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硕士学位论文

增值税对 GDP 增长的影响

Impact of Value Added Tax towards GDP
growth

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摘要

本研究的主要目标是为了探讨是否引进增值税对促进 GDP 增长有十分重要的角色。为了回答这个问题，来自年 1980-2014 的 IMF 世界经济数据用于进行这份研究工作。通过多元回归分析方法来计算此影响。结果表明，引进增值税对大约 4% 的 GDP 增长的积极且在统计上显著的影响。我们还发现，在一个百分点的增值税率由 3% 增加了长期经济增长。最后，我们发现引进增值税增加了发展中国家的经济增长比发达国家更多的约五倍。

关键词：增值税；消费；国内生产总值；效率

ABSTRACT

The main objective of this study is to explore whether the introduction of a value added tax (VAT) is significant in promoting GDP growth. To answer this question, data taken from the World Economic Output of the IMF from years 1980-2014 were used in carrying out this research work. Multiple regressions methodology was employed to calculate this impact. The results revealed that the introduction of a VAT has a positive and statistically significant effect on GDP growth of approximately 4%. We also find that an increase in the VAT rate of one percentage point increases economic growth by 3% in the long run. Lastly, we find that the introduction of a VAT increases economic growth for developing countries by approximately five times more than developed countries.

Key Words: VAT; GDP Growth

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Section 1

INTRODUCTION

BACKGROUND

Value-Added Tax or VAT was first introduced more than 60 years ago by Maurice Lauré, Joint Director of the French Tax Authority. Until the late 1960's, it remained confined to a handful of countries. The rise of the VAT has been the most significant development in tax policy and administration of recent decades. Of those countries that have introduced VAT, the VAT raises about 25 percent of a country's tax revenue on average and 20 percent of the global tax revenue. VAT is a type of consumption tax. It is charged on the value added at each stage of production. The principal claim made by advocates of the VAT is that if it is well-designed, it is particularly efficient at reducing tax evasion.

A VAT often replaces either a turnover tax or a single-stage sales tax. A turnover tax is similar to a sales tax, with the difference that it taxes intermediate and capital goods. It is an indirect tax applicable to a production process or stage. Under a sales tax (levied on the sale of a good to its final end user), people can more easily evade paying the tax to the government. The seller has no incentive to disbelieve a purchaser who says he is not a final user. The seller, therefore, has no incentive to collect the tax. Under VAT, all sellers are required to collect tax and pay it to the government. A purchaser holding an invoice that states the VAT paid on a purchase with the VAT registration number of the supplier can use this payment to reduce his own tax obligation.

If VAT is imposed on all goods, then it is similar to a lump-sum tax, where there is no change in relative prices and thus no distortion. In economic theory, a lump-sum tax in a competitive equilibrium is considered to be Pareto-efficient because it does not interfere with optimal market mechanisms. A lump-sum tax will only reduce people's available income and, therefore, tighten their budget constraint, but leave the relative price of goods unchanged. This will then lead to an income effect: Consumers buy less in general (inwards shift of the budget line). There will be no substitution effect between products, Hindriks and Myles (2006). However, if VAT is applied only to some goods, then it will create distortions by changing relative prices.

The adoption of a VAT is often seen as the central element in a program of modernizing tax administration. By developing the use of methods to improve tax administration, it eases the

process of collecting tax. Under this era of free trade agreements, “VAT has also been adopted by countries as part of a package of trade liberalization, compensating for the revenue loss from the reduction of tariffs whilst preserving the gains in production efficiency from moving producer prices closer to world prices”, Keen and Lockwood (2007).

This thesis attempts to analyze whether VAT has any significant effect on GDP growth. Using panel data from 1980-2014 gathered from the World Economic Outlook Database of the IMF, I estimate the impact of VAT on economic growth, while controlling for time and entity fixed effects.

I consider different ways of measuring the impact of VAT on economic growth. In the first approach, I find that the introduction of a VAT increases economic growth by 4%. In the second approach, I find that an increase in the VAT rate of one percentage point increases economic growth by 3%. There is an optimal rate where the VAT would work best. Finally, I consider whether the impact of introducing a VAT is different for developing countries compared to developed countries. I find that the introduction of a VAT increases economic growth in developing countries by approximately 5 times more than developed countries.

