WHITE PAPER

Effects of Budgeting and Wage Bill Sustainability

National Pay Commission[1]

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Introduction and Methodology

In Maldives, the government employs close to 30% of the labor force and spends a relatively high amount on salaries and allowances for these employees. As such, the wage bill has always taken up a significant portion of the government budget, and has continued to strain government finances. In the recent decade, various government policies have contributed to the gradual increase in the government wage bill, posing questions about its sustainability in the near future.

This paper aims to explore the hypothesis that proper budgeting can have a positive effect on wage bill sustainability. It will attempt to substantiate this proposition by examining and establishing the extent to which budgetary forecasts for revenue, recurrent and capital expenditure; and expected GDP growth have effects on the government wage bill.

The first section discusses various international standards and quantitative indicators used to analyze public sector wage bill. This section also examines the trends and drivers of the wage bill. The second section provides details of a regression analysis carried out and discusses its findings. The last section gives medium-term reform options proposed for wage bill sustainability.

The results of this study is expected to facilitate medium-term fiscal planning during the budgetary process, and ensure that wage bill is within the sustainable level in the medium term, in line with the fiscal deficit and budget targets.

1- International Standards and Comparisons

This paper draws on international standards proposed by International Monetary Fund on Managing Government compensation and employment.[2] There are three main indicators used to measure and assess wage bill management across countries: wage bill to revenue ratio, wage bill to GDP ratio and wage bill to recurrent expenditure ratio. Additional parameters such as wage bill as a share of total spending, and average government wage as a share of GDP per capita provide an indication of the long-term fiscal sustainability of the government budget in terms of employee compensation.

It is vital to ensure that wage bill is within sustainable limits, and thus requires adequate fiscal planning to ensure appropriate financing of the wage bill and a competitive compensation is offered to attract and retain skilled staff and incentivize performance of staff.

The relationship between wage bill and a country's GDP is therefore, a good indicator in assessing the long term sustainability. It gives an indication of how much of a country's economic activity goes into paying salaries as opposed to other expenditure and development needs. Effective management of wage bill spending is needed to ensure that the budgeted expenditures are delivered in a cost-effective and fiscally sustainable manner.

[2] Fiscal Affairs Department, 2016. *Managing Government compensation and employment- Institutions, policies and Reform challenges*. International Monetary Fund

Furthermore, an analysis of the ratio between total wage bill and revenue is important since wages are paid out of revenue. The higher the wage bill to revenue, the more vulnerable an economy becomes since less domestic resources become available for public investment. A lower level is therefore, preferred.

According to the wage bill and compensation standard for upper middle-income economies such as Maldives, the internationally acceptable and sustainable level of wage bill to GDP ratio is 7% while the wage bill to revenue ratio must be within 30%-40%, and wage bill to recurrent expenditure ratio should not exceed 40% (IMF 2016).

Moreover, according to IMF employment and compensation statistics, expenditure on the government wage bill varies between 10 % of GDP in advanced economies to 7½ % of GDP in low-income developing countries, with emerging market economies lying in between. However, the wage bill as a share of total government spending is higher at 27 % in emerging markets and LIDCs compared to 24 % in advanced economies.

Trends and drivers of the wage bill of the public sector

The government employs around 30% of the total labor force in the economy and the main driver of wage bill is the large size of the public sector compared to the total labor force of the economy[3].

Table 1: Key ratios of the wage bill, 2008-2017

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Wage bill (millions MVR)	3,566	4,743	4,178	4,281	4,559	5,606	5,829	6,821	6,899	6,972
Nominal GDP (millions MVR)	29,077	30,020	33,129	40,511	44,345	50,633	56,867	61,566	64,919	71,677
Revenue (millions MVR)	6,939.5	5,313.3	6,392.4	9,172.1	9,771.4	11,783.1	14,999.0	16,669.3	17,673.7	21,030.1
Wage bill to recurrent expenditure ratio	48%	54%	50%	47%	44%	48%	42%	41%	43%	47%
Wage bill growth	38%	25%	-14%	2%	6%	19%	4%	15%	1%	1%
Wage bill to GDP ratio	12%	16%	13%	11%	10%	11%	10%	11%	11%	10%
Wage bill to revenue ratio	51%	89%	65%	47%	47%	48%	39%	41%	39%	33%
Growth in no.of employees	32%	-26%	-1%	4%	-20%	17%	9%	0%	-4%	0%

The ratios in Table 1 reveal that the average annual growth rate in wage bill for the period from 2008-2012 was 12%. In January 2009, salaries of civil servants increased by 25% on average. However in October of the same year, there was a reduction in civil service salaries due to the financial crisis, but was restored in 2011, which is the reason for the negative growth in 2010. The reduced wages were repaid over the period of 2012-2013.

