues fail to be sufficient for the local expenditures requirements which mean that the central government transfer programs must be endorsed. Secondly, sub-national governments tend to depend on unproductive revenue sources that do not meet their collection costs. Finally, individual local revenue sources suffer from dangerous design flaws such as complex structures, ineffective collection mechanism and stagnant bases.

Based on this, it is preferably better not to implement many reforms at once as it would exhaust the local residents and the sub national governments capacity. Instead, it would be better to focus on developing a few local sources of revenue systematically in order to generate substantial yields and create a more efficient link between the benefits that local residents enjoy and the taxes they pay.

Fourthly, there should be an appropriate intergovernmental transfer system. These transfers serve overlapping goals among which helping to cover the sub national governments' fiscal imbalances, helping to narrow the fiscal imbalances among sub-national governments and encouraging local expenditures in goods and services characterized by positive externalities. Nevertheless, designing transfer programs is delicate for many reasons:

No one type of transfer can help achieve all the objectives simultaneously: while unconditional grants can be the ultimate way to redistribute income, conditional grants are seen as more efficient in stimulating expenditures on targeted services. Plus, these grants are hard to design because of the complex political and technical issues in setting the “optimal” distribution of income across decentralized jurisdictions. In parallel, macroeconomic problems can emerge if a large part of central resources is transferred to the sub national governments. That is why; a balance should be found which provides the minimum stable revenue needed by the sub national government to perform their duties while not giving them too much. In addition, transfer programs may have conflicting objectives, additional burden, and unintended results or may be allocated subjectively undermining economic objectives. But despite all these challenges, these transfer programs can improve the status quo. And while it is almost impossible to prescribe an appropriate intergovernmental transfer system, one should expect these programs to balance the main intended objectives, to build incentives for efficient fiscal behavior and to increase the resources of sub national governments in order to enhance their capacity to behave in a fiscally responsible manner.

Fifthly, there should be adequate local access to investment capital. While most of the sub national governments rely on intergovernmental transfers for their capital budget, in some countries, decentralized governments are able to borrow. This took the form of municipal credit institution that developed when countries faced lower levels of internal and external pressures on the fiscal level. However, reforms were undertaken following recent fiscal and economic changes coupled with evidence that subsidization does not benefit primarily the regions in need. The reforms include charging closer-to-market interest rates and enforcing repayment through municipal development funds as well as creating municipal bond markets. The latter makes sense in the cases where

decentralized governments are strong, provided that municipal bond markets are regulated, developed and their credit limits enforced by the central government while some type of municipal development fund is recommended when sub national government are fiscally weak with smaller responsibilities.

Roy Bahl (1999) tried to identify the key elements of a good fiscal decentralization system. Governments around the world are being elected, citizens are actively participating and the services provided by these sub national governments have improved significantly convincing the world that local autonomy is better than separatism as a policy. Bahl noted, however, that poorly conceived decentralization policies are slowing down the progress of fiscal decentralization as a policy. For these reasons, he proposed in his paper 12 implementation rules in order for the design to match the objectives and implementation to combine the various dimensions of decentralization.

1. Fiscal Decentralization Should Be Viewed As a Comprehensive System

Intergovernmental fiscal relations must be thought of a system as a whole, because adopting one element will not lead to success. In order to do so, "political autonomy" is required, as the accountability will be upwards and not downwards to the local population if the local leadership is appointed as opposed to elected. The key elements of a fiscal decentralization system can be seen in Table 1.

2. Finance Follows Function

A responsible assignment of expenditures should be done before tackling the revenue's assignment function for two reasons: The central government should be aware of the expenditure needs of the sub national governments before considering the

issue of revenue assignment. Plus, the economically efficient assignment of revenues could not be done in the absence of a clear knowledge of expenditures.

Table 1. The components of a system of fiscal decentralization

Necessary Conditions	**Desirable Conditions**
Elected Local Council Locally Appointed Chief Officers Significant Local Government Discretion to Raise revenue Expenditure Responsibilities Budget Autonomy A hard Budget Constraint Autonomy	Freedom from Excessive Central Expenditures Mandates Unconditional Transfers from Higher-level Governments Borrowing Powers

Source: B. Roy. (1999). Implementation Rules for Fiscal Decentralization. International Center for Public Policy Working Paper Series No. 9901.

3. There Must Be a Strong Central Ability to Monitor and Evaluate Decentralization

A central government leadership is needed while gradually proceeding to fiscal decentralization, especially to control issues such as the imposition of a uniform system of financial accounts, audit rules, disclosure requirements and to provide local governments with technical assistance. Two necessary conditions are needed throughout the process: a fiscal analysis unit led by adequate staff, in the Ministry of Finance for example, to monitor the finances across local governments and an extensive data system to help monitoring and evaluating finances from the quantitative side.

4. One Intergovernmental System Does Not Fit the Urban and the Rural Sector

Since sub national governments differ in their delivery, financing and borrowing capabilities, it is crucial to develop a system where these differences are incorporated by giving those different financing powers and expenditure

responsibilities.

5. Fiscal Decentralization Requires Significant Local Government Taxing Powers

In order to hold the elected officials accountable, the taxes should be to a great extent locally imposed. Taxes must be visible to these voters and significant enough to impose a burden that cannot be easily exported to residents outside the jurisdiction, though. VAT tax is not a recommended tax for sub national governments. Individual income taxes, however, are appropriate as they cannot be evaded and can be administered easily. Also, the income taxes can be added to the central government's rate without having to set up a tax base specifically for it.

6. Central Governments Must Keep the Fiscal Decentralization Rules That They Make

Central governments do not always keep the rules that they make for FD and this puts the success of fiscal decentralization at risk. That is why, not only transparency in rules is required but also adherence to these rules.

7. Keep It Simple

Most local government administrative systems are unable to handle complicated intergovernmental fiscal arrangements. Examples of such hard arrangements are:

- Complicated grant allocation formulae that cannot be supported adequately by the existing data.
- Local taxes that are structured to accomplish other goals than revenue raising.

- Conditional grants that require a monitoring of the use of the funds.
- Expenditures mandates that have stringent compliance requirements.

For these reasons, it would be preferable to adopt simple fiscal decentralization structures that would reduce both the administrative costs of the local governments and the evaluation costs facing the central government.

8. The Design of the Intergovernmental Transfer System Should Match the Objectives of the Decentralization Reform

Different kinds of intergovernmental transfer systems with different types of impact on local government finances do exist. Therefore, it is necessary for countries not to adopt a grant design before studying its alternatives and differential impacts.

9. Fiscal Decentralization Should Consider All Three Levels of Government

In the countries where provincial governments are too large to ensure the citizens participation in decision making and accountability processes, fiscal decentralization is carried at the lower levels of the government. In fact, most large countries provide a municipal government level that is subordinated to the province. The controversy emerges when deciding whether the central government will design a fiscal decentralization program that will cover all levels of government or whether each state will be left to design its own internal program. Two policy options were debated: the first revolves around allowing provincial autonomy in deciding on distribution among its local governments. The second calls for the central government to mandate some degree of uniformity in sub national government fiscal decentralization policy.

10. Impose a Hard Budget Constraint

Local governments who are given autonomy should be responsible for keeping a balanced budget without the assistance of the central government in the form of bailouts or deficit grants; otherwise it would be violating the rules of a true fiscal decentralization program that should match expenditures to revenues.

