Fiscal decentralization and local budget deficits in Viet Nam: an empirical analysis

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Introduction

- Since 1975, Viet Nam has gradually decentralized more fiscal responsibilities to local authorities.
- In 1996, the first State Budget Law was promulgated, and fiscal decentralization was formally mandated. This law was then revised in 2002 and put into operation in 2004, giving more autonomy to Local Governments (LG).
- Currently, local spending accounts for just over ½ of general government spending, while local revenue accounts for over 1/3 of general government revenue, and just over ½ when extra-budgetary sources are included. These are significant shares when compared to other countries (World Bank (WB), 2014).
- This study has two objectives: (i) to take stock of the current institutional framework for intergovernmental fiscal relations, and (ii) to empirically assess the deficit sustainability of LG in Viet Nam.

Government System

- Viet Nam's LG system operating under the principle of democratic centralism. This principle created a hierarchical top-down administrative system, meaning that subordinates obey superiors, and LGs obey the central government (CG).
- Today, Viet Nam has four tiers of government: (i) central; (ii) 63 provinces, including five major cities; (iii) 710 district-level cities, towns (in urban areas), and districts (in rural areas); and (iv) 11,145 wards and townships/communes.
- Each tier of government has both legislative and executive authorities.
  - At the central level, legislative authority rests with the National Assembly, and executive authority rests with line ministries and agencies.
  - At the local level, each tier of government has a people's council to exercise legislative authority and a people's committee and line departments to exercise executive authority.