The average annual growth of the wage bill between 2013 and 2017 stands around 39%. This is due to an increase in the number of employees as well as an increase in the average wage

[3] World Bank. *Maldives Country Survey*, 2017. World Bank open data.

during this period. The wage bill absorbs around 46 percent of the total recurrent spending within the period of this study.

Considering the annual average for the study period, wage bill to GDP ratio was 11% as compared to the internationally acceptable level of 7%. The wage bill to recurrent expenditure ratio was 46% as compared to the internationally acceptable range of 40% or below. The wage bill to revenue ratio of the government was 50% which has far exceeded the international sustainable ratio of 30%-40%.

Chart 1: Wage bill as a percent of GDP against Per Capital Income (pci)

Chart 1 above depicts the relationship between per capita income and wage bill to GDP ratio for 103 countries.4 It can be seen that the data point for Maldives (at 11%) is significantly higher most other countries. Particularly, the wage bill in terms of GDP for Maldives is in the 88th percentile globally, and even among upper middle-income countries. This means that, among all countries of the world, 87% of countries have lower wage to GDP ratios than Maldives. This also confirms factoring in the size of the public sector the wage bill as a percent of GDP is significantly high compared to the similar economies.

4 The data for this chart relates to the period 2008-2016. Figures have been averaged over this period.

Regression results and analysis

The dependent variable of the multiple linear regression analysis is wage bill and the independent variables tested include budgetary projections of recurrent expenditure, capital expenditure; revenue forecasts and expected GDP growth. Purposive sampling was employed in selecting 10 fiscal year budget data, where data was available (2008-2017).[5] The regression models put forward are based on a similar study done by Nyakudi, Masinde and Galo (2016) for Kenya.

The initial 3 models tested for the analysis are as follows:

$$\frac{w}{rev} = \beta_0 + \beta_1 rev_{forecast} + \beta_2 gdp_{forecast} + \beta_3 recexp_{forecast} + \beta_4\, capex_{forecast}$$

$$\frac{w}{rec\_exp} = \partial_0 + \partial_1 rev_{forecast} + \partial_2 gdp_{forecast} + \partial_3 recexp_{forecast} + \partial_4\, capex_{forecast}$$

$$\frac{w}{GDP} = \alpha_0 + \alpha_1 rev_{forecast} + \alpha_2 gdp_{forecast} + \alpha_3 recexp_{forecast} + \alpha_4\, capex_{forecast}$$

where $\frac{w}{rev}$, $\frac{w}{rec\_exp}$, and $\frac{w}{GDP}$ are the wage bill to revenue, recurrent expenditure, and GDP ratios, respectively, for period t, and *rev_forecast*, *recexp_forecast*, and *capex_forecast* represent the budgetary projections made at the beginning of each year, while *gdp_forecast* is the expected GDP growth for that period.

The regression analysis is expected to explain the changes that occur in the dependent variable as a result of the effect of the independent variables. For statistical and analytical purposes, *rev_forecast*, *recexp_forecast*, and *capex_forecast* have been transformed to log variables whereas all the dependent variable ratios and *gdp_forecast* were used as they were. The standard Ordinary Least Squares (OLS) method was used in assessing the models, throughout this paper.

Table 2: Descriptive Statistics

(Budgetary projections and forecasts are in millions of MVR)

Variable	Obs	Mean	Std. Dev.	Min	Max
rev_forecast	10	13,199	5,634	6,808	21,431
recexp_forecast	10	11,675	2,731	8,756	16,269
capex_forecast	10	6,429	3,464	3,245	13,217
gdp_forecast (%)	10	5.6	2.6	2.1	10.5
wage_to_rev (%)	10	49.90	16.33	34.69	89.26
wage_to_recexp (%)	10	46.32	4.05	40.76	54.11
wage_to_gdp (%)	10	11.43	1.78	9.73	15.80

[5] Fiscal Affairs Division - *National Budget*, Ministry of Finance and Treasury

Table 2 above provides some descriptive statistics on the data used. Given that the data covers a 10-year period, and that a lot of structural changes that affected the government budget took place within this period, the observations used cover a significantly wide range.[6] The ratios as well as the GDP forecast remains much more stable over this period.