11. Recognize That Intergovernmental Systems Are Always In Transition and Plan for This

When adopting fiscal decentralization, the central government should be aware that many of its elements will disappear with economic development such as the disparities among regions. Therefore, it should be flexible in its decentralization plans and adjust to such changes. Examples of this include allowing changes in tax structure to capture changes in the economic structure or providing explicit graduation provisions for local governments. What should be avoided, however, is putting detailed decentralized provisions in the Constitution or creating a completely ad hoc system with no structure as both violate flexibility and transparency rules

12. There Must Be a Champion for Fiscal Decentralization

Decentralization will succeed if there is a strong internal champion who understands the costs and benefits of such a program. The strongest supporters of its establishment are the president and the voters and so they are considered the natural champions. But its failure could deter the chance of the former to be reelected. The Parliament is also a potential champion even if its members are more interested in how they would benefit from it and thus adopt less transparent policies. For their part, local governments will call for decentralization despite the controversial views over the type

of decentralization between the rich and the poor. External donors and advisors also support decentralization. In contrast, the ministry of Finance, reluctant to give up its tools, will oppose the program or try to establish a controlled form of decentralization. The Ministry of Economy will also refuses it, preferring a central system directing investment. The line ministries would oppose decentralization on grounds related to the lack of technical capacity of local governments.

Bahl and Martinez-Vazquez (2006) picked similar rules that are necessary to guarantee the success of fiscal decentralization as listed above. They considered that there is extensive knowledge concerning the design of decentralization programs but a lack of knowledge over its implementation and sequencing. Besides implementation rules, they focused on sequencing of decentralization policies as a main determinant of its success, as experience has shown that many decentralization measures did not result in the desired decentralization outcome. That is why; they provided two approaches to sequencing among which the normative approach:

The decentralization process starts with a national debate that includes the main stakeholders. The general consensus over the establishment of such a system may be reached within the context of a national election or a discussion headed by an appointed national commission.

The second step includes designing a fiscal decentralization program and submitting a policy paper related to it. The latter should be used as the basis for writing the law and outlining the main components of the fiscal decentralization program and the timetable for its implementation.

The third step complements the second as it calls for drafting the law and passing it in order to give legal grounds for the implementation of the fiscal decentralization measures.

The fourth step involves the adoption of a set of implementing regulations that indicates in details how fiscal decentralization will be endorsed.

The fifth step includes implementation. The central and subnational governments start holding their new responsibilities.

The last step involves the esablishement of a well-designed and operational system by the central government and an appropriate accountability system at the sub national level.

The steps outlined above may be summarized by the picture below:

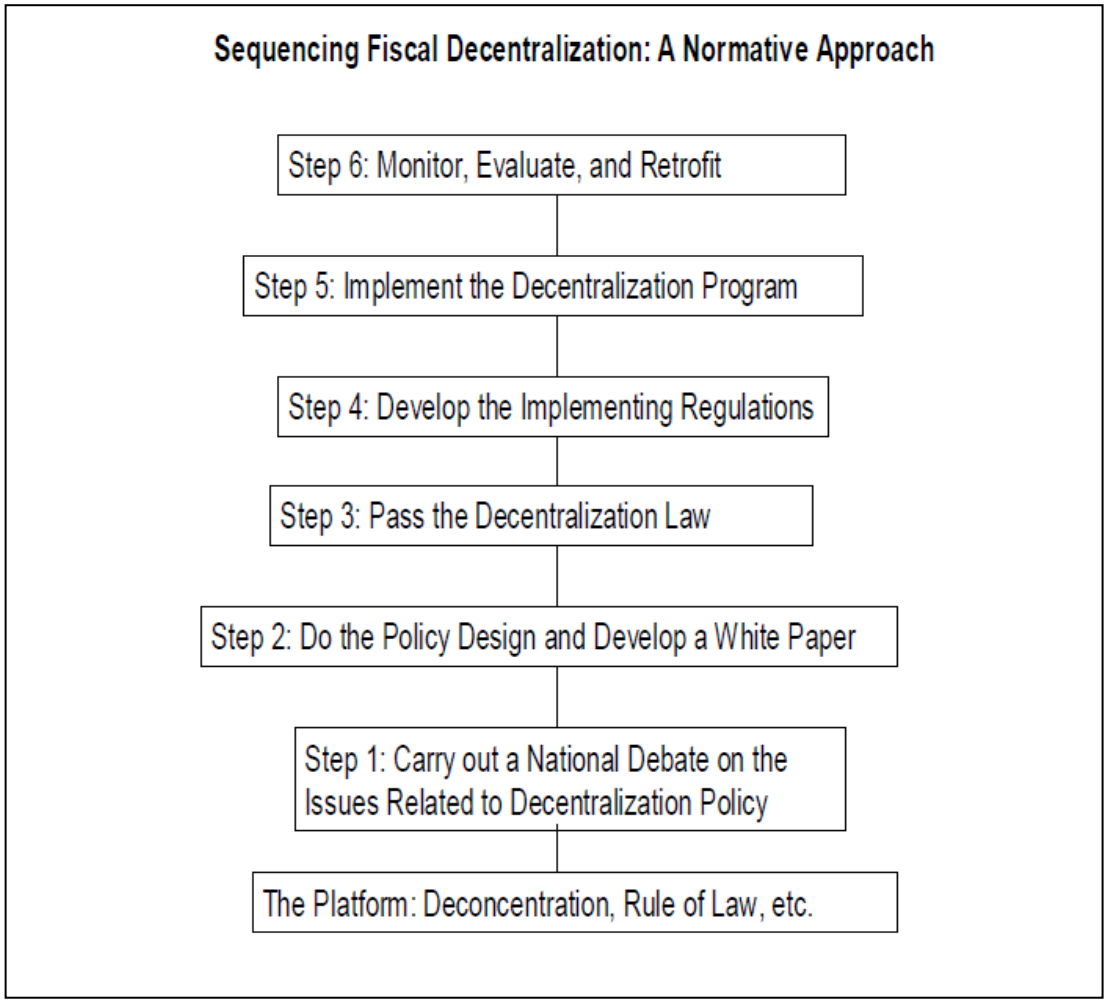


Fig. 1. Sequencing Fiscal Decentralization
Source: Bahl, R. and Martinez-Vazquez, J. (2006). Sequencing fiscal decentralization. World Bank Policy Research Working Paper Series No. 3914.

CHAPTER III

DATA AND METHODOLOGY

While the classical theory tackling FD clearly identified the benefits that FD can yield, the empirical evidence yielded mixed results.

The results of the studies examining the relationship between FD and economic growth, for instance, were contradictory. Some found that fiscal decentralization can induce economic growth while others find no relationship between the two.

This thesis aims at examining this controversial relationship to test the validity of the classical theory. However, it adopts a different approach.

By using the Granger causality test, not only it checks whether FD causes economic growth but also tests whether economic growth also can also trigger the implementation of FD. This is important as it would further highlight the importance of the implementation and sequencing rules that were identified in Chapter II.

The data, the countries' selection and the methodology will be explained in details in this chapter.

A. Data

1. Sources

Data are based on two types of series: The first are series of shares of sub national expenditures (SB) as a percentage of total government expenditures. The second are series of GDP growth (in percentage)(G).

To construct the first type of series, the paper tried to use the International

Monetary Fund (IMF)'s Government Finance Statistics offers that contains statistical data on government financial operations for 145 IMF member countries. Nevertheless, the access to the database was denied and the database was not provided even by a request made to the IMF office in Beirut.

Instead, the paper relied on the OECD database that provides time-series on governments central, local and state expenditures. Using this database, the paper successfully calculated the percentage of sub national expenditures from the total expenditures, as this would constitute a measure of fiscal decentralization, as adopted by the World Bank FD indicators.

In parallel, the paper uses data from the IMF to consolidate the second set of data constituted of time series of GDP growth in constant prices (in %).

2. Countries Selection

The two-selected countries for the study are Germany and Spain.

The data used for Germany is annual ranging from 1991 to 2010. While the data used for Spain is annual, ranging from 1995 to 2010.