The outline for the remainder of this thesis is as follows: Section 2 is the Literature Review; Section 3 describes the Methodology; Section 4 describes the Results; and Section 5 concludes the paper.

Section 2

LITERATURE REVIEW

First we consider from a theoretical perspective the impact of the introduction of a VAT. The analysis consist of two parts. In part 1, we consider the static micro-economic effect on an individual market. In part 2, we consider the dynamic macro-economic effect on an economy.

The welfare loss of a tax comes from the decreased economic well-being caused by the imposition of the tax, creating a wedge at the margin between willingness to pay for the good and the cost of production. Taxpayers suffer because the tax changes relative price and those consumers purchasing behavior. Taxation results in a deadweight loss which results in the economy functioning below optimal levels.

The effect of a tax on welfare is shown in figure 1.

In a competitive market, a given tax surcharge added to the price of each unit of a particular good (gasoline tax, food tax, federal tax) will lower the price received by the seller and increase the price paid by the buyer. We see in figure 1 that the tax places a wedge between the consumer price and producer price, and the equilibrium quantity traded falls as a result of the tax. What are the gains and losses as a result of tax? The government receives tax revenue of $T \times Q$, where T is the amount of tax per unit and Q is the quantity sold. This is a benefit to those who receive benefits from government spending at the tax revenue.

How large will the deadweight loss be from a particular tax? Loss of a consumer surplus and loss of a producer surplus. Difference between benefit measured by government spending and cost measured by consumer and producer surplus is the deadweight loss of the tax.

As can be seen from figure 1, the deadweight loss is determined by the size of the tax and the change in quantity sold. This change in quantity sold is determined by the elasticity of supply and demand. Overall, the more elastic the supply and demand, the larger the deadweight loss of a tax.