As summarized in Table 2, revenue forecast has a mean of MVR 13,199 which is an average of revenue projection for the 10 fiscal year period. Recurrent expenditure projections have a mean of MVR 11,675 million which is an average of recurrent expenditure projection for the period. GDP forecast has a mean of 5.6% representing the average expected GDP growth for the period under study. The mean of the wage to GDP ratio is 11.43%, which implies that the ratio is beyond the internationally acceptable level.

Preliminary testing

Preliminary testing was done on the three regression models to see if the assumptions of the OLS method held. This included testing for heteroskedasticity, autocorrelation and multicollinearity, among others.

Heteroskedacity occurs when the variance of the error term is not constant, meaning the variability of a variable is unequal across the range of values of a second variable that predicts it. A Breusch–Pagan test was conducted for this analysis and evidence showed that the null hypothesis of homoscedasticity could not be rejected.

Autocorrelation test was done to confirm whether an error term of one period may have a relation with the error terms for the period of study. This usually occurs in time series analyses and must be corrected. To test this, Durbin-Watson test was conducted and no evidence for autocorrelation was found.That the error terms in different periods have no interrelation validate the use of t and F statistics in this study. This therefore improves the reliability and confidence in the inferences made.

Given the small sample size, we cannot use the central limit theorem to assume normality in error terms. Therefore, a skewness-kurtosis test was conducted on all models. We found no evidence for rejecting the normality of the error terms in all models.

Multicollinearity occurs when there are high correlations between two or more dependent variables. This creates misleading inferences, skewing the results in a regression model. It further makes it difficult to gauge the effect of independent variables on dependent variables. For the purpose of this analysis, multicollinearity was tested using the variance inflation factor (VIF). A VIF of 10 or more is troublesome, and the model needs to be revised. Among all the models tested, *rev_forecast* was noted to have a high VIF in all models. Therefore, the models were transformed to eliminate this mulitcollinearity.

The regression models were therefore transformed as follows:

[6] Some of the structural changes during this period include the introduction of a tax system in 2011.

Transformed model 1, case 1: $\frac{w}{rev} = \beta_0 + \beta_1 rev\_forecast + \beta_2 recexp\_forecast$

Transformed model 1, case 2: $\frac{w}{rev} = \beta_0 + \beta_1 rev\_forecast + \beta_2 recexp\_forecast + \beta_3 gdp\_forecast$

Transformed model 2, case 1: $\frac{w}{rec\_exp} = \partial_0 + \partial_1 recexp\_forecast + \partial_2 gdp\_forecast$

Transformed model 2, case 2: $\frac{w}{rec\_exp} = \partial_0 + \partial_1 recexp\_forecast + \partial_2 rev\_forecast$

Transformed model 2, case 3: $\frac{w}{rec\_exp} = \partial_0 + \partial_1 recexp\_forecast + \partial_2 capex\_forecast$

Transformed model 3, case 1: $\frac{w}{GDP} = \alpha_0 + \alpha_1 gdp\_forecast + \alpha_2 capex\_forecast$

All the above models were chosen such that no effect of multicollineary remained, i.e. the VIF for all variables in the transformed models were below 10. Moreover, tests for heteroskedasticity, autocorrelation and normality of residuals were also conducted. It was found that all the assumptions of the OLS held.

Regression analysis

The regression summary and the regression coefficients are seen below in Table 3. A brief discussion on the coefficients is also provided below, while a more detailed explanation on the interpretation of the coefficients are given in Appendix 1.