The two-countries have important characteristics in common being two European decentralized countries adopting devolution, with regional levels of governments and direct regional elections:

Devolution is the transfer of authority to an autonomous unit that can act independently. In fact, when governments adopt devolution, they transfer authority for decision making, finance, and management to quasi-autonomous units of regional governments with corporate status. This also means that responsibilities for services are transferred to governmental institutions in regions, whose members can be elected by the region's residents. To add up, these entities can raise their own revenues and take

main investment decisions. Most importantly, these regional governments have clear and legally recognized geographical boundaries over which they exercise authority and within which they perform public functions. Generally, devolution is the type of administrative decentralization that underlies most political decentralization (Crucq and Hemminga 2007).

Nevertheless the two selected European countries differ in terms of the institutional structure whereby Spain is a unitary decentralized state while Germany is a federal state.

To highlight this particular difference, it would be interesting to look briefly at the decentralization process in the two countries:

a. Spain

Spain had always adopted a very centralized political system that lasted until the end of the dictatorship of Franco. In 1978, the decentralization process finally started after the creation of the country's current constitution. The latter created a complex framework that recognizes the concept of Spain as a single political nation with the existence of autonomy statuses granted to all seventeen regions, with a high degree of autonomy granted to some of them, identified as the "historical regions" consisting of Catalonia, the Basque Country and Galicia and Andalusia later on. In contrast, the "ordinary" regions consisted of the rest: Aragon, Asturias, Balearic Islands, the Canary Islands, Cantabria, Castilla de La Mancha, Castilla-Leon, Extremadura, Madrid, Murcia, Navarra, La Rioja and Valencia.

In 1983, the 17 autonomous regions adopted a decree that minimized the differences between the "historical" and "ordinary" regions, as the degree of autonomy increased across all Spanish regions.

In general, the autonomous regions have wide legislative and executive autonomy, with their own parliaments and regional autonomy. However, the distribution of powers is different for every community. Gradually, the ordinary regions that had historically fewer powers, caught up with the historical regions. For instance, in 1992, the regional autonomy pact gave greater powers to the autonomous communities and to the ordinary regions in particular, in the education and health sectors. To summarize, Spain's decentralization can be labeled as an asymmetrical devolution (Crucq and Hemminga 2007).

b. Germany

Shortly after the Second World War, Germany was almost decentralized. This is why; changes towards more decentralization did not take place over the last few decades.

The federation of Germany was founded in 1949. The country is divided into regional states called the "Länder", which are recognized in the constitution as having their own legislature.

Originally, the structure of regional governments as laid out in the basic law was highly decentralized. In fact, the Länder implement federal legislation and have the power to block tax laws suggested by the central governments. Yet, tax legislation is considered a national matter whereas tax administration a regional matter. In its turn, tax collection is decentralized, tax rates are uniform. Tax revenues are distributed between the different levels of governments with a special characteristic entailing horizontal payments between rich and poor states.

As mentioned above, few decentralization measures have been taking place in the last couple of decades, except for some public sector reforms on the local level. It is

worth noting that the German unification in 1990 did not lead to great shift of power between the federal government and the Länder. Overall, Germany is a country characterized by a symmetrical devolution of powers to the regions (Crucq and Hemminga 2007).

3. Descriptive Statistics

a. Spain

Spain had an average growth of 2.85 % between 1995 and 2010, with the highest growth registered of 5.05% in 2005 and the minimum of -3.74% in 2009. The standard deviation was of 2.2.

The average sub national share of expenditures reached 43.43% during that period, with a highest share of 49.85% in 2008 and the lowest share of 32.92% in 1995. The series had a standard deviation of 6.04.

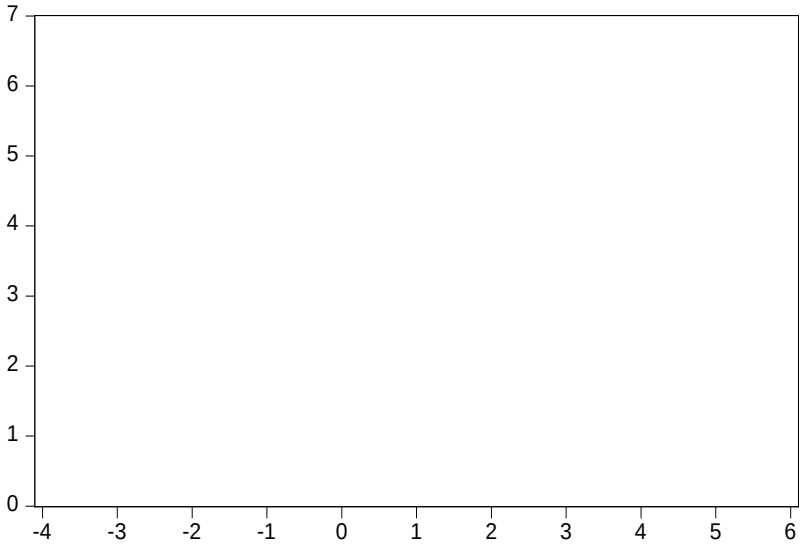


Fig. 2. Descriptive statistics-growth of Spain

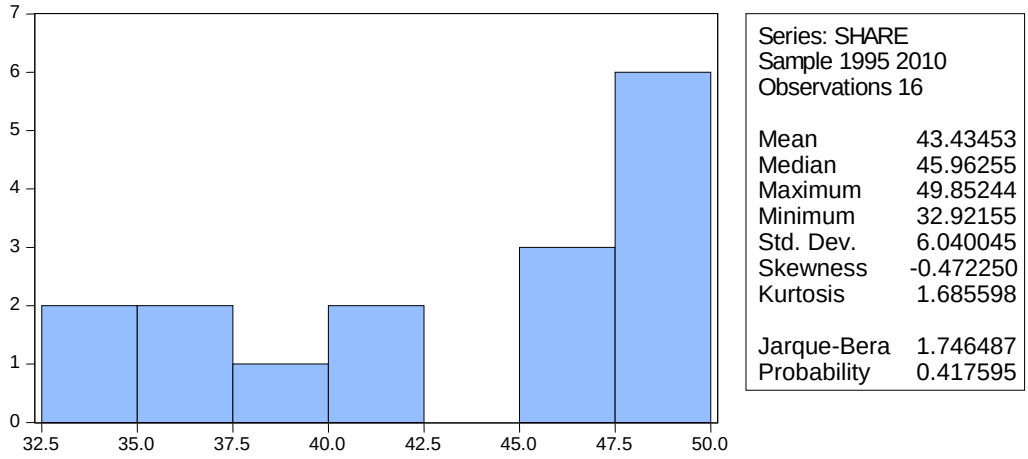


Fig. 3. Descriptive statistics-share of Spain

b. Germany

Germany had an average growth of 1.42 % between 1991 and 2010, with the highest growth registered of 5.05% in 1991 and the minimum of -5.07% in 2009. The standard deviation was of 2.14.

The average sub national share of expenditures reached 37.56% during that period, with a highest share of 39.26% in 1992 and the lowest share of 33% in 1995. The series had a standard deviation of 1.33.