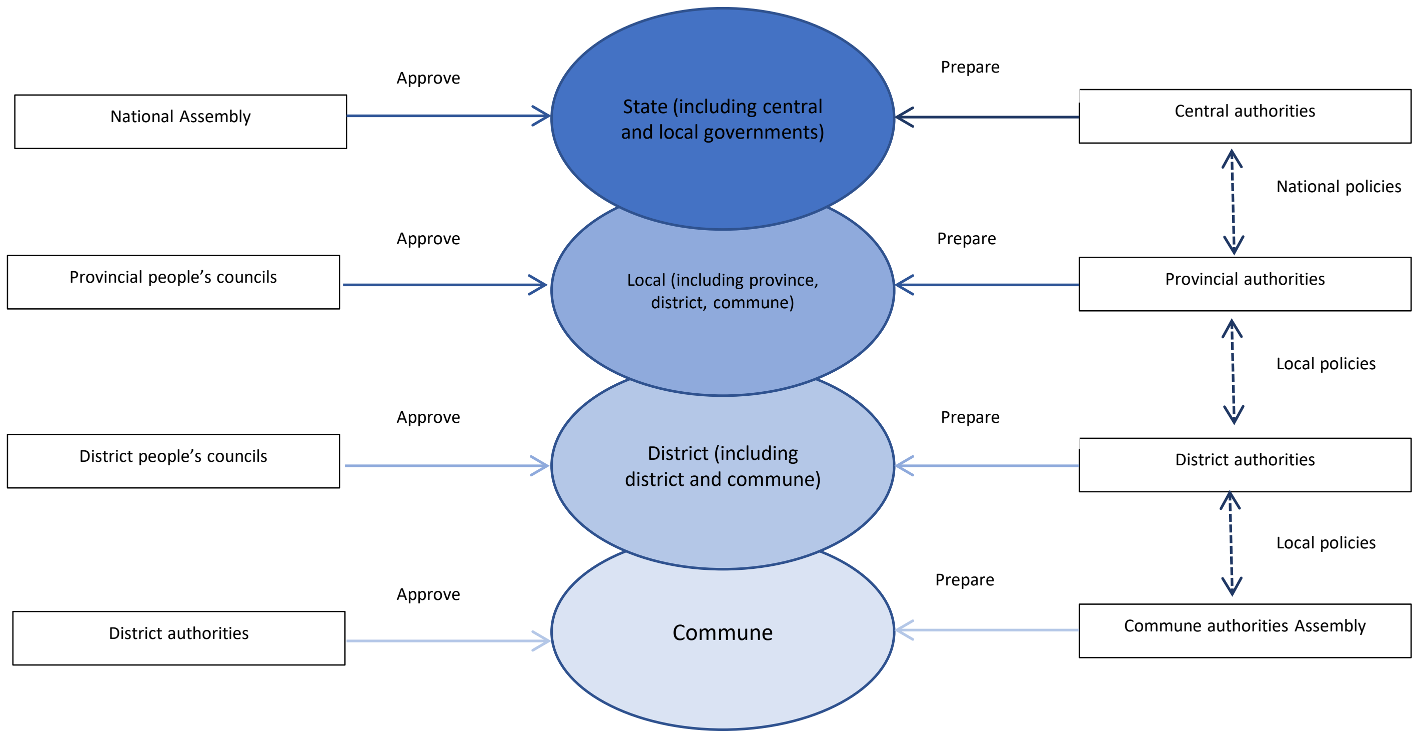
Fiscal Decentralization Process

- From 1975 to 1989, Viet Nam remained a centralized fiscal and economic system.
  - LGs acted as an agency for the CG, with some limited own-source revenue (incl. fees, charges, asset depreciation, some shared revenue).
- In 1989, the government implemented a resolution that regulated the spending responsibilities of and revenue sources for LGs.
- In 1996, the first budget law was promulgated, coming into effect in 1997.
  - This law outlined the spending responsibility and revenue allocations for central and LGs, and regulated the borrowing of LGs and intragovernmental fiscal transfers.
- The 1996 law was then revised in 1998, coming into effect in 1999.
  - Lower tiers of LG (i.e., district and commune levels) were assured greater revenue and expenditure responsibilities (they were to secure at least 70% of their revenue from some types of taxes).
  - This law also defined the roles of different agencies engaged in the preparation of the central budget as well as the roles of line ministries and LGs in implementation.

Fiscal Decentralization Process

- New budget law was promulgated in 2002, taking effect in 2004. More fiscal responsibility given to LGs. This law has several distinguishing features
  - LGs now have autonomy in deciding the fiscal relationship among government levels within their jurisdictions.
  - The fiscal capacity of LGs has been strengthened. The CG now shares some types of revenues with LG;
  - The CG also has designed some incentives for revenue efforts made by LGs.
  - The CG has also established a legal foundation for the adoption of formula-based intergovernmental fiscal transfers.
  - It established budget stabilization periods of three to five years as determined by the National Assembly (3 stabilization periods since 2004: 2004–2006, 2007–2010, and 2011–2016).
  - There is a single, unified public sector budget that must ultimately be ratified by the National Assembly. Moreover, the National Assembly approves not only estimates of total revenues and expenditures but also their composition

Fiscal Process in Viet Nam



Modern Fiscal Decentralization

- Expenditure decentralization
- Revenue decentralization
- Intergovernmental Fiscal Transfers
- LG Borrowing
- Fiscal Sustainability in LGs

Expenditure decentralization

- Local authorities have been given more power in making decisions relating to resources allocation within their provinces.
  - CG still has the exclusive responsibility for some types of expenditure while responsibility for all other public services is shared among the various tiers of governments.
- Expenditure assignments also take into account the special character of provinces and are asymmetric across provinces.
  - Fiscally advantaged provinces enjoy greater fiscal and administrative autonomy, while central government agencies have a more expansive role in fiscally disadvantaged provinces.
- LG spending makes up an important share of total government expenditure in Viet Nam

Expenditure decentralization

- Ratio of Decentralized Revenue to Total Expenditure

Expenditure	2007	2010	2013
Total expenditure	46.6	53.1	52.6
Development investment expenditures (including capital expenditure)	62.7	73.4	68.9
Debt services and overseas aid	15.2	9.7	6.3
Recurrent expenditure	50.3	53.5	53.7
Education	86.2	89.6	90.9
Health	79.0	80.8	84.4
Social welfare	14.0	17.9	24.5

Source: Authors' calculations using Ministry of Finance data

Expenditure decentralization

- At the lower levels of LG, degree of decentralization is rather high. In many provinces, district spending constituted more than 45 percent of total local spending.
  - Lower-level local governments were responsible for most of the recurrent expenditure in the education sector (75 percent in 2012) and health sector (60 percent in 2012).
- Shares of rural population and the level of local capacity in provinces are important factors in explaining the level of district expenditure in local expenditure;
- However, degree of capital expenditure decentralization between the provincial level and lower levels is rather limited (30% of general gov't capital spending):
  - due to some concerns over efficiencies regarding capital spending at the lower levels.

Expenditure decentralization

- Some institutional factors that may have negative effects on the effectiveness of such decisions:
  - Spending responsibilities for each level of government are still not clearly defined, thus creating unnecessary overlaps;
  - Lists of spending functions are both overdetailed and vague, impacting the autonomy and flexibility of local governments.
  - New budget law gives provinces autonomy to assign expenditure responsibilities to lower tiers of governments, which leads to substantial heterogeneity in provinces' expenditure assignments