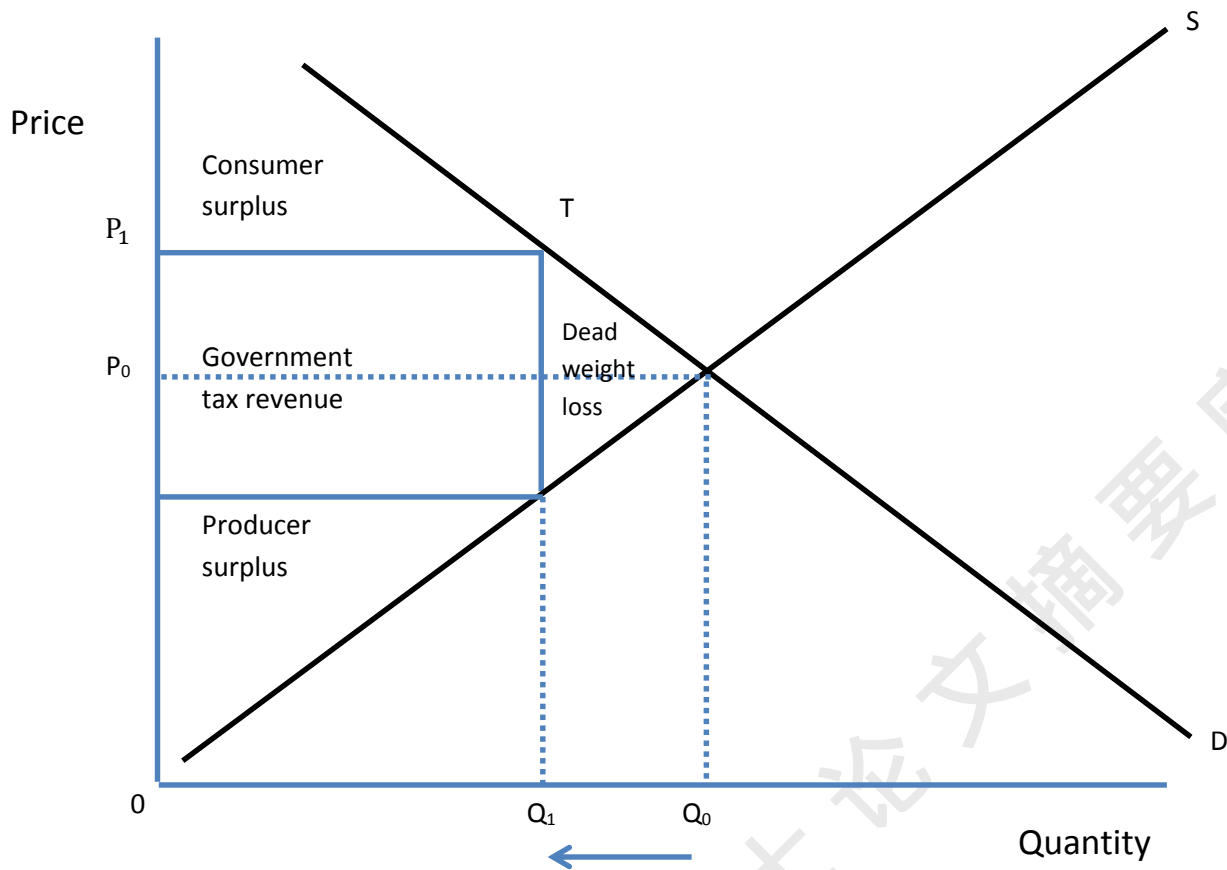


Figure 1: Welfare effects of a tax

However, it should be noted that VAT replaces a number of more distortionary taxes. Terkper (1995) succinctly makes the point that “the worst form of VAT may still be better option for raising revenue than most traditional forms of taxation”, which can further enhance GDP growth.

In theory, in the short run if there is an announcement that the government will raise the VAT rate, people will buy items which can be stocked before the rise of the VAT rate. After the rise in the VAT rate, the aggregate consumption will decline because people will use their stock instead of buying new items. After that the aggregate consumption will grow up gradually as people run out of their stock and need to buy new items, (Miki 2011).

In the long term, VAT would raise more revenue for the government, which is negatively correlated with economic growth, as the government continues to grow and more resources are allocated by political rather than market forces, economic growth will wane and eventually become negative. This doesn't mean that a large government cannot maximize growth. Some factors such as increased activities and building infrastructure has the capability to foster

economic growth. Government expenditures on highways, sewage, sanitation, and environmental protection increase economic growth.

A paper by (Miki 2011) empirically shows the effect of a VAT rate change on aggregate consumption and economic growth. The paper tells that general consumption taxes are better for economic growth rather than income taxes because of their effect in savings and on labor supply, since consumption taxes do not impose on savings which lead to increased investment and growth. Many people believe that a rise in the VAT rate will have a negative effect on aggregate consumption and will weaken economic growth. Similarly, a reduction VAT rate is sometimes an argument for strengthening economic growth by stimulating aggregate consumption under a recession. Miki shows us that although there is a decline of aggregate consumption and economic growth after raising the VAT rate, there is also an increase of aggregate consumption and economic growth before the raise that will offset the negative effect after the raise. Other economist say that people should not fear the negative effect of the VAT rate because the decline is only temporary.

Raising the VAT will hamper growth in the short term, but the impact can be mitigated if the transition to a higher VAT rate is gradual. Although according to Alan S Tait, a fiscal economist, VAT increase in itself will not have a permanent effect on inflation, and whether VAT is inflationary in this sense would depend on a number of factors. A temporary shift in inflation could frontload spending, helping to offset some of the short-term negative growth effects. VAT rates are low in many countries and VAT could provide an important source of stable revenue to help address pressures from an aging population.

A paper by (Gwartney et al 1998) with data taken from 23 OECD countries revealed that higher government expenditures (particularly for high-income countries) were correlated with both less investment and lower rates of growth during 1960-96. In order to find how large government expenditures maximize economic growth, the author separated the core-function expenditures from other government expenditures. They find that the level of government that maximizes the performance of the economy would place government expenditures at 15 percent or less of GDP.

There are many papers discussing about the empirical relationship of taxes and economic growth. They find a negative relationship of taxes on growth. Of those studies they distinguish the different types of taxes.