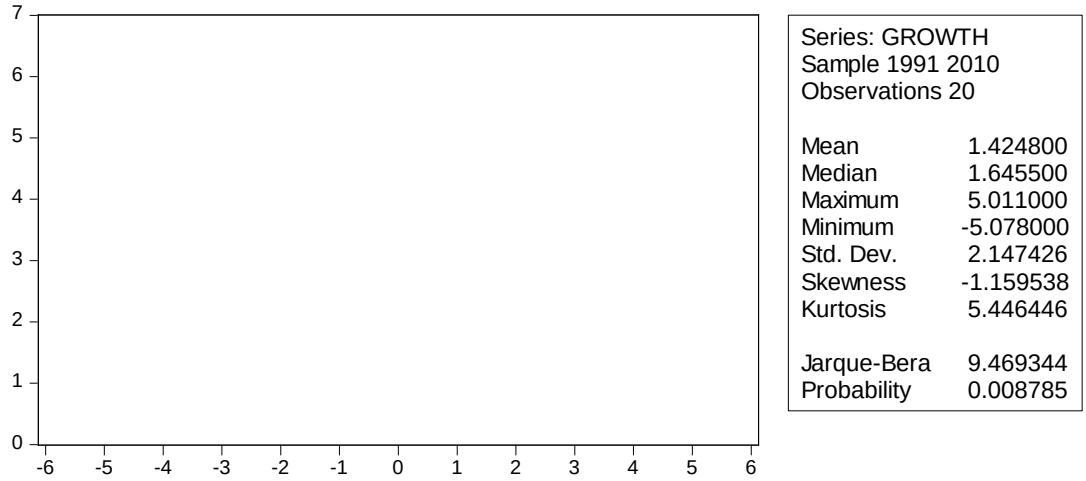


Fig. 4. Descriptive statistics-growth of Germany

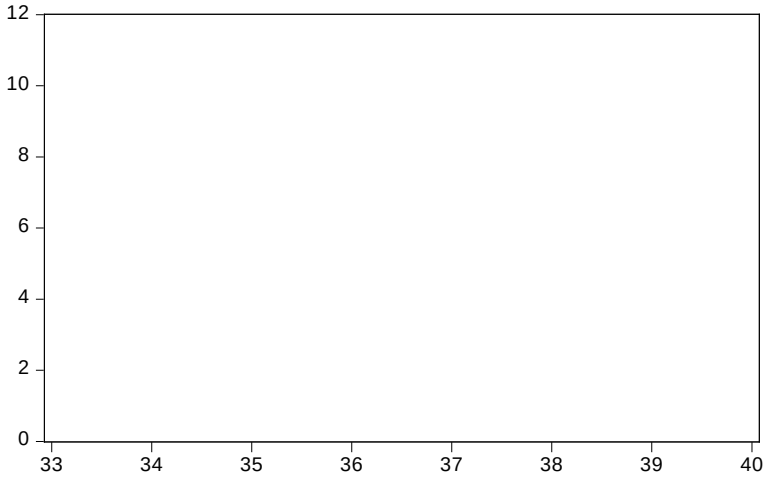


Fig. 5. Descriptive statistics-share of Germany

B. Methodology

The study begins by testing for stationarity which could be done informally by looking at the trend of the variables on their graph and checking to see if it reverts to the mean (stationary I(0)) or not (non-stationary); or formally using the 'Augmented Dicky Fuller' unit root test. In fact, the test is essential since most macro-economic time series are trended; do not revert to a mean and are therefore non-stationary and not integrated (Asteriou and Hall 2007).

1. Augmented Dicky-Fuller Test

The test which applies to all our time series is the augmented Dickey-Fuller test (ADF) developed by Dickey and Fuller (1979; 1981). They consider three different regression equations that can be used to test for the presence of a unit root:

$$1: \Delta yt = \gamma yt - 1 + \sum_{i=1}^{p} \beta \Delta yt - i + ut$$

$$2: \Delta yt = \alpha 0 + \gamma yt - 1 + \sum_{i=1}^{p} \beta \Delta yt - i + ut$$

$$3: \Delta yt = \alpha 0 + \gamma yt - 1 + \alpha 2t + \sum_{i=1}^{p} \beta \Delta yt - i + ut$$

Where y_t is the series being tested, t represents the trend variable, p is the numbers of lags included and u_t an independent identically distributed residual term.

The difference between the three regressions again concerns the presence of the deterministic elements a0 and a2t.

Doldado, Jenkinson and Sosvilla-Rivero (1990) suggest a procedure which starts from the estimation of the most general model given by 3, and then answering a set of questions regarding the appropriateness of each model and moving to the next model. This procedure is illustrated in the below Figure (Enders 1995).

That is needed for an equilibrium, or long run relationship to exist, is a linear combination of Y_t and X_t that is a stationary variable (an I(0) variable). This can be directly taken from estimating the following regression:

$Y_t=\beta_1+ \beta_{2Xt} +u_t$

And taking the residuals

$\hat{u}_t= Y_t- \hat{\beta}_1 - \hat{\beta}_2 X_t$

if $\hat{u}_t \sim I(0)$ then the variables Y_t and X_t are said to be cointegrated.

a. <u>The Error-Correction Model (ECM)</u>

If, then, Y_t and X_t are cointegrated, by definition $\hat{u}_t \sim I(0)$. Thus, we can express the relationship between Y_t and X_t with an ECM specification as:

$$\Delta Yt = a0 + b1\Delta Xt - \pi \hat{u}t - 1 + Yt$$

This equation includes now both long-run and short-run information.

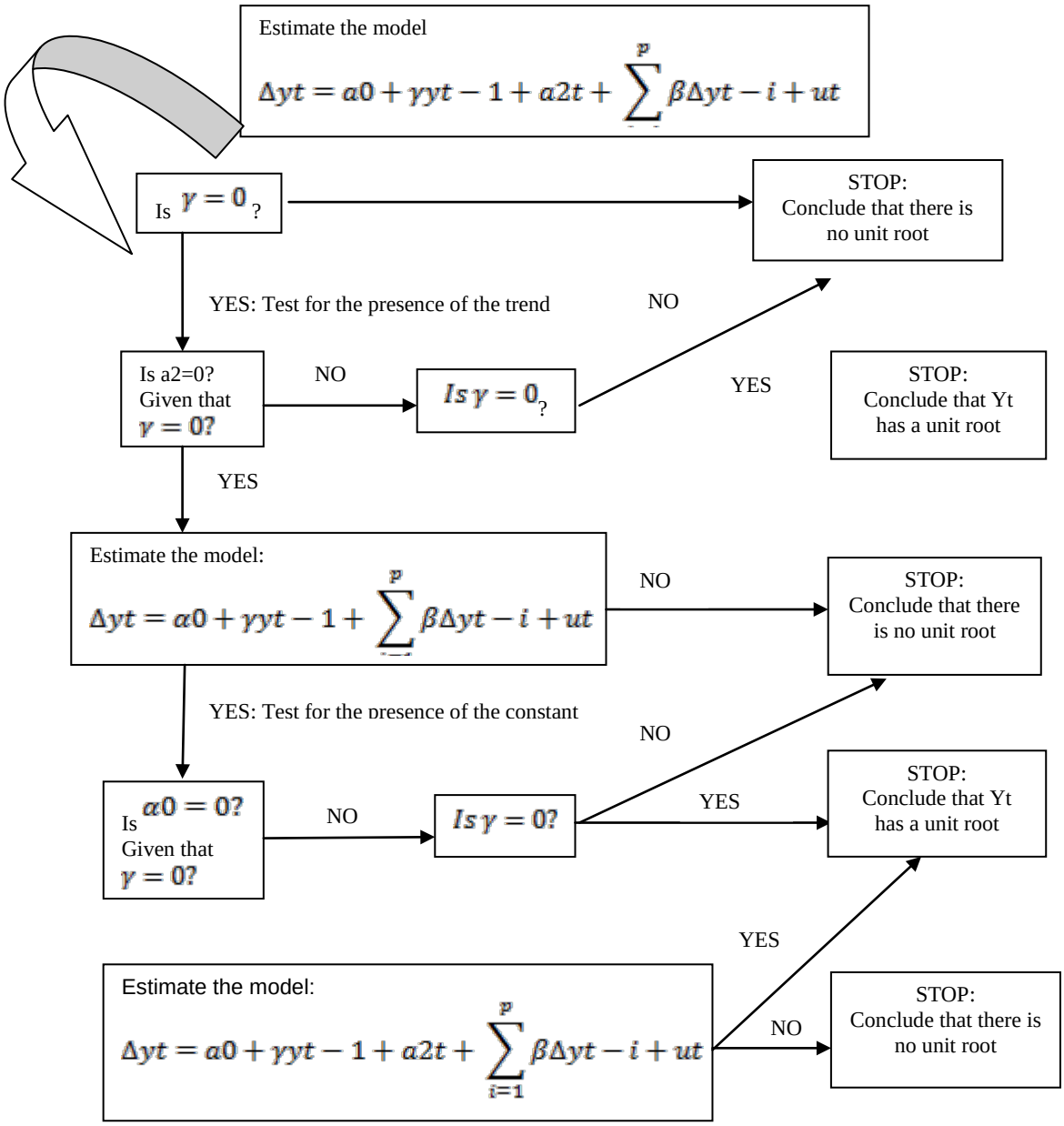
2. Granger Causality Test

To analyze the relationship between the share of sub-national expenditures and

economic growth, this paper focuses on causality among these variables using the method developed by Granger (1969).