Revenue decentralization

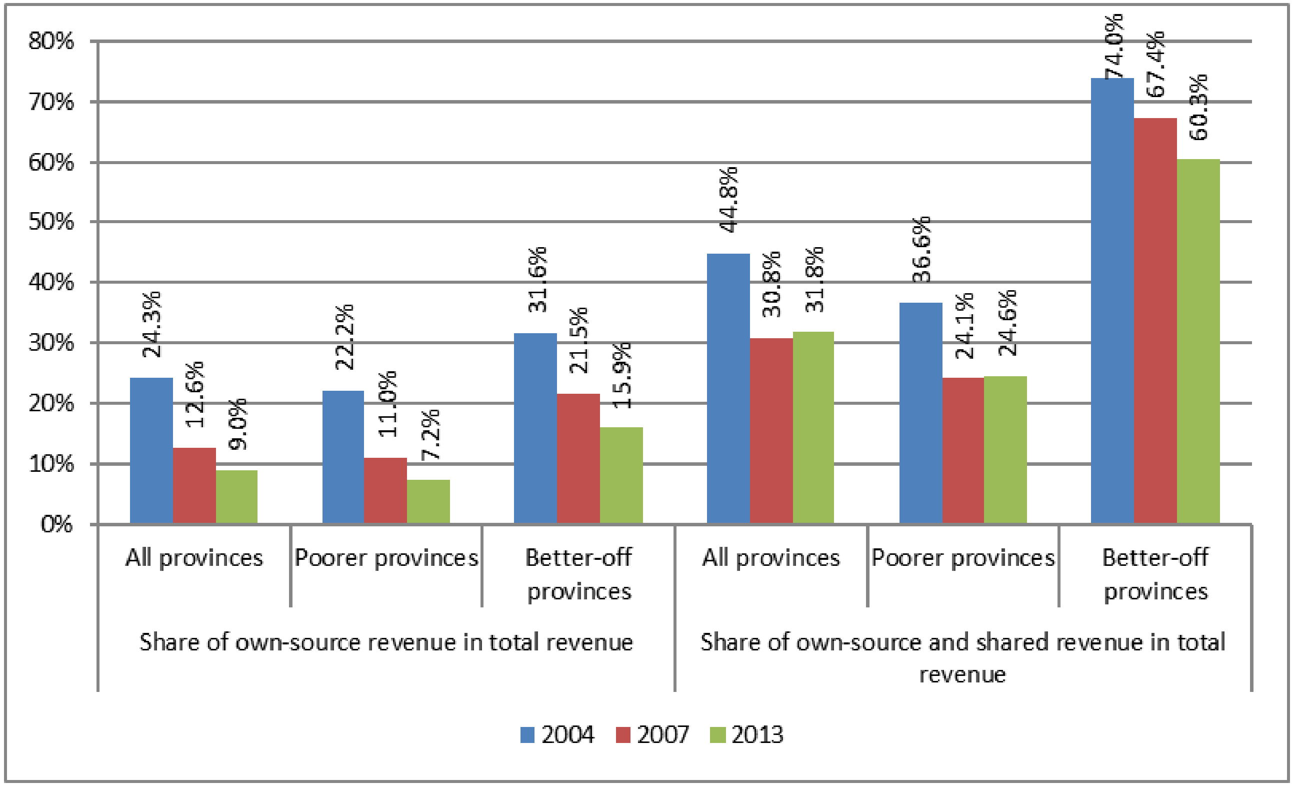
- Revenue collected in Viet Nam can be grouped into three categories: (i) central government revenue; (ii) revenue entirely retained by local governments; and (iii) revenue shared between the central government and local governments.
- Shared taxes include value added tax (VAT) (except the VAT on imported goods), corporate income tax (except some special cases), personal income taxes, taxes on profits remitted abroad (except for the petroleum industry), special consumption taxes, and gasoline and oil fees.
  - Sharing rate introduced at the beginning of each stabilization period, a uniform rate for all shared taxes, a fixed rate during a stability period, and different rates applied in different provinces.
  - The sharing rates are established at the beginning of each stabilization period and are based upon provincial fiscal capacity.
- Taxes and fees fully dedicated to provinces include taxes on land and housing, natural resources (excluding petroleum), license taxes, taxes on transfer of land-use rights, taxes on use of agriculture land, land use fees, land rent, and some other revenues, fees and charges

Revenue decentralization

- Provincial governments allowed to design their own revenue assignments to districts and communes (although there are still some general principles and minimum standards)
    - More autonomy in assigning expenditure responsibilities enables provinces to delineate expenditure responsibilities based upon the fiscal capacity and rural and urban characteristics of local governments.
- The law also includes an incentive for revenue collection at the local government level. A local government can retain up to 30% of all shared revenue actually collected in excess of the estimated amount.
    - But excess amount retained must not exceed the difference between this year's actual revenue in shared taxes and last year's to avoid the temptation to underestimate future shared tax revenues;
- Decentralized revenue in Viet Nam constituted about 9.6% of GDP but account for a small share of local economies (average of 7.0% local GDP)
    - It's because some of the most potential sources of revenue, such as trade-related revenue, petroleum-related revenue, and corporate income taxes from large SOEs, accrue to the central government

