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Determinants of Default in Project Finance in Development Bank of Ethiopia

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Abstract

The study aims to identify the determinant factors affecting project loan default financed by the Development Bank of Ethiopia (DBE), Head Office. In order to realize the objective of the study, the mixed research design was used whereby descriptive, econometrics, and qualitative approaches were blended. Data were collected mainly through primary sources using a questionnaires. Of the 80 borrowers sampled, 40 were non-performing loans. For the analysis of data, descriptive statistics and an econometrics model was used. The results obtained imply that the suitability of the project location for projects, involvement of project owners in the feasibility study, the time taken to process loans, approved amount, and grace period are factors causing project loan default in the DBE head office. Furthermore, results from open-ended questions show that external factors (such as inflation, sudden policy change, power interruption, natural hazards), market problem, management problems, unavailability of raw materials and skilled labor, weak project follow-up and supervision, implementation delay, poor project appraising, working capital problem, elongated loan processing time, custom and logistic problem, and poor infrastructure are identified as causes for project loan default. Hence, to minimize the incidence of project loan default, this study suggests that the Bank should put in place appropriate and transparent loan processing time, and appropriate grace period for projects and should verify the involvement of project owners in the feasibility study. Besides, the bank needs to approve sufficient loan amounts and make sure that the extended loans are used for the planned purpose through timely credit monitoring. Moreover, the Bank should take precaution measures before extending credit facilities regarding the suitability of project location for project performers.

Keywords: Non-performing loans, project Finance, bank, Ethiopia

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Introduction

The role of financial institutions in any nation's economy is very vital. They act as the main mediators between savers and borrowers who need the fund for their viable projects thereby ensure that the money available in the economy is always put to good use. And they enhance investment productivity not only by making the credit flow in the economy ease but also through financing development projects (Richard, 2011). In this regard, project finance is considered as a way out of the financing of long-term infrastructure, industrial projects, and community services based upon a limited recourse financial structure, in which the total investment cost is covered through equity contribution and loan. The repayment will be made from the cash flow generated by the project itself (Gordon.M, 1996). Thus, project finance involves a high degree of complexity in project appraising that extends beyond normal loans. On other hand, lenders would engage in the evaluation of feasibility studies submitted by the project promoters and they must be capable of evaluating the technical and financial projections as well as the assumptions used in their studies (Enzo, 2012).

Since Ethiopia is one of developing nation and there is a growing demand for project loans. To meet this demand, the Development Bank of Ethiopia (DBE) as a state-owned bank, it is uniquely positioned in the banking industry as it is empowered to extend project finance along with working capital loans as a package. The bank provides finance to encourage mainly private sector investors who are engaged in commercial agriculture, manufacturing, agro-processing, and mining & extractive industries. The bank exceptionally finances referral/tertiary hospital projects from the service sector. Moreover, it also supports small and medium enterprises (SMEs) through capital goods lease/hires purchase financing (DBE, 2017). The bank is known for its project-based lending tradition.

To accomplish the objectives of circulating more financial resources, to meet the increasing demand for a project loan, and to keep the bank in a good liquidity position, the extended loans must be recovered in full (Seyoum et al., 2016). Failure to manage and monitor such project loans, which make up the largest share of the bank's assets, would likely lead to the episode of high level of defaulting loans.

When a loan is in default or close to being in default, it is called non-performing. This happens when borrowers fail to make the repayments of principal and /or interest thereon as per the contract and with no intent of making a repayment in the future (Pilbeam, 1998).

As per NBE Directives issued for development finance institutions; loans are classified into five categories of pass, special mention, substandard, doubtful, and loss. Loans became defaulted when principal and/or interest is due and uncollected for three months or outside the planned repayment date or maturity for short-term loans; and on the other hand, when principal and/or interest is due and uncollected for one year or outside the planned repayment date or maturity for medium and long-term loans.

The causes for loan quality deterioration differ in different countries subject to their economic developments and have multidimensional features. Among different reasons, economic depression, high-interest rate, inflation, lenient terms of credit, credit orientation, aggressive lending, high-risk appetite, poor monitoring, and other macroeconomic factors; and most banks have been closed down by regulatory authorities due to default loans (Bercoff *et. al.*, 2002). Recently, DBE's loan default was increased from year to year in relation to the amount and project's number. For fiscal years covering from 2011/12 to 2016/17, NPLs amount has raised from Birr 1.12 to 8.45 billion. Likewise, the NPLs amount has increased for projects administered at the Head office. For the period under review, the NPLs amount has raised from Birr 511.5 million to 5.03 billion (DBE, from 2011/12 to 2016/17 F.Y). This shows that, the NPLs amount is increasing from year to year and which in turn affects the liquidity position of the banks. Moreover, the economic activities of a nation since the financed projects have a substantial influence on the development subject to limited financing sources. Due to its nature, utmost cases project financing requires huge resource mobilization than other credit products. Accordingly, the risk inherits and the payouts are also great. Hence, DBE shall make its utmost effort to avoid or minimize the risk of project loan default as much as possible.

This study examines major determinants of project loan default in general and in particular to project/borrower, bank, and external/macroeconomic related factors of DBE head office.

Research Gaps and Objective

Successful project management is instrumental to bring about broad-based and sustainable development. Ethiopia aspires to become a middle-income country by 2025. Towards this end, the country has devised several projects. For these projects to contribute meaningfully to the development endeavor of the country there needs to be efficient and effective project financing, which is a vital tool that supports the realization of developmental projects thereby bring about economic development. As a government-owned bank, DBE is uniquely positioned in the banking industry as it is empowered to extend project finance along with working capital loans as a package. Accordingly, DBE extends sustainable credit facility for those engaged in manufacturing, agro-processing industries, mining or extractive industries, and commercial agricultural projects. However, the provision of credit alone does not support the economic development of the country unless it is supplemented with efficient utilization of the fund and repayment of loans as per the loan agreement (DBE, 2017).

One of the mechanisms of sustaining the Bank's financial ability is making the payment performance of the bank's clients effective. This will help realize better asset quality, among others. In fact, the non-performing loan (NPL) ratio is used as a measurement of a bank's asset quality. This is the standard criterion and one of the prudential standards, guidelines, and rating systems for African Development Banks and Finance Institutions (AADFI) in which DBE is a member. As a member DBE has agreed to perform towards this standard, which clearly states that non-performing loans should not exceed 15% of the gross loan portfolio or total outstanding loan. However, nonperforming loans of DBE reaches as high a number as 24.98% (it accounts for about Birr 8.45 billion) for the budget year that ended June 30, 2017. Out of this, the head office share is 18.95% (which is about Birr 5.03 billion). This shows that the performance of the Bank is way below the standard. This evidently shows that there is a problem with loan collection, whose factors are worth studying.