Granger causality test is one of the most interesting and widely used VAR applications.

The intuition behind it is simple: If previous values of variable X significantly influence current values of variable Y, then we can say that X causes Y.



CHAPTER IV

EMPIRICAL RESULTS

A. Testing for Unit Roots

1. Informally

a. Spain

Looking at the graphs below, the growth series tend to revert in the long run to the mean (GROWTH to 2.8) implying that it is stationary.

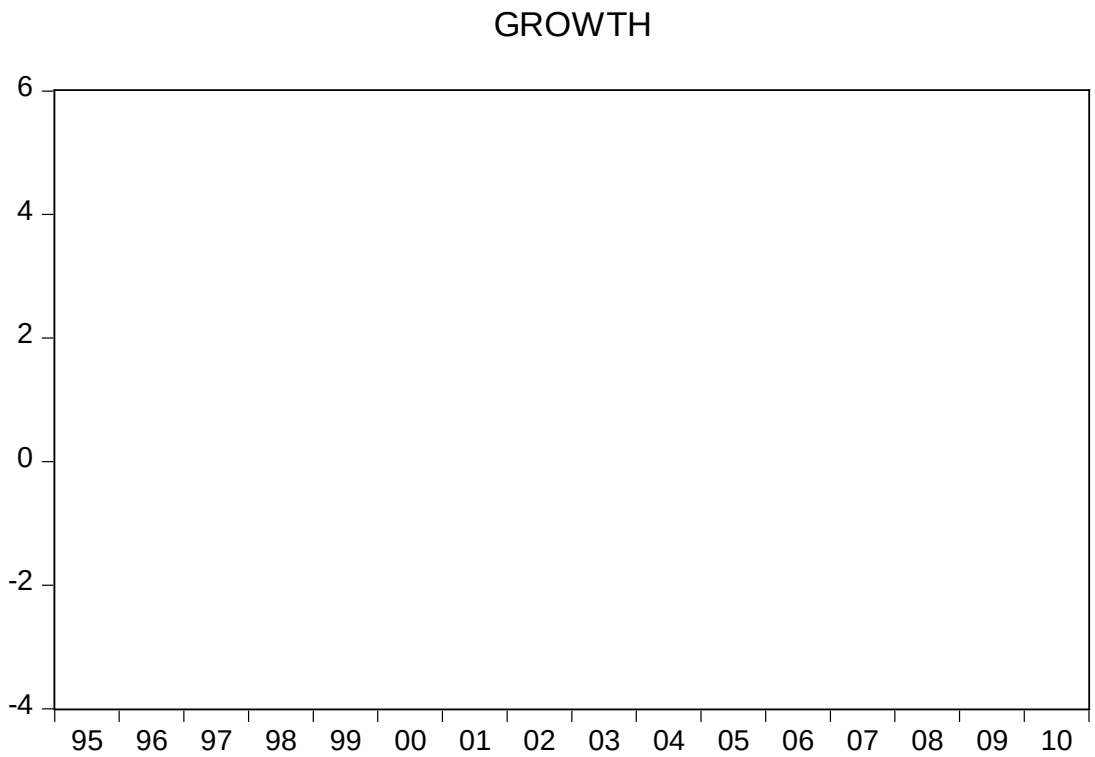


Fig. 6. Spain's growth over time

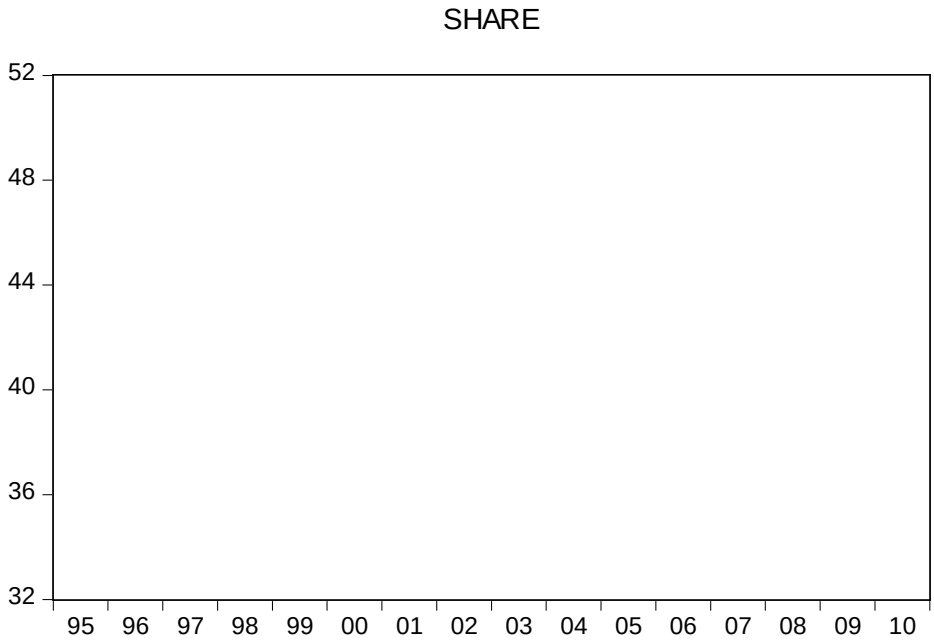


Fig. 7. Spain's share over time

b. Germany

Looking at the graphs below, both series tend to revert in the long run to the mean (GROWTH to 1.42; SHARE to 37.5), implying that both the series are stationary.