Revenue decentralization

Share of Decentralized Revenue in Total Local Government Revenue



Revenue decentralization

- There are several obstacles:
- There are two concerns about the shared revenues.
  1. sharing rates are set to take into account differences in fiscal capacity but, in reality, they are determined through negotiations between central and local government authorities → Potentially suboptimal outcomes
  2. shared revenues in Viet Nam are split based on where revenues are actually collected rather than where the tax is incurred → concern about the fairness of the system;
- Some regulations hinder the autonomy that the CG gives to provincial authorities:
  - Provincial authorities can only set the charges and fees for 19 of 63 items, while the MoF has the authority to set the fees and user charges of the remaining items.
  - While many communes and townships cannot absorb the minimum stated shares of resources, other communes cannot raise adequate resources to meet their spending needs → inefficient spending or regular carryovers in surplus jurisdictions, and poorer services delivery in deficit jurisdictions;
- Lack of minimum standard guidelines for services provision leads to heterogeneity in responsibility sharing across provinces.

Intergovernmental Fiscal Transfers

- Intergovernmental fiscal transfers aim to reduce horizontal fiscal imbalances and to achieve national targets and objectives.
- There are two types of transfer program in Viet Nam: unconditional balancing transfers and targeted transfers.
- Viet Nam currently adopts two formulas to calculate balancing transfers, one to calculate recurrent spending needs and one to estimate capital spending needs.
  - The formulas are based on transfer norms, which are assigned based on particular criteria, including population, development, geographic area, and number of district administrative units.
  - Balancing transfers are highly predictable, as they are fixed in nominal terms over each stability period.
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Intergovernmental Fiscal Transfers

Source of Revenue for Expenditure (%)

	Decentralized Revenue/Total Expenditure	Balancing/Total Expenditure	Transfer/Total Expenditure	Other Sources
All provinces				
2007	65	22	21	27
2010	64	15	24	44
2013	66	23	18	37
Poorer provinces				
2010	31	19	28	7
2013	29	29	20	2

Note: Decentralized revenue includes the own-source revenues and shared revenue.
Source: Authors' calculation using Ministry of Finance data.

- On average, there has been no significant change in the role of each source of revenue in total expenditure, except for the other sources (including local government borrowing).

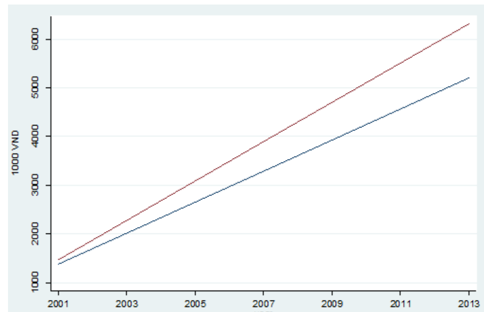
Intergovernmental Fiscal Transfers

- There is a wide gap in the role of each revenue source in expenditure between better-off provinces and poorer ones.
  - In poorer provinces, total transfers still account for about 50% total expenditure, while decentralized revenue makes up only 30%.
  - Poorer provinces do not have enough resources for their spending, even after receiving intergovernment transfers.
- However, at the lower levels of government, imbalances are more severe within provinces than across provinces.
  - In many provinces, more than 75 percent of district expenditure was covered by other sources of finance rather than 100% percent retained revenue.
  - In many districts, less than 12 percent of district core spending was covered by 100 percent retained revenue in 2011, while this figure was around 20 percent in 2006. This is partly due to an increase in spending responsibility decentralization

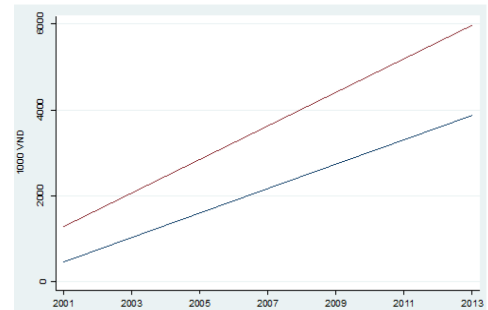
Intergovernmental Fiscal Transfers

- Before transfers, budget deficits seem to widen over time. Deficits seem to be driven by budget deficits in poorer provinces
- After transfers, on average, there is a slight fiscal surplus. In poorer provinces, fiscal deficits, however, are still observed, indicating a growing vertical imbalance across provinces.