A working paper by Jens Arnold, 2008 asks “Do Tax Structures Affect Aggregate Growth?” His main data source used is from the OECD data base and a sample of 21 OECD countries over a period of 1971-2004. With a limited number of countries which makes it difficult to account for unobserved country heterogeneity, it can be a significant concern. Five year averages were used in order to get more information, while still purging out short-term cyclical influences. The author expressed that given the lack of synchronicity in OECD country business cycles, it is highly questionable whether cyclical influences are correctly accounted for by averaging 5 years. So the alternative option he used is an annual data in a fixed effects panel framework and the analysis uses an error correction model (ECM) to model the short term dynamics explicitly. This setting also allows to control for unobserved fixed effects at the country level.

As a result, regarding consumption tax and growth, Arnold’s regression shows that a stronger reliance on consumption and property taxes with a resulting reduction in income taxes would enhance GDP per capita.

Column (2) in p. 13 of Arnold’s regression, the income taxes were broken down into personal and corporate income taxes. The results show that both of these income taxes have a negative significant effect in promoting growth compared to consumption and property taxes.

The last regression is a distinction between consumption taxes and property taxes, with residual adjustment falling on income taxes. Both consumption and property taxes appear to promote high long-run levels of GDP per capita than income taxes. Switching to property seems to be more growth enhancing than consumption taxes. However, property taxes are still a heterogeneous group. The coefficient of both property taxes and consumption taxes are highly positive, saying that these taxes are better for growth, but the coefficient on consumption taxes is significant at the 5% confidence level in which property taxes have a non- significant coefficient.

Overall, results show that income taxes yield lower economic growth than taxes on consumption and property. Property taxes seem to be the most growth friendly followed by consumption tax. Personal income taxes seem to be inferior and corporate taxes have the most negative effect on GDP per capita.

Tax reforms towards property and consumption taxes and especially away from corporate taxes, are likely to enhance the prospects for economic growth. Arnold (2008)

There is evidence, too that the VAT is less damaging for economic growth than personal or corporate income taxes, Arnold (2008).

A cross-country empirical paper by (Acosta-Ormaechea and Yoo 2012) analyses the relationship between tax composition and growth. The dataset comprises 69 countries with at least 20 years observation for both tax and macro variables. They ordered the data depending on the income level of the country. They find and suggest that a shift from income taxes to consumption tax by one percentage point would be associated with an increase in long-run per capita growth of 0.04-0.07 percentage points. Also their regression shows a robust and positive association of a VAT on growth.

(Keen and Lockwood 2007) empirical paper shows that VAT enhance GDP growth. Using 143 countries observed over 25 years, they estimated the two-equation system characterizing both the decision to adopt a VAT and the impact of VAT on revenue once adopted. Their findings show that adoption of a VAT is associated with a long run increase in the overall revenue to GDP ratio of about 4.5 percent, but the impact of the VAT vary with country circumstances.

(Rostami, Nourbakhsh and Akbarian 2012) in paper titled “Impact of fiscal policy on economic growth in Iran with emphasis on the role of Value Added Tax (VAT)” have examined the effect of value added tax on GDP as economic growth for Iran economy. They used annual data from 1979-2009 using auto regressive distributed lags (ARDL). Results show that value added tax have a significant effect on the performance of the country as well as government spending, consumption, investment and net exports.

A research made by Jalata D.M. (2014), analyses the role of VAT on economic growth of Ethiopia from 2003 to 2012 based on theoretical and empirical evidences. His findings reveal that there is a positive correlation between VAT and economic growth indicator of GDP during the period under review. Results show that every 1% increase in VAT revenue causes about 13.55% increases in GDP keeping other variables constant. The descriptive analysis of the study had shown as the ratio of VAT to GDP average was 2.95%. In addition, the finding also reveals that the growth rates of GDP due to VAT increased 66.27% in average compared to the previous periods of general sales tax (1993-2002) where the average GDP growth rates were only 2.53%.

Another paper similar to Jalata D.M. (2014) is an empirical paper by Adereti S.A, Adesina J.A. and Sanni M.R. (2011) which investigated the contribution of Value Added Tax to the

economic growth of Nigeria. It was at 1993 when the Federal Government Nigeria replaced sales tax with VAT in order to increase the revenue base of the government and make funds available for development that will accelerate economic growth. The method used simple regression using time series data for both GDP and VAT revenue from the years 1994-2008. Findings show that there is a positive and significant correlation between VAT revenue and GDP with average of 12.4%. It is rather low compared to other countries that implemented VAT as well with average of 30%, but higher than previous sales tax with only average of 4.9%.