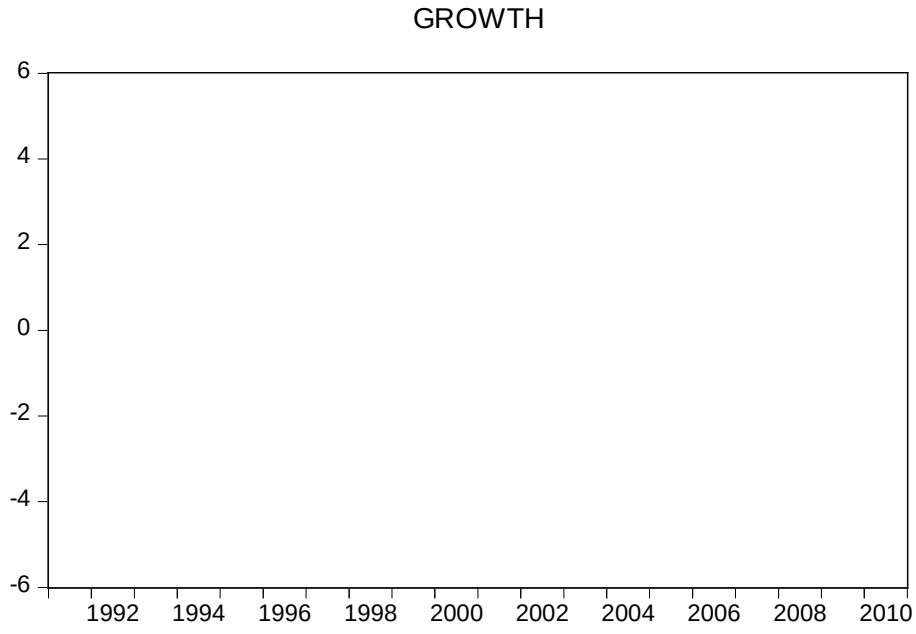


Fig. 8. Germany's growth over time

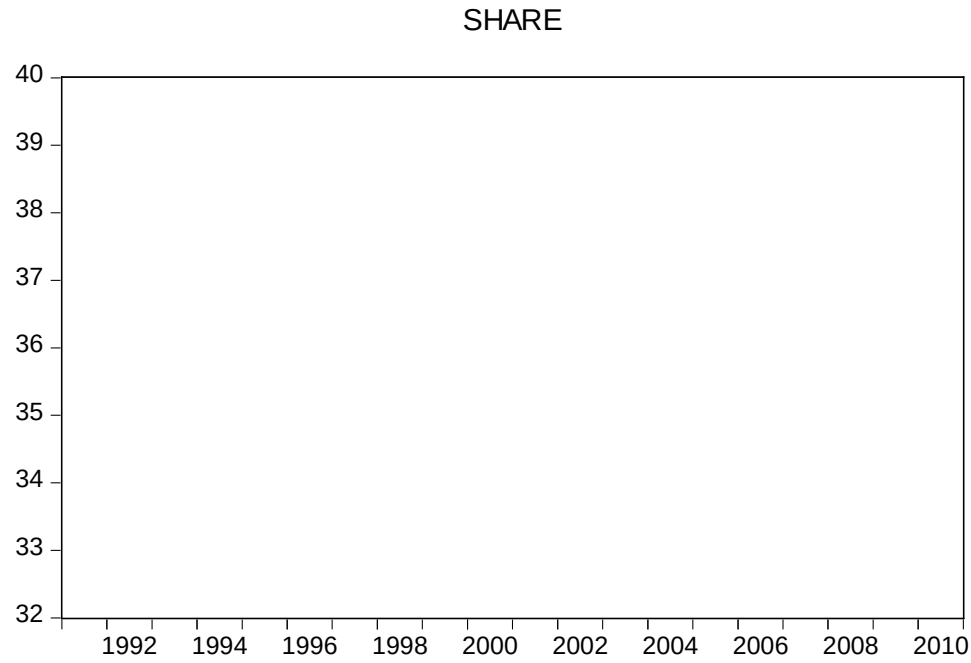


Fig. 9. Germany's share over time

2. Formally: Unit Root Test Using ADF and Flowing Dolado et al. Methodology

a. Spain

- *Growth:*

By testing for the unit root on the level of trend and intercept we get a t-stat of γ=-3.074562 with a probability=0.1491>0.1, therefore we fail to reject γ=0 at the 10% level and move to the next step.

Now we look at a2: its t=-2.52> 1.64 (in absolute value) and its p-value=0.0304<0.1 so we reject that a2=0.

Now we test if γ=0: So we compare -3.074562 to -1.28 (critical value). Since -3.074562<-1.28, we reject that γ=0. We stop and conclude that this series has not unit root. Thus, the growth series of Spain is stationary I(0).

- *Sub national share of expenditures:*

By testing for the unit root on the level of trend and intercept we get a t-stat of

γ=0.897919 with a probability= 0.9993>0.1, therefore we fail to reject γ=0 at the 10% level and move to the next step.

Now we look at a2: its t=--1.519804<1.64 (in absolute value) and its p-value=0.1545>0.1 so we fail to reject that a2=0.

Now we test for the unit root on the intercept only. We get t=-2.343947 and its p-value= 0.1721>0.1. So we fail to reject to reject that γ=0 at the 10%, therefore we move to the next step. We now look at a0, its t=2.785359>1.64 and associated p-value=0.0155<0.1 so we reject that a0=0.

Now we test if γ=0. So we compare t=-2.343947 to -1.28 (critical value). Since t=-2.343947<-1.28, we reject the null. We stop and conclude that the series has no unit root.

Thus, the sub national share series of Spain is stationary I(0).

Table 2. ADF test for the growth of Spain

Null Hypothesis: GROWTH has a unit root Exogenous: Constant, Linear Trend Lag Length: 1 (Automatic - based on SIC, maxlag=3)			
		t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic		-3.074562	0.1491
Test critical values:	1% level	-4.800080	
	5% level	-3.791172	
	10% level	-3.342253	
*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 14			
Augmented Dickey-Fuller Test Equation Dependent Variable: D(GROWTH) Method: Least Squares Date: 05/15/12 Time: 11:39 Sample (adjusted): 1997 2010 Included observations: 14 after adjustments			

"Table 2 – *Cont'd*"

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GROWTH(-1)	-1.308514	0.425594	-3.074562	0.0117
D(GROWTH(-1))	1.057112	0.558455	1.892922	0.0876
C	6.791049	2.070313	3.280204	0.0083
@TREND(1995)	-0.292928	0.116231	-2.520218	0.0304
R-squared	0.558138	Mean dependent var		-0.177929
Adjusted R-squared	0.425580	S.D. dependent var		1.910455
S.E. of regression	1.447944	Akaike info criterion		3.813123
Sum squared resid	20.96542	Schwarz criterion		3.995710
Log likelihood	-22.69186	Hannan-Quinn criter.		3.796221
F-statistic	4.210505	Durbin-Watson stat		2.113029
Prob(F-statistic)	0.036200			

Table 3. ADF test for the share of Spain (1)

Null Hypothesis: SHARE has a unit root Exogenous: Constant, Linear Trend Lag Length: 0 (Automatic - based on SIC, maxlag=3)			
		t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic		0.897919	0.9993
Test critical values:	1% level	-4.728363	
	5% level	-3.759743	
	10% level	-3.324976	
*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 15			
Augmented Dickey-Fuller Test Equation Dependent Variable: D(SHARE) Method: Least Squares Date: 05/15/12 Time: 11:42 Sample (adjusted): 1996 2010 Included observations: 15 after adjustments			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
SHARE(-1)	0.178369	0.198647	0.897919	0.3869
C	-3.391648	6.477816	-0.523579	0.6101
@TREND(1995)	-0.414243	0.272563	-1.519804	0.1545
R-squared	0.410535	Mean dependent var		0.990162
Adjusted R-squared	0.312291	S.D. dependent var		1.295192
S.E. of regression	1.074080	Akaike info criterion		3.157663
Sum squared resid	13.84378	Schwarz criterion		3.299273
Log likelihood	-20.68247	Hannan-Quinn criter.		3.156154
F-statistic	4.178721	Durbin-Watson stat		2.324417
Prob(F-statistic)	0.041952			

Table 4. ADF test for the share of Spain (2)

Null Hypothesis: SHARE has a unit root Exogenous: Constant Lag Length: 0 (Automatic - based on SIC, maxlag=3)				
			t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic			-2.343947	0.1721
Test critical values:	1% level		-3.959148	
	5% level		-3.081002	
	10% level		-2.681330	
*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 15				
Augmented Dickey-Fuller Test Equation Dependent Variable: D(SHARE) Method: Least Squares Date: 05/15/12 Time: 11:51 Sample (adjusted): 1996 2010 Included observations: 15 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
SHARE(-1)	-0.115044	0.049081	-2.343947	0.0356
C	5.953765	2.137522	2.785359	0.0155
R-squared	0.297073	Mean dependent var		0.990162
Adjusted R-squared	0.243001	S.D. dependent var		1.295192
S.E. of regression	1.126891	Akaike info criterion		3.200368
Sum squared resid	16.50848	Schwarz criterion		3.294774
Log likelihood	-22.00276	Hannan-Quinn criter.		3.199362
F-statistic	5.494085	Durbin-Watson stat		1.562614
Prob(F-statistic)	0.035626			

b. Germany

The two-series: growth and subnational share of expenditures are stationary as demonstrated below:

- *Growth*:

By testing for the unit root on the level of trend and intercept we get a t-stat of γ=-3.729772 with a probability=0.0525<0.1, therefore we reject γ=0 at the 10% level. So we stop and conclude that the series has no unit root. Thus, the growth series for Germany is stationary I(0).