In fact, few studies have so far been studied to identify factors determining nonperforming loans to lessen the default rate and to improve the overall performance of banks. Among these studies, the one by Wondimagegnehu (2012) on the determinants of NPLs of the banking industry in Ethiopia and that of Seyoum, *et.al*, (2016) on the factors that affect non-performing loans of the

DBE central Region are worth mentioning. The study conducted by Wondimagegnehu (2012) focused on bank-specific determinants of nonperforming loans in the banking industry in general, while the second study focused on bank and borrower-related factors affecting non-performing loans of DBE, Central Region.

The major loop hole of both studies is the fact that they used descriptive methods of data analyses which have no power to make recommendations. This is because the result of descriptive statistics has less power to forecast the prospects and identify the determinants as well as indicate the level of their significance. This study, therefore, contributes to filling this gap. As its major departure from the abovementioned studies, the current study uses the econometrics model to identify determinants of project loan default and focuses on factors related not only to the Bank and borrowers but also to macroeconomic-specific factors that have led the project loan to default. Based on the above-listed motivations and the growing trend of project loan default in DBE in general and head office in particular, this study has a very strong justification to be undertaken. Therefore, the major objective of this study is to identify project loan default determinants. Having the above revealed statements of the problem, the subsequent research questions to be in this study are indicated as follows: what are specific factors that affect project loan default? Is there cause and effect relationship between the project and or borrower, bank and external specific factors, and project loan default status? What does the trend of project loan default and NPLs ratio of DBE look like?

Literature Review

The financing of infrastructure, huge industrial projects, and public services on a long-term basis is called project financing as per the definition of IPFA (International Project Finance Association). The total project cost used to finance the project comes from the project owner's equity contribution and debt. The debt part of the project is assumed to be paid back from the cash flow generated by the project (Zinat, 2010).

Projects are heavily dependent on debt financing; the debt part of the project accounts for about 70 to 90 percent of total project costs compared to 25 to 35 percent for a typical industrial firm ownership. To avoid the risks associated with financing projects and to overcome liquidity problems most banks enter into co-financing or syndicate financing agreement with other

financers. This kind of financing is the predominant mode of project financing (Esty & Sesia, 2007). The limited nature of project debt shows that the repayment of debt depends only on cash flows generated by the project and the financier does not have a claim on the personal asset of the project owners at the time of project failure or default. Therefore, unlike traditional corporate lending, where creditors check the creditworthiness of the total firm before they offer credit facilities, the lenders in the project assess purely the liquid cash generation capability and the assets of the project. The reputation of the sponsor firm does not influence the debt raising capability of the project, however, the reputation of the lead arranger in the project finance syndicated loans decreases the spread of the project loan (Gatti, *et.al*, 2008).

According to DBE project financing is defined as a loan arrangement for development projects. Accordingly, the bank shall extend medium and long-term loans including working capital loans as a package to the projects in the priority areas set by the government. Financing of such projects shall be made to project promoters who have passed through due diligence assessment and are found creditworthy. Furthermore, all projects to be financed by the bank must be financially as well as economically viable and socially desirable. The viability and desirability of the projects shall be verified through the bank's detailed appraisal and approval process (DBE, 2017).

According to Radha M. (1980), the source of income in any bank majorly comes from loans and advances extended to their borrowers. Since these products constitute a larger share of profit than any other assets. Thus, banks are interested in extending much of their funds to credit facilities. However, the banks have to make appropriate risk mitigation mechanisms to safeguard such advances.

When banks make a larger portion of funds for extending credit facilities, they will maximize their profit subject to managing the risks associated with providing such facilities. Failure to manage these risks, it would impair profit and thereby the very capital. Loan default is the major risk associated with advancing loans and banks need to be cautious in this regard.

That means defaulted loans put financiers in a difficult situation especially when the extended amount is very high. Despite the fact that banks hold collateral for the extended loans, holding collaterals alone doesn't guarantee that the extended loan amount will be repaid back or not; and

at the time of advanced loans being turned into non-performing loans such risks will be materialized. Non-performing loans have been defined by different authors; according to Paterson &Wadman (2004) when banks are incapable of making a profit from their extended loans, the loans become non-performing; and this loan cannot be recovered within the stipulated time that governed by the laws of a country. On the other hand, Pilbeam (1998) defines non-performing loans are in default; and these loans become in default when project promoters are unable to make either the repayment of principal or interest as per the stipulated loan agreement and with no intention of making a repayment in the future. Loans become non-performing when loans (either interest or principal) are in arrears for more than three months or more, if interest in arrears has been capitalized, or if deviated from the loan agreement.

Furthermore, Vigano (1993) define non-performing loans as when the borrowers are unable to make the settlement of loans in the full amount that makes the financier not maximize their earnings; and these loans are not capitalized, particularly mortgages. To overcome this problem the banks take different measures such as they will make repayment rescheduling or they will take over the pledge asset and they transfer to a third party. However, both alternative measures cause the banks to incur the cost. Thus, financiers always endeavor to minimize their non-performing loans as much as possible.

According to Timothy (1994), loans are considered as non-performing when they are subjected not accumulate or when the repayment term is significantly modified. This happens when the banks subtract interest calculated on loans that were recognized but not collected. However, the interpretation of when loans qualified as overdue varied widely.

Moreover, the Central Bank of Eastern Caribbean (2009) defines non-performing loans are all outstanding loans in default. Most banks did not put loans on nonaccrual if the overdue status is less than three months during the reporting period. These loans are not recognized as income, full settlement is not planned in the future, total credits to the accounts are insufficient to cover interest charges over 90 days, or the due date has passed and payment has not been made.

Similarly, Asari, et al. (2011) defined loans as non-performing when the banks are not in a position of making a profit. Generally, if the overdue interest is not paid within three months, however,

different countries may have a different experience in this regard. The inflation rate has insignificant relationship with non-performing in the long run while the interest rate has a significant impact on non-performing loans. However, in the short run, both interest & inflation rates will not impact the non-performing loans.