Table 3: Regression coefficients and key statistics of the transformed models

	Model 1		**Model 2**			**Model 3**
	Case 1	**Case 2**	**Case 1**	**Case 2**	**Case 3**	**Case 1**
Dependent variable / Independent variable	*wage_to_rev*	*wage_to_rev*	*wage_to_recexp*	*wage_to_recexp*	*wage_to_recexp*	*wage_to_gdp*
rev_forecast	-64.926*	-65.214*		-4.182		
recexp_forecast	73.45	73.53	-11.37	-5.476	-15.564	
gdp_forecast		0.102	-0.366			0.035
capex_forecast					1.348	-2.21
Constant	-25.541	-24.158	154.590*	136.803	180.050*	30.355*
R-squared	0.676	0.676	0.555	0.531	0.514	0.369
Pr > F	0.0194	0.0645	0.0587	0.0704	0.0799	0.1999

- **Model 1:** We observe that as the revenue forecast increases, the wage bill to revenue ratio decreases as expected. Additionally, we note that as the budgetary projections for revenue expenditure increases, the wage bill to revenue ratio decreases. <u>These results imply that wage bill to revenue ratio can be controlled if the revenue increases more proportionately than the wage bill as the revenue forecast and recurrent expenditure</u>

budgetary projection increases. Nyakundi et al (2016) recommends this to be done through program-based budgeting system where "the contribution of the wage to revenue of the year is determined before further employments and salary increases, rather than arbitrarily increasing the wage due to revenue forecast increases".

- **Model 2:** The results imply that increases in projections for recurrent expenditure, naturally, reduces the wage bill to recurrent expenditure. Adding in additional variables, we note that a rise in expected growth in GDP and revenue forecast also reduces the wage bill to recurrent expenditure ratio. These imply that to control the wage bill to recurrent expenditure ratio, substantial rises in the wage bill should not be the item that fuels the growth in recurrent expenditure. Rather, the rise in the wage bill should be less proportionate than the rise in the recurrent expenditure. One way to do this is to allow wage increases to reflect their contribution to the economy, i.e. based on their performance and productivity.

Model 3: The regression results from this model can be interpreted to mean that as the expected growth in GDP increases, the wage bill to GDP ratio increases. Meanwhile, as the budgetary projection for capital expenditure increases, the wage bill to GDP ratio declines. This implies that the wage bill expense over the study period has risen more substantially than the increase in the expected GDP growth. A key takeaway is that the increased spending on the wage bill higher than proportionate to the increase in GDP, may reflect wage rises not matched with productivity increases. This may lead to inflationary effects.

In summary, the results support our hypothesis and initial observations that the various measures of wage bill management is above the sustainable levels for Maldives. These regressions provide a basis to come up with some specific recommendations that can be implemented to correct the status quo, and bring the wage bill expense to a sustainable level.

Recommendation and Medium Term reform options for sustainable wage bill management.

The wage sustainability ratios demonstrates that macroeconomic aggregates used for testing affordability and sustainability issues which have been computed from the economic aggregates indicates that the current wage bill is already beyond sustainable levels. In addition it proves that the budget has been surpassing the recommended International standard ratios over the past 10 years.

These alarmingly high ratios implies fiscal unsustainability of the public sector wage bill, and the immediate need to take measures to lower and contain the wage bill at sustainable levels. Government should take measures in line with regional and international best practice to keep the wage bill in the suggested sustainable trajectory.

Although each country's appropriate wage bill level will depend on its specific circumstances, that includes the size of government, fiscal situation, and demographic structure - the following medium term reform options are recommended for the Maldives.

1- **Place a ceiling on the wage bill**. Given the unsustainable public wage structure there is an urgent need to institute a cap on the public sector wage bill. The current trajectory for both wage bill vs. GDP and wage bill vs. recurrent expenditure appears unsustainable (Chart 2 and 3 given below).