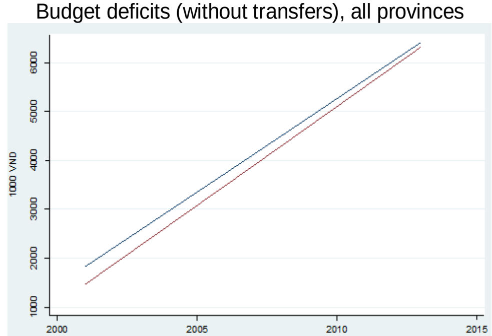
Budget Deficits over Time &Role of Fiscal Transfers



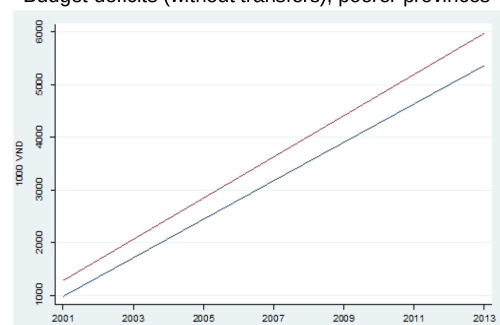
Budget deficits (without transfers), all provinces



Budget deficits (without transfers), poorer provinces



Budget deficits (with transfers), all provinces



Budget deficits (with transfers), poorer provinces

revenue per capita expenditure per capita

Intergovernmental Fiscal Transfers

- There are two types of target programs: national target programs (NTPs) and other target transfers (i.e., conditional transfers).
  - NTPs aim to accelerate progress toward national sociodevelopment objectives; MoF and Ministry of Planning and Investment (MPI) have overall responsibility for financing decisions and monitoring across all NTPs. Line ministries responsible for budget allocations to and oversight of NTPs. Currently, there are 16 NTPs.
  - Other target transfer programs cover a wide range of objectives including capital investment, infrastructure investment, and economic development programs in specific regions.
- Although this type of target transfer still accounted for about 25% of local spending, it became less important: suggesting that local authorities are less dependent on nondiscretionary resources.
- LGs are responsible for proposing activities and implementing associated programs at the local level.
  - They prepare proposals, then discuss them with central government agencies, who in turn submit the financial proposal, including allocation to provinces, to the MoF & MPI.
  - The allocation of NTP resources is based on a set of eligibility criteria.

Intergovernmental Fiscal Transfers

- In general, Viet Nam's intergovernmental fiscal transfer system works effectively to reduce fiscal disparities. But there are some institutional issues that may hinder the effectiveness of such a system.
  - (1) Transfer amount is determined in the first years of a stability period and remains constant in nominal terms over the whole period → poorer provinces suffer from the loss in real terms.
  - (2) Weaknesses in the transfer norms. E.g. education sector, the norms use the number of school-aged children instead of enrolled pupils;
  - (3) Incentive problems due to the right to have full responsibility for resources allocation within assigned resources at the provincial level;
  - (4) Huge gap between estimated budgets and realized budgets (realized budget is usually 175% percent larger than the estimated one, implying a lack of predictability in NTPs) → Pressure on LC budgets and a proliferation of unfunded mandates;
  - (5) Targets set in NTPs are ambiguous, and targets and resourcing are misaligned.
  - (6) Local authorities difficult in coordinating so many target programs,

Local Government Borrowing

- Local borrowing has emerged as an important topic in Viet Nam, particularly for provinces that are unable to satisfy their capital spending needs through existing local revenue and transfers.
- Golden rules (stipulated in the 2009 Public Debt Management Law)
  - Borrowing is solely for capital investment projects that can generate returns to service debt.
  - Ceiling on local outstanding debt at 30% of a province's annual capital budget (Hanoi & HCMC: 100%).
  - Ceiling of 3% of GDP for all local government debt and a ceiling of 65% of GDP for total public and publicly guaranteed debt including local debt.
- Local authorities have a variety of debt-financing options available, including the domestic capital market, the State Treasury, development banks, and on lending from CG of external funds.
  - Monitored closely by MoF.
- Local authorities can also turn to other forms of borrowing, such as local infrastructure development funds and overseas development assistance (as on-lent by CG) but not have direct access to financing from the central bank.
- Provincial borrowings are subject to various approval procedures depending on the utilization of fund and instruments.
  - All borrowings have to be inspected and approved by the MoF and other CG agencies.

Local Government Borrowing

- Thus, borrowing by local authorities remains very low:
  - Subnational debt was kept below 3% of GDP and financed only 4% of development expenditures.
- In 2011, around 13 provinces exceeded their outstanding debt stock limits of 30% of annual capital budget. Debt in some provinces was twice as high as the limit.
- 10 largest borrowers represented more than two-thirds of subnational borrowing in 2012:
  - The ratio of local government borrowing to total local government revenue was 4.0% in 2007 and 2.4% in 2012.
  - LG borrowing tended to be higher in more developed, more fiscally autonomous, and more fiscally sustainable provinces.