Research Design and Methodology

Research design is the overall plan that describes the methods and procedures for collecting and analyzing the required data. The choice of research design primarily depends on the objectives of the study that are going to be achieved (Adebiyi, 2016). In this regard, in order to undertake the planned study comprehensively, three data analysis approaches were adopted and econometric model was used to reach the conclusion. These approaches are quantitative and descriptive research. A causal research design was used to show the relationship between the dependent and explanatory or independent variables.

The target population of the study was all project finance beneficiary investments that were financed by the Development Bank of Ethiopia head office for the last 10 years; for this study purpose, the loan repayment status report which was disclosed on June 30, 2017; this data was generated from T-24 system. In addition to this, the annual report for the fiscal year 2016/17 was employed. Out of 201 projects financed by the DBE head office, 54 projects were categorized as defaulters while the remaining 147 projects are categorized as non-defaulter loans. When we look defaulters in terms of project sectors, 24, 28, 1, and 1 projects from agriculture, manufacturing, service, and mining & extractive sectors, respectively; while the remaining 34, 109, 2, and 2 projects were non-defaulter loans, respectively.

At the time of data collection, the total numbers of projects administered at the head office were 201; and these projects were disseminated throughout the country, due to this reason subjects were selected because of their convenient accessibility and proximity to the researcher. Thus, the research questionnaire was distributed to key informants of project finance beneficiary investors for both defaulters and non-defaulter. From 201 projects financed by the DBE Head office, the researcher selected 80 defaulted respondents and 40 from non-defaulted borrowers. Both descriptive and quantitative analyses are employed.

Accordingly, the following logistic regression model has been constructed based on the collected data and using the variables defined above:

$$\textbf{Loan repayment status}=\alpha + \beta_1 sector + \beta_2 formoforga + \beta_3 numberofpro + \beta_4 ownership + \beta 5 eligibility + \beta_6 creiditpolicy + \beta_7 involvedfeasibility + \beta_8 typeofloan + \beta_9 timetaken + \beta_{10} approvedamount + \beta_{11} graceperiod + \beta_{12} cashflow + \beta_{13} interest + \beta_{14} suitability + \beta_{15} targetmkt + \beta_{16} propolocal + \beta_{17} mktaccess + \beta_{18} mktproblem + \beta_{19} 6.3 followup + \varepsilon$$

Where: $\boldsymbol{\beta_i}$ *is the coefficient which is not directly interpreted as classical linear regression model* $\boldsymbol{\alpha}$*: is the constant term* $\boldsymbol{\varepsilon}$ *is the error term of the model*

The dependent variable is a binary variable; that can be defined in the concept of project loan default status, focus on project loan non-defaulter (0) and defaulter (1), bank, borrower, external/macro-economic and project-related variables are independent or explanatory variables.

An independent variable is defined as a variable that is changed or controlled in a scientific experiment. It represents the cause or reason for an outcome and variables that the experimenter changes to test their dependent variable. A change in the independent variable directly causes a change in the dependent variable. The effect on the dependent variable is measured and recorded in this research the independent variables are project, bank, borrower, and external or macro-economic specific variables. The variables are project sector, Form of organization, Number of projects administered by the promoter at the time, Project controlling mechanism, Type of loan, Loan amount, project Implementation period, project location, suitability for promoters, Target market, market accessibility, and marketing problem; Bank specific factors like inflexible credit policy of the bank, elongated loan processing time, approved amount, grace period, inappropriate cash flow estimation (projected), interest rate, project follow-up, and supervision work; Borrower specific factors like ownership impact, eligibility criteria, and involvement in the feasibility study and Macro Economic/external variables are price change, market competition, advertisement problem, customer test, and preference change and foreign currency fluctuation as obtained from open-ended questions.

Data Analysis and Discussion

General Description:

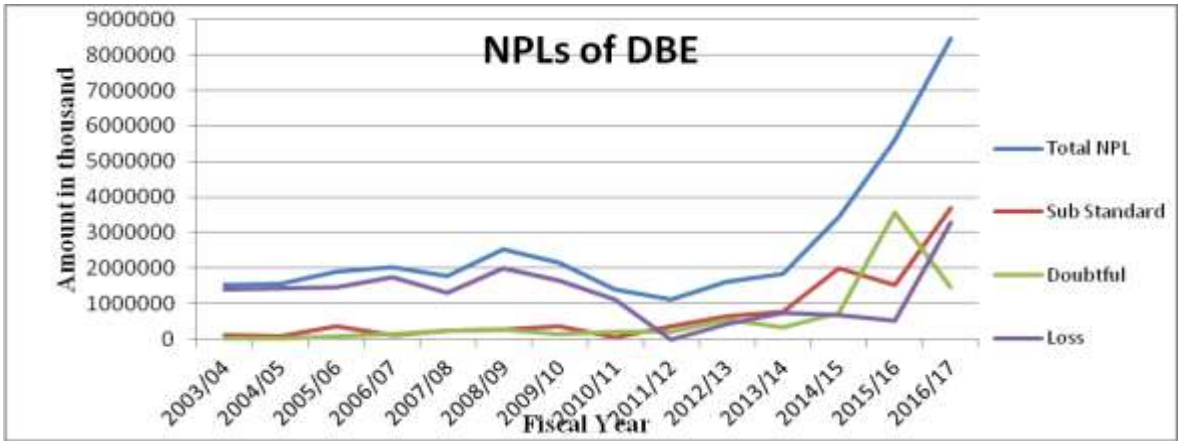
As per Asset Classification and Provisioning Directives of the NBE for Development Finance Institutions (NBE Directives No SBB/48/2010 and 52/2012); the DBE has classified all its loans into five categories of the pass, special mention, substandard, doubtful and loss. The details of loan classification are elaborated in the previous chapters.

In DBE's context, a loan is said to be non-performing when credit quality loans have deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advance is in question. Short term loans are non-performing when principal and/or interest is due and uncollected for 90 (ninety) consecutive days or more beyond the scheduled payment date or maturity while medium- and long-term loans are non-performing when principal and/or interest is due and uncollected for 12 (twelve) consecutive months or more beyond the scheduled payment date or maturity.

In recent years, DBE's NPLs had been increasing from year to year in terms of amount and number of projects. For the period covering from 2003/04 to 2016/17, the NPLs amount raised from Birr 1.12 to 8.45 billion. The trend and status NPLs of the Bank for the last 14 years are presented in figure 1.