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Section 3

METHODOLOGY

MODEL SPECIFICATION

In this part, we concisely describe the method that we use to quantify the effect of VAT on economic growth, which is linear multiple regression with fixed effects. The basic equation is

$$Growth_{i,t} = \delta VD_{i,t} + \beta X_{i,t} + \alpha_i + \delta_t + \mu_{i,t} \quad (1)$$

Where *Growth* is real GDP per capita growth which is the dependent variable, *VD* is the dummy variable for VAT equal to 1 if there is a VAT in country *i* and in period *t*, 0 otherwise. *X* is a vector for control variables, $\alpha_i, i=1, \dots, n$ are the entity fixed effects, $\delta_t, t=1, \dots, T$ are the time fixed effects and $\mu_{i,t}$ is the error term.

The estimation of the entity and time fixed effects model is a variant of the multiple regression model. Therefore, the coefficient can be estimated using Ordinary Least Square (OLS) by including the additional time and entity binary variables, (Stock and Watson 2006)

The idea behind incorporating entity and time fixed effects is that something within the individual entity may impact or influence the outcome variable and may be also correlated with one or more of the regressors. This is the rationale behind the assumption of the correlation between the entity's error terms with the regressor. This is a form of omitted variable bias where a model is created which incorrectly leaves out one or more important casual factors that are correlated with the regressors. Introducing both entity and time dummies will control for these unobserved effects, thus reducing the potential for omitted variable bias.

We need to make a choice about the controls to include in the regression over and above the entity and time dummies. We include real GDP because of the convergence growth theory or the “catch-up effect” where poorer countries' GDP will tend to grow at faster rates than richer countries. Developing countries could replicate the production methods, technologies and institutions of developed countries. For more literature see (Korotayev A. and Zinkina J. 2014)

Recent empirical studies show that the relationship between trade openness and economic growth has a positive effect on economic growth. A wide variety of studies have made use of an assortment of cross-country regressions to test endogenous growth theory and the importance of trade. Due to the difficulty of measuring openness, different researchers have used many different techniques to examine the effects of trade openness on economic growth. The most basic measure used is export plus imports divided by GDP. We also use (O) as a measure of openness, Many papers suggests a positive relationship between openness and economic growth. Using this trade openness (Keen and Lockwood 2007) show empirically there is a positive effect of trade openness.

Another variable we consider is G, government spending as a percent of GDP. As Gwartney et al (1998) shows excessively large governments are expected to crowd out resources from the private sector and be harmful to economic growth. The paper also demonstrates that government expenditures as a share of GDP has a negative effect on GDP growth. With the idea that the government expenditure shares in GDP is higher in a recession and less during prosperity to stabilize the economy. For more complete discussion of the negative relationship between government spending and economic growth, see (Daniel J. Mitchell 2005).

Obviously variables such as consumption and investment may also affect growth, but there is no obvious reason why they would be correlated with the adoption of a VAT. However, if indeed adoption of a VAT is related to Investment. Then it is a threat to the validity of these regression results.

Specifically, the following equations are estimated:

Models:

$$Growth_{i,t} = \delta VD_{i,t} + \beta_1 RGDP_{i,t} + \beta_2 O_{i,t} + \beta_3 G_{i,t} + \alpha_i + \delta_t + \mu_{i,t} \quad (2)$$

$$Growth_{i,t} = \delta V_{i,t} + \beta_1 RGDP_{i,t} + \beta_2 O_{i,t} + \beta_3 G_{i,t} + \alpha_i + \delta_t + \mu_{i,t} \quad (3)$$

$$Growth_{i,t} = \delta V_{i,t} + \beta_1 V^2_{i,t} + \beta_2 RGDP_{i,t} + \beta_3 O_{i,t} + \beta_4 G_{i,t} + \alpha_i + \delta_t + \mu_{i,t} \quad (4)$$

$$Growth_{i,t} = \delta VD_{i,t} + \beta_1 RGDP_{i,t} + \beta_2 O_{i,t} + \beta_3 RGDP * VD_{i,t} + \beta_4 G_{i,t} + \alpha_i + \delta_t + \mu_{i,t} \quad (5)$$

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