Fiscal Sustainability in Local Governments

- 3 sources of contingent liabilities: public financial funds (PFFs), local SOEs, and banking sector stress.
- Viet Nam has more than 30 central and local PFFs whose nature, scope, and scale of operations are diverse. But only few have their own sources of revenue and expenditure mandates, and account for 95 percent of total expenditure of PFFs. The other local-level PFFs are small and operate mostly within provinces.
- Vietnam also has 28 operating local development investment funds (LDIFs), which could be viewed as special purpose vehicles. These LDIFs are the largest PFFs operating at the local level.
  - Such types of special purpose vehicles have expanded considerably in Viet Nam and have mobilized a huge amount of funds for infrastructure investment.
  - LDIFs also engage in short-term borrowing, which can lead to short-term-oriented investments, potentially re-allocating LDIF capital away from long-term infrastructure development →can has negative effects on the banking sector.

Fiscal Sustainability in Local Governments

- The second source of contingent liabilities in Viet Nam is local SOEs (there are 1,506 local SOEs & 982 public service enterprises). These firms have easier access to commercial loans, especially from SOCBs →increasing accumulation of debt of these firms.
- Local authorities in recent years have accumulated payment arrears to construction firms, which, in turn, has prevented these firms from servicing their debts and has led to growing nonperforming loans in local banking systems.
  - By the end of 2011, total debts to construction companies by local governments amounted to VND91,273 billion. There were 15 provinces with payment arrears larger than 100% of planned capital expenditure.
- But there are some issues:
  - Local government borrowing is not included in the budget balance, thus not accounted for in the local budget balance.
  - Current regulations relating to subnational borrowings may not reflect the ability of the local authorities to repay debts. LG borrowing does not necessarily reflect local government fiscal capacity.
  - Ceiling on LG debt does not create proper incentives for borrowers.
  - There is no formal requirement on reporting and disclosure of local debt to the public.

Deficit sustainability in LG: Empirical analysis

- 2 estimation methods to examine deficit sustainability of LG in Viet Nam: (i) fully modified ordinary least squares (FMOLS) to estimate the long-term correlations between the co-integration equation; (ii) dynamic panel data
- Model using FMOLS estimator: based upon Buettner and Wildasin (2006), Buettner (2009), Solé-Ollé and Sorribas-Navarro (2012), and Bessho (2016).
  - Denoting own-source revenue as R_{it}, total local government expenditure as E_{it}, and balancing transfer as T_{it}, their relations are presented as:

    $$R_{it} = \alpha E_{it} - \beta T_{it} + u_{it} \text{ or } u_{it} = R_{it} - \alpha E_{it} + \beta T_{it}$$
  - If u_{it} is stationary, and if R_{it}, E_{it}, and T_{it} are integrated of order 1, then these variables are co-integrated with co-integration vector [1,-a, +b].

Empirical analysis

- Dynamic panel data based on Bohn (2008) model

  $$Surplus_{it} = \alpha_0 + \alpha_1 Surplus_{it-1} + \alpha_2 GDPgap_{it} + \alpha_3 EXPgap_{it} + \alpha_4 BT_{it} + X'_{it}\alpha_5 + \pi_i + \epsilon_t + \vartheta_{it}$$

  where $Surplus_{it}$ is the primary surplus of province *i* at time *t (Surplus* is calculated as the ratio of fiscal surplus to GDP.), $GDPgap_{it}$ is the GDP gap, $EXPgap_{it}$ is the expenditure gap, BT_{it} is the share of balancing transfer in total expenditure, X_{it} is a vector of provincial characteristics,

Empirical analysis

- We use data consolidated by the Ministry of Finance from 2002-2013. These data, however, do not categorize expenditure and revenue items at the provincial level.
- To account for different fiscal capacities, in some estimations, the sample is divided into two groups: (i) provinces for which the share rate is 100% (i.e., poorer provinces); and (ii) provinces with sharing rates lower than 100% (i.e., better-off provinces).
- To avoid spurious regressions, this study examines whether the panel data are stationary by using panel unit root tests (Levin, Lin, James-Chu 2002; Breitung 2002; Im, Pesaran, Shin 2003) and Fisher-type tests using Augment Dickey-Fuller (ADF) and Phillips-Perron (PP) tests (Maddala and Wu 1999).