Chart 2: Sustainability of wage bill to GDP

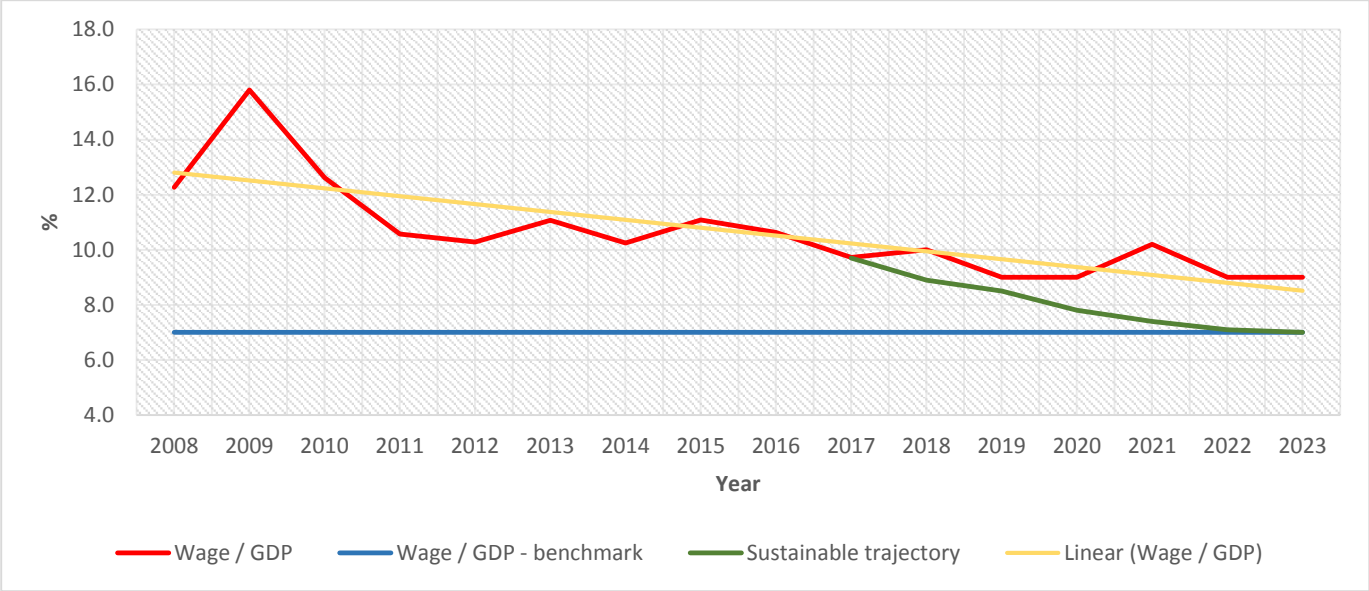
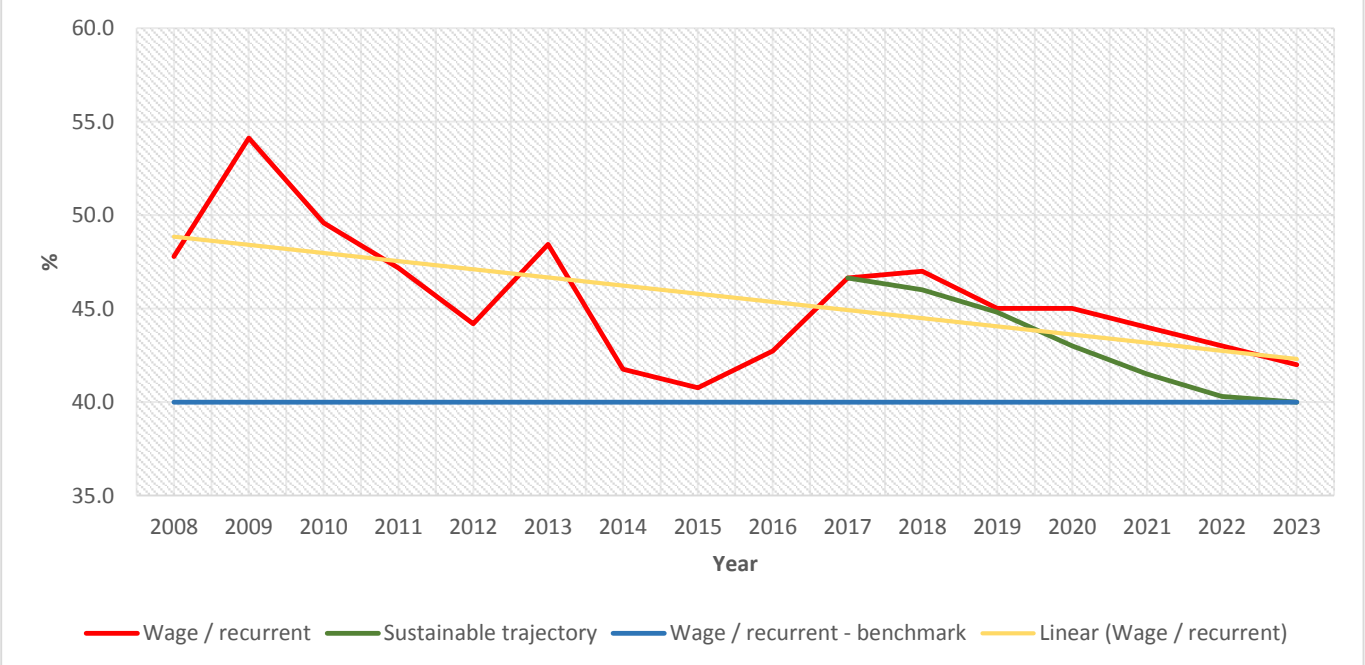