- *Sub national share of expenditures:*

By testing for the unit root on the level of trend and intercept we get a t-stat of γ=-4.881858 with a probability=0.0077<0.1, therefore we reject γ=0 at the 10% level. So we stop and conclude that the series is no unit root. Thus, the sub national share of expenditures series for Germany is stationary I(0)

The detailed results can be found in the tables below:

Table 5. ADF test for the growth of Germany

Null Hypothesis: GROWTH has a unit root Exogenous: Constant, Linear Trend Lag Length: 4 (Automatic - based on SIC, maxlag=4)				
			t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic			-3.729772	0.0525
Test critical values:	1% level		-4.728363	
	5% level		-3.759743	
	10% level		-3.324976	
*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 15				
Augmented Dickey-Fuller Test Equation Dependent Variable: D(GROWTH) Method: Least Squares Date: 05/14/12 Time: 18:38 Sample (adjusted): 1996 2010 Included observations: 15 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GROWTH(-1)	-5.012900	1.344023	-3.729772	0.0058
D(GROWTH(-1))	3.257083	1.040157	3.131337	0.0140
D(GROWTH(-2))	2.816451	1.104656	2.549619	0.0342
D(GROWTH(-3))	1.474832	0.718426	2.052866	0.0742
D(GROWTH(-4))	1.016519	0.486303	2.090301	0.0700
C	9.158750	2.911090	3.146158	0.0137
@TREND(1991)	-0.182478	0.132889	-1.373165	0.2070
R-squared	0.808767	Mean dependent var		0.119467
Adjusted R-squared	0.665343	S.D. dependent var		3.120081
S.E. of regression	1.804954	Akaike info criterion		4.323672
Sum squared resid	26.06287	Schwarz criterion		4.654095
Log likelihood	-25.42754	Hannan-Quinn criter.		4.320152
F-statistic	5.638973	Durbin-Watson stat		1.709584
Prob F-statistic)	0.014412			

Table 6. ADF test for the share of Germany

Null Hypothesis: SHARE has a unit root Exogenous: Constant, Linear Trend Lag Length: 4 (Automatic - based on SIC, maxlag=4)				
			t-Statistic	**Prob.***
Augmented Dickey-Fuller test statistic			-4.881858	0.0077
Test critical values:	1% level		-4.728363	
	5% level		-3.759743	
	10% level		-3.324976	
*MacKinnon (1996) one-sided p-values. Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 15				
Augmented Dickey-Fuller Test Equation Dependent Variable: D(SHARE) Method: Least Squares Date: 05/14/12 Time: 18:39 Sample (adjusted): 1996 2010 Included observations: 15 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
SHARE(-1)	-1.757074	0.359919	-4.881858	0.0012
D(SHARE(-1))	0.588563	0.251624	2.339055	0.0475
D(SHARE(-2))	0.402579	0.172643	2.331853	0.0480
D(SHARE(-3))	0.312008	0.112314	2.777994	0.0240
D(SHARE(-4))	0.328915	0.071091	4.626699	0.0017
C	65.49135	13.22059	4.953737	0.0011
@TREND(1991)	0.023379	0.031220	0.748838	0.4754
R-squared	0.958466	Mean dependent var		0.294679
Adjusted R-squared	0.927316	S.D. dependent var		1.391317
S.E. of regression	0.375098	Akaike info criterion		1.181466
Sum squared resid	1.125588	Schwarz criterion		1.511890
Log likelihood	-1.860996	Hannan-Quinn criter.		1.177946
F-statistic	30.76922	Durbin-Watson stat		0.996690
Prob F-statistic)	0.000042			

3. Cointegration and Granger Causality

The series are all stationary; therefore each pair corresponding to Germany and Spain are cointegrated by default.

Therefore we do not need to go through the cointegration test to find the VECM.

So we move directly to check for the direction of causality between the variables in question.

In this context, four different hypotheses about the relationship between sub national expenditures and economic growth can be formulated:

- Unidirectional Granger-causality from the share of sub national expenditures (SB) to economic growth (G). In this case SB causes G but not vice versa.
- Unidirectional Granger-causality from G to SB. In this case the growth rate of the economy increases the prediction of the sub national share of expenditures but not vice versa.
- Bidirectional (or feedback) causality. In this case G causes SB and vice versa.
- Independence between G and SB. In this case there is no Granger causality in any direction.

Hence by obtaining one of these results it seems possible to detect the causality relationship between SB and G.

a. Spain

By running the Granger causality test we get the following results found in the tables below. Starting with first table, the share of sub national expenditures, a measure of fiscal decentralization does not Granger Cause economic growth (since $p=0.1122>0.1$, so we fail to reject the null hypothesis of Share does not Granger Cause Growth.

In contrast, economic growth was found to granger cause the share of sub national expenditures, as $p=0.0997<0.1$, rejecting the null hypothesis of GROWTH does not Granger Cause SHARE. This result, however, is rejected if the 5% level of

significance is considered.

In the second table, the results are in conformity with those of the first: GROWTH causes SHARE

Table 7. Paiwise Granger Causality Test- Spain

Pairwise Granger Causality Tests Date: 05/15/12 Time: 11:52 Sample: 1995 2010 Lags: 2			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
GROWTH does not Granger Cause SHARE	14	3.01180	0.0997
SHARE does not Granger Cause GROWTH		2.81660	0.1122

Table 8. Granger Causality Test-Spain

VAR Granger Causality/Block Exogeneity Wald Tests Date: 05/15/12 Time: 11:53 Sample: 1995 2010 Included observations: 14			
Dependent variable: SHARE			
Excluded	**Chi-sq**	**Df**	**Prob.**
GROWTH	6.023601	2	0.0492
All	6.023601	2	0.0492
Dependent variable: GROWTH			
Excluded	**Chi-sq**	**Df**	**Prob.**
SHARE	5.633207	2	0.0598
All	5.633207	2	0.0598

b. Germany

By running the Granger causality test, we get the following results found in the tables below. Starting with the first table, the share of sub national expenditures, a measure of fiscal decentralization does not Granger Cause economic growth (since p=0.9270>0, so we fail to reject the null hypothesis of Share does not Granger Cause

Growth).

In contrast, economic growth was found to granger cause the share of sub national expenditures, as p=0.0227<0.1, rejecting the null hypothesis of GROWTH does not Granger Cause SHARE.

In the second table, the results are in conformity with those of the first: GROWTH causes SHARE.

Table 9. Pairwise Granger Causality Test- Germany

Pairwise Granger Causality Tests Date: 05/14/12 Time: 19:00 Sample: 1991 2010 Lags: 2			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
SHARE does not Granger Cause GROWTH	18	0.07624	0.9270
GROWTH does not Granger Cause SHARE		5.13607	0.0227

Table 10. Grager Causality Test-Germany

VAR Granger Causality/Block Exogeneity Wald Tests Date: 05/14/12 Time: 18:42 Sample: 1991 2010 Included observations: 18			
Dependent variable: SHARE			
Excluded	Chi-sq	Df	Prob.
GROWTH	10.27213	2	0.0059
All	10.27213	2	0.0059
Dependent variable: GROWTH			
Excluded	Chi-sq	Df	Prob.
SHARE	0.152489	2	0.9266
All	0.152489	2	0.9266

CHAPTER V

CONCLUSION

The aim of this thesis was to investigate the direction of causality between FD and economic growth, particularly by examining the case of two European countries: Germany and Spain.

The thesis began by an exploration of the major first and second generation FD theories that included a number of arguments promoting FD. It stressed that regional governments are in a better position to adapt outputs of public services to the specific preferences of their constituencies and that FD can enhance competition and promote efficiency across the sub national governments. It also indicated that FD can increase transparency and reduce corruption.

The thesis also examined a number of empirical cases in countries that witnessed the success or the failure of FD, before highlighting important FD policies focusing on the implementation and sequencing of FD.