Empirical analysis

- From the test results (appendix A), it can be concluded that there are unit roots for the data in the level and no unit root for data at the first difference.
- After testing for unit roots, co-integration among the variables of interest is investigated.
  - Pedroni (2000): testing for the co-integrated relationship in 4 different models: (i) without heterogeneous trend and ignoring common time effect, (ii) without common time effect and allowing heterogeneous trend, (iii) with heterogeneous trend and allowing common time effect, and (iv) with common time effect and ignoring heterogeneous trend;
  - Pedroni (1999) showed that there are 7 different statistics for the co-integration test, of which 4 are panel co-integration statistics and are based on the within-dimension approach and 3 statistics are group panel co-integration statistics and are based on the between-dimension approach.
  - The test statistics show that the null hypothesis that there is no unit root in the data the null hypothesis of no co-integration among the four variables can be accepted (Appendix B)

Empirical analysis

Fully Modified Ordinary Least Squares for Co-Integration Relationship

	All Provinces		Poorer Provinces	
	Coefficient	**Standard Error**	**Coefficient**	**Standard Error**
Dependent variable: local government revenue				
Local government expenditure	1.453***	0.01	1.600***	0.011
Balancing transfer	0.01	0.021	–0.214***	0.023
N*T	720		588	
Adjusted R2	0.881		0.423	
Dependent variable: local government expenditure				
Local government revenue	0.671***	0.023	0.649***	0.025
Balance transfer	0.113***	0.023	0.158***	0.026
N*T	720		588	
Adjusted R2	0.281		0.337	

Empirical analysis

Fully Modified Ordinary Least Squares for Co-Integration Relationship

	All Provinces		Poorer Provinces	
	Coefficient	**Standard Error**	**Coefficient**	**Standard Error**
Dependent variable: local government revenue per capita				
Local government expenditure per capita	1.228***	0.047	1.598***	0.053
Balancing transfer per capita	–0.083*	0.048	–0.354***	0.054
Local GDP per capita	0.275***	0.041	–0.124***	0.045
N*T	718		586	
Adjusted R2	0.724		0.496	
Dependent variable: local government expenditure per capita				
Local revenue per capita	0.277***	0.054	0.373***	0.06
Balancing transfer per capita	–0.117**	0.047	-0.095*	0.056
Local GDP per capita	0.418***	0.039	0.287***	0.043
N*T	718		586	
Adjusted R2	0.579		0.767	
Dependent variable: local GDP per capita				
Local government expenditure per capita	0.172***	0.047	0.181***	0.053
Local revenue per capita	0.052	0.056	0.037	0.061
Balancing transfer per capita	–0.057	0.048	–0.067	0.055
N*T	719.00		586.00	
Adjusted R2	0.908		0.845	

Empirical analysis

Budget Deficit Sustainability Analysis

	Fixed-Effect Estimator		Panel GMM	
	Coefficient	**Standard Error**	**Coefficient**	**Standard Error**
Panel A: All provinces				
Lagged dependent variable			–0.096***	0.002
Local GDP gap	–0.073	0.069	0.135***	0.028
Local expenditure gap	–0.152***	0.037	–0.086***	0.006
Population (in log)	0.018	0.048	–0.233***	0.047
Local GDP per capita	0.201***	0.03	0.178***	0.019
Balancing Transfer/expenditure	0.037	0.025	–0.106***	0.012
Constant	–0.672	0.092		
No. of observation	767		531	
No. of instruments			59	
Hansen (p-value)			0.214	
1st order autoregression (p-value)			0.003	
2nd order autoregression (p-value)			0.680	

Empirical analysis

Budget Deficit Sustainability Analysis

	Fixed-Effect Estimator		Panel GMM	
	Coefficient	**Standard Error**	**Coefficient**	**Standard Error**
Panel B: Poorer provinces				
Lagged dependent variable			–0.025***	0.003
Local GDP gap	–0.058	0.091	0.000	0.046
Local expenditure gap	–0.123**	0.048	0.088***	0.018
Population (in log)	–0.265*	0.143	–0.200***	0.066
Local GDP per capita	0.242***	0.018	0.220***	0.034
Balancing Transfer/expenditure	–0.017	0.015	–0.074***	0.015
Constant	–0.722***	0.041		
No. of observation	624		432	
No. of instruments			48	
Hansen (p-value)			0.496	
1st order autoregression (p-value)			0.0243	
2nd order autoregression (p-value)			0.3165	

Conclusions

- Since the new budget law was promulgated in 2002, the fiscal responsibilities of local authorities has significantly increased; thus, local fiscal policies play a significant role in Viet Nam's growth and development.
- To fulfill their growing role, the CG has granted local authorities more financial resources, including sharing parts of its revenue with local governments.
- Intergovernment fiscal transfers have also been reformed to play an important role in mitigating vertical and horizontal fiscal imbalances.
- However, several issues hinder the effectiveness and efficiency of fiscal decentralization in Viet Nam:
  - Unclear expenditure assignments, various measures and regulations that limit the autonomy of local government, and a lack of minimum standards for expenditure outcomes
  - Weaknesses in transfer norms, incentive problems in resources mobilization and allocation, and existence of many overlapping national and provincial targeted programs.
  - Weak fundamental foundations for local government borrowing management are weak.
  - Lack of transparency in all aspects of fiscal decentralization.