Figure 1

Non-performing loan of DBE by loan status



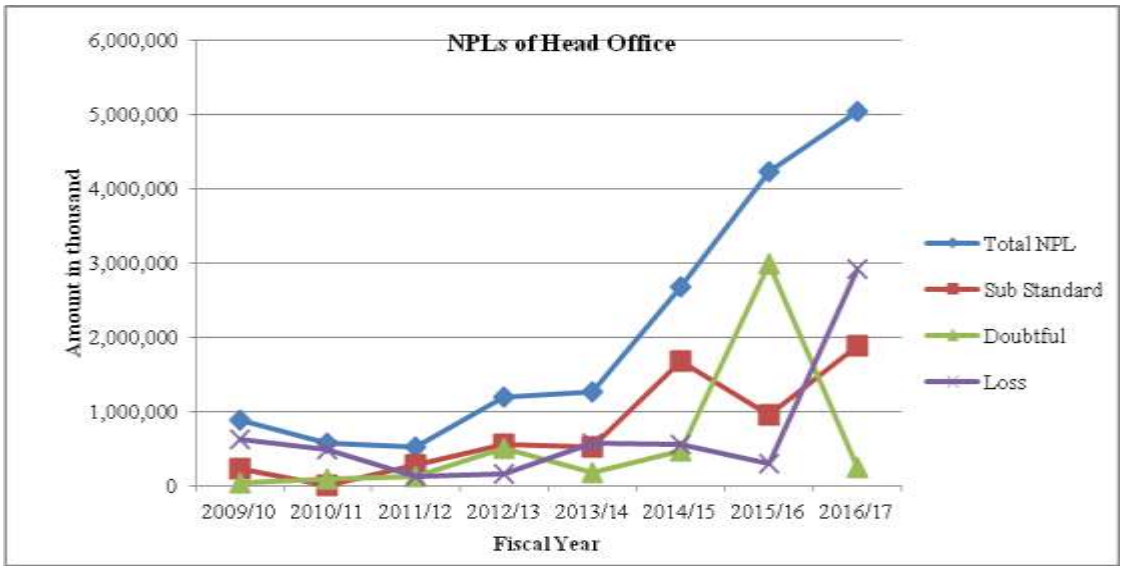
***Source**: annual report of DBE from 2003/04-2016/17 and own computation*

As depicted in the figure above, the largest portion of NPLs lies in the loss category and non-performing loan amounts have increasing trend for the last five years. The amount of NPL in the year 2003/04 was Birr 1.53 billion while it stood at Birr 8.45 billion at the end of June 30, 2017. Simultaneously, the bank's loan portfolio has increased from Birr 2.996 billion to Birr 30.903 billion for the period under review. As of June 30, 2017, from the total nonperforming loans the share of manufacturing was 59% while the share of agriculture was 39%; and out of Birr 8.45 billion (Non-performing loan amount), 36% (it accounts for Birr 3.08 billion) was the contribution of projects financed through second-hand machinery by taking into consideration as equity contribution. Lately, the bank has stopped the consideration of second-hand machineries as an equity contribution and is pending the financing of rain-fed commercial agriculture.

Similarly, at the Head Office, the non-performing was increased from year to year in terms of the amount and number of projects administered at the Head office. For the period under review (2009/102016/17), the total amount of non-performing loans was Birr 887.4 million and 5.03 billion. The trend and status NPLs of the head office for the last 8 years are presented in figure 2.

Figure 2

Non-performing loan of head office by loan status



***Source**: annual report of DBE from 2009/10-2016/17 and own computation*

As depicted in the figure above, the largest portion of NPLs is lies in the substandard category and the amount of non-performing loans has increasing trend for the last six years. The amount of NPL in the year 2009/10 was Birr 887.4 million while it stood at Birr 5.03 billion at the end of June 30, 2017. Simultaneously, the head office loan portfolio has increased from Birr 7.630 billion to Birr 26.538 for the period under review; and the non-performing loan amount of the head office has increased by 467 percent. From this figure, it is clearly understood that the share of non-performing loans of head office is very high which accounts for 60% of NPLs amount of DBE as a whole.

Descriptive Analysis

According to the result obtained from the data, out of the total borrower respondents, 64 (80%) of them were male and the remaining 16 (20%) were female. Out of 40 project loan defaulters, of which 32 (80%) are male while 8(20%) of them are females. The relationship between the dependent variable which is default status and the explanatory variable (sex) is insignificant at a five percent of significant level as it can be evidenced by the chi2 test.

Table 1

Demographic characteristics of respondents

Variable		Number	Percent	Loan repayment status				Chi2 test
				Non-defaulter		Defaulter		
				Number	Percent	Number	Percent	
Sex	Male	64	80	32	80	32	80	1.00
	Female	16	20	8	20	8	20	
Total		**80**	**100**	**40**	**100**	**40**	**100**	

Source: Own computation

According to the result obtained from the data, out of the total borrower respondents 64 (80%) of them were private limited companies while 12 (15%), 2 (2.5%), and 2 (2.5%) of them were a sole proprietorship, share companies and (other) public enterprises respectively. With respect to educational background, 21(21%) and 47 (59%) of them were second and first-degree holders. Whereas, 12 (15%) of them were grade 12 and below completers. In terms of project sectors, borrowers are engaged, 52 (65%) were manufacturing projects while 16 (20%) were commercial agricultural projects. The remaining 12 (15%) respondents were engaged in the agro-processing sector.

Table 2

Socio-economic characteristics of respondents

Variable		Number	Percent	Loan repayment status				Chi2-test
				Non-defaulter		Defaulter		
				Number	Percent	Number	Percent	
Level of education	Masters	21	26.25	10	25	11	27.5	0.966
	Degree	47	58.75	24	60	23	57.5	
	12 completed and below	12	15	6	15	6	15	
Project sector	Manufacturing	52	65	25	62.5	27	67.5	0.436
	Agro-processing	12	15	8	20	4	10	
	Commercial agriculture	16	20	7	17.5	9	22.5	
Legal form of the project	Sole proprietorship	12	15	2	5	10	25	0.022
	PLC	64	80	34	85	30	75	
	Share company	2	2.5	2	5	0	0	
	Other	2	2.5	2	5	0	0	

Source: Own computation

As can be seen from above Table 2, out of 40 project loan defaulters, 11(27%) of them were masters holders, 23(58%) of them were first-degree holders and 6(15%) of the respondents has completed 12 complete and below schooling. On the other hand, 30 (75%) of them were private limited companies while the remaining 10 (25%) of them were sole proprietorships. Moreover, 27 (68%) of them engaged in the manufacturing sector while the remaining 4 (10%) and 9 (22%) of them engaged in agro-processing and commercial agriculture sectors respectively. When we look at the relationship between the dependent variable which is defaulting status and the explanatory variables (level of education, project sector, and legal form of the project); the Legal form of the project is significant at a five percent of significant level for as it can be evidenced by the chi2 test while the remaining two explanatory variables are statistically insignificant.