Chart 3: Sustainability of wage bill to recurrent expenditure



2- **Instigate wage control measures**. Immediate measures needs to be taken to counter the growing demands for wage increases across the public service. In this regard government needs to re-align its policies to ensure that, as stipulated in the Nation Pay Policy Act, wage-related decisions are made by the National Pay Commission. Such a strategy is required for pay-related decisions to be made based on professional research rather than political rationality.
3- **Establish a centralized wage-related data collection mechanism**. The present government-wide processes and systems is not fully capable of capturing all wage-related expenses across the public sector. The lack of a proper mechanism means government is not able to make decisions based on proper and accurate data.
4- **Streamline budgetary processes**. Presently there are multiple budget codes related to the same type of benefits. Additionally some staff-related expenses such as insurance benefits are not integrated into the wage expenses. Such anomalies needs to be streamlined to reduce unnecessary and avoidable wage-related expenses.

References

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Appendix 1

A detailed explanation and interpretation of the regression results in Table 3.

Overall, the lack of significance in almost all coefficients in the regressions and in the total explanatory power of the regressions is unsurprising given that the dataset we used only comprised 10 observations. Moreover, we note that there was one observation that was an outlier, which also contributed to the lack of a sustained trend among the original data.[7]

- **Model 1, Case 1:** The results can be interpreted that, controlling for budgetary projections for recurrent expenditure, a 1% increase in the revenue forecast for that year decreases the wage bill expenditure as a percent of revenue by 0.65 percentage points. And keeping revenue forecast constant, a 1% increase in the budgetary forecast for recurrent expenditure is estimated to increase wage bill as a per cent of revenue by 0.73 percentage points.

- **Model 1, Case 2:** The correlation between wage bill to revenue and ratio indicates the existence of a strong negative relationship between revenue forecast expenditure budgetary projection and wage bill to revenue ratio.
  (The coefficients in model 1 and model 2 are highly similar, even with the inclusion of *gdp_forecast* as an additional variable in model 2. This leads us to believe that *gdp_forecast* may not be a useful additional to the model to explain the variance in *wage_to_rev*. To test this presumption, an F-test was conducted on the unrestricted model against the restricted model and found that indeed, there is insufficient evidence to suggest that adding *gdp_forecast* as an additional variable improves the model).

- **Model 2, Case 1:** the results imply that, holding expected GDP growth constant, a 1% increase in recurrent expenditure forecast will lead to a reduction in wage bill as a percent of recurrent expenditure by 0.11 percent. Additionally, holding recurrent expenditure forecasts constant, an increase in the GDP forecast by 1 percentage point decreases wage bill as a percent of recurrent expenditure by 0.37 percentage points. It suggest that changes in wage bill to recurrent expenditure ratio may not be significantly explained by the model. In addition recurrent expenditure increased more proportionately that the wage bill but the proportion of the increase was still not substantial to reduce the wage bill to recurrent expenditure at the required level. To control the wage bill to recurrent expenditure ratio, the recurrent expenditure should increase substantially than the wage expenditure.

- **Model 2, Case 2:** The results interpret that correlation between wage bill to recurrent expenditure ratio and recurrent expenditure budgetary projection is -5.4. This suggests existence of a strong negative relationship between wage bill to recurrent expenditure ratio and recurrent expenditure budgetary projection. In addition results suggests the existence of a strong negative relationship between expected growth in GDP and wage bill to recurrent expenditure ratio. Budgetary allocations are based on GDP growths and other economic

[7] The outlying observation was that of 2009, and was caused due to the effects of the global financial crisis.

conditions like inflation. Increased GDP implies that both recurrent and development expenditure projections may increase. Thus, this finding is consistent with theory and economic reality.

- **Model 3, Case 1:** Controlling for budgeted capital expenditure, we note that a 1 percentage point increase in the expected growth of GDP is estimated to increase wage bill as a percent of GDP by 0.04 percentage points. Meanwhile, controlling for the GDP forecast, a 1% increase in the budgetary projections for capital expenditure is estimated to decrease wage bill as a percent of GDP by 0.02 percentage points.

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