Conclusions

- It is recommended that the central government implement the following:
  - CG should make expenditure assignments more explicit. It could also give up some of its responsibilities to lower tiers of governments. The central government also needs to design minimum standards of services delivery;
  - CG should review its current sharing arrangements (using separate formulas for each revenue sources); allow provinces to impose surtaxes on some types of taxes or give them more autonomy in setting fees and charges. Introducing a property tax could be considered in the longer term.
  - revising transfer norms, adopting a formula-based transfer system, and avoiding negotiations to mitigate incentive problems in resources allocation.
  - review the current targeted programs, including objectives and targets, and identify overlapping programs.
  - strengthen the current legal foundations for local government borrowing, areas
  - Measures should be created that ensure fiscal accountability at the local government level.

Appendix A: Unit root tests

Null Hypothesis	Unit Root (assumes common unit root process)		Unit Root (assumes individual unit root process)		
Statistics	Levin, Lin, James-Chu	Breitung	Im, Pesaran, Shin	ADF-Fisher	PP-Fisher
Level					
Local government expenditure	–5.81***	–4.30***	1.15	126.93	128.24
Local government revenue	–7.55***	–3.15***	–1.05	130.90	225.90***
Balance transfer	–17.24***	–0.35	–1.59	133.65	118.35
Local government expenditure per capita	–4.72***	–4.74***	1.84	120.46	115.58
Local government revenue per capita	–8.29***	–2.40***	–1.27	136.70	222.90***
Local GDP per capita	–4.85***	1.52	1.16	106.30	95.50
Balance transfer per capita	–19.58***	–0.55	–2.14**	138.27	134.62
First difference					
Local government expenditure	–9.28***	–2.16***	–5.66***	222.36***	666.58***
Local government revenue	–1.05	–10.01***	–3.75***	174.92***	833.69***
Balance transfer	–21.66***	–14.80***	–10.96***	337.30***	638.29***
Local government expenditure per capita	–7.14***	–2.48***	–5.67***	222.48***	688.28***
Local government revenue per capita	–0.52	–10.18***	–3.52***	169.16***	821.24***
Local GDP per capita	–13.65***	–3.55***	–4.84***	202.40***	378.90***
Balance transfer per capita	–21.94***	–14.68***	–11.33***	345.62***	641.05***

GDP = gross domestic product.

Note: * p<0.1, ** p<0.05, *** p<0.01.

Appendix B: Panel Co-Integration Tests

Panel A: Model 1				
(local government expenditure, local government revenue, balancing transfer)				
Pedroni Residual Co-Integration Test (H0: no co-integration)				
Trend Assumption	Drift and No Deterministic Trend		Drift and Deterministic Intercept	
	Statistic	Prob.	Statistic	Prob.
H1: Common AR co-efficients (within-dimension)				
Panel v-Statistic	2.739	0.003	–1.940	0.974
Panel rho-Statistic	–2.155	0.016	2.176	0.985
Panel Pedroni Panel-Statistic	–14.653	0.000	–14.758	0.000
Panel ADF-Statistic	–4.272	0.000	–1.489	0.068
H1: Individual AR coefficients (between-dimension)				
Group rho-Statistic	2.029	0.979	5.584	1.000
Group Pedroni Panel-Statistic	–21.255	0.000	–22.822	0.000
Group ADF-Statistic	–4.316	0.000	–1.636	0.051
Kao Residual Co-Integration Test				
ADF	–5.711	0.000		
Panel B: Model 2				
(local government expenditure per capita, local government revenue per capita, balancing transfer per capita, GDP per capita)				
Pedroni Residual Co-Integration Test (H0: no co-integration)				
Trend Assumption	Drift and No Deterministic Trend		Deterministic Intercept and Trend	
	Statistic	Prob.	Statistic	Prob.
H1: Common AR co-efficients (within-dimension)				
Panel v-Statistic	–2.562	0.995	–6.334	1.000
Panel rho-Statistic	1.611	0.946	5.057	1.000
Panel Pedroni Panel-Statistic	–11.122	0.000	–14.350	0.000
Panel ADF-Statistic	–8.975	0.000	–9.160	0.000
H1: individual AR coefficients (between-dimension)				
Group rho-Statistic	5.655	1.000	8.309	1.000
Group Pedroni Panel-Statistic	–31.219	0.000	–36.478	0.000
Group ADF-Statistic	–10.967	0.000	–9.523	0.000
Kao Residual Co-Integration Test				
ADF	–7.908	0.000		