Thus, the result of the survey regarding socio-economic characteristics of borrowers shows that the majority of default borrowers of the head office were Plc.'s. From those who are under sole proprietorship, most defaulters were male. Generally speaking, it is clear that education matters for project loan performance but the majority of defaulters were first-degree and above holders.

On the other hand, the manufacturing sector accounts the lion share and is followed by commercial agriculture with respect to project loan default.

The summary statistics for continuous variables for 80 respondents is presented in Table 3. The result shows that the mean age, project manager experience (in the year), project manager relevant experience (in the year), loan processing time (in the month), approved amount (in Birr), grace period (in the year), project location (in Km) and proportion of local market (in percentage), of respondents, was 45, 14, 10, 8, 222 million, 2.2, 65 and 68 respectively. When we look at the result of minimum and maximum data, the minimum age, project manager experience (in the year), project manager relevant experience (in the year), loan processing time (in the month), approved amount (in Birr), grace period (in the year), project location (in Km) and proportion of local market (in percentage) of respondents was 20, 4, 2, 1, 24.9 million, 0.5, 0 and 0 while the maximum was 70, 30, 25, 18, 1.69 billion, 5, 750 and 100 respectively.

Table 3

Summary statistics for continuous variables

Loan Status	Stats	Variable							
		Age	**PM Expe.**	**PM R. Ex.**	**Loan processing Time**	**Approved Amount**	**Grace period**	**Project Location**	**Proportion of local Market**
Non defaulter	mean	50.425	13.7576	9.515152	8.625	2.25E+08	2	62.475	65.125
	p50	52	12	8	9	5.83E+07	2	22.5	77.5
	Sd	11.637	5.62933	5.579657	4.532999	4.16E+08	1.047586	114.6263	36.9075
	N	40	33	33	40	40	40	40	40
	Min	20	5	3	1	6087200	0.5	0	0
	Max	70	25	20	18	1.69E+09	5	620	100
Defaulter	mean	39.875	14.1892	10.05405	7.225	2.18E+08	1.6375	66.9	70.775
	p50	45	12	9	7	9.55E+07	1	22.5	83
	Sd	12.005	7.43803	5.92521	3.109023	3.43E+08	0.847224	155.1193	33.91429
	N	40	37	37	40	40	40	40	40
	Min	20	4	2	1	249000	0.5	0	0
	Max	70	30	25	17	1.50E+09	4	750	100
Total	mean	45.15	13.9857	9.8	7.925	2.22E+08	1.81875	64.6875	67.95
	p50	48	12	8	7	6.92E+07	1.8	22.5	80
	Sd	12.891	6.60367	5.729658	3.925815	3.79E+08	0.964049	135.5363	35.33202
	N	80	70	70	80	80	80	80	80
	Min	20	4	2	1	249000	0.5	0	0
	Max	70	30	25	18	1.69E+09	5	750	100

Source: Own computation

Project management and the number of projects administered by promoters:

According to the result obtained from the data, out of the total borrower respondents 70 (88%) of them were hired project managers while 10 (12%) were not. With respect to the educational background of project managers, 53 (76%) and 17 (24%) of them were first- and second-degree holders respectively. With respect to the number of projects administered by promoters, 42 (53%) of them were engaged in the administration of two or more projects and 21 (50%) of them were separate entities while the remaining were not, and 29 (69%) of them said that the controlling

mechanism is the same while the remaining is different. Whereas, 38 (47%) of them were engaged in the administration of one project.

Table 4

Project management and number of projects administered by promoters

Variable		Number	Percent	Loan repayment status				Chi2-test
				Non-defaulter		Defaulter		
				Number	Percent	Number	Percent	
Promoters who hired project manager or not	No	10	12.5	7	17.5	3	7.5	0.176
	Yes	70	87.5	33	82.5	37	92.5	
Project manager's level of education	Masters	17	24.29	8	20	9	22.5	0.994
	Degree	53	75.71	25	62.5	28	70	
Number of projects administered	Two or more project	42	52.5	18	45	20	50	0.654
by the promoter	Only one project	38	47.5	22	55	20	50	
Are they separate entity for the promoter who owns more than one project	No	21	50	14	35	7	17.5	0.064
	Yes	21	50	8	20	13	32.5	
Controlling mechanism of project promoters who owned more than one project	No	13	30.95	5	12.5	8	20	0.227
	Yes	29	69.05	17	42.5	12	30	

Source: Own computation

As can be seen from above Table 4, out of 40 project loan defaulters, 37(92%) were hired as project manager while the remaining 3(8%) were not. With respect to project manager level of education, 28(76%) of them hired BA/BSc degree holders while 9(24%) of them hired master's degree

holders. On the other hand, 20 (50%) of them are engaged in two or more projects while the remaining 20 (50%) of them are engaged only in one project. When we look at the relationship between the dependent variable which is default status and the explanatory variables mentioned in table 4 are insignificant at a five percent of significant level as it can be evidenced by the chi2 test.

On the other hand, out of the total borrower respondents, 10 (12%) were not hired, project managers. From open-ended questions, 10 responses were obtained regarding the reason for not hiring a project manager. The major reasons were the project owners believe that they can manage and or handle the project properly which accounts for 50 percent of the total response. Whereas, educated/experienced shareholders act as project manager and the remuneration requested by the project manager were the remaining responses they account for 30 and 20 percent of the total response respectively.