Subsequently, the thesis applied the Granger Causality test to depict the direction of causality between sub national share of expenditures in each of Germany and Spain and the economic growth in these countries.

As opposed to what was expected, sub national share of expenditures, an indicator of FD, did not Granger Cause economic growth as was always implied in the theory. In contrast, economic growth turned out to Granger Cause FD.

To conclude, the model may have some limitations. On the one hand, it is applied on a small size of observations. On the other hand, it fails to capture the channels through which FD affects economic growth.

Nonetheless, by discovering an interesting direction of causality between FD and economic growth, i.e. that economic growth causes FD, this thesis opens up the discussion on the ability and the will of more developed economies to call for FD. It also stresses on the role of implementation and sequencing that can either guarantee the success of a FD system or cause its failure.

In fact, such a result can pave the way for a more detailed analysis on the factors needed to start with the FD process and the elements needed to reap its benefits. Indeed, the debate may not be revolving anymore on whether FD causes economic growth or not but rather how FD is implemented and sequenced.

In light of the implementation rules highlighted in the literature, there are various reasons that are able to explain the thesis' main result:

These economies have an appropriate enabling environment that can make the adoption of FD easier. For instance, these countries have a political will to decentralize as they have all the requirements to make it succeed. They have a strong central government that can design good decentralization policies and implement them adequately. Besides, they have the tools to evaluate FD and monitor its outcomes and a powerful mechanism that is able to coordinate the complex FD activities.

In summary, the thesis introduced the use of Granger Causality in the FD field, which has rarely been used within this context. The same procedure can thus be applied on a larger scale, including various other countries, to come up with more conclusive results.

BIBLIOGRAPHY

Aisyah,S.2008. The effect of fiscal decentralization on economic growth. Master's thesis. Institute of social studies; available from http://oaithesis.eur.nl/ir/repub/asset/6735/Siti%20Aisyah%20ECD.pdf; Internet; accessed 20 March 2012.

Asfaw, A., Frohberg, K., James, K., and Jutting, J. (2007). Fiscal decentralization and infant mortality: Empirical evidence from rural India. *The Journal of Developing Areas* 41(1), 17-35.

Asteriou, D. and Hall, G.A. 2007. *Applied econometrics: A modern approach using E-views and Microfit revised edition*. New York: Palgrave Macmillan.

Bahl, R. and Martinez-Vazquez, J. 2006. Sequencing fiscal decentralization. World Bank Policy Research Working Paper Series No. 3914; available from http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2006/05/05/000016406_20060505110515/Rendered/PDF/wps3914.pdf; Internet; accessed 20 March 2012.

Besley, T., and Coate, S. (2003). Centralized versus decentralized provision of local public goods: A political economy approach. *Journal of Public Economics* 87: 2611–2637.

Boex, J. 2009. Fiscal decentralization and intergovernmental finance reform as an international development strategy. IDG Working Paper no. 2009-06. The Urban Institute Center on International Development and Governance; available from http://www.urban.org/publications/411919.html; Internet; accessed 20 March 2012.

Brennan, D., and Buchanan, J. 1980. *The power to tax: Analytical foundations of a fiscal constitution*. Cambridge: Cambridge University Press.

Bwire, A. and Rodriguez-Pose, A. 2003. The Economic. In: *Efficiency of Devolution*. Department of Geography and Environment, London School of Economics.

Crucq, P., and Hemminga, H. (2007). Decentralization and economic growth per capita in Europe. *Science Shop of Economics, Management & Organization*.

De Mello, L. 2010. Does fiscal decentralization strengthen social capital? Cross-country evidence and the experiences of Brazil and Indonesia (OECD economics department Working Papers, No.825; available from. IMF's website http://www.imf.org/external/pubs/ft/wp/2000/wp00129.pdf; Internet; accessed 20 March 2012.

Dickey, D.A and Fuller, W.A. (1981).Likelihood ratio for autoregressive time series with a unit root. *Econometrica* 49: 1057-1072.

Dolado, J., Jenkinson, T., and Sosvilla-Rivero, S. (1990). Cointegration and unit roots. *Journal of Economic Surveys* 4: 249–273.

Enders, W. 1995. *Applied econometrics time series*. New York: John Wiley.

Fisman, R. and Gatti, R. (2002). Decentralization and corruption: evidence across countries. *Journal of Public Economics* 83(3): 325-345.

Geo-Jaja, M. (2006). Education decentralization, public spending and social justice in Nigeria. *International Review of Education* 52: 125-148.

Granger, C.J. (1969). Investigating causal relationships by econometric models and cross spectral methods. *Econometrica* 37: 425-435.

Hobbes, T. 1660. *The leviathan*.

Iimi, A. (2005).Decentralization and economic growth revisited: an empirical note. *Journal of Urban Economics* 57: 449-461.

Lockwood, B. (2002). Distributive politics and the costs of centralisation. *Review of Economic Studies* 69(2): 313–337.

Montero-Granados, R., de Dios Jime´nez, J., and Martı´, J. (2007). Decentralisation and convergence in health among the provinces of Spain (1980-2001). *Social Science & Medicine* 64: 1253–1264.

Musgrave, R.A. 1959. *The theory of public finance*. New York: McGraw-Hill.

National Accounts of OECD Countries - Vol. IV: General Government AccountsWorld; available from http://www.imf.org/external/pubs/ft/weo/2012/01/weodata/ weoselgr; Internet; accessed 20 March 2012.

Oates, W. E. (1999). An essay on fiscal federalism. *An Essay on Fiscal Federalism* 37(3): 1120-1149.

Oates, W. E. (2005). Towards a second-generation of fiscal federalism. *International Tax and Public Finance* 12: 349–373.

Oates, W.E. 1972. *Fiscal federalism.* New York: Harcourt Brace Jovanovich.

OECD database; available from http://stats.oecd.org/Index.aspx?DataSetCode= SNA_TABLE11; Internet; accessed 20 March 2012.

Porcelli, F. 2009. Effects of fiscal decentralisation and electoral accountability on government efficiency: Evidence from the Italian health sector (Working Papers 2009/29); available from Institut d' Economia de Barcelona's website*:* http://www.ieb.ub.edu/aplicacio/fitxers/SM09Porcelli.pdf; Internet; accessed 20 March 2012.

Prud'homme, R. (1995). The dangers of fiscal decentralization. *The World Bank Research Observer* 10(2): 201-220.

Roy, B. 1999. Implementation Rules For Fiscal Decentralization. International Center for Public Policy Working Paper Series No. 9901; available from http://siteresources.worldbank.org/INTDSRE/Resources/3p.pdf; Internet; accessed 20 March 2012.

Sacchi, A. and Salotti, S. 2011. Income inequality, regional disparities and fiscal decentralization in industrialized countries (University Roma Tre Departmental Working Papers No 142; available from http://econpapers.repec.org/paper/rtrwpaper/0142.htm; Internet; accessed 20 March 2012.

Seabright, P. 1996. Accountability and decentralisation in government: An incomplete contracts model. *European Economic Review* (40): 61-89.

Smoke, P. 2000.Fiscal decentralization in east and southern africa: A selective review of experience and thoughts on moving forward. Paper presented at IMF Conference on fiscal decentralization, Washington, DC, November; available from: http://www.imf.org/external/pubs/ft/seminar/2000/fiscal/smoke.pdf; Internet; accessed 20 March 2012.

The World Bank. 2000. Entering the 21st century. World Development Report 1999/2000. Washington: The World Bank.

Thornton, J. (2006). Fiscal Decentralization and Economic Growth Reconsidered. *Journal of Urban Economics* 61: 64-70.

Weingast, B.R. (1995). The economic role of political institutions: market-preserving federalism and economic development. *Journal of Law, Economics and Organizations* 15(1)*: 1–31.*

World Bank. (1990). *Argentina: Provincial government finance study.* Report 8176-AR.