Source of finance and financing institution:

According to the result obtained from the data, out of the total borrower respondents, 5 (12) of them borrowed bank loans only for the establishment of projects while 37 (88%) of them established projects with both equity contributions and bank loans. When we look at financing institutions, 37 (88%) of them have borrowed from DBE and the remaining 5 (12%) of them financed by co-financing (joint financing of DBE & other institutions). With respect to the ownership of the bank, 51 (64%) of them prefer state-owned banks while 29 (36%) of them prefer private banks is presented in Table 5.

The bank charges interest rate of 12% per annum on the outstanding loan balance for all projects under the implementation stage and for projects who do not meet the entered agreement. However, the bank provides interest incentives of 3% and 3.5% off, for projects engaged in export; and import substitution & farming produce used for direct and indirect export such as cotton, leather processing, rice, sesame, coffee, and soya beans commercial farms respectively. Interest accrued on loans shall be paid within a maximum of four (4) months (DBE, 2017). Currently, DBE's lending rate is the lowest when it is compared to the average lending rate in the banking industry, which is more than 16% per annum. In this regard, out of 80 respondents 68 (85%) of them said that the bank charges lower interest while 12 (15%) of them said that the bank charges higher interest when it is compared to other banks, and 60 (75%) of them said that the bank charges

similar interest rate while 20 (25%) of them said that the bank charges different interest rate when it is compared to other sectors the same result is presented in Table 5.

Table 5

Source of finance and financing institution

Variable		Number	Percent	Loan repayment status				Chi2 test
				Non-defaulter		Defaulter		
				Number	Percent	Number	Percent	
Source of finance	Bank loan	5	11.9	2	5	3	7.5	0.555
	Both	37	88.1	20	50	17	42.5	
Financing institutions	DBE	37	88.1	19	47.5	18	45	0.716
	Co-financing	5	11.9	3	7.5	2	5	
Bank ownership structure	No	29	36.25	11	27.5	18	45	0.104
	Yes	51	63.75	29	72.5	22	55	
Bank charges higher interest rate compared to other banks	No	68	85	31	77.5	37	92.5	0.06
	Yes	12	15	9	22.5	3	7.5	
Bank charges higher interest rate to compared to other sectors	No	60	75	29	72.5	31	77.5	0.606
	Yes	20	25	11	27.5	9	22.5	

Source: Own computation

Eligibility criteria and documents required by the bank:

According to the result obtained from the data, out of the total borrower respondents 73 (91%) of them knew the bank's eligibility criteria. Whereas, 7 (9%) of them don't know the bank's eligibility criteria. Regarding the flexibility of the bank's credit policy, 60 (75%) of them thought that the bank's credit policy is not flexible to accommodate the dynamic nature of projects while 20 (25%) of them thought that the bank's credit policy is flexible enough.

As per the bank's loan application check list, all applicants are required to submit a feasibility study which is conducted by a licensed consulting firm but most of the project promoters don't comply with it. Accordingly, all sampled respondents submitted a feasibility study during the loan application stage. Out of the total respondents, 3 (4%) of them submitted a feasibility study conducted by a licensed consulting firm while 77 (96%) of them were not, and 42 (53%) of them were Tot involved in the feasibility study while 38 (47%) of them were involved in the feasibility study as it is presented in Table 6.

Table 6

Eligibility criteria and documents required by the bank

Variable		Number	Percent	Loan repayment status				Chi2 test
				Non-defaulter		Defaulter		
				Number	Percent	Number	Percent	
Promoters who know the bank's eligibility criteria	No	7	8.75	2	5	5	12.5	0.235
	Yes	73	91.25	38	95	35	87.5	
Flexibility of bank's credit policy	No	60	75	30	75	30	75	1.00
	Yes	20	25	10	25	10	25	
Promoters who submitted a feasibility study	Yes	80	100	40	100	40	100	-
Promoters who prepared feasibility study by consulting firm	No	77	96.25	37	92.5	40	100	0.077
	Yes	3	3.75	3	7.5	0	0	
Promoters who involved in a feasibility study	No	42	52.5	13	32.5	29	72.5	0.000
	Yes	38	47.5	27	67.5	11	27.5	

Source: Own computation

As can be seen from above Table 4.6, out of 40 project loan defaulters, 35(87%) of them knew the bank's eligibility criteria while 5 (13%) of them did not. With respect to the bank's credit policy

flexibility, 30 (75%) of them said that the bank's credit policy is not flexible while the remaining 10 (25%) of them said that the bank's credit policy is flexible; and 40 (100%) of them submitted feasibility study but not conducted by the licensed consulting firm. On the other hand, 29 (73%) of them are not involved in the feasibility study and the remaining 11(27%) of them are involved.

Loan processing and approval:

The Bank extends investment credit to creditworthy borrowers and projects that have received a thorough appraisal and are found to be financially and economically viable and socially desirable. Accordingly, DBE extends long and medium-term loans as well as short-term working capital loans with a debt-equity ratio of 75:25 and 50:50 for new loans for local and foreign investors respectively, and 60:40 for expansion loans. The bank extends permanent working capital loans along with the investment loan as a package but when deemed necessary the bank extends short-term working capital loans for its borrowers (DBE, 2017). Accordingly, out of the total respondents, 57 (71%) of them has taken new loans, 18 (23%) of them has taken expansion loan and the remaining 2 (3%), 1 (1%), and 2 (2%) of them has taken a combination of new & expansion, new & working capital, and new, expansion & working capital respectively as presented in Table 7.

The loan processing is a period covering from the date of application receiving until equity blocking. The major activities conducted by the bank during loan processing time are loan application receiving, document screening, due diligence or KYC, project appraisal, loan approval, loan contract signing & registration, and equity blocking. As per the bank's BPR document, the average loan processing time is 32 days (DBE, 2009). Accordingly, out of the total respondents, 74 (93%) of them believed that the bank takes significant loan processing time while 6 (7%) of them did not; and as per this study, the survey result the average loan processing time was 7.9 months.

With respect to the approved amount, the mean approved amount was Birr 222 million while the minimum and maximum amount of loan approved by the bank is Birr 24.9 million and 1.69 billion respectively. Out of 80 respondents 52 (65%) of them said that the approved amount was not

sufficient and the rest 28 (35%) of them said that the approved amount was sufficient for their project performance as presented in Table 7.

Table 7

Loan processing and approval

Variable		Number	Percent	Loan repayment status				Chi2 test
				Non-defaulter		Defaulter		
				Number	Percent	Number	Percent	
Type of loan	New	57	71.25	26	65	31	77.5	0.676
	Expansion	18	22.5	11	27.5	7	17.5	
	New and expansion	2	2.5	1	2.5	1	2.5	
	New and working	1	1.25	1	2.5	0	0	
	New, expansion and working	2	2.5	1	2.5	1	2.5	
Loan processing time takes a significant time	No	6	7.5	4	10	2	5	0.396
	Yes	74	92.5	36	90	38	95	
Approved loan amount is sufficient	No	52	65	27	67.5	11	27.5	0.000
	Yes	28	35	13	32.5	29	72.5	
Have utilized the approved loan amount properly	Yes	80	100	40	100	40	100	-

Source: Own computation

Project Implementation

According to the result obtained from the data, out of the total respondents, 61 (76%) of them said that project implementation is not completed as per the stipulated plan. Whereas, 19 (24%) of them said that project implementation is completed as per the scheduled plan as presented in Table 8.

A grace period is a time in a project's life when a borrower may not be required to make a principal loan repayment. The Bank may give its clients a maximum grace period that involves a period of implementation up to the commencement of operation and the grace period shall not exceed 5 years. However, the maximum grace period for tree fruits shall be 6 years (DBE, 2017). According to the survey result, 44 (55) of them believe that the bank gives a sufficient grace period while 36 (45%) of them do not; and the average grace period of respondents is 2.2 years. The maximum grace period given is 5 years while the minimum grace period is 6 months.

Table 8

Project Implementation

Variable		Number	Percent	Loan repayment status				Chi2 test
				Non-defaulter		Defaulter		
				Number	Percent	Number	Percent	
Projects whose implementation schedule is completed as per the plan	No	61	76.25	0	0	40	100	0.000
	Yes	19	23.75	40	100	0	0	
The bank gives a sufficient grace period	No	36	45	39	97.5	32	80	0.013
	Yes	44	55	1	2.5	8	20	
Whose projected cash flow alliance with loan repayment frequency	No	33	41.25	12	30	21	52.5	0.041
	Yes	47	58.75	28	70	19	47.5	

Source: Own computation

Project location, market, and follow-up:

According to the result obtained from the data, out of the total borrower respondents 70 (88%) of them believed that the project location is suitable for project performers. Whereas, 10 (12%) of them said that the project location is not suitable for project performers. With respect to project location accessibility for marketing and marketing problems, 71(89%) of them said that project

location is accessible for marketing and 58 (73%) of them said that hasn't faced marketing problems. Regarding the target market of the project, 33 (41%) of them produce only for the local market and 6 (8%) of them produce only for the export market while the remaining 41 (51%) of them produce for both markets as presented in Table 9.

Table 9

Project location, marketing, and follow up

Variable		Number	Percent	Loan repayment status				Chi2 test
				Non-defaulter		Defaulter		
				Number	Percent	Number	Percent	
The project location is suitable for project performers	No	10	12.5	2	0.05	8	0.2	0.043
	Yes	70	87.5	38	0.95	32	0.8	
The target market of the project	Local	33	41.25	14	0.35	19	0.475	0.440
	Export	6	7.5	4	0.1	2	0.05	
	Both	41	51.25	22	0.55	19	0.475	
The project location is accessible to the market	No	9	11.25	2	0.05	7	0.175	0.077
	Yes	71	88.75	38	0.95	33	0.825	
Projects who faced marketing problems	No	58	72.5	29	0.725	29	0.725	1.000
	Yes	22	27.5	11	0.275	11	0.275	
The bank conducts regular follow up	No	11	13.75	3	0.075	8	0.2	0.105
	Yes	69	86.25	37	0.925	32	0.8	

Source: Own computation

Econometrics Analysis

This part of the thesis attempts to explain the relationship between the dependent variable which is project loan status and independent variables which include sector, the form of organization, number of projects, ownership impact, eligibility criteria, credit policy, involved feasibility, type of loan, time is taken, approved amount, sufficiency, grace period cash flow, interest bank, project location, suitability, targeted market, proportion local, market accessibility, marketing problem,

and follow-up & supervision works. The econometrics analysis is carried out to identify the significance of variables as well as to evaluate the cause-effect relationship between the dependent variable and explanatory variables in a particular study. In this case, statistical inference can be undertaken, unlike descriptive analysis. Thus, this thesis has done probit regressions to answer the research questions. All post-estimation tests are satisfied.

The dependent variable, project loan default, is a dummy variable and hence, the study uses a probit model. The probit model provided a means to examine the probability of certain events occurring given a particular set of conditions or range of explanatory variables. The estimated probit model can be used to predict the probabilities of change in the dependent variable over a range of independent variable values (Verbeke, Ward and Viaene, 2000). The impact individual explanatory variables had on project loan status can be evaluated through the probit model as follows:

Table 10

Probit regression for the determinants of project loan default

Variables	dy/dx	Coef.	Std. Err.	z	P>z
Sector	-0.055144	-0.14224	0.4123865	-0.34	0.73
Form of organization	-1.732541	-4.46908	1.455208	-3.07	0.002
Number of projects administered by project owners	-0.367542	-0.97885	0.8336362	-1.17	0.24
Bank Ownership Impact	0.645789	1.853124	0.9801641	1.89	0.059
Eligibility Criteria of the Bank	-0.516343	-3.22521	1.878795	-1.72	0.086
Credit Policy	0.413064	1.264282	0.9602828	1.32	0.188
Involvement of project owners in the feasibility study	-0.967562	-4.31461	1.507603	-2.86	0.004
Type of loan	-0.280846	-0.72444	0.4820481	-1.5	0.133
Loan processing time taken	-0.098404	-0.25383	0.1240462	-2.05	0.041
Approved amount	1.13E-09	2.9E-09	1.4E-09	2.08	0.037
Grace period	-0.653796	-1.68646	0.7869563	-2.14	0.032
Project cashflow	-0.167339	-0.4392	0.7836471	-0.56	0.575
Interest rate	-0.158128	-0.40096	1.669208	-0.24	0.81
Project location	-0.000208	-0.00054	0.0020288	-0.26	0.791
Suitability of project location	-0.677314	-5.59679	2.62423	-2.13	0.033
Targeted market	0.488398	1.25982	0.7725572	1.63	0.103
Proportion local market	-0.003543	-0.00914	0.0163656	-0.56	0.577
Market accessibility of project location	0.061912	0.157833	2.081177	0.08	0.94
Marketing problem	-0.292569	-0.75246	0.8845368	-0.85	0.395
Follow_up and supervision	-0.591882	-3.44363	7.045306	-0.49	0.625
_cons		24.83576	10.58048	2.35	0.019

Source: Own computation

Significance of explanatory variables: As can be seen from Table 4.11, the variables “form of organization”, “involved feasibility", "time taken", "approved amount", "grace period" and "suitability" are statistically significant because their respective p-values are less than 5%, the level of significance. While the rest of the variables are statistically insignificant in the model since their respective p-values are beyond a 5%, level of significance.

Form of organization: affects defaulting status of the projects negatively at 5% of the level of significance. The marginal effect shows that the predicted probability of defaulting is 1.73 less for

sole proprietorships than for private limited companies holding another constant. The project promoters organized under private limited companies have a high probability of defaulting and the same was confirmed by Seyoum, *et.al,* (2016).

Involvement of project owners in the feasibility study: affects defaulting status of the projects negatively at 5% of the level of significance. The marginal effect shows that the predicated probability of defaulting is 0.97, when the defaulting status changes from zero to one, the probability for the involvement of project owners in the feasibility study taking the value one rises by 97 percent. As per the bank's check list loan applicants are required to submit a feasibility study conducted by the consulting firm (DBE, 2017) but in most cases, the involvement of project owners in the feasibility study and the capacity of consulting firms is not checked by the bank.

Time taken: affects defaulting status of the projects negatively at 5% of the level of significance. The marginal effect shows that the predicated probability of defaulting is 0.098. If the average loan processing time of a borrower goes up by a day, the probability of the variable loan processing time taking the value one rises by 10 percent. As per the bank's BPR document, the average loan processing time is 32 days (DBE, 2009). However, the result of this study shows that the mean loan processing time is 7.9 months. The bank is taking significant time for loan processing and affected the success rate of projects negatively.

Loan Approved Amount: affects defaulting status of the projects positively at 5% of the level of significance. The marginal effect shows that the predicted probability of default is 0.00. If the average approved amount of a borrower goes up by a million Birr, the probability for the variable approved amount taking the value one less by 0.0 percent. This indicates that defaulters are getting less amount of loans than non-defaulter or the approved loan amount is not sufficient for project implementation and operation when it is compared to non-defaulters.

Grace period: affects defaulting status of the projects negatively at 5% of the level of significance. The marginal effect shows that the predicted probability of default is 0.65. If the average grace period of a borrower goes up by a year, the probability for the variable grace period taking the value one is less by 65 percent. The bank gives its clients a maximum of 5 years grace period for all projects and 6 years for tree fruit projects (DBE, 2017). As per the result obtained, the mean grace period of respondents is 2.2 years. However, the mean grace period of defaulters is less than

0.36 for non-defaulters. This clearly indicates that providing insufficient grace period is a factor in project loan default.

Suitability: affects defaulting status of the projects negatively at 5% of the level of significance. The marginal effect shows that the predicted probability of default is 0.68, when the defaulting status changes from zero to one, the probability for the suitability of project location for project performers taking the value one rises by 68 percent.

Among the statistically significant variables, the variable form of organization involved feasibility (involvement of project owners in the feasibility study) and suitability (suitability of project location) are the promoter and or project-related factors, while the time taken (loan processing time), approved amount and grace period are bank related factors.

From the findings, it can be further deduced that the form of organization, involvement of project owners in the feasibility study, suitability of project location, loan processing time, approved amount, and grace period significantly affect project loan default. According to Seyoum *et. al,* (2016), study results on bank and customer-specific factors affecting nonperforming loans of the DBE central region, the loan approval process, and the amount of loan approved by the bank were the causes for the occurrence of NPLs in the region.

Conclusion and Recommendations

The broad objective of this research was to identify determinant factors of project loan default in the case of the DBE Head office. Based on the broad objective specific objectives and research questions were developed. To achieve this objective, the study has used mixed research approaches whereby descriptive, quantitative (econometrics), and qualitative approaches were blended; and the study used a structured questionnaire that was dispatched to the borrowers of the bank; and annual reports & publications of the bank. The results showed that based on the respondents' view it was evident that the most likely factors that affect occurrences of project loan default in the DBE Head office are presented in the following paragraphs.

The average ratio of non-performing loans in the bank for the last fourteen years was 22.9% which is greater than the acceptable standard of 15% of the total loan outstanding set by the Association of African Development Finance Institutions while the average ratio of non-performing loans in

the Head office for the last eight years was 10% which is within the acceptable standard, however, for the last two years the ratio of nonperforming was beyond the acceptable standard. Empirical evidence shows that NPL is found to be one of the major critical factors that adversely affect asset quality and the overall performance of financial institutions. It results in poor asset quality, undermines the net income, endangers sustainability, tarnish image and reputation, etc. Consequently, it affects banks and the financial system in the economy and the country's economy at large. Understanding the causes of NPLs is crucial for designing appropriate regulatory measures to strengthen the asset quality of the bank.

Thus, the aim of this study was to identify the determinants of project loan default in the case of the Development Bank of Ethiopia's Head office. The study tried to find out project, borrower, bank, and macroeconomic determinant factors of loan default. Among statistically significant variables, the suitability of project location for project performers is project specific factor while the legal form of organization and involvement of the project owner in the feasibility study are borrower-related factors. Whereas, the loan processing time, approved amount, and grace period are bank-related factors causing project loan default in the DBE head office.

Based on the findings of the study the researchers forwarded the following recommendations: The bank should prepare continuous awareness creation forums, promotion, and advertisement regarding its products and eligibility criteria to improve the credit culture of the society in general and potential project investors in particular. The bank should verify the involvement of project owners in the preparation of the feasibility study and have a clear understanding of the intended project. The bank should put in place appropriate and transparent loan processing time. The bank should approve sufficient loan amounts and needs to make sure that the extended loans are being used for the intended purpose through enhanced timely credit monitoring before subsequent disbursement is made. The bank should take precaution measures before extending credit facilities regarding the legal form of organization, and suitability of project location for project performers. The bank should provide appropriate grace period. This study tries to identify the project, borrower, bank, and macroeconomic factors affecting project loan default in the case of DBE head office using selected variables. However, there are so many variables that were not included in this study. Thus, the study might be used as a reference for further research.

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